



COSM 2025

May 17-18, 2025

**Hyatt Regency New Orleans
New Orleans, LA**

PROGRAM GUIDE



Kevin Welch, MD,
FACS, FARS

Presidential Welcome to the ARS at COSM 2025

Welcome to New Orleans for the 2025 ARS at COSM meeting!



Over the weekend, plan to hear some of the most advanced research in rhinology be presented by our ARS members and by colleagues from around the world. Please reach out to and congratulate our President-Elect and Program Chair Dr. Amber Luong for her diligent work in constructing a fantastic scientific meeting and series of panels.

Our Board of Directors meeting will take place in the evening of May 16th, and we cap the night with our combined poster reception during which you can interact in Elite Hall with our poster presenters and colleagues. We kick off the official meeting on Saturday, May 17th, and again feature the best of the best: our Top Basic Science and Top Clinical abstracts. Look for panels on the role of AI in rhinology and Entrepreneurship. An afternoon of breakouts will highlight more scientific research as well as panels on epigenetics, AFS, skull base approaches and skull base care. After the meeting ends on Saturday evening, plan to join us at the President's Reception at 5:30 PM.

We start Saturday, May 18th with the Women in Rhinology Breakfast Roundtable. To follow will be presentations on clinical rhinology as well as panels on immunomodulators, cybersecurity, and coding pearls and pitfalls.

As always, COSM marks the midpoint of one's presidency and an opportunity to look behind to see all that the ARS has accomplished and changed as well as an opportunity to gain a glimpse of the bright future rhinology has. I have been mentored by amazing rhinologists, and I have had the honor of training incredible rhinologists over the years. I have also had the distinct pleasure of learning from my colleagues and building life-long relationships with them. The ARS is a world leader in rhinologic education and research. Our outreach with international societies continues to grow and make gains. Our involvement in education and research around the globe continues to expand. This growth is because our members are ambitious and bold. It is a gift to be so involved with this society.

I hope you enjoy New Orleans and the meeting, and I am looking forward to seeing you at the meeting.

Kevin C. Welch, MD, FACS, FARS
President, American Rhinologic Society



ARS Spring Meeting at COSM - Welcome! from the President-Elect & Program Chair



Amber Luong, MD,
PhD, FARS

It is with great enthusiasm that I welcome you to the 2025 American Rhinologic Society Spring Meeting, taking place in the vibrant city of New Orleans. Held in conjunction with the Combined Otolaryngology Spring Meetings (COSM), this annual gathering is one of our most anticipated events—a time for learning, collaboration, and connection.

Each year, the ARS Spring Meeting reflects the remarkable momentum within our field. This year, we were thrilled to receive 248 abstract submissions—a significant increase over last year. The result is a dynamic and diverse program that includes 76 oral presentations and more than 170 posters, showcasing the cutting edge of rhinologic science and clinical care.

Our two-day meeting is thoughtfully designed to maximize learning while preserving time for meaningful connection. Saturday will feature a full day of sessions, culminating in the always-popular President's Reception—a perfect chance to reconnect with friends and colleagues. The meeting concludes at noon on Sunday, giving everyone the opportunity to travel home with time to reset before the new week begins.

This year's educational offerings include eight engaging panel discussions covering a wide range of topics, from artificial intelligence and immunomodulation to skull base techniques and perioperative care. We're especially excited to feature a fireside keynote conversation on the critical topic of **cybersecurity in healthcare**, with expert insight from Terry Ray, Vice President of Product Strategy of Varonis (a leading enterprise data security software company), and AAO-HNS Past President Gavin Setzen. Together, they'll explore the increasing threat of ransomware, patient data vulnerabilities, and the implications for our practices.

In addition to scientific programming, we are proud to highlight sessions hosted by our ARS member sections:

- **Women in Rhinology (WiR)** will lead a breakfast roundtable exploring career development and mentorship.

- **Skull Base and Orbital Surgery (SBOS)** will present a focused session on building a career in skull base surgery—especially helpful for our early-career members.

Beyond the meeting rooms, New Orleans provides an unforgettable setting. Whether you're savoring the city's iconic cuisine, exploring the French Quarter, or simply enjoying the music that spills into the streets, I hope you'll take time to experience the culture and history that make this city so special.

Personally, what I value most about the ARS Spring Meeting is the opportunity to engage with our remarkable community—catching up with old friends, building new collaborations, and finding inspiration in the work we all do. What's your favorite part?

Thank you for being part of this year's meeting. I look forward to seeing you in New Orleans and to another memorable and meaningful gathering.

ARS at COSM 2025 Program Committee

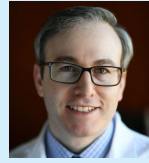
Amber Luong, MD, PhD, FARS
Program Chair

Kevin Welch, MD, FARS
Angela Donaldson, MD, FARS
Marc Dubin, MD, FARS
Christopher Ito, MD, FARS
Edward Kuan, MD, FARS
R. Peter Manes, MD, FARS
Jose Mattos, MD
Mickey Stewart, MD, FARS
Kevin Welch, MD, FARS

American Rhinologic Society Executives - 2025



Kevin Welch, MD, FARS
President
Northwestern University
675 N. St Clair Street
Suite 15-200
Chicago, IL 60611
Tel: 312-695-3115
Email: kcwelchmd@gmail.com



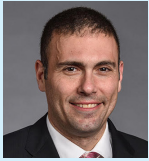
Benjamin Bleier, MD, FARS
Treasurer
Massachusetts Eye and Ear Infirmary,
Harvard Medical School
243 Charles St
Boston, MA 02114
Tel : 617-573-6966
Email: benjamin_bleier@meei.harvard.edu



Amber Luong, MD, PhD, FARS
President-Elect
McGovern Medical School at the
University of Texas Health Science
Center
6431 Fannin Street
MSB 5.036
Houston, TX 77030
Tel: 713-500-5421
Email: amber.u.luong@uth.tmc.edu



Pete Batra, MD, FARS
Past President
Rush University Medical Center
1611 W. Harrison Street, Suite 550
Chicago, IL 60612
Tel: 312-942-7182
Fax: 312-942-6653
Email: pete_batra@rush.edu



Marc Dubin, MD, FARS
First Vice President
Centers for Advanced ENT Care –
ENT Associates at GBMC
6565 N. Charles Street, Suite 601
Baltimore, MD 21204
Tel: 410-821-5151
Email: mdubin@cadentcare.com



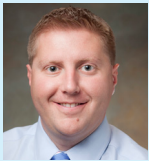
Michael Stewart, MD, FARS
Executive Vice President
Weill Cornell Medical College
575 Lexington Avenue
New York, NY 10022
Tel: 646-962-4777
Fax: 646-962-0388
Email: mgs2002@med.cornell.edu



Jivianne Lee, MD, FARS
Second Vice President
UCLA Medical Center
1131 Wilshire Boulevard
Santa Monica, CA 90401
Tel: 424-259-6559
Email: jtleee@mednet.ucla.edu



Brent Senior, MD, FARS
VP Development & Strategic Initiatives
UNC School of Medicine
Physician's Office Building, G-190
170 Manning Drive, CB#7070
Chapel Hill, NC 27599
Tel: 919-966-3344
Fax: 919-966-7941
Email: Brent_Senior@med.unc.edu



R. Peter Manes, MD, FARS
Secretary
Yale School of Medicine
800 Howard Avenue, 4th Floor
New Haven, CT 06519
Tel: 203-785-5430
Email: rpeter.manes@yale.edu



Wendi Perez
Executive Administrator
2820 N. Pinal Avenue
Suite 12, #615
Casa Grande, AZ 85122
Tel: 973-545-2735 x4105
Fax: 862-322-8039
Email: wendi@american-rhinologic.org

ARS Board of Directors



Seth Brown, MD,
FARS



Jean Kim, MD,
FARS



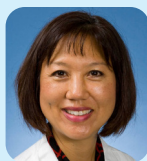
Nyall London,
MD, FARS



Elina Toskala,
MD, FARS



Eric Wang,
MD, FARS



Marilene Wang,
MD, FARS



Edward Kuan,
MD, FARS



Timothy Smith,
MD, FARS,
(Editor in Chief, IFAR)

ARS Consultants to the Board



Anthony Del Signore,
MD, FARS



Elisa Illing,
MD, FARS



Bobby Tajudeen,
MD, FARS

ARS Staff



Wendi Perez
Executive Administrator



Susan Arias
Development Liaison



Tammy Lorimer
*Office Coordinator/
Administrative Assistant*

ARS Committee Chairs



AUDIT
Nyal London,
MD, FARS



AWARDS
Jean Kim, MD, FARS



BY-LAWS
Brett Comer,
MD, FARS



CME
Christopher Ito, MD,
FARS



DEVELOPMENT
Brent Senior, MD, FARS



DIVERSITY & INCLUSION
Jose Mattos, MD, FARS



**EDUCATION
COORDINATOR**
Raj Sindwani, MD, FARS



**EDUCATION
INNOVATION**
Ashleigh Halderman, MD,
FARS



ETHICS
Kristine Anne Smith,
MD, FARS



FELLOWSHIP
Stacey Gray, MD, FARS



HISTORIAN
Michael Benninger, MD,
FARS



**INTERNATIONAL
COMMITTEE**
Do-Yeon Cho, MD, FARS



**INFORMATION
TECHNOLOGY**
Chirag Patel, MD, FARS



**LIVE & ANCILLARY
COURSES**
Angela Donaldson, MD,
FARS



MARKETING
Sanjeet Rangarajan, MD,
FARS



MEMBERSHIP
Daniel Beswick, MD, FARS



MENTORSHIP
Murugappan Ramanathan,
Jr., MD, FARS



NEWSLETTER
Arthur Wu, MD, FARS



ONLINE EDUCATION
Theodore Schuman, MD,
FARS



PATIENT ADVOCACY
Toby Steele, MD, FARS



**PEDIATRIC
RHINOLOGY**
Chadi Makary, MD, FARS



QUALITY IMPROVEMENT
Christopher Roxbury,
MD, FARS



RESEARCH
Vijay Ramakrishnan, MD,
FARS



**RESIDENT/FELLOWS
IN TRAINING**
Nicholas Rowan, MD

ARS Section Chairs



**ALLERGY IN
RHINOLOGY SECTION**
Chadi Makary, MD, FARS



**RHINOLOGISTS IN
PRIVATE PRACTICE
SECTION**
Douglas Reh, MD, FARS



**SKULL BASE & ORBITAL
SURGERY SECTION**
Garret Choby, MD, FARS



**WOMEN IN RHINOLOGY
SECTION**
Devyani Lal, MD, FARS

ARS Mission Statement

The American Rhinologic Society's mission is to serve, represent and advance the science and ethical practice of rhinology. The Society promotes excellence in patient care, research and education in Rhinology and Skull Base Disorders. The American Rhinologic Society is dedicated to providing communication and fellowship to the members of the Rhinologic community through on-going medical education, patient advocacy, and social programs. The ARS continuing medical education activities serve to improve professional competence, performance, and promote research.

Business/ACCME

Continuing Education

Accreditation Statement

The American Rhinologic Society (ARS) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

Credit Designation Statement

ARS designates this live activity for a maximum of 9.50 AMA PRA Category 1 Credit(s)[™]. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Learning Objectives from Practice Gaps

At the conclusion of this meeting participants will be able to:

- Discuss the current management paradigm and updated understanding of the pathophysiology of chronic rhinosinusitis and its varying phenotypes and endotypes
- Appraise scientific advances in the understanding of diseases affecting the nose and paranasal sinuses
- Educate attendees on procedure coding and billing guidelines
- Explore the use of emerging technologies, such as artificial intelligence, for use in medicine
- Review and assess recent developments in the pathophysiology and management of smell disorders
- Evaluate evolving therapeutic options for the treatment of rhinologic conditions
- Discuss the role of multidisciplinary teams to improve care for patients afflicted by sinonasal manifestations of systemic disease
- Understand management algorithms for benign and malignant neoplasms of the paranasal sinuses and skull base.

How to Obtain Your CME Certificate

At the conclusion of the meeting, you will be provided with a post-meeting link to claim your CME.

ARS at COSM 2025 - IFAR Peer Review

At IFAR, we aspire to peer review performed with fairness, rigor, and timeliness. Peer review is thankless work and voluntary. Peer reviewers offer criticism and/or praise to challenge thinking, provide honest feedback, and ultimately improve the scientific method. This is a great service to our specialty, the profession of medicine, and to humankind. The editorial board, Associate Editors, and Editors greatly appreciate the below-named individuals for the reviews they submitted in 2024.

*Top reviewers are in bold font. *Three to four reviews. **Five or more reviews.*

-- Timothy L. Smith, MD, Editor, *International Forum: Allergy & Rhinology*

Waleed Abuzeid*
Omar Ahmed**
Saad Alsaleh*
Robert Ameo
Noel Ayoub**
Catherine Banks*
Emily Barrow*
Regan Bergmark
Dan Beswick
Ben Bleier**
Tripti Brar*
Christopher Brook
Kathleen Buchheit
Raewyn Campbell
Anders Cervin
Nikita Chapurin
Nipun Chhabra
Do-Yeon Cho**
Garret Choby
Naweed Chowdhury
Andy Chua*
Emily Cope
John Craig*
Cecelia Damask
Greg Davis
Eugenio De Corso*
Adam S. DeConde*
John DelGaudio*
Alexander Dent
Kara Detwiller
Angela M Donaldson*
Richard Douglas*
Jennifer Douglas
Alexander Duffy
Charles Ebert
Thomas Edwards*
Nyssa Farrell
Elisabeth Ference**
Jakob Fischer*
Adam Folbe
Mathew Geltzeiler
Amarbir Gill
Jessica Grayson
David Gudis
Ralph Abi Hachem
Ashleigh Halderman
Eric Holbrook**

Steven Houser*
Di Huang*
Thomas Hummel*
Kevin Hur
Peter Hwang*
Alfred Illoreta*
Aria Jafari**
David Jang**
Rong-San Jiang*
Yan Jiang
Larry Kalish*
Ashoke Khanwalkar**
Jean Kim*
Daewoo Kim
Raymond Kim
Adam Kimple
Michael Kohanski**
Kenji Kondo**
Edward Kuan
Devyani Lal**
Kent Lam
Basile Landis*
Andrew Lane**
Victoria Lee
John Lee**
Stella Lee**
Robert Lee
Bo Liao
Sandra Lin*
Ryan Little**
Zheng Liu
Patricia Loftus**
Nyall London
Lauren Luk
Amber Luong*
Jess Mace**
Chadi Makary*
Sonya Malekzadeh*
R. Peter Manes**
Sonya Marcus**
Michael Marino**
Jose Luis Mattos**
Alice Maxfield*
Justin McCormick**
Edward McCoul**
Amar Miglani*
Jessa Miller

James Mims**
Jin-Young Min*
Ji-Hun Mo
Sarina Mueller**
Jennifer Mulligan**
Tsuguhisa Nakayama
Gretchen Oakley
Jonathan Overdevest*
Vivek Pandrangi
Zara Patel**
Spencer Payne
Katie Phillips
Michael Platt**
Steven Pletcher
David Poetker
Alkis Psaltis*
Abigail Pulsipher
Murray Ramanathan**
Vinay Rathi
William Reisacher
Charles Riley**
Ryan Rimmer
Barak Ringel
Kenneth Rodriguez
Rebecca Rohde*
Lauren Roland
Brandon Rosvall*
Nicholas Rowan
Christopher Roxbury
Glenis Scadding
George Scangas**
Rod Schlosser
John Schneider**
Ahmad Sedaghat**
Kachorn Seresirikachorn
Hideaki Shiga
Hyun-Woo Shin**
Kristine Smith**
Kornkiat Snidvongs
Zach Soler**
Daniel Spielman
Toby Steele*
Janalee Stokken*
Jeffrey Suh
Yueqi Sun**
Auddie Sweis
Abtin Tabae

Bobby Tajudeen*
Pongsakorn Tantilipikorn**
Brian Thorp*
Charles Tong*
Elina Toskala**
Justin Turner*
Fabiana Valera
Thad Vickery*
Jennifer Villwock*
De Yun Wang*
Marilene Wang*
Eric Wang
Marilene Wang
Alan Workman
Arthur Wu*
Dawei Wu*
Carol Yan**
William Yao
Jing Ye**
Michael Yim
Jonathan Yip
Frederick Yoo**
Shaoqing Yu

IFAR Senior Editor Team
Dan Beswick, MD
Ben Bleier, MD
Do-Yeon Cho
Kara Detwiller, MD
Stacey Gray, MD
Robert Kern, MD
Sandra Lin, MD
Amber Luong, MD, PhD
Edward McCoul
Nicholas Rowan, MD
Rod Schlosser, MD
Ahmad Sedaghat
Zach Soler, MD, MS
Justin Turner MD, PhD
Sarah Wise, MD
Timothy Smith, MD, MPH

2025 Friends in Research Donations

Diamond

Michael Stewart, MD, FARS

Platinum

J. Noble Anderson

Roy Casiano, MD, FARS

Greg Davis, MD, FARS

The Eloy Family Charitable
Fund

Devyani Lal, MD, FARS

Marc Rosen, MD, FARS

Masayoshi Takashima, MD, FARS

Jonathan Ting, MD, FARS

Marilene Wang, MD, FARS

Sarah Wise, MD, FARS

Gold

Omar Ahmed, MD, FARS

Nadeem Akbar, MD

Steven Davis, MD

Charles Ebert, Jr., MD, FARS

Ashoke Khanwalkar, MD, FARS

Corinna Levine, MD, FARS

Micah Likness, MD

Brian Lobo, MD, FARS

Tran Locke, MD, FARS

Chadi Makary, MD, FARS

Amrita Ray, MD, FARS

Jordan Teitelbaum, MD, FARS

Silver

Aria Jafari, MD, FARS

Austin Rose, MD, FARS

Christopher Roxbury, MD, FARS

Bronze

Sanford Archer MD, FARS

Rohit Bawa, MD

Daniel Beswick, MD, FARS

Rohit Garg, MD, FARS

Friend

Carolyn Orgain, MD

Jessica Southwood, MD

As of 4/29/25

ARS at COSM 2025 Scientific Abstract Reviewers

Omar Ahmed, MD, FARS

Yvonne Chan, MD, FARS

Do-Yeon Cho, MD

Garret Choby, MD, FARS

Naveed Chowdhury, MD

Anthony Del Signore, MD, FARS

Kara Detwiller, MD, FARS

Angela Donaldson, MD, FARS

Marc Dubin, MD, FARS

Charles Ebert, Jr., MD, FARS

Nyssa Farrell, MD

Meha Fox, MD, FARS

Mathew Geltzeiler, MD, FARS

Jessica Grayson, MD

David Gudis, MD, FARS

Michael Kohanski, MD, FARS

Edward Kuan, MD, FARS

Christopher Le, MD, FARS

Victoria Lee, MD, FARS

Corinna Levine, MD, FARS

Patricia Loftus, MD, FARS

Nyall London, MD, FARS

Amber Luong, MD, PhD, FARS

Chadi Makary, MD, FARS

R. Peter Manes, MD, FARS

Michael Marino, MD, FARS

Jose Mattos, MD

Daniel O'Brien, MD, FARS

Katie Phillips, MD

Lauren Roland, MD

Nicholas Rowan, MD

Isaac Schmale, MD, FARS

Theodore Schuman, MD, FARS

Kristine Smith, MD, FARS

Stephanie Smith, MD

Bobby Tajudeen, MD, FARS

Dennis Tang, MD, FARS

Arthur Wu, MD, FARS

Carol Yan, MD

William Yao, MD, FARS

PROGRAM AT-A-GLANCE

MEETING HIGHLIGHTS

- 2 days, 2 afternoon breakout sessions
- 76 oral scientific presentations
- Over 170 poster presentations
- Keynote session on Cybersecurity - featuring lessons learned from a recent attack of ENT practice
- Skull Base and Orbital Surgery Section - Breakfast symposium focused on developing an early career skull base practice
- Women in Rhinology Breakfast Roundtable Session
- Maximum of 9.5 AMA PRA Category 1 Credit(s)[™]
- Four 45-min panels highlighting:
 - Artificial Intelligence in rhinology
 - Taking research ideas to products and companies
 - Allergic fungal rhinosinusitis
 - Advances to approaches to skull base outside of the nasal cavity
- Focused panels featuring:
 - Common coding errors
 - Immunomodulators and autoimmune disease; risk of developing CRS?
 - Perioperative care for ESS
 - Environment and epigenetic modifications in CRS

Friday, May 16, 2025

ARS Board of Directors Meeting

1:00 pm – 4:00 pm

Room: Celestin GH

ARS Poster Viewing

9:00 am – 7:00 pm

Elite Hall (Exhibit Hall)

Combined Poster Reception

5:30 pm – 7:00 pm

Elite Hall (Exhibit Hall)

Saturday, May 17, 2025

ARS Poster Viewing

9:00 am – 4:00 pm

Elite Hall (Exhibit Hall)

Saturday, May 17, 2025

Morning Session – Celestin D

8:00 am – 12:00 pm CST

8:00 am – 8:05 am

Welcome

Kevin Welch, MD, FARS, ARS President; Amber Luong, MD, PhD, FARS, ARS President-Elect and Program Chair

Oral Presentations – Top Basic Science

Moderators: Michael Kohanski, MD, PhD, FARS; Edward Kuan, MD, FARS

8:05 am – 8:13 am

Ginsenoside Rb2, TMEM16A channel potentiator: A promising therapeutic strategy for CF sinusitis

Do-Yeon Cho, MD

8:14 am – 8:22 am

Interferon signaling and post-Influenza olfactory dysfunction

Carol Yan, MD

8:23 am – 8:31 am

Chronic rhinosinusitis endotyping insights through factor analysis

Brooke Gleason

8:32 am – 8:40 am

Dupilumab initiation associated with differential gene expression in CRSwNP

Christina Dorismond, MD, MPH

8:41 am – 8:49 am

PM 2.5 associated transcriptional pathways

Rory Lubner, MD

8:50 am – 8:55 am

Q&A

8:56 am – 9:05 am

Awards Ceremony

Jean Kim, MD, PhD, FARS

9:05 am – 9:45 am

PANEL: The role of artificial intelligence in advancing rhinology: Clinical applications and educational transformation

Moderator: Bobby Tajudeen, MD, FARS

Panelists: Edward McCoul, MD, FARS; Zara Patel, MD, FARS; Sanjeet Rangarajan, MD, FARS

9:45 am – 10:15 am

Break with Exhibitors

Oral Presentations – Top Clinical Science

Moderators: Stella Lee, MD; William Yao, MD, FARS

10:15 am – 10:23 am

Initial results of a double-blinded, randomized controlled trial of EDS-FLU for chronic ETD

Arthur Wu, MD, FARS

10:24 am – 10:32 am

Evaluating surgical field clarity and cost in endoscopic sinus surgery

Kurt Mueller, MD

10:33 am – 10:41 am

Characterizing the genomic landscape of sinonasal inverted papilloma

Jacquelyn Callander, MD

10:42 am – 10:50 am

PM2.5 CRS inflammatory endotyping

Daniel Lofgren, DO

10:51 am – 10:59 am

Invention of “smell aids”

Kai Zhao, PhD

11:00 am – 11:05 am

Q&A

11:05 am – 11:55 am

PANEL: Concept to Company: Navigating the Journey from Research to Entrepreneurship

Moderator: Greg Davis, MD, FARS

Panelists: Peter Hwang, MD, FARS; Sujuana Chandrasekhar, MD; Brandon McCutcheon, MD
Supported by the Research Grants Committee and Rhinologists in Private Practice Section

11:55 am – 12:00 pm

Q&A

12:00 pm – 1:00 pm

Lunch with Exhibitors

Saturday, May 17, 2025

Afternoon Session – Celestin D

1:00 pm – 5:00 pm CST

Room Moderator: Chadi Makary, MD, FARS

Scientific Oral Presentations:

Moderators: Naweed Chowdhury, MD; Carol Yan, MD

1:00 pm – 1:06 pm

TRMs, TLS, and type 2 cytokine production in CRSwNP

Tolani Olonisakin, MD, PhD

1:07 pm – 1:13 pm

Nitric oxide synthase expression patterns within the sinonasal tract

W. Jared Martin, BA

1:14 pm - 1:20 pm

Elevation of alarmin cytokines in chronic rhinosinusitis

Sarah Almas, MD

1:21 pm – 1:27 pm

Histopathologic features of eosinophilic vs mixed eosinophilic-neutrophilic chronic rhinosinusitis

Evan Patel, MS

1:28 pm – 1:34 pm

Impact of obesity on the structured histopathology of chronic rhinosinusitis patients

Daniel Ma, BS

1:35 pm – 1:40 pm

Q&A

1:41 pm – 2:04 pm

PANEL: Epigenetic changes in CRS: An unfortunate melding of genetics and environment

Moderator: Devyani Lal, MD, FARS

Panelists: Naweed Chowdhury, MD; Jayant Pinto, MD

Sponsored by the Women in Rhinology Section

Moderators: Victoria Lee, MD, FARS; Nicholas Rowan, MD

2:05 pm – 2:11 pm

ICIs and type 2 inflammatory signatures: Clues on immunologic mechanisms of airway inflammation

Jonathan Zou, BA

2:12 pm – 2:18 pm

Glycosaminoglycans for chronic rhinosinusitis treatment

Fatemeh Zarei Haji Abadi, PharmD

2:19 pm – 2:25 pm

Use of macrolide therapy for the presence of neutrophils on structured histopathology

Alison Yu, MD

2:26 pm – 2:32 pm

Preclinical validation of nasal epithelial stem cell grafting as a therapeutic approach

Do-Yeon Cho, MD

2:33 pm – 2:39 pm

Endoscopic transnasal sphenopalatine ganglion block for chronic craniofacial pain

David Liu, MD, PhD

2:40 pm – 2:45 pm

Q&A

2:45 pm – 3:15 pm

Break with Exhibitors

Moderators: Philip Chen, MD, FARS; Theodore Schuman, MD, FARS

3:16 pm – 3:22 pm

Biomolecular analysis of novel cerebrospinal fluid-specific aptamers

Edward Kuan, MD, FARS

3:23 pm – 3:29 pm

Quantifying eosinophils in sinonasal tissue using optical coherence tomography

Ido Badash, MD

3:30 pm – 3:36 pm

External validation of a diagnostic prediction model for acute invasive fungal rhinosinusitis

Aviv Spillinger, MD

3:37 pm – 3:43 pm

Measuring observer attention to thyroid eye disease: What amount of proptosis is noticeable?

Forrest Fearington, BS

3:44 pm – 3:50 pm

Comparative insights into refractory chronic rhinosinusitis: Next-generation sequencing vs. conventional culture

Emily Moldoff, FNP-C

3:51 pm – 3:57 pm

MRI vs. CT in acute invasive fungal sinusitis: Mapping diagnostic accuracy across sinonasal subsites

Shreya Ramkumar, MD

3:58 pm – 4:04 pm

The use of ChatGPT in shared decision-making in rhinology: A randomized controlled trial

Omer Baker, BS

4:05 pm – 4:10 pm

Q&A

4:11 pm – 4:55 pm

PANEL: Allergic fungal rhinosinusitis: Current and future research directions

Moderator: Lauren Roland, MD

Panelists: Joshua Levy, MD, FARS; Amber Luong, MD, PhD, FARS; Sarah Wise, MD, FARS;

Supported by the Allergy in Rhinology and Women in Rhinology Sections

4:55 pm – 5:00 pm

Q&A

5:00 pm – 5:30 pm

Business Meeting

5:30 pm – 7:00 pm

ARS President's Reception

Room: Empire C

Saturday, May 17, 2025
Concurrent Afternoon Session –
Empire CD
1:00 pm – 5:00 pm CST

Room Moderator: Charles Ebert, Jr., MD, FARS

Moderators: Garret Choby, MD, FARS; Jessica Grayson, MD

1:00 pm – 1:06 pm

Comparison of HPV-positive and HPV-negative sinonasal squamous cell carcinoma

Avraham Adelman, BS

1:07 pm – 1:13 pm

Fine particulate matter exposure and sinonasal malignancy

Zechariah Franks, MD, MPH

1:14 pm – 1:20 pm

Improved survival of HPV-related sinonasal squamous cell carcinoma with chemoradiation treatment

Jamie Oliver, MD

1:21 pm – 1:27 pm

Quality of life among pituitary adenoma patients with & without middle turbinectomy

Narin Nard Carmel Neiderman, MD MSc

1:28 pm – 1:34 pm

Cost implications of moving lumbar drain placement to IR from the OR

Chau Phung, BA

1:35 pm – 1:40 pm

Q&A

1:41 pm – 2:04 pm

PANEL: Variations in perioperative care in endoscopic sinus and skull base surgery: What is the evidence?

Moderator: Edward Kuan, MD, FARS

Panelists: Mindy Rabinowitz, MD, FARS; Christopher Roxbury, MD, FARS; Eric Wang, MD, FARS

Supported by the Quality Improvement Committee and Skull Base and Orbital Surgery Section

Moderators: Ashleigh Halderman, MD, FARS; Michael Marino, MD, FARS

2:05 pm – 2:11 pm

Vision-guided surgical navigation using computer vision for dynamic intraoperative imaging updates

Waleed M. Abuzeid, MD, FARS

2:12 pm – 2:18 pm

Transforming ENT surgical triage: A novel AI-driven approach to chronic sinusitis management

Bradford Bichey, MD, MPH

2:19 pm – 2:25 pm

Artificial intelligence-based prediction of surgical outcomes in chronic rhinosinusitis

Waleed M. Abuzeid, MD, FARS

2:26 pm – 2:32 pm

Automation of sinus system segmentation using neural networks

James Mihalich, HSD

2:33 pm – 2:39 pm

Performance of deep learning-based segmentation of the paranasal sinuses using computed tomography

Jack Paladin, BS

2:40 pm – 2:45 pm

Q&A

2:45 pm – 3:15 pm

Break with Exhibitors

Moderators: Mathew Geltzeiler, MD, FARS; Elisa Illing, MD, FARS

3:16 pm – 3:22 pm

Impact of stent duration following endoscopic DCR

Maya Hatley, BA

3:23 pm – 3:29 pm

Septal synthetic interposition grafting to prevent nasal septal perforation after bilateral apposing septal tears during septal surgery

Anthony Di Ponio, DO

3:30 pm – 3:36 pm

Persistent post-surgical sinonasal crusting: A CFD analysis

Persistent post-surgical sinonasal crusting: A computational fluid dynamics analysis

Nidhi Jha, BA

3:37 pm – 3:43 pm

Opioid prescribing for functional endoscopic sinus surgery

Robert Africa, MD

3:44 pm – 3:50 pm

Single-institution review of sphenopalatine ganglion blocks for sinonasal surgeries

Avraham Adelman, BS

3:51 pm – 3:57 pm

Endoscopic endonasal optic nerve decompression: A systematic review

Brandon Yeshoua, MD, MHA

3:58 pm – 4:04 pm

Olfactory recovery in transsphenoidal pituitary surgery

Sanjena Venkatesh

4:05 pm – 4:10 pm

Q&A

4:11 pm – 4:55 pm

PANEL: Endoscopic approaches to the skull base outside the nose

Moderator: Nyall London, MD, PhD, FARS

Panelists: Sungwoo Cho, MD; Je Beon Hong; Lifeng Li, MD

Supported by the International Committee and Skull Base and Orbital Surgery Section

4:55 pm – 5:00 pm

Q&A

5:30 pm – 7:00 pm

ARS President's Reception

Room: Empire C

**Sunday, May 18, 2025
Morning Session – Celestin D
8:00 am – 12:00 pm CST**

7:00 am – 8:00 am

WiR Breakfast Roundtable Session

Location: Celestin F

“Career Growth and Development: A Panel Based Discussion of Real-World Scenarios”

Moderator: Ashleigh Halderman, MD, FARS

Panelists: Amber Luong, MD, PhD, FARS, ARS President-Elect and Program Chair; Devyani Lal, MD, FARS (Women in Rhinology Section); Corinna Levine, MD, FARS (Mentorship Committee); Erin Lopez, MD (Diversity & Inclusion Committee)

Sponsored by the Women in Rhinology Section, Mentorship Committee, and Diversity & Inclusion Committee

Supported by Aerin Medical

Room Moderator: Katie Melder, MD

Moderators: Omar Ahmed, MD, FARS; Katie Phillips, MD

8:00 am – 8:06 am

Association of xylene exposure and non-allergic rhinitis

Evelyn Rowe

8:07 am – 8:13 am

The statistical fragility of efficacy data on intranasal corticosteroids for AR

Shreya Deshmukh, BA

8:14 am – 8:20 am

Investigation of commercially available acoustic vibratory devices for congestion

W. Jared Martin, BA

8:21 am – 8:27 am

Surgical management of rhinitis

Asher Ripp

8:28 am – 8:32 am

Q&A

Moderators: Kent Lam, MD, FARS; Tran Locke, MD, FARS

8:33 am – 8:39 am

Comparing balloon sinuplasty and endoscopic sinus surgery for chronic rhinosinusitis

Miti Parikh, BA

8:40 am – 8:46 am

Surgeon case volume impacts revision rate of endoscopic sinus surgery

Daniel Lee, MD, FRCSC

8:47 am – 8:53 am

Factors influencing early recovery after endoscopic sinus surgery

Felix Fernandez-Penny, BS

8:54 am – 9:00 am

Factors influencing adherence to budesonide nasal irrigation in sinusitis and rhinitis patients

Clifford Jiajun He, BA

9:01 am – 9:04 am

Q&A

9:05 am – 9:20 am

PANEL: Role of the immunomodulators and autoimmune/rheumatologic diseases in patients with CRS

Moderator: Chadi Makary, MD, FARS

Panelists: Stella Lee, MD; Bruce Tan, MD

Supported by the Allergy in Rhinology Section

Moderators: Christopher Le, MD, FARS; Arthur Wu, MD, FARS

9:21 am – 9:27 am

Biologics and acute rhinosinusitis: A protective effect

Wynne Zheng, MA

9:28 am – 9:34 am

Association between US wildfires and increased in acute rhinosinusitis

Lirit Levi, MD

9:35 am – 9:41 am

Rheumatic adverse events in biologics for CRS

Carlos Khalil, MD

9:42 am – 9:45 am

Q&A

9:45 am – 10:15 am

Break with Exhibitors

Moderators: Dennis Tang, MD, FARS; Patricia Loftus, MD, FARS

10:16 am – 10:24

QoL outcomes of ESS with PM2.5 exposure

Chandler Rygalski, MD

10:25 am – 10:33 am

Effects of smoking on 5-year quality of life outcomes after endoscopic sinus surgery

Allen Zhou, MD

10:34 am – 10:42 am

The association of weight loss with improved chronic rhinosinusitis outcomes

Zain Mehdi, BA

10:43 am – 10:51 am

CoSI index predicts success in AERD by asthma control test and SNOT-22 score

Alison Yu, MD

10:52 am – 11:00 am

Psychometric validity and subdomain analysis of the SNOT-22 in cystic fibrosis sinusitis

Christine Liu, BS

11:01 am – 11:05 am

Q&A

11:08 am – 11:50 am

Introduction: Amber Luong, MD, PhD, FARS

From breach to best practices: Lessons for ENT professionals on cybersecurity:

Gavin Setzen, MD, FARS; Terry Ray, VP of Product Strategy at Varonis

11:50 am – 11:55

Q&A

11:55 am – 12:00 pm

Closing Statements

Kevin Welch, MD, FARS, ARS President; Amber Luong, MD, PhD, FARS, ARS President-Elect and Program Chair

Sunday, May 18, 2025

Concurrent Morning Session –

Celestin GH

8:00 am – 12:00 pm CST

Room Moderator: William Yao, MD, FARS

Moderators: Do-Yeon Cho, MD; Nyssa Farrell, MD

8:00 am – 8:06 am

Analysis of FDA adverse event reports on fluticasone nasal sprays: Xhance vs. Flonase

Thomas Haupt MD

8:07 am – 8:13 am

Impact of topical antibiotics in refractory chronic rhinosinusitis

Allen Zhou, MD

8:14 am – 8:20 am

Delivery of Mupirocin to the paranasal sinuses: Powder versus ointment

Lauren Pinzas, MD

8:21 am – 8:27 am

Utilization, spending, and price of exhalation delivery system with fluticasone, 2018-2023

Taylor Erickson, MD

8:28 am - 8:32 am

Q&A

Moderators: Jayant Pinto, MD; Kristine Smith, MD, FARS

8:33 am – 8:39 am

U-smell-it: A new app-based olfactory test for rapid screening of smell dysfunction

Benjamin Bernard, MD

8:40 am – 8:46 am

Sodium citrate nasal spray with olfactory training for chronic COVID-19 olfactory dysfunction (RCT)

Lauren Cook, BS

8:47 am – 8:53 am

Nasal cycling and olfactory deposition efficiency

Michelle Kim, BA

8:54 am – 9:00 am

Moving beyond odor identification: Defining olfactory subdomain cutoffs in frailty risk assessment

Varun Vohra, BA

9:01 am – 9:04 am

Q&A

9:05 am – 9:20 am

PANEL: Common coding mistakes

Moderator: Toby Steele, MD

Panelists: Corinna Levine, MD, FARS; Gretchen Oakley, MD, FARS; Vinay Rath, MD

Supported by the Patient Advocacy Committee and Skull Base and Orbital Surgery Section

Moderators: Leigh Sowerby, MD; Dennis Tang, MD, FARS

9:21 am – 9:27 am

Detection of mild cognitive impairment in older adults through combined olfactory and MoCA testing

Varun Vohra, BA

9:28 am – 9:34 am

Questionnaire of olfactory disorders negative statements in age-related olfactory dysfunction

Rodney Schlosser, MD, FARS

9:35 am – 9:41 am

Gustatory dysfunction is associated with increased mortality among US adults

Simon Chiang, Research Coordinator

9:42 am - 9:45 am

Q&A

9:45 am – 10:15 am

Break with Exhibitors

Moderators: Angela Donaldson, MD, FARS; Isaac Schmale, MD, FARS

10:16 am – 10:24 am

FESS versus biologic therapy for CRSwNP: A systematic review with meta-analysis

Chadi Makary, MD, FARS

10:25 am – 10:33 am

Depression and anxiety in empty nose syndrome: A systematic review and meta-analysis

Anuja Shah, BA

10:34 am – 10:42 am

Association between conflicts of interest and published position on absorbable nasal valve implants

Elizabeth Liao, MD

10:43 am – 10:51 am

Industrial payments to peer reviewers and editorial board members in rhinology journals

W. Jared Martin, BA

10:52 am – 11:00 am

Impact of intraoperative microbreaks on pain and performance in rhinology

Shahed Mohamed, MD

11:01 am – 11:05 am

Q&A

Location – Celestin D

11:08 am – 11:50 am

Introduction: Amber Luong, MD, PhD, FARS

From breach to best practices: Lessons for ENT professionals on cybersecurity:

Gavin Setzen, MD, FARS; Terry Ray, VP of Product Strategy at Varonis

11:50 am – 11:55

Q&A

11:55 am – 12:00 pm

Closing Statements

Kevin Welch, MD, FARS, ARS President; Amber Luong, MD, PhD, FARS, ARS President-Elect and Program Chair

Posters

Poster #G001

20 Year delayed CSF leak

Twenty-year delayed CSF rhinorrhea after facial trauma

Kevin Li, MD

Poster #G002

52-week outcomes from the Phase 3 ENLIGHTEN 1 trial for LYR-210 in CRS

Vineeta Belanger, PhD

Poster #G003

A case of canine transmitted post-operative staphylococcus schleiferi sinusitis

Helena Cabrera, BA

Poster #G004

A case report of persistent epistaxis due to acquired hemophilia

Lauren Storm, BS

Poster #G005

A case report prompting consideration for agammaglobulinemia as a differential diagnosis

Lauren Storm, BS

Poster #G006

A rare presentation of bilateral dentigerous cysts of the maxillary sinus

Cynthia Koenigsberg, MD

Poster #G007

A realistic cadaver model for complex endoscopic retroinfundibular tumor resections

Eve-Marie Roy, MD

Poster #G008

WITHDRAWN

Poster #G009

A three dimensional holistic staging for nasopharyngeal angiofibroma: Georgean experience

Anupam Mishra, MBBS, MS, DNB, FACS

Poster #G010

AERD: Impact of patient demographics on optimal post-desensitization aspirin dosage

Krithika Kuppusamy, BS

Poster #G011

AI ChatGPT normal sinus CT scans

Anthony Saad, BA

Poster #G012

AI endoscopic and CT sinus anatomy

Anthony Saad, BA

Poster #G013

AI large language model and skull-base guidelines

Anthony Saad, BA

Poster #G014

AI sinus pathology diagnosis

Anthony Saad, BA

Poster #G015

AI-generated responses to complication queries: A comparative analysis in rhinology

Luke Schwetschenau, BS

Poster #G016

Air pollution exposure and sinusitis incidence in central New York secondary to increased wildfires

Christopher Bushnell, BS

Poster #G017

An uncommon etiology of chronic rhinosinusitis: Ectopic teeth in a patient with autoimmune disorders

Shahed Mohamed, MD

Poster #G018

An unusual case of pterygopalatine fossa angioleiomyoma

Leo Song, Medical Student

Poster #G019

Analysis of postoperative length of stay following endoscopic endonasal pituitary surgery

Gaurav Jategaonkar

Poster #G020

Analyzing intolerance to aspirin therapy after desensitization (ATAD) in AERD Patients

Lancelot Herpin, MD/MSTR Candidate

Poster #G021

Anemia in orbital floor fracture

Joseph Celidonio, Medical Student

Poster #G022

Antibiotic utilization for chronic rhinosinusitis

Larry Wang, MS

Poster #G023

Artificial intelligence in chronic rhinosinusitis

Karena Zhao, BS

Poster #G024

Assessment of lifetime inhalational exposure burden and associations with chronic rhinosinusitis

Nina Westcott

Poster #G025

Assessment of variability in sinonasal anatomic measurements relevant for nasoseptal flap harvest

Beatrice Katsnelson

Poster #G026

Association between ultraprocessed food intake and sinusitis

Anthony Thai, MD

Poster #G027

Association of asthma and allergic rhinitis with depression in chronic rhinosinusitis patients

Sherron Thomas, BSA

Poster #G028

Association of preoperative vascularization patterns and embolization methods with recurrence in JNA

Brennan Olson, MD, PhD

Poster #G029

Atypical eosinophilic angiocentric fibrosis

Eugene Oh, BS, MSE

Poster #G030

Barriers to CRS care for sexual and gender minorities

Faizaan Khan, BS

Poster #G031

Baseline healthcare resource utilization in patients with CRSwNP from the AROMA global registry

Scott Nash, MD

Poster #G032

Bibliometric analysis of top cited septoplasty publications

Jonathan Collard de Beaufort

Poster #G033

Bibliometric analysis on Dupilumab and chronic sinusitis with nasal polyposis

Pauline Huynh, MD

Poster #G034

Biological subtypes of nasal polyps by laser-capture microdissected gene expression profiling

Shen Kai Ng, BSc. (Hons)

Poster #G035

Can sinonasal surgery decrease the risk of cardiovascular disease?

Sarah Ridge, MD

Poster #G036

Cannabis use and chronic rhinosinusitis

Austin Lee, BS

Poster #G037

Cavernous carotid pseudoaneurysm case report

Josef Shargorodsky, MD, MPH

Poster #G038

CCI in SNSCC

David Herz, BS

Poster #G039

CFD modeling of swirling effect to the drug spray for sinus disease treatment

Zheng Li

Poster #G040

Characterization and description of extra-olfactory REAH

Jakob Fischer, MD

Poster #G041

Characterizing the nasal vestibule swell body

Michael Werner, MD, PhD

Poster #G042

WITHDRAWN

Poster #G043

Chronic sinusitis and rheumatoid arthritis flare following treatment of Cushing's syndrome

Sandhya Ganesan, BS

Poster #G044

Clinical factors for odontogenic maxillary sinusitis and endoscopic transnasal apicoectomy

Kenta Fukui, MD

Poster #G045

Comparative analysis of fungal organisms in invasive fungal rhinosinusitis

Janice Chung, MD

Poster #G046

Comparison of NGS and traditional culture in identifying pathogenic bacteria in CRS

You Kim, BS

Poster #G047

Concordance between at-home finger-prick and blood allergen-specific IgE allergy testing

Ezer Benaim, MD

Poster #G048

CRS and isolated orbital floor fractures

Katherine Yu, MD

Poster #G049

ctHPVDNA for recurrence detection in HPV+ SNSCC

Elise Krippaehne, BS

Poster #G050

Cytokine sampling in the sinonasal cavity

Yasine Mirmozaffari, BS

Poster #G051

Digital health access and use among patients presenting to a tertiary rhinology center

Elise Krippaehne, Clinical Research Fellow

Poster #G052

Direct-to-consumer customized nasal sprays for allergy relief: A market overview

Lauren Cook, BS

Poster #G053

Disease severity as a predictor of Dupilumab response in patients with CRSwNP

Kelsey Limage, BS

Poster #G054

Does superior ophthalmic vein thrombosis require anticoagulation?

Emily Sagalow, MD

Poster #G055

Does the modified endoscopic denker procedure impact aesthetic outcomes?

Felix Fernandez-Penny, BS

Poster #G056

Does total inferior and middle turbinectomy always lead to empty nose syndrome?

Nidhi Jha, BA

Poster #G057

Drugs, money, and sex: An update on gender and industry sponsorship within otolaryngology

Emma Elbert, BS

Poster #G058

Dupilumab for pediatric CRSwNP with immunodeficiency

Olivia Nieto Rickenbach, MD

Poster #G059

Ectopic olfactory neuroblastoma within the maxillary sinus: A case report and literature review

Ryan Hudnall, MD

Poster #G060

Effect of sinus surgery on nasal discharge

Erin Briggs

Poster # G061

Effectiveness of middle meatal spacers in reducing synechiae post-ESS: Updated meta-analysis

Raisa Chowdhury

Poster #G062

Endoscopic resection of nasopharyngeal salivary neoplasm: Case report

Thant Zaw, MD

Poster #G063

Endoscopic sinus surgery for recurrent acute sinusitis: A systematic review and meta-analysis

David Liu, MD, PhD

Poster #G064

WITHDRAWN

Poster #G065

Enhancing pituitary surgery patient education materials with language learning models

Samantha Spence, Medical Student

Poster #G066

Esthesioneuroblastoma of maxillary sinus: Obscure sinonasal source of hyponatremia in adolescent

Sarah Debs, MD

Poster #G067

Ethmoid sinus CSF leak repair in Puerto Ricans

Giovanny Pérez, MD

Poster #G068

Evaluating online patient materials regarding balloon sinuplasty

Shreya Bhalla, BS

Poster #G069

Evaluation of a balloon dilation system: A cadaveric study

Yasine Mirmozaffari, BS

Poster #G070

Feminization rhinoplasty surgery effect on nasal cavity volume

Narin Nard Carmel Neiderman, MD, MSc

Poster #G071

FESS indications in cystic fibrosis population on CTFR modulator therapy

Alec Straughan, MD

Poster #G072

Frontal sinus auto-obliteration

Lucas Cruz, BA

Poster #G073

Gustatory dysfunction and volatile organic compounds in industrial and fuel emissions

Sophie Yu

Poster #G074

Gustatory dysfunction is associated with reduced dietary micronutrient intake

Sophie Yu

Poster #G075

Histopathologic analysis of transplant patients with chronic rhinosinusitis

Abdulkader Yassin-Kassab, MD

Poster #G076

Hypoglossal nerve stimulator use in patients with hereditary hemorrhagic telangiectasia

Kathryn Mozzochi

Poster #G077

WITHDRAWN

Poster #G078

Identification of key allergens associated with recalcitrant cough with and without asthma

Claudia Cabrera, MD, MS

Poster #G079

Immunophenotyping chronic rhinosinusitis by flow cytometry of nasal and nasopharyngeal swab samples

Farhoud Faraji, MD, PhD

Poster #G080

Impact of depression on postoperative complications following septoplasty with turbinateplasty

Iman Adibi, BS

Poster #G081

Impact of immunosuppression on refractory CRS: Outcomes of topical antibiotic treatment

Bastien Valencia, MD

Poster #G082

Impact of medication adherence on rhinosinusitis patient outcomes

Clifford Jiajun He, BA

Poster #G083

Improvement of mouth breathing after nasal surgery

Ayham Alkarmi, MD

Poster #G084

IMRIS for pituitary adenoma resection: A single-center 13-year review and observational study

Chad Purcell, MD

Poster #G085

Industrial and fuel emissions are associated with non-allergic rhinitis

Sophie Yu

Poster #G086

Inferior meatal antrostomy in select maxillary pathologies

Ronald S. Wang, BS

Poster #G087

Institutional analysis of PLT in pituitary surgery

Thomas Scharfenberger, BS

Poster #G088

Insurance and surgical intervention in CRS

David Herz, BS

Poster #G089

Intraoperative MRI assists in dissection of CVJ pathology

Alec Straughan, MD

Poster #G090

Invasive fungal sinusitis due to candida auris

Carley Boyce, MD

Poster #G091

WITHDRAWN

Poster #G092

Ipsilateral versus contralateral nasoseptal flaps for repair of sphenoid lateral recess defects

Kurt Mueller, MD

Poster #G093

Management of frontal sinus disease with mometasone stents and triamcinolone impregnated microsphere - Oral

Christopher Jabbour, MD

Poster #G094

Maxillary sinus antrochoanal polyp recurrence following surgery in adults: A systematic review

Kimberly Oslin, MD

Poster #G095

Medication adherence in the allergic fungal sinusitis population: An institutional review

Diana Bigler, MD

Poster #G096

Metachronous inverted papillomas

Kevin Li, MD

Poster #G097

Metastatic RCC in the nasal cavity

Anastasiya Stasyuk, MD

Poster #G098

Microbiology of odontogenic sinusitis

Charles Tong, MD, FARS

Poster #G099

Middle turbinate medialization with absorbable packing after transsphenoidal skull base surgery

Mark Liu, MD

Poster #G100

Misdiagnosis of spontaneous CSF rhinorrhea

Matthew Liu, MD

Poster #G101

Multifocal chordoma: A case of clival and sacral involvement

Kelsey Limage, BS

Poster #G102

Nail salon occupational exposures and sinonasal symptoms: A scoping review

Orli Weiss, BA

Poster #G103

Nasal dermoid resection

Walter Jongbloed

Poster #G104

Nasal endoscopy and acoustic rhinometry in the evaluation of nasal obstruction

Rafael Hijano, MD, PhD

Poster #G105

Nasal endoscopy fellowship directors

Abtin Tabaee, MD, FARS

Poster #G106

Nasoseptal flap enhancement on MRI

Maria Espinosa, MD

Poster #G107

Nosebleeds and beyond and rhinology: Accuracy and impact of Instagram content

Ogechukwu Anwaegbu, BS

Poster #G108

Number of allergens present in chronic versus allergic rhinitis

Sofia Piperno

Poster #G109

Obesity is associated with an increased risk of new-onset allergic rhinitis

David Hoying, BS

Poster #G110

Old age rhinitis: Pathophysiology and issues in treatment

Kamlesh Dubey, MS

Poster #G111

Olfactory dysfunction impacts mental health among adults in the United States

Sidharth Sengupta, MS

Poster #G112

Olfactory dysfunction in patients with migraine

Erin Briggs

Poster #G113

Online health resources and electronic health literacy among patients with sinonasal disease

Elise Krippaehne, Clinical Research Fellow

Poster #G114

Orbital pyoderma gangrenosum: A rare manifestation of chronic intranasal cocaine use

Cynthia Koenigsberg, MD

Poster #G115

Outcomes of balloon sinus dilation vs. ESS in CRSsNP: Is the balloon value proposition overinflated?

David Hoying, BS

Poster #G116

Outcomes of endoscopic dacryocystorhinostomy in pediatric patients

Maya Hatley, BA

Poster #G117

Paramaxillary SPA ligation: Landmarks and techniques in cadaveric study

Richa Nathan, BS

Poster #G118

Patients with CRSwNP had fewer sinus procedures and less HCRU following Dupilumab initiation

Scott Nash, MD

Poster #G119

Pediatric clival chondrosarcoma

Viraj Shah, MD

Poster #G120

Pediatric poorly differentiated chordoma with aggressive cervical and skull base expansion

Michelle Yu, MD, MS

Poster #G121

Pediatric sinusitis trends and COVID-19

Claire Chapel, MD

Poster #G122

Personalized surgery in allergic fungal rhinosinusitis

Shabih Jafri, Medical Student

Poster #G123

Pituitary tumor size and STOP-BANG score in endoscopic endonasal surgery

Edward Harwick, BS

Poster #G124

Post-COVID increases in intracranial complications from pediatric sinusitis and otitis

Pranav Patel, BS

Poster #G125

Postoperative complications of nasal surgeries in dysautonomia

Emaan Dawood, MS3

Poster #G126

Postoperative CSF leak secondary to early CPAP use following anterior skull base resection

Marcin Marciniak, BS

Poster #G127

Postoperative healthcare utilization and outcomes in radiation-induced CRS after ESS

Jaynelle Gao

Poster #G128

Postoperative outcomes CSF leak repair

Matthew Liu, MD

Poster #G129

Predictive value of postoperative patient outcomes for eustachian tube balloon dilation

Alexander Gomez-Lara, BA, BS

Poster #G130

Predictors of surgical intervention in patients with recurrent acute rhinosinusitis

Chadi Makary, MD, FARS

Poster #G131

Preoperative computed tomography for dacryocystorhinostomy: Practice patterns and outcomes

Tissiana Vallecillo, MS

Poster #G132

Prescription patterns of topical antibiotic irrigation after sinus surgery in refractory CRS

Bastien Valencia, MD

Poster #G133

Primary chordoma of the posterior nasal septum in a pediatric patient

Hans Baertsch, MD

Poster #G134

Prognosis of chemosensory recovery among Long COVID-19 patients -- 3- and 6-month follow-ups

Lauren Gastineau, BS

Poster #G135

Prolonged topical nasal decongestant usage

Marn Joon Park, MD, MS

Poster #G136

WITHDRAWN

Poster #G137

Psammomatoid juvenile ossifying fibroma (PJOF)

Sahil, MBBS

Poster #G138

Psychedelics and sensory function

Angela Kaczorowski-Worthley, BSN

Poster #G139

Racial and gender disparities in chronic rhinosinusitis treatment

Christina Zhu, BS

Poster #G140

Real-world study of FDA-approved and off-label use of biologics in chronic rhinosinusitis

Nitish Kumar, MBBS, MS

Poster #G141

Recreational drug use & chronic rhinosinusitis

Grant Primer, Medical Student

Poster #G142

Recurrent acute rhinosinusitis and anatomical variations

Harel Sofer

Poster #G143

WITHDRAWN

Poster #G144

Retrospective review of post-irradiated nasopharyngeal carcinoma patients with osteoradionecrosis

Xian Yao Christopher Liao, MD

Poster #G145

Review of health disparities in chronic rhinosinusitis

Russel Whitehead, BS

Poster #G146

Secondary validation of the parosmia olfactory dysfunction outcomes rating (DisODOR)

Andrew Peterson, MD, MSCI

Poster #G147

“Secret shopper study” comparing wait times for Medicaid and private insurance patients

Apurva Ramanujam, BS

Poster #G148

Sensory and autonomic fibers in nasal nerves

John Craig, MD, FARS

Poster #G149

Septoplasty opioid prescribing trends

Robert Africa, MD

Poster #G150

Silastic septal splints to manage refractory HHT epistaxis

Avraham Adelman, BS

Poster #G151

Sinonasal biphenotypic sarcoma

Wilson Lao, MD

Poster #G152

Sinonasal fungus ball rhinosinusitis and anatomical variations

Narin Nard Carmel Neiderman, MD MSc

Poster #G153

Sinus mucosal involvement of cutaneous facial vascular anomaly contributes to CRS

Alec Straughan, MD

Poster #G154

Sinus surgery and dementia in chronic sinusitis

George Bebawy, BA

Poster #G155

Smell training in southeastern Chinese adults

Brian Wing Hei Mak, MBBS

Poster #G156

Social perceptions and economic impact of proptosis in thyroid eye disease

Lazaro Perazu, MD

Poster #G157

Suspected invasive fungal sinusitis in a healthy elderly patient

Alice Cheng, MBA

Poster #G158

Systematic review of measured biomarker changes after biologic treatments for CRSwNP

Sai Nimmagadda, MD

Poster #G159

The role of imaging findings and their impact on clinical outcomes for dacryocystorhinostomy

Jeffrey Graves, MS

Poster #G160

The roles of sinonasal symptoms and olfactory dysfunction in cognitive impairment

Shahed Mohamed, MD

Poster #G161

The statistical fragility of safety data on intranasal corticosteroids for AR

Olivia First, BA

Poster #G162

The statistical fragility of saline nasal irrigation for rhinosinusitis: A systematic review

Ronit Sethi, BS

Poster #G163

The surprising effect of priming on SNOT-22 and RSDI results: An international phenomenon

Ibtisam Mohammad, MD

Poster #G164

WITHDRAWN

Poster #G165

Tranexamic acid in anterior skull base surgery – A scoping review

Kevin Li, MD

Poster #G166

Transoral dacrocystorhinostomy

Hector Perez, MD

Poster #G167

Trigeminal trophic syndrome: A two-patient case series

Jamie Lewis, M4

Poster #G168

Unilateral skull base approach to olfactory neuroblastoma resection

Dilan Shah, M3

Poster #G169

UPSIT response patterns in skull base surgery patients with and without recent SARS-CoV-2 infection

Bastien Valencia, MD

Poster #G170

Utilization of healthcare resources among adults with sinusitis in the United States

Eric Wei, MD

Poster #G171

Vivaer update: A correlation between symptom scores and objective findings

Auddie Sweis, MD

ORAL PRESENTATIONS

Friday, May 16, 2025

ARS Board of Directors Meeting
1:00 pm – 4:00 pm
Room: Celestin GH

ARS Poster Viewing

9:00 am – 7:00 pm
Elite Hall (Exhibit Hall)

Combined Poster Reception

5:30 pm – 7:00 pm
Elite Hall (Exhibit Hall)

Saturday, May 17, 2025

ARS Poster Viewing

9:00 am – 7:00 pm
Elite Hall (Exhibit Hall)

Saturday, May 17, 2025 Morning Session – Celestin D 8:00 am – 12:00 pm CST

8:00 am – 8:05 am

Welcome

Kevin Welch, MD, FARS, ARS President; Amber Luong, MD, PhD, FARS, ARS President-Elect and Program Chair

Oral Presentations – Top Basic Science

*Moderators: Michael Kohanski, MD, PhD, FARS;
Edward Kuan, MD, FARS*

8:05 am – 8:13 am

Ginsenoside Rb2, TMEM16A channel potentiator: A promising therapeutic strategy for CF sinusitis

Do-Yeon Cho, MD
Shaoyan Zhang, PhD
Daniel Skinner, BS
Jessica Grayson, MD
Justin Turner, MD, PhD, FARS
Bradford Woodworth, MD, FARS
University of Alabama at Birmingham

Introduction:

Dysfunction of the CFTR Cl⁻ channel in cystic fibrosis (CF) patients leads to thick airway mucus and impaired mucociliary transport (MCT). While targeted therapies improve channel function, they are not universally effective in restoring airway function. New therapeutic strategies are needed to ensure comprehensive CF treatment. We previously demonstrated that red ginseng aqueous extract, rich in various ginsenosides, potentiates the TMEM16A channel, enhancing MCT in a CF rat model. This study assessed the efficacy of individual

ginsenosides in activating TMEM16A to develop a pharmacotherapeutic approach to improve Cl⁻ secretion in CF sinusitis.

Methods:

Individual ginsenosides were evaluated for activity in CF rat nasal epithelial cultures using Ussing chambers to measure changes in short-circuit current (ΔI_{sc}) and identify the most potent activators. Three candidate ginsenosides (Rb2, Rd, and RG3s) were further tested for TMEM16A potentiation via patch clamp analysis in TMEM16A-transfected human embryonic kidney (HEK) cells. Calcium release was measured with Fluo-4AM, and cellular toxicity was assessed using a lactate dehydrogenase assay.

Results:

Among all ginsenosides tested, Rb2 was the most effective potentiator, demonstrating strong activation of the TMEM16A channel ($\Delta I_{sc} = \mu A/cm^2$; Rb2, 82.80 ± 7.19 vs. control, -1.79 ± 5.16 ; $p < 0.0001$) without increasing intracellular calcium. Rb2 also significantly enhanced UTP-mediated current in TMEM16A-transfected HEK cells and showed no cellular toxicity.

Conclusions:

Rb2 is a potent TMEM16A potentiator and a promising candidate for rescuing epithelial Cl⁻ secretion in CF airways. Further studies are planned in a preclinical CF rat model with *P. aeruginosa* infection.

8:14 am 8:22 am

Interferon signaling and post-Influenza olfactory dysfunction

Carol Yan, MD
Farhoud Faraji, MD
Sophie Jang
Kwang Pak
Alistair Russell
Arwa Kurabi
University of California San Diego

Olfactory dysfunction (OD) may occur following viral infection of the upper airway and significantly diminishes quality of life. The molecular and cellular changes in the olfactory epithelium (OE) underlying post-viral OD remain poorly understood. In the present study, we investigated the effects of H1N1 influenza A infection on the murine OE. Using the buried food test, a well-established behavioral model to assess olfactory function in mice, we demonstrated that H1N1 infection resulted in diminished ability to find buried chow that was most pronounced by day 7 post-infection.

We hypothesized that these deficits are driven by viral-mediated alterations in the OE and performed transcriptional profiling of the olfactory and respiratory nasal mucosa by using single-cell RNA

sequencing (scRNAseq) 7 days after nasal administration of H1N1 or saline. Analysis of epithelia from 6 mice identified 18,450 cells spanning the spectrum of cell types previously identified in the murine OE, including olfactory sensory neurons and progenitor globose and horizontal basal cells. Notably, infection with H1N1 resulted in a significant reduction in stromal cells. Few cells expressed H1N1 transcripts by day 7, suggesting the absence of active viral replication. Yet interferon-stimulated genes and transcriptional signatures for type I and II interferons remained elevated, particularly in horizontal basal cells.

These findings suggest that prolonged anti-viral signaling may inhibit olfactory stem cell differentiation, thereby impairing OE regeneration and potentially resulting in OD. Ongoing mechanistic studies will investigate the potential therapeutic applications of local interferon blockade as a strategy in the restoration of post-viral OD.

8:23 am – 8:31 am

Chronic rhinosinusitis endotyping insights through factor analysis

Brooke Gleason
Zhidi Luo, Biostatistician
Aditi Agarwal
Junqin Bai, PhD
David Conley, MD, FARS
Kevin Welch, MD, FARS
Robert Kern, MD, FARS
Stephanie Shintani-Smith, MD
Atsushi Kato, PhD
Lutfiyya Muhammad, Assistant Professor
Bruce Tan, MD
Northwestern University

Rationale:

Endotyping uses biomarkers to assign inflammatory profiles to patients with CRS. Prior methods applied clustering algorithms to categorize biomarkers and patients. We hypothesized that factor analysis may facilitate stable and continuous endotype assignment to CRS patients and assessed its cross-sectional and longitudinal relationship to outcomes.

Methods:

148 CRS patients were evaluated pre-ESS (V0) and 6-12 months post-ESS (V1) with 94 completing the 18-60 months post-ESS (V2) evaluation. Middle meatal mucus biomarkers were analyzed at baseline and V1 using Luminex and ELISA. Radiographic Lund-Mackay (LM) scores and patient reported CRS-PRO were collected at all time points. Exploratory factor analysis organized biomarkers into latent factors. Confirmatory factor analysis estimated factors loadings and assigned factor scores, which were subsequently used to assess associations with outcomes.

Results:

26 biomarkers organized into four factors identifiable as type 1 (T1), type 2 (T2), type 3 (T3), and severity (S). V0 T2 and S were associated with CRSwNP phenotype and contemporaneous LM scores (all $p < 0.01$ - $p < 0.0001$) whereas T3 was only associated with LM scores ($p < 0.0001$). All four V1 factor scores were associated with contemporaneous LM scores ($p < 0.0001$) and CRS-PRO scores ($p < 0.001$). Longitudinally, V0 factor scores were not predictive of V2 outcomes but V1 T2, T3, and S factor scores were predictive of LM scores ($p < 0.001$) and CRS-PRO scores at V2 ($p < 0.05$).

Conclusion:

Biomarker-generated factor scores quantitatively assigned endotype using middle meatal mucus samples. Endotype factor scores were cross-sectionally associated and longitudinally predictive of radiographic and patient reported outcomes.

8:32 am – 8:40 am

Dupilumab initiation associated with differential gene expression in CRSwNP

Christina Dorismond, MD, MPH
Rory Lubner, MD
Daniel Lofgren, DO
Chandler Rygalski
Ping Li
Katherine Cahill
Mason Krysinski, MD
Rakesh Chandra, MD, FARS
Justin Turner, MD, PhD, FARS
Naweed Chowdhury, MD
Vanderbilt University Medical Center

Introduction:

Monoclonal antibodies targeting the type-2 inflammatory axis have been a recent addition to the treatment algorithm for patients with recalcitrant chronic sinusitis with nasal polyps (CRSwNP). However, it remains difficult to identify patients at risk of recalcitrant disease prior to surgery. In this work, we aimed to utilize transcriptomics to identify differential gene expression and pathways associated with initiation of dupilumab after endoscopic sinus surgery (ESS).

Methods:

Patients undergoing ESS for CRSwNP were enrolled in a prospective longitudinal observational study and clinically followed for at least 6 months. High-throughput RNA-sequencing was performed on middle meatal brushings obtained from 53 patients during surgery to obtain bulk human transcriptome expression counts. Differential expression analysis and gene-set enrichment analysis (GSEA) were used to identify genes and pathways associated with postoperative initiation of dupilumab.

Results:

Twenty of 53 patients (37%) were prescribed dupilumab for CRSwNP during the study period. On differential expression analysis, the CLC gene encoding the galectin-10 protein was significantly higher in patients starting biologic therapy (log-fold change 4.63, adjusted $p=0.0041$). GSEA showed enrichment in pathways associated with periostin (normalized enrichment score [NES]=1.81, $q=0.01$), eicosanoid synthesis (NES = 1.71, $q=0.02$), and prostaglandin/leukotriene metabolism (NES=1.71, $q=0.01$).

Conclusion:

Surgically recalcitrant polyp disease requiring dupilumab initiation is associated with upregulation of CLC and activation of eicosanoid pathways. Transcriptomic biomarkers may be a useful prognostic tool in the future for predicting response to treatment.

8:41 am – 8:49 am

PM 2.5 associated transcriptional pathways

Rory Lubner, MD
Christina Dorismond, MD, MPH
Daniel Lofgren, DO
Ping Li
Katherine Cahill
Mason Krynski, MD
Rakesh Chandra, MD, FARS
Justin Turner, MD, PhD, FARS
Naweed Chowdhury, MD, MPH
Vanderbilt University Medical Center

Introduction:

Exposure to ambient particulate matter $\leq 2.5 \mu\text{m}$ in diameter (PM_{2.5}) has played a pivotal role in elucidating the impact of the exposome on chronic rhinosinusitis (CRS) pathogenesis. We previously demonstrated PM_{2.5} is an independent risk factor for CRS and may bias the nasal mucosa towards a type-2 inflammatory pathway. However, there is a paucity of data on the impact of PM_{2.5} on a cellular level. The aim of this study is to employ a transcriptomics approach to link differential patterns of active cellular processes in CRS patients to estimated PM_{2.5} exposure.

Methods:

84 patients with CRS undergoing endoscopic sinus surgery were enrolled and PM_{2.5} exposures 1-year prior to surgery were estimated with a geospatial model. High-throughput RNA-sequencing was performed on human nasal epithelial cells harvested via middle meatal brushings. Differential expression analysis and gene-set enrichment analysis (GSEA) were used to identify genes and pathways associated with high vs low PM_{2.5} exposures as defined by the mean cohort exposure.

Results:

81 genes were upregulated and 179 were downregulated in patients with high estimated PM_{2.5} exposures. Notable findings on GSEA included upregulation in glucuronidation pathways (normalized enrichment score (NES) of 2.13, $q < 10^{-8}$) in the high PM_{2.5} group and downregulation of the oxidative damage response pathway (NES= -1.71, $q = 0.01$), including downregulation of the NRF2 pathway (NES = -1.72, $q = 0.0021$), consistent with previously reported findings in mouse models.

Conclusions:

This study is the first to demonstrate transcriptional alterations in oxidative stress and detoxification pathways in CRS patients with high estimated PM_{2.5} exposure.

8:50 am – 8:55 am

Q&A

8:56 am – 9:05 am

Awards Ceremony

Jean Kim, MD, PhD, FARS

9:05 am – 9:45 am

PANEL: The role of artificial intelligence in advancing rhinology: Clinical applications and educational transformation

Moderator: Bobby Tajudeen, MD, FARS
Panelists: Edward McCoul, MD, FARS; Zara Patel, MD, FARS; Sanjeet Rangarajan, MD, FARS

9:45 am – 10:15 am

Break with Exhibitors**Oral Presentations – Top Clinical Science**

Moderators: Stella Lee, MD; William Yao, MD, FARS

10:15 am – 10:23 am

Initial results of a double-blinded, randomized controlled trial of EDS-FLU for chronic ETD

Arthur Wu, MD, FARS
Randall Ow, MD, FARS
Dennis Tang, MD, FARS
Edward McCoul, MD, FARS
Missaël Vasquez
Elisa Illing, MD, FARS
Cedars-Sinai

Background:

The novel fluticasone exhalational delivery system (EDS-FLU) may improve topical delivery to the nasopharynx based on a prior studies. Our hypothesis is that EDS-FLU is effective for chronic ETD.

Methods:

Patients with >3 months of obstructive ETD symptoms, ETDQ-7 > 14.5, and at least one ear with abnormal tympanogram (type B, C, or As) were randomized to 6 weeks of EDS-FLU or EDS-placebo. There was an open-label extension for an additional 6 weeks for all patients using EDS-FLU. Primary endpoints were change in ETDQ-7 score and normalization of tympanometry.

Results:

34 patients were randomized to placebo (17 patients, 21 ears) and EDS-FLU (17 patients, 18 ears). There was a significant difference in the distribution of abnormal tympanometry types, with the EDS-FLU arm having more type B/C patients than the placebo arm ($p=0.05$). At 6 weeks, 46% of placebo patients normalized their ETDQ-7 scores vs 25% of EDS-FLU patients ($p=0.4$). Mean ETDQ7 improvement was 10 in placebo patients vs 2 in EDS-FLU patients at 6 weeks ($p=0.056$) and 12 at 12 weeks ($p=0.5$). Tympanometry normalization was 44% for EDS-FLU patients at 12 weeks but was 43% for placebo ($p=0.9$).

Discussion:

Initial analysis of the first 34 patients in this RCT demonstrates that both EDS-FLU and EDS-placebo improve both ETD symptoms and objective tympanometry in chronic ETD patients with no significant difference found between these two arms at 12 weeks. It is possible that the relatively strong placebo effect seen could be caused by intrinsic effects of the EDS device.

Conclusion:

No significant differences were found at 12 weeks between EDS-FLU and EDS-placebo, though both arms independently showed significant improvements in ETDQ-7 and tympanometry.

10:24 am – 10:32 am

Evaluating surgical field clarity and cost in endoscopic sinus surgery

Kurt Mueller, MD

Jacob Hagen, Medical Student

Michael Dunham, MD

Stephen Hernandez, MD

LSU Health Sciences Center - New Orleans

Introduction:

Clear surgical visualization is crucial during endoscopic sinus surgery (ESS), where bleeding plays a significant role. Tranexamic acid (TXA) and total intravenous anesthesia (TIVA) have independently been shown to improve visualization, though TIVA is associated with higher costs than inhalational anesthesia. This study compares the efficacy and cost-effectiveness of TIVA alone versus inhalational anesthesia with TXA.

Methods:

In this prospective, double-blinded randomized control trial, subjects undergoing ESS received either TIVA (control group) or inhalational anesthesia with 15mg/kg TXA (study group). An artificial intelligence-powered endoscopic image clarity classifier was used to determine endoscopic surgical field clarity index (ESFCI) and operating efficiency scores. The pharmaceutical cost of each surgery was analyzed.

Results:

Forty-one patients were enrolled; 31 had video documentation. No statistical differences were found between both groups in terms of ESFCI (0.691 vs. 0.675, $p = 0.820$), operating efficiency (64% vs. 63%, $p = 0.743$), surgeon satisfaction score (3.9 vs. 4.1, $p = 0.682$), operating time (136 min vs. 129 min, $p = 0.681$) and anesthesia time (187 min vs. 171 min, $p = 0.414$). However, those receiving inhalational anesthesia with TXA had lower pharmaceutical costs than TIVA, both in terms of total cost (\$208 vs. \$324, $p = 0.001$) and cost per minute of anesthesia (\$1.76 vs. \$2.15, $p = 0.001$).

Conclusions:

Inhalational anesthesia with tranexamic acid provides comparable surgical field visualization quality to total intravenous anesthesia alone and may be more cost-effective. Additional investigations and a larger sample size is needed to further elucidate this relationship.

10:33 am – 10:41 am

Characterizing the genomic landscape of sinonasal inverted papilloma

Jacquelyn Callander, MD

Andrew Goldberg, MD, FARS

Steven Pletcher, MD

Patricia Loftus, MD, FARS

Jose Gurrola, MD

University of California San Francisco

Background:

The etiology of sinonasal inverted papilloma (SNIP), clinical behavior, and predictive biomarkers for malignant transformation remain poorly defined. In this study, the genetic landscape of SNIP was characterized to provide insights into etiology and clinical behavior.

Methods:

Patients presenting to a tertiary care center for surgical management of SNIP from June 2021-September 2024 were retrospectively enrolled. Clinical data was collected. A genetic panel analyzing the coding regions of 529 cancer genes via next-generation sequencing was performed on tumor tissue.

Results:

20 subjects met inclusion criteria with a mean follow-up time of 12.8 months (SD 12.2). 3 patients (15%)

were found to have severe dysplasia and 1 patient (5%) was found to have malignant transformation. 85% of IPs demonstrated an EGFR exon 20 insertion, and the mean number of pathogenic or likely pathogenic mutations identified was 2 (range 1-4). Malignant transformation was positively correlated to mutations in genes responsible for epigenetic regulation ($r=0.459$, $p=0.042$). Residual SNIP remaining after initial surgery requiring a staged approach to resection was associated with a higher number of pathogenic mutations ($p=0.006$) and was positively correlated with mutations in DNA repair genes ($r=0.577$, $p=0.0077$). 9/11 tumors tested (82%) were negative for human papilloma virus via in situ hybridization.

Conclusion:

This study provides insights into the genomic landscape of SNIP, highlighting the prevalence of EGFR exon 20 insertions and identifying a novel association of epigenetic and DNA repair gene mutations with malignant transformation and residual tumor presence, respectively.

10:42 am – 10:50 am

PM2.5 CRS inflammatory endotyping

Daniel Lofgren, DO
Christina Dorismond, MD, MPH
Rory Lubner, MD
Ping Li
Chandler Rygalski
Katherine Cahill
Mason Krysinski, MD
Rakesh Chandra, MD, FARS
Justin Turner, MD, PhD, FARS
Naweed Chowdhury, MD
Nanda Nayak
Vanderbilt University Medical Center

Chronic rhinosinusitis (CRS) is a complex, multifactorial disease characterized by persistent sinonasal inflammation of unknown etiology. Recent work has identified a unique inflammatory signature of CRS associated with PM2.5 exposure characterized by univariate elevations in mucus IL-2,5,7,12-23p40, and 21. We sought to validate this finding in a larger cohort and further define this previously unreported putative endotype in a joint multivariate cytokine analysis.

Clinical and demographic data for 634 patients undergoing sinus surgery for CRS were extracted with the use of a spatiotemporal machine learning model to estimate daily PM2.5 exposure levels for 12 months before surgery. Inflammatory mucus cytokines were quantified with a cytometric bead assay. Levels of IL-2,5,7,12-23p40, and 21 were log-transformed, scaled, and summed to create a composite measure of PM2.5-associated inflammation. Pearson correlations and regression analysis were performed to characterize the relationship between this scaled metric and estimated

PM2.5 exposures. Estimated 12-month PM2.5 levels were positively associated with elevations in the cytokine score on univariate analysis ($\beta=1.17$, $p<0.0001$). This relationship between the IL-2,5,7,12-23p40, and 21 composite score and PM2.5 levels was persistent after adjusting for numerous potential clinical and sociodemographic confounders [age, BMI, history of asthma/allergic rhinitis, polyps, and income/rurality measures ($\beta=1.27$, $p<0.0001$).] PM2.5-associated inflammation in CRS appears to be characterized by joint global elevations in mucus IL-2,5,7,12-23p40, and 21.

Further experimental validation and investigation of upstream pathways are needed to identify possible mechanisms leading to this endotype.

10:51 am – 10:59 am

Invention of “smell aids”

Kai Zhao, PhD
Veronica Formanek, BS
Barak Spector, Medical Student
Gabriela Zappitelli, Student
Zhenxing Wu, Postdoc
Ohio State University

Background:

Eye glasses, hearing aids, etc. all serve to enhance the sensory stimuli to enable patients to see or hear things that they wouldn't otherwise be able to, but we have no equivalent technology for olfaction.

Methods:

We invented “Smell-Aids” by non-invasively enhancing intranasal odorant delivery to the olfactory epithelium, using: (a) a nasal foam plug with a diagonal channel embedded to direct air/odor flow upwards to the olfactory region; (b) a clip (similar to what synchronized swimmers use) pinching a critical nasal valve region that may intensify the nasal airflow vortex to the olfactory region.

Results:

We tested both prototypes on 54 patients with confirmed olfactory losses (age 21-80y, median 54.5), majority of whom ($=37/54=69\%$) were post-COVID long haulers (infected 12/15/2019 to 10/4/23; persisted 30 to 1260 days, median 22 months). The remaining non-COVID smell losses ($n=17$) span significantly longer from 5m-27 years (median 8.5 y). The 9-item NIH toolbox odor ID score significantly improved after application of both smell aids (baseline: 4.30 ± 2.27 , plug 5.11 ± 2.32 , pinch 4.82 ± 2.06 , mixed model $p<0.05$), especially among the non-COVID cohort. For COVID long haulers, only the nasal plug remained effective ($p<0.05$). Subgroup analysis was performed on patients who reported diminished (hyposmia/anosmia 38/54) vs distorted smell (parosmia/phantosmia 27/54, $n=11$ reported both) and showed that the nasal plug remains effective for both cohorts ($p<0.05$) while the pinch is only effective for the hypo/anosmia cohort ($p<0.05$).

Conclusion:

These results demonstrated the novelty of improving olfactory function through peripheral mechanisms for different patient cohorts and may one day lead to an effective OTC smell aid.

11:00 am – 11:05 am

Q&A

11:05 am – 11:55 am

PANEL: Concept to Company: Navigating the Journey from Research to Entrepreneurship

Moderator: Greg Davis, MD, FARS

Panelists: Peter Hwang, MD, FARS; Sujuana Chandrasekhar, MD; Brandon McCutcheon, MD
Supported by the Research Grants Committee and Rhinologists in Private Practice Section

11:55 am – 12:00 pm

Q&A

12:00 pm – 1:00 pm

Lunch with Exhibitors**Saturday, May 17, 2025****Afternoon Session – Celestin D**

1:00 pm – 5:00 pm CST

Room Moderator: Chadi Makary, MD, FARS

Scientific Oral Presentations:

Moderators : Naweed Chowdhury, MD; Carol Yan, MD

1:00 pm – 1:06 pm

TRMs, TLS, and type 2 cytokine production in CRSwNP

Tolani Olonisakin, MD, PhD

Andrew Lane, MD, FARS

Hsin-Tzu Keng, MS

Abigail Gaffar, MS

Stephane Lajoie, PhD

Jerlon Chiu, MD

Johns Hopkins School of Medicine

Introduction:

IL-4 and IL-13 are primary drivers of chronic rhinosinusitis with nasal polyps (CRSwNP) : pathophysiology, as evidenced by the effectiveness of dupilumab. These cytokines derive from multiple cellular sources, including prominently Th2 lymphocytes. Among Th2 cells, CD4+ tissue-resident memory T cells (TRMs) are gaining increasing attention in chronic inflammatory diseases and tumor biology. Tertiary lymphoid structures (TLS) have been described in CRSwNP, but their significance is unknown.

Methods:

Human nasal samples were collected from CRSwNP patients during endoscopic sinus surgery and processed for flow cytometry and immunohistochemistry (IHC). TRMs were identified by co-expression of the markers CD4, GATA3, and CD69. C57BL/6 mice were intranasally challenged with a combination of house dust mite, *Alternaria*, and cockroach antigen, or PBS, for 6 weeks and nasal mucosa was harvested for flow cytometry.

Results:

In human nasal polyps, CD4+ TRMs outnumber non-memory CD4+ T cells ($P < 0.0001$), with a greater proportion of TRMs expressing IL-13. A similar TRM predominance was found in nasal tissue from the type 2 inflammation mouse model ($P = 0.0004$). Human polyp tissue IHC reveals clusters of GATA3+ CD69+ TRMs resembling TLS, suggesting aggregation of these cells in specific niches.

Conclusion:

This study demonstrates that TRMs are the major lymphocyte source of IL-13 in CRSwNP, as well as chronic Th2 nasal inflammation in a mouse model. Additionally, human TRMs appear to aggregate in specific tissue niches resembling TLSs, providing evidence that a special microenvironment may provide the necessary signals for their maintenance, with potential for therapeutic targeting.

1:07 pm – 1:13 pm

Nitric oxide synthase expression patterns within the sinonasal tract

W. Jared Martin, BA

Rodney Gilmore

Kevin Byrd

Yasine Mirmozaffari

Lauren Cook, BS

Ezer Benaim, MD

Tom Raz Yarkoni, MD

Michael Armstrong, MD

Wanda O'Neal

Brent Senior, MD, FARS

Adam Kimple, MD, PhD, FARS

University of North Carolina School of Medicine

Introduction:

Nitric oxide (NO) is a vital molecule in the human sinonasal tract, playing key roles in vasodilation, immune defense, and cellular signaling. The enzymes responsible for producing NO, known as nitric oxide synthases (NOS), exist in three isoforms: neuronal (NOS1), inducible (NOS2), and endothelial (NOS3). However, the variation in NOS expression across different anatomical locations within the sinonasal tract remains poorly understood.

Methods:

We utilized single-cell transcriptomics to identify the cell types involved in NOS expression and NO production in healthy sinonasal epithelium. RNA

scope probes for NOS1, NOS2, and NOS3 were employed to determine the distribution of NOS expression in the nasal, turbinate, and sinus epithelium, as well as in specific cell types.

Results:

Single-cell analysis revealed NOS1 expression in neuronal cells, NOS2 in goblet cells, and NOS3 in vascular endothelial cells. In healthy human tissue, NOS2 was consistently present in the respiratory epithelium of the nasal cavity and maxillary sinus, while NOS1 and NOS3 were absent.

Conclusions:

Our findings reveal distinct NOS expression patterns within the sinonasal tract, with each isoform exhibiting specific cellular and anatomical localization. The consistent presence of NOS2 in the respiratory epithelium underscores its critical role in maintaining sinonasal health. Future studies will investigate specific NOS isoform expression in additional anatomical sites, specifically the ethmoid and sphenoid sinus mucosa, as well as in various disease states, to better elucidate the multifaceted role of NO in supporting sinonasal health and its implications for therapeutic interventions.

1:14 pm - 1:20 pm

Elevation of alarmin cytokines in chronic rhinosinusitis

Sarah Almas, MD
Hazel Marriott
Paige Lacy
David Cote
University of Alberta

Background:

Airway epithelial cells play an integral role in immune responses and modulating chronic diseases. Alarmin cytokines (thymic stromal lymphopoietin (TSLP), interleukin (IL)-25, IL-33, and TL1A) are produced by epithelial cells, and their elevation underlies the pathogenesis of chronic rhinosinusitis (CRS). However, expression of these cytokines from different regions of the nasal cavity remains to be elucidated. Here, we aim to compare alarmin cytokine production from different regions of paranasal sinuses in patients with CRS. We hypothesize that nasal and sinus epithelial samples from patients with CRS express elevated alarmin cytokines.

Methods:

Patients with CRS were recruited during initial consultation at a tertiary rhinology practice and completed a questionnaire grading their symptom severity and paranasal sinus specimens were obtained during their functional endoscopic sinus surgery. Paranasal sinus specimens were subjected to fixation and permeabilization to detect intracellular alarmin cytokine expression in cytokeratin 8 (Ck8)-expressing epithelial cells via flow cytometry.

Results:

Ck8+ epithelial cells from brushings from the posterior and anterior portions of all four paranasal sinuses revealed high levels of IL-25, IL-33, TSLP, and TL1A in all patients with CRS, which may correlate with reported symptom severity. We also observed differential alarmin cytokine expression from different regions of the sinus cavities.

Conclusion:

Identifying distinct profiles of key cytokines driving symptomatology in CRS highlights targets for pharmaceutical interventions that target innate immune mechanisms. Our findings suggest that sinus brushings may provide predictive biomarkers for treatment with biologics.

1:21 pm – 1:27 pm

Histopathologic features of eosinophilic vs mixed eosinophilic-neutrophilic chronic rhinosinusitis

Evan Patel, MS
Ali Baird
Peter Filip, MD
Peter Papagiannopoulos, MD
Pete Batra, MD, FARS
Bobby Tajudeen, MD, FARS
Rush University Medical Center

Background:

Chronic rhinosinusitis (CRS) is a heterogeneous inflammatory condition with varying inflammatory profiles, including eosinophilic and mixed neutrophilic/eosinophilic patterns. These differing profiles may influence CRS severity and treatment response. This study aims to identify distinct structured histopathological (SHP) features associated with each inflammatory pattern to support more targeted CRS management.

Methods:

A retrospective review of 190 patients with CRS undergoing endoscopic sinus surgery was conducted. Patients were stratified based on the presence of eosinophilic (>10 eosinophils per HPF) infiltrate or a mixed neutrophilic/eosinophilic inflammatory pattern on SHP analysis of tissue samples. Clinical data and SHP features were collected and compared for statistical significance between groups using SPSS.

Results:

61 patients with mixed neutrophilic/eosinophilic inflammation and 129 patients with eosinophilic infiltration alone were included. Pre-operative Lund-Kennedy and SNOT-22 scores were similar among groups. In the eosinophilic group, mucosal ulceration was present in 0.8% of patients compared to 11.3% of patients in the mixed neutrophilic/eosinophilic group ($p < 0.001$). Squamous metaplasia was present in 20.2% of patients in the eosinophilic group versus 46.8% in the mixed group ($p < 0.001$).

Conclusion:

This study highlights differences in inflammatory profiles between eosinophilic predominant and a mixed neutrophilic/eosinophilic CRS. The presence of neutrophils among patients with eosinophilic CRS may contribute to mucosal ulceration and squamous metaplasia. The identification of SHP-related variables may guide future therapeutic approaches for better-targeted management of these patients.

1:28 pm – 1:34 pm

Impact of obesity on the structured histopathology of chronic rhinosinusitis patients

Daniel Ma, BS
Sushanth Neerumalla, BS
Ali Baird, Dr.
Russel Whitehead, BS
Peter Filip, MD
Bobby Tajudeen MD, FARS
Pete Batra, MD, FARS
Peter Papagiannopoulos, MD

Background:

Obesity is an established risk factor for asthma, which shares common inflammatory pathways with chronic rhinosinusitis (CRS). However, the link between obesity and CRS remains poorly understood. By identifying trends in the structured histopathology (SHP) of obese patients with CRS, we aim to better understand how changes in the tissue architecture of obese patients may contribute to CRS.

Methods:

Retrospective chart review was conducted on chronic rhinosinusitis (CRS) with and without nasal polyp patients who underwent functional endoscopic sinus surgery. Data was collected on structured histopathology, demographics, and comorbidities. Chi-squared, logistic analyses, and multivariate analysis were performed.

Results:

464 CRS patients were enrolled. The patient cohort was 50.5% female. Mean age was 52.01 years and mean BMI was 38.17. 49.5% were diagnosed with CRS with nasal polyps. 279 were non-obese (BMI<30), 100 were obese class I (BMI 30-34.9), 39 were class II (BMI 35-39.9), and 46 were class III (BMI≥40). It was found that class III obesity was associated with statistically significant increases in several histopathological markers, including hyperplastic/papillary changes (17.4% vs 5.6% P<0.026), Charcot Leyden Crystals (17.4% vs 6.6% P<0.037), and squamous metaplasia (26.1% vs 17.6% P<0.028). Multivariate analysis was performed, controlling for asthma, smoking, CRS subtype, and diabetes mellitus status. None of the variables significantly impacted the results.

Conclusion:

Several SHP variables are more prevalent in obese patients and may serve as a predictor of CRS severity. This suggests the inflammatory pathway in obese patients leading to CRS is distinct from the asthmatic inflammatory pathway.

1:35 pm – 1:40 pm

Q&A

1:41 pm – 2 :04 pm

PANEL: Epigenetic changes in CRS: An unfortunate melding of genetics and environment

Moderator: Devyani Lal, MD, FARS
Panelists: Naweed Chowdhury, MD; Jayant Pinto, MD
Supported by the Women in Rhinology Section

Moderators: Victoria Lee, MD, FARS; Nicholas Rowan, MD

2:05 pm – 2:11 pm

ICIs and type 2 inflammatory signatures: Clues on immunologic mechanisms of airway inflammation

Jonathan Zou, BA
William Thorley
Evelyn Rowe
Simon Chiang, Research Coordinator
Sophie Yu, Student
Alice Maxfield, MD, FARS
Rachel Roditi, MD, FARS
Regan Bergmark, MD, FARS
Stella Lee, MD
University of Rochester School of Medicine and Dentistry

Introduction:

Treatment with immune checkpoint inhibitors (ICIs) may be associated with new onset type 2 inflammatory signatures and associated eosinophilia or eosinophilic-related diseases.

Methods:

Patients who received ICI therapy for cancer and a comparison group of cancer patients who did not receive ICI therapy were evaluated from the TriNetX electronic health-record registry. Patients with immunodeficiency diagnoses were excluded. Propensity score matching was conducted based on demographics, smoking history, obesity, hypertension and dyslipidemia. Multi-variate cox proportional hazard models and Kaplan Meier methods were utilized to assess the development of new-onset eosinophilia (≥300/uL), atopic dermatitis, chronic rhino-sinusitis, allergic rhinitis, nasal polyps, eosinophilic esophagitis, eosinophilic pneumonitis, eosinophilic gastritis, eosinophilic colitis, eosinophilic asthma, GPA, EGPA, and biologics use.

Results:

94807 cancer patients (52.36% male; 70.72% white; 63.4±13.4 mean age at index) who received ICI treatment and 94807 cancer patients (52.36% male; 70.72% white; 63.6±15.2 mean age at index) who never received ICI were recruited. Associated Kaplan-Meier curves showed significantly increased eosinophilia risk among the ICI group for all follow-up years (Risk ratio 18.99 (95% CI: 1.859, 1.941), $p<0.0001$). The risk of eosinophil and type 2 inflammatory associated diseases were within a RR of 0.44 – 1 across all studied outcomes.

Conclusions:

A significantly increased risk of eosinophilia was found among the ICI treatment group. Further investigation is needed on ICI treatment and new onset type-2 inflammation that could shed light on the mechanisms of immunologic dysfunction in upper airway inflammation.

2:12 pm – 2:18 pm

Glycosaminoglycans for chronic rhinosinusitis treatment

Fatemeh Zareihajiabadi, PharmD
Chelsea Pollard, Research Analyst
Paige Shipman
Won Yong Lee
Justin Savage
Jeremiah Alt, MD, PhD, FARS
Abigail Pulsipher, Assistant Professor
University of Utah

Background:

GM-1111, a non-steroidal anti-inflammatory agent based on glycosaminoglycans, has shown efficacy in reducing sinonasal inflammation in a mouse model of chronic rhinosinusitis (CRS) by inhibiting Toll-like receptor-mediated activation of the innate immune response. Due to the unified airway hypothesis, we postulated that GM-1111 will also reduce lung inflammation.

Methods:

A mouse model of type 2 inflammatory CRS with lung inflammation was developed using *Aspergillus fumigatus* extracts in BALB/c mice (n=51). Mice were treated with intranasal (n=9), subcutaneous (n=9), or aerosolized (n=6) GM-1111 and compared to controls: intranasal budesonide (n=9), normal (n=8), and disease (n=10). Inflammatory cell infiltration in bronchoalveolar lavage fluid (BALF) was assessed by flow cytometry. Sinonasal tissue and blood biomarkers were evaluated through histology, immunohistochemistry, and immunoassays. Data were analyzed via ANOVA with Tukey's post hoc tests.

Results:

Subcutaneous GM-1111 surpassed budesonide in reducing sinonasal inflammation scores. All treatments reduced BALF eosinophils versus disease

controls, with aerosolized GM-1111 achieving significance ($p<0.05$). Aerosolized GM-1111 elevated lung tissue-resident macrophages and, with budesonide, lowered serum IgE versus other groups ($p<0.05$). Intranasal GM-1111 decreased sinonasal MBP+ eosinophils compared to all groups ($p<0.001$). CD4+ T cells increased across groups ($p<0.0001$), while Ly-6G+ neutrophils showed no significant changes.

Conclusion:

GM-1111 shows promise as an alternative to steroids for CRS treatment across upper and lower airways when inhaled or systemically administered. Further formulation, dosing, and respiratory mechanics studies are required.

2:19 pm – 2:25 pm

Use of macrolide therapy for the presence of neutrophils on structured histopathology

Alison Yu, MD
Sanjena Venkatesh, Medical Student
Jadyn Wilensky, Clinical Research Assistant
Alan Workman, MD
Jeremy Chang
Maria Espinosa, Fellow
Jennifer Douglas, MD
James Palmer, MD, FARS
Nithin Adappa, MD, FARS
Michael Kohanski, MD, PhD, FARS
University of Pennsylvania

Background:

Structured histopathology at the time of surgery can help inform prognosis and guide postoperative therapy. Macrolide therapy may be beneficial for reducing neutrophilic inflammation in the airway. The objective of this study was to compare sinonasal outcomes for subjects with neutrophils who were and were never on macrolide therapy.

Methods:

We identified post-surgical chronic rhinosinusitis without nasal polyps (CRSsNP) patients who had neutrophils present on structured histopathology between January 2019 and May 2024. All surgeries involved opening of all sinuses with at least Draf IIa frontal sinusotomy. We compared the postoperative SNOT-22 scores, and oral antibiotic and steroid use between patients who were never on macrolide and those who were placed on low dose azithromycin therapy after surgery (250mg every Monday, Wednesday, and Friday) for at least 3 months.

Results:

77 CRSsNP patients met the inclusion criteria, of which 34 (44.2%) patients were in the macrolide group. The SNOT-22 score was significantly improved in the macrolide group compared to the non-macrolide group at 6 months (13.2 vs 23.4, $p=0.010$). At 3 months, the macrolide group had a significantly lower rate of antibiotic use (5.9% vs.

27.9%, $p=0.013$) and steroid use (2.9% vs. 18.6%, $p=0.034$) than the non-macrolide group. At 6 months, the macrolide group continued to have a lower rate of antibiotic use (8.8% vs. 23.3%, $p=0.093$).

Conclusion:

Low dose macrolide therapy in neutrophilic CRSsNP patients was associated with an improvement in sinonasal symptoms and decreased antibiotics and steroids requirement compared to those who were never on macrolide, suggesting the utility of early macrolide therapy after surgery in these patients.

2:26 pm – 2:32 pm

Preclinical validation of nasal epithelial stem cell grafting as a therapeutic approach

Do-Yeon Cho, MD

Jessica Grayson, MD

Bradford Woodworth, MD, FARS

Justin Turner, MD, PhD, FARS

Catherine Banks, MBChB

Shafegh Waters

Shaoyan Zhang, PhD

Daniel Skinner, BS

University of Alabama at Birmingham

Introduction:

Stem cell biology has recently attracted considerable interest due to stem cells' unique abilities for self-renewal and adaptability. Innovations in the isolation and culture of nasal epithelial stem/progenitor cells (NESPCs) have paved the way for potential therapeutic applications in sinonasal disease treatment. This study assesses the feasibility of NESPC allografting in a rabbit model as an initial proof of concept to regenerate healthy epithelium.

Methods:

Healthy rabbits' nasal septal mucosa was harvested, and NESPCs were expanded in vitro using a feeder- and serum-free dual SMAD inhibition culture technique. NESPCs were seeded onto a 6mm graft material (Myriad Matrix). After preparing the rabbit nasal septum by exposing the septal cartilage, 3 rabbits received NESPC-seeded grafts, and 3 others received unseeded grafts as negative controls. Rabbits were sacrificed 3 weeks post-grafting.

Results:

Nasal endoscopic examination revealed scar formation between the nasal septum and lateral wall in control rabbits. Histological analysis showed epithelial regeneration in NESPC-seeded grafts, while controls exhibited complete fibrosis. No differences were observed in the subepithelial layer, as neither group exhibited regenerated submucosal glands. Epithelial function, assessed through nasal potential difference measurements, indicated significantly higher chloride secretion in NESPC-seeded grafts ($-12.6 \pm 0.12 \text{ mV}$) compared to controls ($-4.2 \pm 0.6 \text{ mV}$) ($p < 0.001$).

Conclusions:

This preclinical study demonstrates that nasal epithelial stem cell allografting supports the regeneration of epithelial structure and function. Stem cell-based grafting holds promise for advancing targeted treatments for upper airway diseases.

2:33 pm – 2:39 pm

Endoscopic transnasal sphenopalatine ganglion block for chronic craniofacial pain

David Liu, MD, PhD

Pooya Roozdar, MD, MPH

Erik Chan, Clinical Research Coordinator

Michael Yong, MD, MPH, MBA

Meredith J. Barad, MD

Xiang Qian, MD, PhD

Peter Hwang, MD, FARS

Michael T. Chang, MD

Background:

Chronic craniofacial pain is challenging to treat, with varied outcomes from existing treatments. This study explores using an endoscopic transnasal technique for targeting the sphenopalatine ganglion (SPG). The objective was to assess the efficacy and safety of repeated endoscopic transnasal submucosal liposomal bupivacaine (Exparel®) injections into the SPG for managing craniofacial pain.

Methods:

In this prospective, longitudinal, open-enrollment trial, 11 patients with chronic craniofacial pain were treated at a tertiary center. Patients who experienced symptom relief after an initial bupivacaine challenge were included. Repetitive endoscopic transnasal submucosal SPG blocks (SPGB) with liposomal bupivacaine were then administered in the office under local anesthesia using a spinal needle. Pain was assessed with a 10-item questionnaire at baseline and one day, one week, and one month post-injection.

Results:

Of the 82 injections performed, 81 were successful (98.8%). Analysis of variance showed significant improvements in pain scores for average pain ($p < 0.01$), worst pain ($p < 0.01$), and least pain ($p < 0.01$) in the last 24 hours at day one and one week post-treatment compared to baseline. Additionally, pain-related quality of life measures, including eating habits, annoyance, and sleep, showed significant improvements (all $p < 0.01$). Five minor adverse events were reported: transient diplopia ($n=2$), headache/facial pain ($n=1$), bleeding at the injection site ($n=1$), and nasal irritation ($n=1$).

Conclusions:

Endoscopic transnasal injection of bupivacaine into the SPG appears to be a safe and effective procedure for providing significant pain relief in patients with chronic craniofacial pain.

2:40 pm – 2:45 pm

Q&A

2:45 pm – 3:15 pm

Break with Exhibitors

Moderators: Philip Chen, MD, FARS; Theodore Schuman, MD, FARS

3:16 pm – 3:22 pm

Biomolecular analysis of novel cerebrospinal fluid-specific aptamers

Edward Kuan, MD, FARS

Xinlei Chen

Arash Abiri, PhD

Mehmet Senel

Brandon Latifi

Andrej Luptak

Michelle Khine

University of California, Irvine

Objectives:

Currently, diagnostic confirmation of cerebrospinal fluid (CSF) leaks is limited to immunofixation electrophoresis, which has a latency time of 3-5 days and often requires processing at specialized laboratories. Through in vitro selection using clinical samples, our group has identified 2 candidate ssDNA aptamers specific for CSF biomarkers which may serve as a platform for point of care (POC) detection. This study provides further characterization of these novel aptamers through biomolecular techniques.

Methods:

Magnetic beads modified with CSF-specific aptamers were exposed to individual patient CSF samples and pooled serum. Upon binding to the CSF-specific biomarker, the amount of aptamer which detached from the beads was quantified through quantitative polymerase chain reaction (qPCR). The fully enriched CSF-specific aptamer library was also exposed to individual CSF samples by the same method and the libraries were sequenced.

Results:

For each aptamer, the qPCR test exhibited 93% sensitivity for individual CSF samples (n=16 each). Each aptamer appeared to bind to different biomarkers which was demonstrated by an inverse correlation in terms of abundance within CSF. Sequencing results demonstrated heterogeneity of CSF biomarkers between unique patients.

Conclusion:

Utilizing biomolecular techniques, we further characterize the novel CSF-specific aptamers which may guide development of a high-sensitivity, dual-aptamer, electrochemical biosensor for POC CSF detection.

3:23 pm – 3:29 pm

Quantifying eosinophils in sinonasal tissue using optical coherence tomography

Ido Badash, MD

Michael Serafino

Adrian Correa

John Oghalai

Brian Applegate

Bozena Wrobel, MD, FARS

Kevin Hur, MD

Background:

Eosinophilic chronic rhinosinusitis (ECRS) is a severe subtype of CRS that is diagnosed with histologic evidence of tissue eosinophilia. There is currently no test that can non-invasively quantify eosinophils in sinonasal tissue to diagnose ECRS. We aimed to quantify eosinophils per field of view (FOV) in excised sinonasal tissue using optical coherence tomography (OCT), a high-resolution imaging modality, and compare these counts with eosinophils per high power field (HPF) measured on histology.

Methods:

Fresh eosinophils were first obtained from nasal swabs of patients with allergic rhinitis, dyed with Hansel stain, and imaged using OCT to determine their appearance. Sinonasal tissue from patients undergoing surgery for CRS was then collected. Half of each sample was imaged using high-resolution OCT (1- μ m) while the remainder underwent histologic analysis. Globules with the appearance of eosinophils were counted and averaged over 3 OCT images per sample. Correlation between mean eosinophil counts per FOV and eosinophils per HPF on histology was analyzed. Using a cutoff of 55 eosinophils per HPF on histology, a receiver operating curve (ROC) for diagnosing ECRS was computed.

Results:

Sinonasal tissue was obtained from 14 patients with CRS. The mean age was 50 years and half of patients (50%) had polyps. There was a statistically significant correlation between globules per FOV on OCT and eosinophils per HPF on corresponding histology slides ($R = 0.86$, $P < 0.05$). A cutoff of 70 globules per FOV was 83% sensitive and 100% specific for a diagnosis of ECRS.

Conclusion:

OCT may be used to diagnose ECRS by imaging excised sinonasal tissue, although additional research is necessary to quantify eosinophils in-vivo.

3:30 pm – 3:36 pm

External validation of a diagnostic prediction model for acute invasive fungal rhinosinusitis

Aviv Spillinger, MD
Johanna Ellefson
Qiuyu Yang
Linda Yin
Janalee Stokken, MD, FARS
Thomas Pasic
Ian Koszewski, MD, FARS
Sandra Lin, MD, FARS

Background:

Prompt detection and intervention is imperative for improved morbidity and mortality in acute invasive fungal rhinosinusitis (AIFR). The aim of the current study was to externally validate a previously published diagnostic prediction model for AIFR by assessing its predictiveness in an independent patient cohort, in order to determine its generalizability to a broader population.

Methods:

Retrospective chart review at a tertiary care center between 2008 to 2023 was used to identify patients with an Otolaryngology consult to evaluate for possible AIFR. A total of 65 patients were identified, 11 (16.9%) with definite AIFR based on histopathologic analysis. The risk of AIFR was then calculated using the predictive equations from Yin et al's diagnostic prediction model. The predictive performance of the model on the new, independent patient set was then assessed for calibration and discrimination.

Results:

According to the calibration-in-large, the model overestimated the probability of AIFR in this external dataset, with a calculated risk of 24.2% compared to the observed 16.9% rate of positive AIFR diagnosis. However, the model demonstrated excellent discrimination, with a C-index of 0.96. At the optimal cut-point of 0.42 identified by Youden index, the sensitivity of the model approached 100%, while the specificity was 81.6%.

Conclusion:

Yin et al's diagnostic prediction model shows overall good performance in predicting the risk of AIFR in this external dataset. External validation is an important step for translating the prediction model into clinical practice. The high sensitivity seen on the external validation supports its use as an initial screen to identify patients at highest risk for AIFR.

3:37 pm – 3:43 pm

Measuring observer attention to thyroid eye disease: What amount of proptosis is noticeable?

Forrest Fearington, BS
Lazaro Peraza, MD
Aja Leatherwood, Research Intern
Alexis Grover, Research Intern
Jacob Dey, MD
Andrea Tooley, MD
Janalee Stokken, MD, FARS
Mayo Clinic Alix School of Medicine

Background:

Thyroid eye disease (TED) is an autoimmune disorder associated with retroorbital inflammation and proptosis. TED consultations can be complex given the increased social anxiety associated with TED and the risks of therapies, yet there is a lack of literature regarding how the general public perceives varying severities of TED.

Aim: We used eye tracking technology to objectively determine what extent of proptosis was noticeable to casual observers.

Methods:

Twenty female TED patients (mean age 52) and five female control (mean age 49) with frontal and oblique facial images were evenly stratified into groups by Hertel (<18mm controls, 18-19.99mm, 20-21.99mm, 22-23.99mm, 24-26mm) and again by palpebral fissure height (PF) (<9mm, 9-10.99mm, 11-12.99mm, >13mm). Lay observers gazed freely at each image for 10 seconds while their gaze was tracked using an infrared eye-tracking system. Observers were not informed of the faces' TED diagnoses prior to viewing.

Results:

Ninety-eight observers (62 female, mean age 45) viewed the images. Mixed effect analysis demonstrated that Hertel and PF were both significantly associated with increased gaze in the orbital region for both frontal and oblique images ($p < 0.01$), with every 1 mm increase in Hertel leading to a eye gaze increase of 107 milliseconds. Analysis further demonstrated that Hertel >24 mm led to a statistically significant increase in attention on the eyes ($p = 0.0009$) compared to control faces.

Conclusion:

Hertel and PF are both strong predictors of increased attention to the eyes of patients with TED. Patients with Hertel greater than 24 mm draw significantly more casual observer attention to their eyes and could potentially benefit most from aesthetic treatment.

3:44 pm – 3:50 pm

Comparative insights into refractory chronic rhinosinusitis: Next-generation sequencing vs. conventional culture

Emily Moldoff, FNP-C

Evelyn Rowe

William Thorley

Simon Chiang

Allen Zhou, MD

Stella Lee, MD

Brigham and Women's Hospital, Harvard Medical School

Introduction:

Next-generation sequencing (NGS) has been used to characterize bacterial communities across various human body sites, including the gastrointestinal tract, skin, oral cavity, and respiratory system. Its application in analyzing the sinonasal microbiome, particularly in the context of treatment for patients with acute exacerbations of chronic rhinosinusitis (CRS), remains less explored.

Methods:

In this prospective observational study, adult patients with CRS experiencing acute exacerbations including mucopurulent drainage unresponsive to appropriate medical therapy were enrolled. Sinonasal swabs of purulent drainage were collected using both NGS and conventional culture methods. Lund Kennedy scores (LKS) were obtained. The microbial profiles obtained from each method were compared including bacterial composition, load and correlation with LKS.

Results:

Thirty-nine samples from 22 patients were collected using NGS and traditional culture at baseline and at 1-month intervals. There was concordance between NGS and culture in 25/39 (64%) samples. Using LKS as the standard, NGS exhibited sensitivity nearing 100% and specificity of 50% compared to culture which exhibited sensitivity of 67% and specificity of 50%. NGS led to tailored antibiotic therapy in 10 additional samples in which culture results would have been considered negative, a 32% increase in patients treated appropriately.

Conclusion:

NGS has higher sensitivity and similar specificity compared to traditional cultures, potentially allowing for tailored antibiotic therapy in symptomatic patients. Clinical findings must be correlated with NGS results due to its high sensitivity and low specificity.

3:51 pm – 3:57 pm

MRI vs. CT in acute invasive fungal sinusitis: Mapping diagnostic accuracy across sinonasal subsites

Shreya Ramkumar, MD

Charlie Gallego, Medical Student

Nirushan Narendran, PhD Student

Shireen Samargandy, Consultant

Christopher Le, MD, FARS

University of Arizona

Introduction:

Acute invasive fungal sinusitis (AIFS) is a rapidly progressing disease with poor outcomes when diagnosis is delayed. Computed tomography (CT) scans and magnetic resonance imaging (MRI) are two modalities that can aid in diagnosis. This study aims to directly compare CT and MRI in the subsite-specific detection of AIFS.

Methods:

We performed a retrospective chart review of patients with an intraoperative biopsy confirmed diagnosis of AIFS of any sinonasal subsite who had available CT and MRI imaging at a tertiary care center from July 2016 to June 2023. Chi-square tests were used to evaluate sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) by sinonasal subsite for both imaging modalities. A p-value <0.05 was considered significant.

Results:

Our study included 57 patients (mean age on admission: 54.0 years, standard deviation: 17.3 years) with a biopsy-proven AIFS. On subsite analysis, MRI significantly outperformed CT in detecting AIFS within the nasal septum (sensitivity: 79% vs. 12%, $p < 0.001$), turbinate (sensitivity: 80% vs. 0%, $p < 0.001$), and hard palate (sensitivity: 100% vs. 61%, $p = 0.008$). MRI was significantly more accurate compared to CT in excluding AIFS in both the nasal septum (NPV: 83.8% vs. 58.8%, $p = 0.03$) and the turbinate (NPV: 80.7% vs. 50.94%, $p = 0.01$). There were no significant differences in diagnostic accuracy between CT and MRI within the paranasal sinuses and skull base.

Conclusion:

Our results demonstrate the superiority of MRI in detecting and excluding AIFS compared to CT, particularly in the turbinate, septum, and hard palate. Early identification using radiologic features may aid in prompt diagnosis and expedited treatment of suspected patients.

3:58 pm – 4:04 pm

The use of ChatGPT in shared decision-making in rhinology: A randomized controlled trial

Omer Baker, BS
Clifford Jiajun He, BA
Andrew Yousef, Resident Physician
Adam DeConde, MD
Carol Yan, MD
University of California San Diego School of Medicine

Introduction:

Shared decision-making (SDM) integrates patient preferences into evidence-based care. Recent studies have suggested that ChatGPT can be a useful clinical tool. This study aimed to assess ChatGPT's effectiveness in facilitating SDM in rhinology.

Methods:

In a randomized controlled trial, adult patients with medically refractory chronic rhinosinusitis (CRS) and/or nasal obstruction were recruited after elective surgery discussions. Participants were randomized to use either ChatGPT or an internet search engine (Google) to ask treatment-related questions. The primary outcome was change in decisional conflict scale (DCS) score. Secondary outcomes were changes in treatment-related knowledge (4-item questionnaire, MCQ) and system usability scale (SUS) score. T-tests or Fisher's exact tests were used for inter- and intra-group comparisons. Rhinologists assessed ChatGPT response accuracy on a 10-pt Likert scale.

Results:

Of 42 patients, 40 completed the study, with no significant demographic differences between the ChatGPT (n=20) and Google (n=20) groups. Both groups showed significant improvement in DCS scores post-intervention (ChatGPT: 18.9 vs. 14.1, $p=0.002$; Google: 15.5 vs. 12.7, $p=0.008$). ChatGPT users experienced a significant reduction in the uncertainty subdomain (27.5 vs. 17.9, $p=0.004$). Preference for surgery increased in both groups (ChatGPT: 45.0% to 50.0%, $p=0.001$; Google: 65.0% to 75.0%, $p=0.001$). MCQ scores remained unchanged and usability scores were similar between groups. ChatGPT's responses were rated as moderately accurate at 7.2/10 (SD=2.0).

Conclusion:

SDM using ChatGPT and Google may boost patient confidence in pursuing surgery, with ChatGPT offering added benefits in reduced treatment uncertainty.

4:05 pm – 4:10 pm

Q&A

4:11 pm – 4:55 pm

PANEL: Allergic fungal rhinosinusitis: Current and future research directions

Moderator: Lauren Roland, MD
Panelists: Joshua Levy, MD, FARS; Amber Luong, MD, PhD, FARS; Sarah Wise, MD, FARS
Supported by the Allergy in Rhinology and Women in Rhinology Sections

4:55 pm – 5:00 pm

Q&A

5:00 pm – 5:30 pm

Business Meeting

5:30 pm – 7:00 pm

ARS President's Reception

Room: Empire C

Saturday, May 17, 2025

Concurrent Afternoon Session – Empire CD

1:00 pm – 5:00 pm CST

Room Moderator: Charles Ebert, Jr., MD, FARS

Moderators: Garret Choby, MD, FARS; Jessica Grayson, MD

1:00 pm – 1:06 pm

Comparison of HPV-positive and HPV-negative sinonasal squamous cell carcinoma

Avraham Adelman, BS
Young Lee, MS
Brian Lobo, MD, FARS
Jeb Justice, MD, FARS
Nikita Chapurin, MD, MHS
University of Florida

Introduction:

Recent evidence indicates increasing incidence of human papilloma virus (HPV)-mediated sinonasal squamous cell carcinoma (SNSCC). We assessed current trends of HPV pathologic testing and positivity rates of SNSCC, as well as other epidemiological and clinical characteristics.

Methods:

Retrospective chart review of all patients with pathology-proven SNSCC from 2011-2024. Demographics, clinical characteristics, staging, and HPV testing data were collected. HPV and non-HPV cohorts were compared with chi-square, t-test, and linear regression.

Results:

Overall, 169 SNSCCs (50.4% of all sinonasal cancers) were diagnosed from 2011-2024. 72 cases

(42.6%) were tested for HPV and 41 (56.9%) were positive. Patient demographics were similar between the groups. Linear regression revealed a ($p<0.05$) temporal decline in HPV testing from 61.1% in 2011-2013 to 33.3% in 2021-2024. During this period, HPV positivity rates increased overall. The frequency of positive tumors originating in the nasal cavity (65.9%) and maxillary sinus (12.2%) significantly ($p<0.001$) differed from HPV-negative in the nasal cavity (22.6%) and maxillary sinus (61.3%). Prognostically, 81.5% of HPV-negative tumors were T4 as opposed to 60.6% of HPV-positive tumors. Moreover, the proportion of T4b was greater ($p<0.05$) in HPV-negative (45.5%) tumors compared to HPV-positive (15.8%).

Conclusion:

Majority of SNCCs are now HPV-driven and predominantly arise from the nasal cavity. Despite increasing reported incidence of HPV-related SNCCs, national and our institutional HPV-testing rates is decreasing. Given the prognostic implications of HPV-positive SNCCs and novel circulating tumor DNA surveillance, clinicians should routinely test SNCCs for HPV markers.

1:07 pm – 1:13 pm

Fine particulate matter exposure and sinonasal malignancy

Hong-Ho Yang, BS
Peter Hwang, MD, FARS
David R. Grimm, MD
Zechariah Franks, MD, MPH

Background:

Pollution with fine particulate matter (PM2.5) has been linked to respiratory disease and multiple malignancies but an association with sinonasal malignancy has not been previously investigated.

Methods:

We performed a case-control study using the Merative MarketScan outpatient database. The historical PM2.5 exposure of 4293 newly diagnosed cases of sinonasal malignancy were compared to that of a reference cohort of well-patient cases between 2007 and 2019. The rolling average daily PM2.5 exposure 1 year and 5 years prior to claims was mapped using EPA measurements based on the associated Core-based Statistical Area. Logistic regression modeling was used to estimate the relationship between PM2.5 exposure and odds of being diagnosed with sinonasal malignancy as opposed to being a well-adult visit. Models were adjusted for age, sex, allergic rhinitis, asthma, COPD, and pneumonia.

Results:

The odds of being diagnosed with sinonasal malignancy increased by 8% for each 1 $\mu\text{g}/\text{m}^3$ rise in mean daily PM2.5 exposure 1 year prior to claims (adjusted OR 1.08, 95% CI 1.05–1.10), and increased

by 7% each 1 $\mu\text{g}/\text{m}^3$ increase in mean daily PM2.5 exposure 5 years prior to claims (adjusted OR 1.07, 95% CI 1.05–1.10).

Discussion:

Sinonasal malignancy cases, on average, had greater PM2.5 exposure in the 1 to 5 years prior to diagnosis when compared to well-patient claims. PM2.5 should be an active subject for prospective studies on sinonasal malignancy as well as more targeted retrospective studies based on pathologic diagnosis.

1:14 pm – 1:20 pm

Improved survival of HPV-related sinonasal squamous cell carcinoma with chemoradiation treatment

Jamie Oliver, MD
Naomi Wang, Research Fellow
Ameen Amanian, Fellow
Andrés Bur, Associate Professor
D. David Beahm, MD
University of Kansas

Background:

Human papillomavirus-related (HPV+) sinonasal squamous cell carcinoma (SNSCC) is associated with improved overall survival (OS) compared to similarly staged HPV- SNSCC. However, data on treatment-related outcomes have been quite limited.

Methods:

We analyzed the National Cancer Database (NCDB) for all SNSCC cases diagnosed 2010-2017 with available HPV testing data. Clinicodemographic factors, treatments, and survival were analyzed. Multivariable Cox regression and propensity score-matched survival analyses were performed.

Results:

We included 1697 HPV-tested SNSCC cases. 551 (32.5%) had HPV+ SCSCC. HPV+ SNSCC was associated with significantly improved OS in both multivariable (hazard ratio [HR]=0.74; 95% CI=0.57-0.96, $p=0.02$) and propensity score-matched (HR=0.73, 95% CI=0.55-0.98, $p=0.04$) survival analyses controlling for demographic, comorbidity, staging, and treatment factors. Within the propensity score matched cohort, HPV+ tumors had a strong association with improved OS in cases treated with chemoradiation (HR=0.59; 95% CI=0.38-0.91, $p=0.02$), whether it was surgery with adjuvant CCRT (HR=0.58, 95% CI=0.33-1.04, $p=0.07$) or chemoradiation alone (HR=0.60, 95% CI=0.31-1.16, $p=0.13$). HPV+ SNSCC was not associated with improved OS in cases treated with surgery alone (HR=0.79, 95% CI=0.37-1.69, $p=0.54$), surgery with radiation (HR=1.16, 95% CI=0.58-2.30, $p=0.68$), radiation alone (HR= 0.75, 95% CI=0.25-2.28, $p=0.62$) or the aggregate of these three groups (HR=0.95; 95% CI=0.60-1.50, $p=0.82$).

Conclusion:

These results suggest that HPV+ SNSCC may be particularly chemoradiation sensitive. Routine HPV testing may be warranted to investigate if alternative treatment approaches may benefit patients with HPV+ SNSCC.

1:21 pm – 1:27 pm

Quality of life among pituitary adenoma patients with & without middle turbinectomy

Narin Nard Carmel Neiderman, MD, MSc
Orr Raved
Avraham Abergel, MD
TASMC

Introduction:

Pituitary adenoma resection is associated with significant morbidity and can potentially damage patients' quality of life. The endoscopic approach to skull base lesions, is considered less aggressive, and associated with improved tumor related and nasal related quality of life. However, there is an ongoing literature debate regarding the necessity to preserve the middle turbine during the procedure.

Objective:

The aim of the study was to compare tumor & nasal related quality of life among patients undergoing endoscopic endonasal resection of pituitary adenomas with or without middle turbine preservation.

Materials and Methods:

Prospective cohort study of all patients with pituitary adenomas who underwent trans-sphenoidal surgery at Tel Aviv Sourasky Medical Center between 2014 and 2021. Recruited patients completed the Anterior Skull Base Disease-Specific QOL (ASBS-Q) questionnaire and the Sinonasal Outcome Test 22 (SNOT-22) questionnaire in four time points: prior to surgery, 2 months after surgery and 2-6 months post-operatively and 6 months and onwards. Demographic and clinical data were gathered.

Results:

Our study included 73 patients, 63 (74.11%) patients underwent middle turbinectomy resection and 23 (25.89%) did not. The overall ASBS-Q score difference of post ASBS-Q score did not alter significantly between both groups in the long term post operative course (>6 months). SNOT-22 score difference also did not alter significantly post throughout all post operative course.

Conclusion:

Among our cohort, middle turbinectomy did not cause significant deterioration in nasal and tumor related QOL.

1:28 pm – 1:34 pm

Cost implications of moving lumbar drain placement to IR from the OR

Chau Phung
David Lerner, MD
Saawan Patel
Chau Phung
Khashayar Eshaghi
Alan Workman, MD
Glenn Pennington
Robert Stetson
Jennifer Douglas, MD
Michael Kohanski, MD, PhD, FARS
James Palmer, MD, FARS
Nithin Adappa, MD, FARS
University of Miami

Background:

Surgeons often opt to place lumbar drains (LD) perioperatively in patients undergoing repair for cerebrospinal fluid (CSF) leak associated with idiopathic intracranial hypertension (IIH). Here we analyze the cost implications of a transition from LD placement in the same operating room (OR) to a separate Interventional Radiology suite (IR) on the morning of surgery.

Methods:

We performed a retrospective analysis of patients with IIH undergoing endoscopic CSF leak repair with LD placement from August 2015 to June 2023. Patient factors and inflation-adjusted costs were compared between groups.

Results:

Eighty patients were identified, including 42 patients with LD placement in the OR and 38 patients in IR. All LDs placed prior to August of 2019 were performed in the OR, and all after in IR. Most patients were female (86.3%) with an average patient age and BMI of 52.8 years and 37.8 kg/m², respectively. Both direct labor costs and operating room time direct costs were significantly higher among the OR group (\$7647.37 vs \$6169.66, p=0.02; \$5150.96 vs. \$4472.51, p=0.012). Accordingly, non-surgical OR time was significantly shorter among patients with LD placement by IR (80.7 vs. 97.6 minutes, p=0.014).

Conclusions:

Transition from routine LD placement in the OR to a separate IR suite was associated with a savings of about \$1,500 in direct labor costs per procedure for the hospital, reflecting the reduction in operating room time and associated personnel costs. Importantly, placement of LD in a separate suite allows for increased OR efficiency and productivity by the Otolaryngology team, which may perform an additional procedure prior to the CSF leak repair case.

1:35 pm – 1:40 pm

Q&A

1:41 pm – 2:04 pm

PANEL: Variations in perioperative care in endoscopic sinus and skull base surgery: What is the evidence?

Moderator: Edward Kuan, MD, FARS

Panelists: Mindy Rabinowitz, MD, FARS; Christopher Roxbury, MD, FARS; Eric Wang, MD, FARS

Supported by the Quality Improvement Committee and Skull Base and Orbital Surgery Section

Moderators: Ashleigh Halderman, MD, FARS;

Michael Marino, MD, FARS

2:05 pm – 2:11 pm

Vision-guided surgical navigation using computer vision for dynamic intraoperative imaging updates

Waleed M. Abuzeid, MD, FARS

Jeremy Ruthberg, Resident

Pengcheng Chen, MS

Nicole Gunderson, BS

Wenhao Li, MS

Mahdi Alghezi, Medical Student

Randall Bly, MD

Eric Seibel, PhD

University of Washington

Introduction:

Image-guided surgery (IGS) navigation systems for endoscopic sinus surgery (ESS) rely on static preoperative CT imaging incapable of dynamic intraoperative updates. By digitally reconstructing the surgical field, anatomic changes can be reflected on CT imaging during surgery. We leverage advanced computer vision techniques to reconstruct the surgical field as a photorealistic 3D scene from 2D endoscopic video and evaluate the accuracy of the 3D reconstruction relative to ground-truth CT imaging.

Methods:

Preoperative CT scans were taken of three 3D-printed sinonasal phantoms prior to bilateral ESS. Postoperative results were recorded using rigid endoscopy followed by postoperative CT. A novel pipeline that combines Neural Radiance Fields (NeRF) with stereo depth estimation was used to generate 3D reconstructions of the pre- and post-operative surgical field from the 2D video. The postoperative 3D reconstructions were then used to update the preoperative CT scans to reflect surgical tissue removal. Volumetric analysis was conducted to compare the ethmoid sinus volume between the reconstruction and ground truth CT images.

Results:

The ethmoid cavity in the 3D reconstruction demonstrated a 4% error compared to the volume on the postoperative CT (2936 mm³ vs 3060 mm³). 3D

reconstructions were overlaid onto postoperative CT scans demonstrating sub-millimeter reconstruction errors (average modified Hausdorff distance 0.24 mm; average distance from reference mesh 0.25 mm).

Conclusion:

NeRF-based 3D scene reconstruction demonstrates sub-millimeter reconstruction accuracy. This new paradigm of “vision-based surgical navigation” may exceed the capability of IGS systems by dynamically updating CT images during ESS.

2:12 pm – 2:18 pm

Transforming ENT surgical triage: A novel AI-driven approach to chronic sinusitis management

Bradford Bichey, MD, MPH

Indiana Sinus Centers

Objective:

This study aims to address the inefficiencies in traditional pathways for chronic sinusitis management assessing an Artificial Intelligence (AI) based process to enhance patient care.

Data Sources:

Metadata from a novel Software as a Service (SaaS) solution, utilizing automated multimodal communication to optimize the surgical care pathway for chronic sinusitis patients.

Review Methods:

The study analyzes 10,124 patient journeys through a software system, focusing on the implementation and impact of the AI-enhanced triage system.

Conclusions:

The SaaS solution featured AI-enhanced algorithms for personalized scheduling, statistical analysis, and a multimodal communication system. This approach aimed to streamline the triage process, reduce wait times, and improve overall efficiency and patient satisfaction in surgical care. Results indicated the AI-driven triage pathway identified 55% of patients as suitable surgery candidates, and reduced time to treat significantly. SMS communication increased patient engagement by 65%, aiding implementation of more optimal scheduling. This approach successfully prequalified surgical candidates and enhanced resource utilization, showing a 50% improvement in cost and efficiency. Additionally, 90% of patients met prior authorization criteria, significantly reducing the need for peer-to-peer interactions.

Implications for Practice:

The introduction of an AI-enhanced triage system markedly improves the management of chronic sinusitis, demonstrating significant advancements in patient scheduling and prequalification. This approach optimizes efficient, patient-centric surgical

care and indicates the potential for broader AI integration in healthcare.

2:19 pm – 2:25 pm

Artificial intelligence-based prediction of surgical outcomes in chronic rhinosinusitis

Waleed M. Abuzeid, MD, FARS
Mahdi Algezi, Medical Student
Arun Raghavan, MD
Mohamed Aboueisha, Fellow
Ion Prohntichi, MD
Ian M. Humphreys, DO, FARS
Aria Jafari, MD, FARS
University of Washington

Introduction:

Some patients with chronic rhinosinusitis (CRS) will fail to improve after endoscopic sinus surgery (ESS). There is no precise method to identify those most likely to fail ESS. This study aims to evaluate artificial intelligence (AI) models in predicting ESS outcomes.

Methods:

285 CRS patients who underwent primary ESS were used as a training set and then cross-validation performed. Predictor variables included demographic data, comorbidities and preoperative medication usage, symptoms, Lund-Mackay CT scores, and Lund-Kennedy endoscopic scores. The AI model was trained to identify achievement of the minimal clinically important difference, defined as a 9-point decrease, between the pre- and post-operative total SNOT-22 score. The performance of two machine learning models (XGBoost and XGBoost + TabNet Ensemble) and a logistic regression (LR) model were evaluated.

Results:

Fifty-nine preoperative predictors were evaluated. Compared to the Ensemble model and LR, the XGBoost model achieved the highest sensitivity (97.4% vs 82.1% vs 89.7%, respectively) and moderate specificity (66.7% vs 83.3% vs 44.4%, respectively). XGBoost and Ensemble models were more accurate than LR (87.7% vs 82.4% vs 75.4%, respectively, $p < 0.02$) and had superior performance (c-index 0.91 vs 0.92 vs 0.79, respectively, $p < 0.008$).

Conclusion:

Machine learning models based on patient health data and preoperative endoscopic and CT findings outperformed conventional regression models in predicting ESS outcome. With its high sensitivity, accuracy and c-index, the XGBoost model effectively identified patients likely to fail ESS based on preoperative characteristics and, after external validation, could be used for clinical decision-making.

2:26 pm – 2:32 pm

Automation of sinus system segmentation using neural networks

James Mihalich, HSD
Kai Zhao, PhD
Kimerly Powell, PhD
The Ohio State University Wexner Center

Introduction:

Precise segmentation of the complete sinus system from computed tomographic (CT) scans can provide valuable visualization and simulation opportunities for pre-surgical and post-surgical analysis. This study presents a method using a custom convolutional neural network (CNN) trained to effectively and efficiently delineate nasal airway passages and sinuses from CT stacks.

Methods:

43 high-resolution clinical CT scans, hand segmented in the coronal plane by a group of experts, resulted in 18,021 individual binary mask-image pairs of resolution 512x512x1. This dataset was randomly divided into 80% training and 20% validation subsets. A 2D U-Net architecture, comprising of 4 encoding blocks with max pooling, a bottleneck layer with dropout, and 4 decoding blocks with transposed convolutions, was trained for 150 epochs. Upon completion of training, model performance was evaluated by calculating the DSC between the ground truth and model predictions to validate accuracy on data subsets.

Results:

The CNN model achieved high accuracy (DSC=0.9020 +/- 0.0044), indicating strong convergence with manual delineation. Furthermore, key structures to nasal geometry, including septum and turbinates, were conveyed effectively.

Conclusion:

The presented model allows for automation of sinus system segmentation, traditionally time-consuming task, with high accuracy. Applications of this technology range from simple visualization to opportunities in accelerating computational fluid dynamic procedures and virtual surgery simulation. Providing these operations on-demand shows promise for improving personalization in patient care in the future.

2:33 pm – 2:39 pm

Performance of deep learning-based segmentation of the paranasal sinuses using computed tomography

Jack Paladin, BS
Onyekachi Nnabue
Cooper Ruwe
Samuel Armato
Jayant Pinto

Background:

Segmentation of the paranasal sinuses enables clinicians to better quantify disease burden in chronic rhinosinusitis through scoring systems (e.g., Lund-Mackay/modifications). However, the significant time and labor required to manually outline the sinuses render this impractical. We developed a set of deep convolutional neural networks to automatically segment the sinuses on computed tomography (CT) scans.

Methods:

Relevant anatomic regions on sinus CT scans from adult patients (n=25) were manually outlined. U-Net convolutional neural networks with VGG-19 or SEResNext101 encoders were trained to segment each region using 936 axial sections from 19 of these scans. The models were validated using 178 sections from 3 scans and then applied to a test dataset of 170 sections from 3 CT scans. Dice similarity coefficient (DSC) and average Hausdorff distance (AHD) were calculated to determine segmentation accuracy.

Results:

Across all sinuses, we demonstrated a combined DSC of 0.89 and an average AHD of 3.75 mm. Results for individual sinuses ranged more broadly. As expected, automated segmentation of the maxillary sinuses performed better than that of regions of complex geometry such as the anterior ethmoids.

Conclusion:

Convolutional neural networks offer a feasible approach to automatically segmenting the paranasal sinuses using CT scan data. A larger training dataset (in progress) may improve model accuracy. Automated quantification of sinus inflammation could augment and improve care for patients with chronic rhinosinusitis.

2:40 pm – 2:45 pm

Q&A

2:45 pm – 3:15 pm

Break with Exhibitors

Moderators: Mathew Geltzeiler, MD, FARS; Elisa Illing, MD, FARS

3:16 pm – 3:22 pm

Impact of stent duration following endoscopic DCR

Maya Hatley, BA
Jared Dublin, MD
Joseph Connors, MD
Mackenzie O'Connor, MD
Seth Lieberman, MD
NYU Grossman School of Medicine

Background:

Prior studies have investigated outcomes of nasolacrimal duct obstruction treated with endoscopic dacryocystorhinostomy (DCR). Silicone stents may be used to canalize the nasolacrimal duct and are typically removed 6-8 weeks post-operatively, though there is currently no consensus on the timing of stent removal. This study aims to analyze clinical outcomes of early (≤ 4 weeks) stent removal.

Methods:

Adult patients who underwent DCR with stent placement by one surgeon at NYU Langone Health, from 2016 to 2024, were reviewed. Recorded outcome measures included need for revision surgery, anatomic patency, and the development of post-operative sinusitis. These were compared between patients who underwent early (≤ 4 weeks) versus standard (> 4 weeks) stent removal using the two-sided Fisher's exact test.

Results:

84 cases of endoscopic DCR with stent placement were identified. In 19 (22.6%) cases stents were removed at ≤ 4 weeks (median: 3.3 weeks, range: 1.0-3.9 weeks), and in 65 (77.4%) cases stents were removed at > 4 weeks (median: 7.3 weeks, range: 4.1-29.9 weeks). Between the early and standard stent removal groups, there were no significant differences in the rate of need for revision (10.53% [2/19] vs 9.2% [6/65], $p>0.99$), anatomic patency (89.47% [17/19] vs 90.1% [59/65], $p>0.99$), or post-operative sinusitis (0% vs 13.8% [9/65], $p=0.11$).

Conclusion:

In this study, clinical outcomes were similar after endoscopic DCR in patients with shorter and longer stent duration. This data suggests that early stent removal may be safe and effective. Larger comparative studies are necessary to determine optimal stent duration.

3:23 pm – 3:29 pm

Synthetic interposition grafting to prevent nasal septal perforation after bilateral apposing septal tears during septal surgery

Anthony Di Ponio, DO
Robert Deeb, Dr.
John Craig, MD, FARS
Henry Ford Health

Background:

Septoplasty is a common cause of nasal septal perforation (NSP), especially when bilateral apposing mucosal tears occur intraoperatively. While prior studies have largely focused on NSP management once it forms, there is limited published data on how to prevent NSP formation should bilateral apposing septal tears occur during septoplasty. The purpose of this study was to assess the efficacy of intraoperative placement of synthetic interposition (IP) grafts to prevent NSPs following bilateral apposing mucosal tears during septoplasty.

Methods:

A single-institution retrospective cohort study was conducted with adult patients who underwent septoplasty with or without concomitant sinonasal surgeries by two surgeons. Patients who had bilateral apposing mucosal tears intraoperatively underwent IP grafting with either cadaveric dermal or porcine collagen grafts. Patients were monitored endoscopically for NSP development postoperatively for a minimum of one month.

Results:

Of 1284 patients reviewed between January 2016 and July 2024, 50 patients had bilateral apposing septal tears (3.9%), and had IP grafts placed. Of these 50 patients, mean age was 51.3 years, 74.0% were males, and median (IQR) follow-up was 128 (61, 404) days. Amongst IP grafts placed, 52.0% were porcine collagen, while the other 48.0% were cadaveric dermis. While 46/50 septal tears completely mucosalized (92.0%), 4 developed NSPs postoperatively (8.0%). All failures occurred with porcine collagen grafts.

Conclusion:

Intraseptal synthetic IP graft placement demonstrated 92% success in preventing NSP following bilateral apposing mucosal tears.

3:30 pm – 3:36 pm

Persistent post-surgical sinonasal crusting: A CFD analysis

Nidhi Jha, BA
Ahmad Odeh, BS
Zhenxing Wu, PhD
James Mihalich, HSD
Jed Speers, BS
Kai Zhao, PhD
Ohio State University

Educational Objective:

To use computational fluid dynamic modeling to understand why patients experience chronic post-surgical sinus crusting.

Introduction:

Sinus crusting is a common post-surgical complication that requires post-operative care: e.g. routine office debridement. While some crusting is expected for the first few weeks some patients require consistent debridement well past the post-operative period. To understand why this occurs, we used computational fluid dynamics (CFD) modeling to investigate the airflow dynamics in these patients.

Study Design:

Retrospective case series

Methods:

We retrospectively recruited 12 patients that had undergone FESS on either side and 6 of them had experienced prolonged sinus crusting (6 months – 5 years) that required office debridement. 6 patients were matched controls with similar degree and types of surgeries but with no crusting. Pre- and post-surgical CT scans were obtained, and 3D models were constructed. CFD was done using the methods described in our previous studies.

Results:

The sinus crusting patients had significant higher mucosal heat flux at the crusting site during restful breathing than their respective matched controls (553.2 ± 307.4 vs. 473.6 ± 216.3 W/m², $p < 0.05$). This is likely due to excessive airflow stream penetrating into the post-op sinuses. Yet such excessive airflow is not observed among the controls, despite similar degree of surgeries.

Conclusions:

Sinus crusting is likely due to multiple factors, but excessive airflow penetrating into post operative sinuses creating mucosal drying and cooling may be one of the contributing factor.

3:37 pm – 3:43 pm

Opioid prescribing for functional endoscopic sinus surgery

Robert Africa, MD
Amber Dunmire, Resident
Robert McQuitty, Resident
Brian McKinnon, MD, MBA, MPH
Viran Ranasinghe, Assistant Professor
Scott Hardison, Assistant Professor
Tyler Janz, MD
Charles Hughes, Professor
Farrah Siddiqui, Associate Professor
University of Texas Medical Branch

To evaluate the trends in opioid and non-opioid prescribing for functional endoscopic sinus surgery (FESS) before and after the publication of guidelines by the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) in April 2021.

De-identified patient data were obtained from the TriNetX database including patients who were prescribed either opioid or non-opioid analgesic within 1-5 days following FESS from January 1, 2013 to December 31, 2023. The trends in prescribing were evaluated by interrupted time series analysis in Statistical Analysis System (SAS) 9.4 with significance set at $p < 0.05$ to assess trends before and after the new opioid prescription guidelines.

For opioid prescription, the change in the trend increased by 0.87% immediately after the guideline publication which is not statistically significant ($p = 0.92$). The trend throughout the rest of the study period decreased by 0.20% and is not significant ($p = 0.35$). There was a notable decrease prior to the guideline change by 0.20% which is significant ($p = 0.0002$). For non-opioid prescription, there was a significant sustained increase in non-opioid prescription after the guideline change by 0.07% ($p = 0.03$).

There was no observed decrease in opioid prescription after the guideline publication, which implies a stable trend in prescription after surgery. Non-opioid prescription did not have an immediate increase, but the trend increased post-publication period.

3:44 pm – 3:50 pm

Single-institution review of sphenopalatine ganglion blocks for sinonasal surgeries

Avraham Adelman, BS
Young Lee, MS
Aniela Edwards, BS
Kartik Motwani, PhD
Cristina Benites, MBS
Cameron Smith, MD, PhD
Nikita Chapurin, MD, MHS
Jeb Justice, MD, FARS
University of Florida

Introduction:

Sphenopalatine ganglion blocks (SPGB) are used to reduce post-operative pain in sinonasal surgeries, but their efficacy remains controversial. We evaluated perioperative outcomes of SPGB in sinonasal surgeries at our institution.

Methods:

Retrospective chart review of sinonasal surgeries from 2018-2024, divided into SPGB and non-SPGB cohorts. Data collected included demographics, opioid use, surgical durations, diagnosis, surgical indication, pain levels, and SPGB timing. Inter-group analyses were made with Chi-square, t-tests, and ANOVA.

Results:

Of the 167 surgeries (66 SPGB, 101 non-SPGB), most (92.8%) were endoscopic sinus surgery (ESS) for chronic rhinosinusitis (52.1% w/o polyps, 24% w/ polyps), and 23.4% were revision. No significant differences existed in demographics, surgery type, indication, or revision status between groups. SPGB group had longer ($p < 0.0001$) operative (+39.4 min) and total surgical durations (+48.6 min). The SPGB group required slightly less intra-operative fentanyl (-19.6mg, $p > 0.5$) and PACU oral oxycodone (-1.3mg, $p > 0.5$), but greater PACU duration (+59.5 min, $p < 0.001$). No differences were seen in PACU IV opioid use or 60-minute pain score. Analysis of revision status revealed greater PACU duration for SPGB (+71.8 min, $p < .01$) in non-revision cases only. Diagnosis-based analysis revealed non-significant differences across all variables.

Conclusion:

SPGB was associated with increased procedure time, total OR time, and PACU time, without significant reduction in opioid use or immediate post-op pain. Ongoing data collection will investigate its impact in non-CRS endoscopic procedures and with variations in intra-operative factors, for example, local and topical anesthetic variability.

3:51 pm – 3:57 pm

Endoscopic endonasal optic nerve decompression: A systematic review

Jeremy Ruthberg, MD
Brandon Yeshoua, MD, MHA
T. Logan Lindemann, MD
Ashton E. Lehmann, MD
Aria Jafari, MD, FARS
University of Washington

Background:

Endoscopic endonasal optic nerve decompression (OND) is increasingly used to manage optic neuropathy (ON). Unlike traditional open approaches, it is minimally invasive and potentially reduces morbidity and recovery times. Despite its growing use, its overall effectiveness and safety have not yet been systematically reviewed.

Methods:

A comprehensive search was conducted in PubMed, EMBASE, CINAHL, and Web of Science for articles published up to September 27, 2024. Studies were included if they reported on patients undergoing endoscopic OND, focusing on visual acuity and complications. Two reviewers independently screened citations and extracted data. Methodological quality was assessed using the Newcastle-Ottawa Scale, and data were pooled for analysis.

Results:

Out of 982 abstracts screened, 30 studies met the inclusion criteria, encompassing 236 patients. The average patient age was 37 years, with a male-to-female ratio of 1.2:1. Traumatic optic neuropathy (TON) was the most common indication (8 studies, 90 patients), followed by idiopathic intracranial hypertension (IIH) (5 studies, 30 patients) and fibrous dysplasia (FD) (5 studies, 13 patients). Visual acuity improved in 72% of patients with preoperative vision loss, demonstrating the effectiveness of this technique. Reported complications included one case each of cerebrospinal fluid (CSF) leak, epistaxis, and transient orbital emphysema, along with three cases of transient rhinitis and two cases of diplopia.

Conclusion:

Endoscopic OND is a safe and effective technique for managing optic neuropathy across various pathologies. It offers significant improvements in vision with a low complication rate and outcomes comparable to traditional open approaches.

3:58 pm – 4:04 pm

Olfactory recovery in transsphenoidal pituitary surgery

Sanjena Venkatesh

Jadyn Wilensky, Clinical Research Assistant

Maria Espinosa, Fellow

Alison Yu, MD

Michael Kohanski, MD, PhD, FARS

James Palmer, MD, FARS

Nithin Adappa, MD, FARS

Jennifer Douglas, MD

University of Pennsylvania

Background:

Endoscopic endonasal surgery raises concerns of olfactory impairment. Olfactory flap (OF) preservation aims to preserve olfaction by protecting the olfactory epithelium during nasoseptal flap harvest. This study investigates objective olfactory function and olfactory-specific quality of life (QOL) following OF-preserving transsphenoidal approach (TSA) for pituitary adenoma.

Methods:

We enrolled all pituitary adenoma patients undergoing OF-preserving TSA. Objective olfaction was assessed via the Brief Smell Identification Test

(B-SIT); olfactory and sinonasal QOL were evaluated via the Questionnaire of Olfactory Disorders–Negative Statements (QOD-NS) and 22-item SinoNasal Outcome Test (SNOT-22), respectively.

Results:

31 patients met inclusion criteria (48±17 years; 32% male). B-SIT scores declined at two weeks (-3.7±3.5, $p<0.0001$) but returned to baseline by four weeks (-0.6±2.5, $p=0.33$). QOD-NS and SNOT-22 scores worsened at two weeks (QOD-NS: +1.8±3.7, $p=0.02$; SNOT-22: +17.4±18.0, $p<0.0001$) and four weeks (QOD-NS: +3.0±4.6, $p=0.01$; SNOT-22: +12.8±22.6, $p=0.02$), returning to baseline at six weeks (QOD-NS: +2.00±4.43, $p=0.32$; SNOT-22: +0.8±14.7, $p=0.89$). In contrast, the SNOT-22 smell score remained elevated across timepoints ($p=0.01$).

Conclusion:

This is the first study to present serial objective olfactory and olfactory QOL data for patients undergoing OF-preserving TSA. We demonstrate early return to baseline, at four weeks for olfactory function and six weeks for olfactory QOL. Notably, we show olfactory-specific QOL preservation via the QOD-NS—a previously unstudied metric. QOD-NS scores importantly do not align with SNOT-22 smell scores, which have historically been used to approximate olfactory QOL.

4:05 pm – 4:10 pm

Q&A

4:11 pm – 4:55 pm

PANEL: Endoscopic approaches to the skull base outside the nose

Moderator: Nyall London, MD, PhD, FARS

Panelists: Sungwoo Cho, MD; Je Beom Hong, MD;

Lifeng Li, MD

Supported by the International Committee

4:55 pm – 5:00 pm

Q&A

5:30 pm – 7:00 pm

ARS President's Reception

Room: Empire C

Sunday, May 18, 2025
Morning Session – Celestin D
8:00 am – 12:00 pm CST

7:00 am – 8:00 am

Women in Rhinology Breakfast Session

“Career Growth and Development: A Panel Based Discussion of Real-World Scenarios”

Moderator: Ashleigh Halderman, MD, FARS

Panelists: Amber Luong, MD, PhD, FARS, ARS

President-Elect and Program Chair; Devyani Lal, MD,

FARS (Women in Rhinology Section); Corinna

Levine, MD, FARS (Mentorship Committee); Erin

Lopez, MD (Diversity & Inclusion Committee)

Sponsored by the Women in Rhinology Section,

Mentorship Committee and Diversity & Inclusion

Committee

Supported by Aerin Medical

Room Moderator: Katie Melder, MD

Moderators: Omar Ahmed, MD, FARS; Katie Phillips, MD

8:00 am – 8:06 am

Association of xylene exposure and non-allergic rhinitis

Evelyn Rowe

Sophie Yu

Jonathan Zou, BS

Mitali Banerjee

Younsoo Jung

Margaret Mitchell, MD, MS

Simon Chiang, Research Coordinator

Stella Lee, MD

Harvard Medical School

Introduction:

Volatile organic compounds (VOCs) are emitted from sources like household products, cleaning agents, paint, vehicle exhaust, and industry and are linked with adverse respiratory health effects and olfactory dysfunction. Herein we assess the association of VOC exposure with non-allergic rhinitis (NAR) compared to allergic rhinitis (AR).

Methods:

We utilized data from the 2005-2006 National Health and Nutrition Examination Survey (NHANES). Exposures comprised 19 urinary VOC metabolite concentrations (log normalized and corrected for creatinine). Subjects had a reported history of physician-diagnosed “hay fever” and negative serum IgE for the NAR cohort and positive serum IgE for the AR cohort. We examined the association of VOC exposure and NAR using weighted univariate and multivariable logistic regression adjusting for age, sex, race, family income, and smoking status (serum cotinine).

Results:

The unweighted analytical cohort comprised 260 adults (79.6% with NAR, median age=45, 52.5% female). On univariate logistic regression, patients with NAR had higher levels of metabolites of acrylonitrile (odds ratio[OR]=1.50, 95% confidence interval[CI]=1.04-2.17, p=0.032), acrylamide (OR=1.48, 95% CI=1.09-2.00, p=0.016), and xylene (OR=2.31, 95% CI=1.18-4.53, p=0.018 and OR=4.66, 95% CI=1.18-18.31, p=0.03). On multivariable logistic analysis, patients with NAR continued to have higher levels of metabolites of xylene (OR=2.20, 95% CI=1.05-4.63, p=0.041 and OR=4.27, 95% CI=1.01-18.10, p=0.049).

Conclusion:

Xylene exposure is significantly associated with a diagnosis of NAR compared to AR, indicating that VOCs may play a distinct role in the pathophysiology of NAR although the mechanism requires further elucidation.

8:07 am – 8:13 am

The statistical fragility of efficacy data on intranasal corticosteroids for AR

Shreya Deshmukh, BA

Olivia First, Medical Student

Rahul Guda, Medical Student

Shiven Sharma, Medical Student

Kaan Oral, Medical Student

Ronit Sethi, Medical Student

Mohammed Khan, Assistant Professor

Background:

While intranasal corticosteroids are commonly used to treat allergic rhinitis (AR), research shows variation in their reported effectiveness. Fragility indices (FI) and quotients (FQ) assess the statistical robustness of data from existing randomized control trials (RCT) that investigate the clinical efficacy of corticosteroids to treat AR.

Methods:

PubMed, MEDLINE, and Embase were systematically searched to identify RCTs published between January 2004 and November 2023 assessing the effectiveness of intranasal corticosteroids for AR. Of the 280 studies screened, 15 studies were included in the analysis. FI and reverse fragility indices (rFI) of dichotomous variables were calculated by determining the number of outcome reversals required to flip the significance of significant and nonsignificant variables, respectively. FQs and rFQs were assessed by dividing FI and rFIs by effective study size.

Results:

Across thirty dichotomous efficacy outcome variables, the mean FI was 8.33 (SD 5.72) and the mean FQ was 0.048 (SD 0.036). Of those, eighteen outcomes were statistically significant (p<.05). These outcomes had a mean FI of 10.89 (SD 5.84) and mean FQ of

0.033 (SD 0.022). The remaining twelve nonsignificant outcomes had a mean rFI of 4.5 (SD 2.61) and mean rFQ of 0.072 (SD 0.042).

Conclusion:

Overall data supporting the effectiveness of intranasal corticosteroids for AR is moderately robust and is particularly strong among statistically significant outcome variables; however, low reverse fragility indices and quotients for the nonsignificant outcomes suggest that the effectiveness should still be cautiously interpreted by physicians. Reporting FI and FQs alongside p-values ensures accurate interpretation of RCT findings.

8:14 am – 8:20 am

Investigation of commercially available acoustic vibratory devices for congestion

W. Jared Martin, BA

Yasine Mirmozaffari

Lauren Cook, BS

Ezer Benaim, MD

Aurelia Monk, Medical Student

Michael Armstrong, MD

Tom Raz Yarkoni, MD

Brian Thorp, MD, FARS

Charles Ebert, Jr., MD, FARS

Brent Senior, MD, FARS

Adam Kimple, MD, PhD, FARS

University of North Carolina School of Medicine

Introduction:

Commercially available acoustic vibratory devices (AVDs) have shown promise in alleviating nasal congestion. These devices are proposed to enhance sinonasal nitric oxide (NO) production through acoustic vibrations, potentially reducing inflammation and improving mucociliary clearance. However, this mechanism of action has not been clearly established.

Methods:

Participants with and without sinonasal disease were randomly assigned to use one of two commercially available AVDs (AVD1 or AVD2). Before and after a single use, we measured nasal nitric oxide (nNO) levels and peak nasal inspiratory flows (PNIF). We administered the Nasal Obstruction Symptom Evaluation (NOSE) survey and a visual analog scale for current congestion symptoms. Data was analyzed using paired t-tests.

Results:

With AVD1 (n = 8), nNO levels decreased, on average, by 5.5 parts per billion (ppb) \pm 88.3 ppb (p = 0.86) following treatment. With AVD2 (n = 6), nNO decreased by 1.2 ppb \pm 44.3 ppb (p = 0.95). PNIF increased by 7.3 L/min \pm 14.7 L/min (p = 0.20) with AVD1 and decreased by 2.1 L/min \pm 7.0 L/min (p = 0.50) with AVD2. NOSE and visual analog scale scores showed no significant changes after the use of either AVD.

Conclusion:

Some participants demonstrate subjective and objective improvements in congestion with AVD use, including potentially clinically significant increases in PNIF. However, nasal NO production remained relatively stable after a single use of an AVD. Further research is warranted to identify the optimal patient populations that would benefit from these devices.

8:21 am – 8:27 am

Surgical management of rhinitis

Asher Ripp

Pranav Patel, Mr.

Shaun Nguyen, Dr.

Alexander Duffy, MD

Isabella Schafer

Zachary Soler, MD, FARS

Rodney Schlosser, MD, FARS

Medical University of South Carolina

Background:

Rhinitis can present with severe nasal obstruction, rhinorrhea, nasal itching and sneezing. Surgical treatment options include inferior turbinate procedures, typically targeting nasal congestion, and posterior nasal nerve (PNN) procedures, targeting rhinorrhea. This review intends to quantify the degree of specific symptom resolution to guide procedure selection in a personalized manner.

Methods:

A literature search identified studies reporting rhinitis symptoms at baseline and following surgical treatment. Outcomes of interest were the 4-item Total Nasal Symptom Score (TNSS) and VAS equivalents for "rhinorrhea," "nasal obstruction," "nasal itching," and "sneezing."

Results:

A total of 19 studies (N = 1,408) were analyzed. The TNSS fell by 4.25 points [95% CI 3.49-5.02], with all four symptoms undergoing significant amelioration. Nasal congestion and rhinorrhea saw the largest improvement, with reductions of 1.49 [95% CI: 1.09-1.88] and 1.32 [95% CI: 1.15-1.49], respectively. Allergic (AR) and nonallergic (NAR) patients experienced similar benefits following surgery, apart from nasal itching, which was more alleviated in AR patients (mean reductions of 2.75 and 0.5, respectively, p=0.009). Turbinate and PNN procedures led to similar improvements in congestion and rhinorrhea, with average score reductions of 56.8% and 57.6% (p=0.7168), respectively. Nasal itching underwent differential improvement, favoring PNN procedures (57.8% vs 43.5%, p=0.0033).

Conclusion:

Surgical treatment improves patient symptom burden, having the most drastic effect on nasal congestion and rhinorrhea. PNN procedures result in greater improvements in nasal itching, but otherwise perform similarly to inferior turbinate surgeries.

8:28 am – 8:32 am

Q&A

Moderators: Kent Lam, MD, FARS; Tran Locke, MD, FARS

8:33 am – 8:39 am

Comparing balloon sinuplasty and endoscopic sinus surgery for chronic rhinosinusitis

Miti Parikh, BA

Antonio Franco, Medical Student

Kevin Hur, MD

Keck School of Medicine of the University of Southern California

Background:

We aimed to compare revision rates and postoperative healthcare utilization between patients with chronic rhinosinusitis (CRS) who undergo balloon catheter sinuplasty (BCS) versus endoscopic sinus surgery (ESS).

Methods:

Using the TriNetX US database, patients 18 years or older with CRS were retrospectively followed for five years, excluding those with a history of cystic fibrosis or sinonasal malignancy. The cohort was stratified into patients who underwent BCS versus ESS, and subsequently propensity score matched by age, sex, race, ethnicity, history of asthma, allergic rhinitis, smoking, and nasal polyposis. The primary outcome was revision ESS or BCS. Secondary outcomes included prescription of antibiotics, oral steroids, and nasal anti-inflammatories following initial surgery.

Results:

Of the 5,598 patients included, 28.7% had nasal polyps. Within 5 years of initial surgery, 5.68% of patients with initial BCS underwent revision surgery compared to 3.89% of patients with initial ESS ($p < 0.0001$). Initial BCS was associated with a higher risk of requiring revision ESS or BCS, as compared to initial ESS at 6 months [OR 1.86; 95%CI (1.34, 2.59)], 3 years [OR 1.37; 95%CI (1.11, 1.68)], and 5 years [OR 1.45; 95%CI (1.19, 1.77)] after surgery. Additionally, within 6 months of surgery, patients with initial BCS were prescribed antibiotics and nasal anti-inflammatories at increased frequency compared to patients with initial ESS ($p < 0.05$).

Conclusion:

Patients with CRS who undergo BCS are at a higher 5-year-risk for revision ESS or BCS, as compared to patients who undergo ESS. Within 6 months of initial BCS, patients are

8:40 am – 8:46 am

Surgeon case volume impacts revision rate of endoscopic sinus surgery

Daniel Lee, MD, FRCSC

Chungah Kim

Mauz Asghar

John Lee, MD

Jasmin Kantarevic

Lyn Sibley

Yvonne Chan, MD, FARS

University of Toronto

Introduction:

Previous studies have demonstrated a relationship between surgeon volume and patient outcomes. While this relationship has been established in oncologic, bariatric and orthopedic surgeries, little is known in the realm of endoscopic sinus surgery (ESS). The objective was to assess the association between surgeon's ESS annual volume and rates of revision surgery within 5 years and 30-day complications for patients with chronic rhinosinusitis (CRS).

Methods:

We identified CRS patients in Ontario, Canada, who underwent primary ESS, using surgeon-level administrative data between 2014 and 2018 ($N=13,562$). Surgeon volume was calculated based on number of cases performed in the previous year by the surgeon and was divided into quartiles. We identified those who underwent revision ESS within a 5-year period. Complications were defined as unplanned hospital admission or emergency department visit within the first 30 days of operation. A multivariate regression model was used to estimate the effect of surgeon volume on revision rate.

Results: A crude model demonstrated that high surgeon volume quartile ($>63/\text{year}$) was associated with lower rates of revision surgery and 30-day hospitalization ($p < 0.05$ for both) along with a higher rate of complete ESS ($p < 0.001$). After controlling for patient/surgeon covariates and extent of ESS, low volume surgeons ($1-17/\text{year}$) remained an independent statistically significant predictor of revision surgery (hazard ratios [HR]: 1.60, 95% confidence interval [CI]: 1.17 – 2.19).

Conclusion:

Our study is the first to demonstrate a surgeon volume-outcome relationship in ESS. High-volume surgeons are predictors of lower revision rate in CRS patients undergoing ESS.

8:47 am – 8:53 am

Factors influencing early recovery after endoscopic sinus surgery

Felix Fernandez-Penny, BS
Katherine Mozingo, Medical Student
Jeremy Ruthberg, Resident
Mohamed Aboueisha, Fellow
Mahdi Algehezi, Medical Student
John Paul Giliberto, Assistant Professor
Waleed M. Abuzeid, MD, FARS
Ian M. Humphreys, DO, FARS
Aria Jafari, MD, FARS
University of Washington

Background:

While factors affecting long-term recovery after endoscopic sinus surgery (ESS) are well-documented, their impact in the Post-Anesthesia Care Unit (PACU) and first 24 hours at home remains underexplored. This study examines how these factors influence early recovery following ESS.

Methods:

A pilot cohort of 55 ESS patients at a tertiary care practice was retrospectively reviewed. Demographic, perioperative (anesthetic type, nerve block, acetaminophen or NSAID use), and procedural factors (blood loss, duration, extent of surgery, implants) were collected. All patients completed the validated 15-item Quality of Recovery (QoR-15) assessment of 24-hour postoperative health, with higher scores reflecting better recovery. Correlation analyses and simple linear regression assessed relationships with three outcomes: morphine equivalent (ME) dose in PACU, PACU length of stay (LoS), and QoR-15 score.

Results:

Longer PACU LoS (mean = 55.05min, SD = 33.52) was correlated and associated with longer procedure duration ($r = 0.39$, all $p < 0.01$), septoplasty ($r = 0.29$, all $p < 0.05$), and number of sinuses operated ($r = 0.32$, all $p \leq 0.05$). Use of Doyle splints trended toward lower QoR-15 scores ($r = -0.24$, all $p = 0.07$; mean = 109.73, SD = 22.84). The mean ME was 38.74mg (SD = 88.61). Infraorbital nerve block, anesthetic type, acetaminophen, and NSAID use were not significantly associated with the outcomes.

Conclusions:

Procedural more than perioperative factors, appear to drive early recovery. These findings may guide patient counseling and hospital resource planning. Continued analysis and cohort expansion will enhance our understanding of early recovery influences.

8:54 am – 9:00 am

Factors influencing adherence to budesonide nasal irrigation in sinusitis and rhinitis patients

Clifford Jiajun He, BA
Omer Baker, BS
Olivia LaMonte
Philipp Verpukhovskiy
Carol Yan, MD
Adam DeConde, MD
University of California San Diego School of Medicine

Background:

Medication adherence is critical for improving patient outcomes, reducing healthcare costs, and achieving therapeutic goals. In rhinosinusitis patients, topical steroid nasal irrigation is a widely recommended treatment. However, adherence to this therapy remains variable, and the factors influencing it are not well understood. This study aims to identify demographic and clinical factors that predict adherence to budesonide nasal irrigation.

Methods:

We conducted a prospective longitudinal, observational study at a tertiary hospital rhinology clinic, tracking the medication adherence of 60 sinusitis / rhinitis patients who were prescribed budesonide nasal irrigation. Adherence data were collected at least two time points. We analyzed the relationship between adherence and demographic / clinical characteristics, baseline SNOT-22 and sinus discomfort VAS using regression analysis.

Results:

Across the entire cohort, the average adherence rate was 60%. Longitudinally, adherence decrease in 45%, increased in 35% and stayed the same in 20%. Greater baseline sinus discomfort was associated with increased adherence ($\beta=0.5$, $p=0.008$) while overall SNOT-22 scores showed no significant association with adherence ($\beta = 0.19$, $p=0.44$). Female patients had 38% higher adherence ($\beta=37.5$, $p=0.02$) than males, and white patients had 39% higher adherence ($\beta=39.3$, $p=0.02$) compared to all other races. Age and comorbidities were not associated with adherence.

Conclusion:

Patients' own assessments of their symptoms are the primary drivers of adherence, particularly with more severe symptoms. Personalized interventions aimed at improving adherence should focus on patients with lower symptom burdens.

9:01 am – 9:04 am

Q&A

9:05 am – 9:20 am

PANEL: Role of the immunomodulators and autoimmune/rheumatologic diseases in patients with CRS

Moderator: Chadi Makary, MD, FARS

Panelists: Stella Lee, MD; Bruce Tan, MD

Supported by the Allergy in Rhinology Section

Moderators: Christopher Le, MD, FARS; Arthur Wu, MD, FARS

9:21 am – 9:27 am

Biologics and acute rhinosinusitis: A protective effect

Wynne Zheng, MA

Christina Zhu, Ms.

Daniel Spielman, MD

Christopher Guirguis, Dr.

Objective:

To assess whether biologic therapies (dupilumab, mepolizumab, and omalizumab) that are approved for chronic sinusitis with nasal polyps (CRSwNP) exhibit a protective effect on sinonasal health even in patients without CRSwNP.

Methods:

This retrospective cohort study utilized the All of Us Research Program database to identify patients treated with dupilumab, mepolizumab, or omalizumab, excluding those with CRSwNP. A control group matched by race, gender, and comorbidities (asthma, allergic rhinitis, atopic dermatitis) was created using propensity score matching (1:1 ratio) and K-nearest neighbors. The primary outcome was the frequency of being diagnosed with acute bacterial rhinosinusitis (ABRS) in the biologic-exposed versus control groups. The dataset was analyzed using χ^2 tests to calculate odds ratios (ORs) and 95% confidence intervals (CI).

Results:

Out of 1,234 subjects, the biologic group had a significantly lower rate of ABRS (7%) compared to controls (25%) (OR 0.2386, $p < 0.0001$). Dupilumab use was associated with the greatest reduction in ABRS risk (OR 0.1516, $p < 0.0001$), followed by mepolizumab (OR 0.1925, $p < 0.0015$). Omalizumab showed no significant effect on ABRS incidence ($p = 0.3474$).

Conclusion:

Dupilumab and mepolizumab appear to reduce ABRS episodes in patients without CRSwNP, suggesting a protective effect on sinonasal health. These findings highlight the potential use of biologics in managing patients with refractory recurrent acute sinusitis despite surgery. Further studies are needed to confirm these effects and to evaluate risks associated with long-term biologic use in non-CRSwNP populations.

9:28 am – 9:34 am

Association between US wildfires and increased in acute rhinosinusitis

Lirit Levi, MD

Amir Levi

Esther Velasquez, PhD

Maxime Fieux, MD, PhD

Riley Hue Vo

David R. Grimm, BS

Peter H. Hwang, MD, FARS

Stanford University School of Medicine

Background:

Wildfires (WF), a major contributor to air pollution, and exposure to ambient particulate matter (PM_{2.5}), has been shown to be a risk factor for sinonasal diseases. Our aim was to evaluate the impact of WFs on the proportion of healthcare claims for acute rhinosinusitis (ARS) in the US.

Methods:

Using the Wildland Fire Interagency Geospatial Services and smoke-related PM_{2.5} EPA-based databases, we selected metropolitan statistical areas (MSAs) with at least one WF between 2014-2019, defining WF as those exceeding 50,000 acres and smoke PM_{2.5} $> 100 \mu\text{g}/\text{m}^3$. We linked WF exposure to MarketScan healthcare claims matching dates and MSAs. We identified pre- and post- WF periods, and for each period, we calculated the proportion of outpatient visits for ARS among all outpatient visits by MSA, using ICD-9 and -10 codes. Relative risk (RR) of ARS was calculated as the weighted mean of ARS proportion in post-WF compared to pre-WF periods. As a control for seasonality, the same periods within the same MSA in non-WF years were used to calculate the RR of ARS. Finally, cross-correlation (CC) analysis between the daily smoke PM_{2.5} and proportion of ARS was used to identify the time-dependent relationship between the two.

Results:

11 large WFs events from 8 MSAs were captured, associated with 1.26M claims. ARS claims and utilization proportions increased in the two months post-WF periods, with an RR of 1.21 (CI=1.16-1.27; $p < 0.001$). Control analysis (0.76M claims) yielded an RR of 1.06 (CI= 0.99-1.10). CC analysis yielded significant correlation (0.4 ± 0.02 ; $p < 0.001$) in all WFs with a lag of 53 ± 6 days.

Conclusions:

There is a strong delayed association between WF smoke exposure and development of ARS following exposure.

9:35 am – 9:41 am

Rheumatic adverse events in biologics for CRS

Carlos Khalil, MD
Jenny Xiao, MSc
Helen Hsiao;
John Lee, MD

Background:

Biologic therapies approved for treating chronic rhinosinusitis with nasal polyps (CRSwNP) have well-established safety profiles but reports of rheumatic adverse events (AEs) are increasing and not well-defined. This review aims to assess the risk and incidence of rheumatic AEs associated with biologic therapy in CRSwNP and summarize current reported management strategies.

Methods:

A search was conducted in four electronic databases: Medline (Ovid), Embase, Scopus, and Cochrane CENTRAL from inception until January 4, 2024. Two reviewers independently screened citations and extracted data. Methodological quality was assessed using the Joanna Briggs Institute's critical appraisal tool. Data was pooled using a random effects model to calculate overall incidence and relative risk (RR).

Results:

21 studies met the final inclusion criteria, totalling 3,434 patients of which 2,763 (80%) received either dupilumab (n=2,257; 82%), mepolizumab (n=372; 13%), or omalizumab (n=134; 5%) for treatment of CRSwNP. The overall incidence rate for any on-treatment rheumatic AE was 0.05 per person-year (95% CI, 0.03-0.09, I²=75%). Biologic therapy increased the risk of developing a rheumatic AE (RR = 2.53; 95% CI, 1.29-4.94) compared to placebo. The most frequently reported rheumatic AE was arthralgia or joint pain (n=94; 95%), followed by lupus-like syndrome or lupus erythematosus-like reaction (n=2; 2.5%). Discontinuation of treatment was the most common intervention (n=21, 39%).

Conclusion:

Biologic therapy increases the risk of rheumatic AEs in CRSwNP patients by over two-fold. Healthcare providers should remain vigilant in monitoring rheumatic AEs and apply appropriate management strategies on a case-by-case basis.

9:42 am – 9:45 am

Q&A

9:45 am – 10:15 am

Break with Exhibitors

Moderators: Christopher Le, MD, FARS; Patricia Loftus, MD, FARS

10:16 am – 10:24

QoL outcomes of ESS with PM2.5 exposure

Chandler Rygalski, MD
Nanda Nayak
Christina Dorismond, MD, MPH
Rory Lubner, MD
Daniel Lofgren, DO
Ping Li
Katherine Cahill
Mason Kryszinski, MD, FARS
Rakesh Chandra, MD, FARS
Justin Turner, MD, PhD, FARS
Naweed Chowdhury, MD
Vanderbilt University Medical Center

Introduction:

Chronic rhinosinusitis (CRS) is among the most common chronic upper airway diseases in the United States. In prior work, long-term exposure to air pollutants such as PM2.5 have been linked with a unique mixed inflammatory signature in CRS characterized by elevations in IL-2,5,7,13,12-23p40, and 21; however, the role of PM2.5 in the response to endoscopic sinus surgery (ESS) remains understudied. We hypothesized that chronic PM2.5 exposure may adversely impact quality-of-life (QoL) outcomes after ESS in CRS patients.

Methods:

Patients undergoing endoscopic sinus surgery were enrolled in single-center prospective observational cohort study of CRS and followed for at least 6 months. A high-resolution geospatial machine-learning model was used to obtain daily PM2.5 exposure levels for 1 year prior to surgery. Regression models were used to estimate the association between average 12-month PM2.5 exposures and postoperative QoL outcomes as measured by the 22-item SinoNasal Outcomes Test (SNOT-22) and its five subdomains after adjusting for sociodemographic confounding variables.

Results:

227 patients met inclusion criteria and had sufficient follow-up. In patients with nasal polyps (CRSwNP), 12-month PM2.5 levels were significantly associated with lower postoperative improvement in total SNOT-22 scores ($\beta=8.11$, $p=0.037$), psychological domain scores ($\beta=3.64$, $p=0.013$), and sleep domain scores ($\beta=2.55$, $p=0.036$). No statistically significant associations between postoperative quality of life outcomes and 12-month exposures were identified in the overall CRS or CRSwNP group.

Conclusions:

Chronic PM2.5 exposure is a potential risk factor for reduced QoL improvement after ESS in CRSwNP patients.

10:25 am – 10:33 am

Effects of smoking on 5-year quality of life outcomes after endoscopic sinus surgery

Allen Zhou, MD
Benjamin Bleier, MD, FARS
Eric Holbrook, MD, FARS
George Scangas, MD
Ralph Metson, MD, FARS
Stacey Gray, MD, FARS
Mass Eye and Ear/Harvard Medical School

Background:

Previous studies regarding the impact of smoking on the short-term outcomes of sinus surgery for chronic rhinosinusitis (CRS) have shown mixed results. Our objective was to assess the impact of smoking status on long-term disease-specific and general-health outcomes in a large cohort of endoscopic sinus surgery (ESS) patients.

Methods:

CRS patients who underwent ESS completed preoperative 22-item sinonasal outcome test (SNOT-22) and EuroQoL 5-dimension (EQ5D) visual analogue scale (VAS) and health utility value (HUV) surveys. Postoperative surveys were completed at 3 months and annually thereafter for five years. Clinical outcomes were compared between smoking and non-smoking cohorts.

Results:

Of 1306 patients enrolled, 80 were active smokers (6.1%). Within the smoking group, 44 (56.3%) completed the survey at 1 year, 26 (33%) at 4 years, and 15 (19%) at 5 years. Smokers had higher SNOT-22 ($p=0.007$) and lower EQ5D VAS ($p=0.027$) and HUV ($p=0.0367$) scores preoperatively. There was no significant difference between smokers and nonsmokers in SNOT-22 or EQ5D VAS and HUV scores at any postoperative timepoint from 3 months to 5 years. For nonsmokers, EQ5D VAS and HUV scores were significantly better than baseline at every timepoint from 3 months to 5 years, whereas this improvement was lost in smoking patients by 3 years and 2 years in EQ5D VAS ($p=0.2947$) and HUV ($p=0.07$), respectively. SNOT-22 was improved at each postoperative timepoint regardless of smoking status.

Conclusions:

There was no significant difference in long-term ESS outcomes by smoking status, though non-smoking patients appear to have a longer-lasting general health improvement compared to baseline.

10:34 am – 10:42 am

The association of weight loss with improved chronic rhinosinusitis outcomes

Zain Mehdi, BA
Jagan Dwarampudi, MS
Heli Majeethia, BS
Tania Banerjee, PhD
Masayoshi Takashima, MD, FARS
Mohamad Chaaban, MD, FARS
Aatin Dhanda, MD
Roshan Dongre, BS
Renjie Hu, PhD
Amber Luong, MD, PhD, FARS
Omar Ahmed, MD, FARS

Introduction:

While the association between obesity and chronic rhinosinusitis (CRS) has been studied, the effect of weight loss (WL) on CRS has not been evaluated. This is the first study comparing the impact of weight loss on CRS and subsequent need for medication.

Methods:

We queried the All of US NIH database for patients with BMI ≥ 30 and CRS. WL (BMI decrease of ≥ 5 with ending BMI under 30) was stratified into cohorts of any weight loss (AWL); un-sustained WL (USWL); and 1, 2, and 3-year sustained WL (SWL). These cohorts were propensity score matched to no weight loss (NWL) cohorts, controlling for visit frequency, age, sex, and ethnicity. We examined the association between WL and percent patients with follow-up CRS visits as well as medication use (nasal sprays, steroids, and antibiotics). Logistic regression evaluated confounding CRS co-morbidities.

Results:

537 CRS patients experienced weight loss. There were no significant differences in demographics. SWL was associated with significantly fewer CRS visits than NWL: 1Y-SWL 11.4% vs 17.9% (p -value=0.048), 2Y-SWL 10.4% vs 18.4% (p -value=0.0), and 3Y-SWL 9.4% vs 16.1% (p -value=0.14). USWL was associated with more CRS visits: 23.5% vs. 17.7% (p -value=0.06). AWL demonstrated similar CRS as NWL: 19.2% vs. 17.5% (p -value=0.52). 2Y-SWL demonstrated significantly fewer antibiotic prescriptions after WL: 19.59% before, 8.39% after (p -value=0.02). Logistic regression showed 2Y-SWL significantly improved OSA and essential hypertension but not other CRS confounders.

Conclusion:

Only sustained weight loss in obese patients independently is associated with CRS disease improvement and reduced need for antibiotics. Prospective studies are needed to further study this concept.

10:43 am – 10:51 am

CoSI index predicts success in AERD by asthma control test and SNOT-22 score

Alison Yu, MD
 Alexa Finuoli
 Maria Espinosa, Fellow
 Jennifer Douglas, MD
 Michael Kohanski, MD, PhD, FARS
 Nithin Adappa, MD, FARS
 John Bosso, MD
 James Palmer, MD, FARS
 Alan Workman, MD
 University of Pennsylvania

Background:

More extensive endoscopic sinus surgery has been shown to correlate with better disease control for CRSwNP. A recently developed scoring system, Completion of Surgery Index (CoSI), is based on the remaining bony partitions after sinus surgery. CoSI<70, which correlates with increased residual bony partitions, (a measure of incomplete surgery) conferred a higher degree of SNOT-22 improvement with revision surgery. We evaluated the impact of CoSI on the Asthma Control Test (ACT) and SNOT-22 improvement after surgery in AERD patients.

Methods:

In the database of CRSwNP patients for the year of 2021, patients with AERD were placed into 2 cohorts, those with CoSI<70 (previous incomplete surgery) and CoSI greater than or equal to 70 (previous complete surgery), based on preoperative CT scan. ACT and SNOT-22 data were collected at preop and 12 months.

Results:

17 patients with AERD underwent revision surgery in 2021. 11 (64.7%) patients had preoperative CoSI<70, comprising the previous incomplete surgery group. 6 (35.3%) patients had preoperative CoSI greater than or equal to 70, comprising the previous complete surgery group. Previous incomplete surgery had an improvement in SNOT-22 of 29.0 (SD 21.2) and an ACT at 12 months of 23.0 (3.6), whereas previous complete surgery had an improvement in SNOT-22 of 9.6 (13.0) and an ACT at 12 months of 14.8 (7.2). Both SNOT-22 and ACT reached statistical significance in group comparisons ($p=0.048$ and $p=0.041$, respectively).

Conclusion:

In AERD patients, CoSI<70 predicted significantly greater improvement in SNOT-22 and ACT after revision surgery. This conclusion supports the need for complete surgery (CoSI>70) prior to initiating systemic therapies in patients with CRSwNP and AERD.

10:52 am – 11:00 am

Psychometric validity and subdomain analysis of the SNOT-22 in cystic fibrosis sinusitis

Christine Liu, BS
 Jakob Fischer, MD
 Jonathan Overdevest, MD
 Anna Zemke, Assistant Professor
 David Gudis, MD, FARS
 Adam Kimple, MD, FARS
 Jeremiah Alt, MD, PhD, FARS
 Peter Hwang, MD, FARS
 Milene Saavedra, MD
 Jennifer Taylor Cousar, Professor
 Daniel Beswick, MD, FARS
 University of California, Los Angeles

The 22-item sinonasal outcome test (SNOT-22) is widely used to evaluate quality of life (QOL) in cystic fibrosis chronic rhinosinusitis (CF-CRS) but lacks formal validation in people with CF (PwCF). This study explores the psychometric properties and domain structure of the SNOT-22. Data from four prospective observational cohort studies were pooled across 10 U.S. centers.

Participant data from three studies investigating the impact of eluxacaftor/tezacaftor/ivacaftor (ETI) on CF-CRS were used for validity assessments. SNOT-22 scores, Lund-Mackay (LM) computed tomography (CT) sinus scores, and Cystic Fibrosis Questionnaire-Revised (CFQ-R) scores were used to assess test-retest reliability, construct validity, and responsiveness to clinical change in SNOT-22 scores. To delineate the SNOT-22's domain structure, data from a study of participants with CF-CRS was added and exploratory factor analysis (EFA) was performed.

Strong test-retest reliability was observed for the SNOT-22 during the first 6 months post-ETI ($N=53$, all $r \geq 0.80$, $p<0.001$). Mean individual scores in 20 SNOT-22 items decreased from baseline to post-ETI (90.1%, $p<0.05$). Moderate convergent validity was observed between pre-treatment SNOT-22 scores and LM scores ($r = -0.42$, $p=0.002$) and CFQ-R respiratory domain scores ($r = -0.35$, $p=0.025$). EFA ($N=191$) identified four thematically distinct domains in the SNOT-22: sleep, nasal, psychological, and ear/facial symptoms.

The SNOT-22 is a valid, reliable, and responsive instrument for evaluating CRS-specific QOL in PwCF, and functions effectively as a unidimensional construct across most of its 22 items. Our findings suggest a SNOT-22 factor structure in PwCF similar to existing domain structures in non-CF populations.

11:01 am – 11:05 am

Q&A

11:08 am – 11:50 am

Introduction: Amber Luong, MD, PhD, FARS

“From breach to best practices: Lessons for ENT professionals on cybersecurity”

Gavin Setzen, MD, FARS; Terry Ray, VP of Product Strategy at Varonis

11:50 am – 11:55

Q&A

11:55 am – 12:00 p

Closing Statements

Kevin Welch, MD, FARS, ARS President; Amber Luong, MD, PhD, FARS

Sunday, May 18, 2025

Concurrent Morning Session – Celestin GH

8:00 am – 12:00 pm CST

Room Moderator: William Yao, MD, FARS

Moderators: Do-Yeon Cho, MD; Nyssa Farrell, MD

8:00 am – 8:06 am

Analysis of FDA adverse event reports on fluticasone nasal sprays: Xhance vs. Flonase

Thomas Haupt MD

Jonathan Liang, MD, FARS

Rijul Kshirsagar, MD

Kaiser Permanente, Oakland, California

Objective:

Fluticasone nasal sprays, commonly used to treat allergies and nasal polyps, are designed to target specific areas within the nasal cavity. Xhance, a fluticasone spray delivered via an exhalation delivery system (EDS), was recently approved, and its side effects are generally considered comparable to those of other intranasal steroids; however, few studies have investigated this. This study compares the adverse event (AE) profiles of Flonase (fluticasone) and Xhance (fluticasone via EDS).

Study Design:

Retrospective database study.

Methods:

The FDA Adverse Event Reporting System (FAERS) was queried for Flonase and Xhance cases from Q1 2018 to Q1 2023. Patient demographics and adverse reactions were analyzed with descriptive statistics and multivariate logistic regression to compare AE incidence between medications.

Results:

There were 3,160 AE reports for Xhance from 1,318 subjects (63.3% female, mean age 53 ± 14.1 years),

primarily for nasal polyps (56%). Common AEs included epistaxis ($n=224$), headache ($n=108$), and nasal congestion ($n=56$). For Flonase, 4,318 AEs were reported from 2,091 subjects (62% female, mean age 57.2 ± 23.2 years), mainly for allergies (52%), with frequent AEs being epistaxis ($n=178$), headache ($n=102$), and anosmia ($n=89$). Xhance users reported significantly higher rates of epistaxis (16.4% vs. 8.51%, $p<0.01$) and headache (7.8% vs. 4.88%, $p<0.01$), with higher odds of epistaxis (OR 1.84, 95% CI 1.06-3.20) after adjusting for age, sex, season, and indication.

Conclusion:

Despite FAERS limitations, this analysis suggests higher rates of headache and increased odds of epistaxis in Xhance users compared to Flonase users. Proper Xhance administration is essential to reduce local side effects.

8:07 am – 8:13 am

Impact of topical antibiotics in refractory chronic rhinosinusitis

Allen Zhou, MD

Emily Moldoff, NP

Simon Chiang, Research Coordinator

Alan Workman, MD

Stella Lee, MD

Mass Eye and Ear/Harvard Medical School

Background:

Limited data exists on the efficacy of topical antibiotics for chronic rhinosinusitis without nasal polyposis (CRSsNP) and subsequent changes in the sinonasal microbiome. Our objective was to assess the effects of topical antibiotic irrigations on subjective and objective outcomes and the microbiome in patients with CRSsNP and history of sinus surgery (FESS).

Methods:

Adults with history of FESS for CRSsNP presenting with an acute exacerbation refractory to appropriate medical therapy including oral antibiotics were enrolled. Next-generation sequencing (NGS) and standard culture swabs were obtained at baseline and after treatment. Topical antibiotic irrigations were prescribed for 1 month based on NGS and culture results. Pre- and post-treatment 22-item sinonasal outcome test (SNOT-22) scores, Lund-Kennedy (LK) endoscopy scores, and NGS and cultures were compared.

Results:

12 patients were enrolled in this pilot study. LK scores demonstrated significant improvement (-5.5 , $p<0.0001$) after treatment and though total SNOT-22 scores improved with topical antibiotic therapy (-6.9 , $p=0.0848$), the MCID and statistical significance were not met. The ear/face subdomain significantly improved (-2.0 , $p=0.0156$) and the nasal subdomain trended towards improvement, but did not reach

significance (-3.09, $p=0.125$). 10/12 (83%) patients had a change in the dominant organism on NGS after treatment, but there was no change in overall bacterial load. Of the 12 patients, 6 (50%) were initially positive, and after treatment, 3 became negative, 2 grew a different organism, and 1 had no change.

Conclusion:

In appropriately selected CRSsNP patients, topical antibiotics may improve disease-specific quality of life and endoscopic appearance.

8:14 am – 8:20 am

Delivery of Mupirocin to the paranasal sinuses: Powder versus ointment

Lauren Pinzas, MD
Auddie Sweis, MD
Joseph Raviv, MD
Jason Jerusik, Pharmacist
Endeavor Health

Introduction:

Sinonasal mupirocin (MP) rinses have demonstrated symptomatic relief and short-term eradication of *Staphylococcus aureus* in refractory chronic rhinosinusitis (CRS). However, few studies have investigated the most effective preparation of mupirocin for intranasal delivery. The purpose of this study is to determine the potency of mupirocin nasal irrigation solutions after various durations of mixing.

Methods:

MP irrigations were formulated by dissolving either a 30 mg mupirocin capsule or 110 mg of MP 2% ointment into 240 mL of distilled water mixed with a proprietary salt blend. Potency tests were performed after 30, 60, 90, and 120 seconds of handheld shaking. All solutions were independently compounded by Advanced Rx (Fort Washington, PA) and analyzed by Eagle Analytical Services (Houston, TX).

Results:

Mixtures of MP 2% ointment (0.458 mg/mL) in isotonic buffered saline yielded concentrations of 0.298 mg/mL (65.1%), 0.402 mg/mL (87.8%), 0.470 mg/mL (102.6%), and 0.479 mg/mL (104.6%) after 30, 60, 90, and 120 seconds of shaking, respectively. Mixtures of MP 30 mg capsules (0.125 mg/mL) yielded a concentration of 0.132 mg/mL (105.6%) after 30 seconds of shaking.

Conclusion:

Suboptimal intranasal drug delivery in CRS patients may contribute to the development of recalcitrant symptom burden and MP-resistant *S. aureus* strains. In our study, mupirocin rinses formulated with 30 mg capsules (0.125 mg/mL) or 2% ointment (0.458 mg/mL) achieved target potencies after 30 and 90 seconds of continuous shaking, respectively. This data may help guide clinicians and patients on proper

delivery of topical mupirocin for various formulations of the medication.

8:21 am – 8:27 am

Utilization, spending, and price of exhalation delivery system with fluticasone, 2018-2023

Taylor Erickson, MD
Katie Phillips, MD
Akash Bhat, Medical Student
George Scangas, Assistant Professor
Alan Workman, MD
Vinay Rathi, MD
University of California San Francisco

Background:

The US Food and Drug Administration (FDA) recently approved an exhalation delivery system with fluticasone (EDS-FLU) for the treatment of chronic rhinosinusitis (CRS) with (September 2017) and without nasal polyposis (March 2024). We investigated adoption and pricing of this novel CRS treatment in the US following market launch in 2018.

Methods:

We performed a cross-sectional analysis of EDS-FLU utilization, spending, and price between 2018 and 2023 (most recent available data) using two public sources: (1) 10-K filings by the manufacturer (Optinose) and (2) the CMS Part D Spending by Drug dataset. We estimated net manufacturer and point-of-sale (POS) prices; net prices reflect amounts paid after manufacturer co-pay assistance and rebates to pharmacy benefit managers/health plans. We extrapolated total spending based on manufacturer revenue and the relative difference between POS/manufacturer net prices. We adjusted all prices/spending for inflation to reflect August 2024 USD.

Results:

Between 2018-2023, utilization of EDS-FLU totaled 1,473,969 prescriptions and increased 10.3-fold from 32,869 to 339,400 prescriptions/year. Estimated total spending was \$1.0 billion and increased 11.0-fold from \$21.1 million to \$252.9 million/year. Manufacturer net price/prescription decreased from \$272.98 to \$228.34 (absolute difference: -\$44.64; compound annual growth rate [CAGR]: -3.5%) and POS net price/prescription increased from \$642.72 to \$745.11 (absolute difference: \$102.3; CAGR: 3.0%).

Conclusions:

EDS-FLU utilization and spending have rapidly grown following market launch. Despite manufacturer price reductions, the POS price paid by patients and payers has increased due to markup by supply chain intermediaries and pharmacies.

8:28 am - 8:32 am

Q&A

Moderators: Jayant Pinto, MD; Kristine Smith, MD,

FARS

8:33 am – 8:39 am

U-smell-it: A new app-based olfactory test for rapid screening of smell dysfunction

Benjamin Bernard, MD

Carol Yan, MD

Omer Baker, BS

Alena Pauley, MS

Clifford Jiajun He, BA

Vivian Vo, BS

Derek Toomre, PhD

Molley Hagen, Statistician

University of California San Diego

Background:

Olfactory dysfunction (OD) is a prevalent disorder associated with increased morbidity and mortality that may often go unrecognized. Psychophysical olfactory testing is paramount in screening for OD, yet current measures may be costly and time-consuming. We present a novel, rapid olfactory test that assesses for smell identification, intensity, and hedonic value.

Methods:

The performance of a self-administered, mobile-app based olfactory test, U-Smell-It (USI) containing 5 scents (score 0-5) was evaluated. Demographic, clinical characteristics, and subjective olfactory function (binary and VAS) were assessed. USI performance was compared against the validated Brief Smell Identification Test (BSIT). Linear associations between USI and BSIT scores were evaluated using Spearman's correlation coefficient. Sensitivity and specificity of USI scores were determined using BSIT scores as the 'gold standard'.

Results:

Of 264 study participants (mean age 47 yrs; 143 female participants [54%], 133 White participants [50%]), 218 (82.6%) denied OD while 46 (17.4%) reported subjective OD. Mean USI score was significantly lower in those with subjective OD (2.83) than without OD (3.62, $p < 0.001$). BSIT and USI scores were strongly correlated ($R = 0.88$, $p < 0.0001$). USI predicted OD with a score of 2 or less as the cut-point for hyposmia (AUC=0.89, sensitivity=0.78, specificity 1.0). Mean time for test completion was 137 seconds.

Conclusions:

USI is a rapid, effective psychophysical test for olfactory function that may function as a low-cost method of longitudinal screening for OD.

8:40 am – 8:46 am

Sodium citrate nasal spray with olfactory training for chronic COVID-19 olfactory dysfunction (RCT)

Lauren Cook, BS

Taylor Stack, BS

Aurelia Monk, Medical Student

Ibtisam Mohammad, Research Fellow

W. Jared Martin, BA

Yasine Mirmozaffari

Ezer Benaim, MD

Tom Raz Yarkoni, MD

Michael Armstrong, MD

Adam Kimple, MD, PhD, FARS

Brent Senior, MD, FARS

University of North Carolina Chapel Hill

Background:

The first-line therapy for COVID-19-associated olfactory dysfunction (OD) is olfactory training (OT), yet 60% of people still do not improve. We aimed to evaluate adjunctive intranasal (IN) sodium citrate (NaCit) with OT for patients in a randomized, placebo-controlled, double-blind trial.

Methods:

Adults with at least 3 months of subjective OD and confirmed COVID-19 diagnoses were eligible and completed the University of Pennsylvania Smell Identification Test (UPSIT), baseline covariates, and the Sniffin' Sticks Identification Test (SSIT). Participants administered 2.5% NaCit or normal saline (NS) placebo followed by OT twice daily for 90 days before a second SSIT. Threshold-discrimination-identification (TDI) scores were compared before and after treatment within and between each group with t-tests.

Results:

A total of 16 participants (8 NaCit, 8 NS) were included. Mean OD durations were 145 weeks (NaCit) and 123 weeks (NS) at enrollment. Mean TDI change scores (post-treatment minus pre-treatment) was 3.86 ($p = 0.019$) for the NaCit cohort, which was both clinically and statistically significant. In the NS cohort, mean TDI change score was 2.43 ($p = 0.183$), which was also clinically but not statistically significant. The difference in mean TDI scores pre- and post-treatment between the NaCit and NS cohorts was 1.43 ($p = 0.284$).

Conclusions:

Our results suggest adjunctive NaCit with OT may offer a modest improvement for patients with chronic COVID-19-associated OD. The NaCit cohort demonstrated a greater improvement in TDI scores compared to the NS cohort and was both statistically and clinically significant. These findings support the potential feasibility and efficacy of this combined therapeutic approach.

8:47 am – 8:53 am

Nasal cycling and olfactory deposition efficiency

Michelle Kim, BA
Sarah Russel, Resident Physician
Dennis Frank-Ito

Background:

Optimizing intranasal drug delivery to the olfactory cleft is an active area of research, primarily hindered by the complexities of the nasal cavity, olfactory cleft location relative to the alar rim. Challenges such as nasal valve compromise and deviated septum further impede effective drug targeting. This study aims to understand the influence of nasal cycling on intranasal drug delivery to the olfactory cleft, a largely unexplored area.

Methods:

Nasal models were created from radiographic images of 15 healthy subjects with normal anatomy and classified based on the degree of nasal cycling: Mid (n=7), Mild (n=4), Extreme (n=4). Flow simulations at 15L/min and drug transport to the olfactory cleft were conducted using computational fluid dynamics. Administration parameters included head position (upright), particle velocities (1, 5, 10m/s), plume angles (100, 200, 400, 700), and spray release insertion depths (10mm center, 20mm center, 20mm mid-superior, 20mm max-superior). A total of 175,000 particles (1-50um) per nostril were sprayed.

Results:

Across all cycling states, average olfactory cleft deposition was higher on the more congested side (MCS) (Mid=8%, Mild=8%, Extreme=6%) than the less congested side (LCS) (Mid=2%, Mild=4%, Extreme=1%). Deposition was highest in all subjects regardless of cycling state at 1m/s particle velocity. For Extreme, highest deposition occurred at 100 and 700 plume angle in MCS and LCS, respectively; Mid highest deposition was at 700, and Mild at 100 and 400.

Conclusion: Preliminary results suggest that accounting for nasal cycling amongst other administration factors can influence intranasal drug delivery to the olfactory cleft, with the less patent airway having greater deposition.

8:54 am – 9:00 am

Moving beyond odor identification: Defining olfactory subdomain cutoffs in frailty risk assessment

Varun Vohra, BA
Qian-Li Xue, Dr.
Akhil Katuri, Mr.
Jacqueline Langdon, Ms.
Nicholas Rowan, MD

Introduction:

Prior studies detailing the link between olfactory impairment and frailty have focused on odor identification (I), potentially overlooking unique insights from lower order measures of olfaction, such as odor threshold (T) and discrimination (D). Our objective was to characterize the relationship between olfactory subdomains scores with frailty status, and determine optimal subdomain score limits.

Methods:

We conducted a prospective study assessing frailty with the Physical Frailty Phenotype (PFP) and olfaction with the Sniffin' Sticks Test in older adults. T, D, I (range 0-16 for all) and the composite TDI score (range -0-48) were evaluated using receiver operating characteristic (ROC) analysis and area under the curve (AUC) measures.

Results:

We enrolled 103 participants, with a mean age of 82.8±5 years, 56% (n=58) female, and 89% (n=92) white. Frail participants had clinically significantly lower OS (8.5±3.3 vs. 4.4±3.0), OD (11.4±2.0 vs. 8.1±2.5), OI (11.9±2.4 vs. 9.2±2.9), and TDI scores (31.9±5.9 vs. 21.7±6.6) compared to non-frail individuals (p<0.001 all). TDI demonstrated the greatest AUC, distinguishing between frail and non-frail participants (AUC=0.86), followed by D (AUC=0.85), T (AUC=0.82), and I (AUC=0.78). Optimal cutoffs were established for T (score = 6, sensitivity:82%, specificity:78%), D (10, 73%, 88%), I (12, 82%, 69%), and TDI (29, 93%, 69%).

Conclusion:

Unique olfactory subdomain score cutoffs may enhance risk stratification of frail individuals. Odor discrimination or threshold scores may yield distinct information relative to identification alone, and these subdomain scores should be investigated in larger samples of older adults as an accessible marker of untoward aging.

9:01 am – 9:04 am

Q&A

9:05 am – 9:20 am

PANEL: Common coding mistakes

Moderator: Toby Steele, MD

Panelists: Corinna Levine, MD, FARS; Gretchen

Oakley, MD, FARS; Vinay Rath, MD

Supported by the Patient Advocacy Committee and Skull Base and Orbital Surgery Section

Moderators: Leigh Sowerby, MD; Dennis Tang, MD, FARS

9:21 am – 9:27 am

Detection of mild cognitive impairment in older adults through combined olfactory and MoCA testing

Varun Vohra, BA

Anne Newman, Dr.

Nancy Glynn, Dr.

Elsa Strotmeyer, Dr.

Stephen Kritchevsky, Dr.

Nicholas Rowan, MD

Introduction:

Amid the rising prevalence of dementia among older adults, early detection of mild cognitive impairment (MCI) is crucial. The Montreal Cognitive Assessment (MoCA) and olfactory dysfunction (OD) have been independently associated with MCI, though their combined value remains underexplored.

Methods:

Cross-sectional within the Study of Muscle, Mobility and Aging (SOMMA), a longitudinal study examining the biological basis of muscle/mobility decline in adults aged >70 years. OD was detected with the Brief Smell Identification Test (range 0-12, impairment < 9). Cognition was assessed with the MoCA (score <23), Digit Symbol Coding (DSC), Trail Making Test B (TMT-B), and California Verbal Language Test (CVLT). Multivariable regression quantified the association of combined testing (normal, OD-only, MoCA-only, OD-MoCA) and cognitive testing.

Results:

Participants (N=812) were 76.2±5 years, with 60% women and 85% White. OD was associated with higher odds of MoCA impairment (AOR=1.9, 95%CI[1.09, 3.45]). Relative to the normal group, the OD-MoCA group had significantly fewer correct responses in the DSC (B=-8.1, 95%CI[-12.7, -3.6]), took longer to complete the TMT-B (B=47.8 [28.4, 67.4]), and demonstrated worse immediate recall (B=-3.7 [-5.1, -2.2]), short-delay free recall (B=-1.8 [-2.4, -1.2]), and long-delay free recall (B=-2.4 [-3.1, -1.7]) on the CVLT. Notably, the OD-MoCA group performed significantly worse than the MoCA-only and OD-only groups across CVLT assessments.

Discussion:

When observed with low MoCA performance, OD may signal greater cognitive impairment. These

findings highlight the potential of integrating olfactory assessments with MoCA testing to improve early cognitive screening.

9:28 am – 9:34 am

Questionnaire of olfactory disorders negative statements in age-related olfactory dysfunction

Rodney Schlosser, MD, FARS

Alexander Duffy, MD

Zachary Soler, MD, FARS

Tina LaPointe, Research Associate

Medical University of South Carolina

Introduction:

Olfactory dysfunction (OD) is under-recognized in the aging. It is crucial to understand the impact of OD upon quality of life (QOL) and associated psychosocial and cognitive comorbidities. This study examined the relationship of the Questionnaire of Olfactory Disorders Negative Statements (QOD-NS) with psychophysical testing in the aging, and sought to identify a correlation between the QOD-NS and patient reported outcome measures (PROMs), and cognitive testing.

Methods:

Prospective cohort study in which healthy, adult volunteers completed the QOD-NS, olfactory testing via Sniffin' Sticks (TDI), olfaction-related Visual Analog Scale (VAS) questions, De Jong Gierveld Loneliness Scale (DJG), UCLA loneliness survey (UCLA), Patient Health Questionnaire-9 (PHQ9), and the Montreal Cognitive Assessment (MoCA).

Results:

Two-hundred and twenty-eight adults with were included. Aging subjects (>50 years, n=132) had greater proportions of hyposmia and anosmia compared to younger subjects (58.3% vs 19.8% and 9.1% vs 3.1%, respectively, p<0.001), and worse olfaction-related QOL via the QOD-NS and VAS (p<0.001 for both). Aging subjects had significant correlations between QOD-NS and TDI (r=-0.386, p<0.001), all VAS (p<0.001), and PHQ9 (r=0.283, p=0.001). QOD-NS and MoCA had a non-significant correlation. ROC curve demonstrated a QOD-NS of 8.0 as optimal cutoff for Youden's index of 0.233 for detection of dysosmia.

Conclusions:

This study shows that the QOD-NS, an easily-distributed PROM, has significant correlation with psychophysical testing and psychosocial PROMs in the aging. A low Youden Index suggests that additional demographic and medical factors must be considered to augment its potential as a screening tool for OD.

9:35 am – 9:41 am

Gustatory dysfunction is associated with increased mortality among US adults

Simon Chiang, Research Coordinator

Sophie Yu

Margaret Mitchell, MD

Jonathan Zou, BA

Mitali Banerjee

Regan Bergmark, MD, FARS

Alice Maxfield, MD, FARS

Rachel Roditi, MD, FARS

Sarah Fleet

Kentaro Ikeda

Stella Lee, MD

Harvard Medical School

Background:

Gustatory dysfunction (GD) reduces quality of life and is linked to mortality in a small cohort of acutely ill adults. This study characterizes this association in a large national database adjusting for multiple comorbidities.

Methods:

Data was derived from the 2013-2014 National Health and Nutrition Examination Survey (NHANES) linked to mortality data from the National Death Index (NDI) through February 2019. Outcomes include subjective GD and objective whole mouth taste tests. Cox proportional hazards regression models examined associations between GD and mortality, adjusting for demographics (age, sex, race, family income, smoking status), comorbidities, nutritional status, cognitive function, and depression.

Results:

The analytical cohort consisted of 2,706 adults (≥ 40 years old). Subjective GD was associated with a 98.9% increased risk of mortality among adults aged 40-64 years old, adjusting for demographics, nutritional status, cardiovascular, diabetes, and malignancy history (hazard ratio[HR]=1.989, 95% Confidence Interval[CI]=1.053-3.747, $p=0.034$). Among older adults (≥ 65 years old) and female participants, objective GD was associated with a 52.4% and 69.9% increased risk of mortality after adjusting for covariates (HR=1.839, 95% CI=1.105-3.061, $p=0.019$ and HR=1.699, 95% CI=1.237-2.333, $p=0.001$). Objective GD was associated with a 65.7% increased risk of mortality among all participants, independent of the covariates and depression and cognitive function (HR=1.657, 95% CI=1.061-2.589, $p=0.026$).

Conclusion:

This study suggests that in addition to its impact on patient quality of life, GD is associated with increased mortality among the US adult population, a finding that requires more clinical scrutiny.

9:42 am - 9:45 am

Q&A

9:45 am – 10:15 am

Break with Exhibitors

Moderators: Angela Donaldson, MD, FARS; Isaac Schmale, MD, FARS

10:16 am – 10:24 am

FESS versus biologic therapy for CRSwNP: A systematic review with meta-analysis

Chadi Makary, MD, FARS

Heli Majeethia, BS

Zain Mehdi, Medical Student

Omar Ahmed, MD, FARS

Masayoshi Takashima, MD, FARS

George Kelley

Hassan Ramadan, MD, FARS

West Virginia University

Background:

Studies that directly compare biologic therapy to functional endoscopic sinus surgery (FESS) are limited.

Objective: To compare subjective and objective outcomes of FESS vs biologic therapy for chronic rhinosinusitis with nasal polyps (CRSwNP).

Methods:

A systematic search of MEDLINE (OVID), Scopus, Web of Science, and Cochrane Central Register of Controlled Trials (CENTRAL) databases was performed. Any study design that directly compared FESS to biologic therapy in CRSwNP was included.

Results:

Five studies representing 849 patients were pooled. Meta-analysis was limited to FESS vs dupilumab. Sino-nasal outcome test (SNOT-22) scores were similar at 6 months, but dupilumab was superior to FESS in improving SNOT-22 scores at 12-month follow-up [WMD, 3.83 (95% CI: 1.28, 6.38), $I^2 = 0\%$]. Although the dupilumab group tended to have worse baseline olfactory function [SMD 0.56 (95% CI: -0.07, 1.19), $I^2 = 87.59\%$], both groups had similar smell scores at 6 months [SMD -0.05 (95% CI: -0.47, 0.36), $I^2 = 73.29\%$]. FESS showed better improvement than dupilumab in endoscopy scores at 6 months [SMD, -2.06 (95% CI: -2.96, -1.16), $I^2 = 94.21\%$] and 12 months [SMD, -0.89 (95% CI: -1.37, -0.42), $I^2 = 80.26\%$]. No statistically significant between-group differences were observed in the prevalence of asthma, aspirin exacerbated respiratory disease, or prior sinus surgery.

Conclusion:

Dupilumab may be superior to FESS for long-term SNOT-22 scores, while FESS may be superior for improving endoscopy scores. Given the small number of studies included and/or heterogeneity observed, additional studies are needed before any level of certainty can be reached.

10:25 am – 10:33 am

**Depression and anxiety in empty nose syndrome:
A systematic review and meta-analysis**

Anuja Shah, BA

Isabelle Chai, Clinical Research Fellow

Shaun Nguyen, Dr.

Rodney Schlosser, MD, FARS

MUSC

Background:

Empty nose syndrome (ENS) is a condition associated with excess surgical resection of turbinate tissue. This study aims to understand prevalence of depression and anxiety in patients with ENS and the impact of augmentation procedures on psychological symptoms.

Methods:

CINAHL, Cochrane Library, PubMed, Scopus, and PsycINFO were searched in accordance with PRISMA guidelines. Outcome measures included continuous measures (mean) and proportions (%) with 95% confidence intervals (CI).

Results:

Of 1056 abstracts identified, 11 studies (N=286 patients) were included. Among patients with ENS, prevalences of depression and anxiety were 76.6% (61.0, 89.1) and 81.1% (65.2, 93.4). Postoperative Patient Health Questionnaire-9 scores at 1, 3, and 6 months improved by 5.57 ([2.78, 8.36], $p<0.0001$), 5.81 ([0.42, 11.20], $p=0.03$), and 5.52 ([−0.05, 11.54], $p=0.07$), and Generalized Anxiety Disorder-7 scores improved by 4.49 ([1.93, 7.05], $p=0.0006$), 5.24 ([−0.66, 11.13], $p=0.08$), and 9.51 ([8.1, 10.92], $p=0.2$), respectively. Postoperative Beck Depression Inventory-II scores at 6 and 12 months improved by 11.93 ([8.67, 15.21], $p<0.00001$) and 12.00 ([9.31, 14.69], $p<0.00001$) and Beck Anxiety Inventory scores improved by 10.84 ([7.66, 14.03], $p<0.00001$) and 11.56 ([9.08, 14.04], $p<0.00001$), respectively.

Conclusions:

Depression and anxiety are prevalent among patients with ENS. While patients with ENS demonstrated improvement in depression and anxiety scores following augmentation procedures, results varied across surveys and time points. Further research should investigate the relationship between ENS and psychological symptoms. Clinicians should be aware of the mental health implications in patients with ENS to guide management.

10:34 am – 10:42 am

Association between conflicts of interest and published position on absorbable nasal valve implants

Elizabeth Liao, MD

Aaliyah Riccardi, Dr.

Lauren Gardiner, Dr.

Linda Magaña, Dr.

Grant Gillman, Dr.

University of Pittsburgh Medical Center

Objective:

To examine the association between published position on absorbable nasal valve implants (favorable vs neutral/unfavorable) and the financial conflict of interest (FCOI) of listed authors.

Study Design:

Retrospective cross-sectional analysis.

Methods:

Research publications identified on Google Scholar and PubMed reporting outcomes of bioabsorbable nasal valve implants from 2016 – 2023 were included. Articles were independently reviewed and coded as favorable or neutral/unfavorable. Information on FCOI for physician authors was gathered from declared disclosures in the publication and the CMS Open Payments database.

Results:

Twelve articles (7 favorable, 5 neutral/unfavorable) with 33 unique authors were evaluated (52 author listings including repeat authorships). Twelve authors (12/34, 35%) of favorable articles declared a FCOI, as compared to 3 of 18 authors (17%) of neutral/unfavorable articles. Using CMS data to verify all physician payments, a FCOI was identified in 91% (31/34) of authors on favorable articles as compared to 44% (8/18) of author listings on neutral/unfavorable articles. Of 52 author listings there were 26 FCOI nondisclosures when manuscripts were compared to CMS data. When total author payments from 2016-2023 were considered, the collective total author payments per favorable paper averaged \$234,236 as opposed to \$18,141 on neutral/unfavorable papers.

Conclusion:

Our findings suggests that FCOI with the product manufacturer is associated with favorable published position on outcomes of bioabsorbable nasal implants for nasal valve collapse. The high rate of undisclosed FCOI highlights the need for more diligent reporting on behalf of authors and greater scrutiny from editorial reviewers.

10:43 am – 10:51 am

Industrial payments to peer reviewers and editorial board members in rhinology journals

W. Jared Martin, BA
Lauren Cook
Yasine Mirmozaffari
Ezer Benaim, MD
Tom Raz Yarkoni, MD
Michael Armstrong, MD
Jackson Vuncannon, MD
Charles Ebert, Jr., MD, FARS
Brian Thorp, MD, FARS
Brent Senior, MD, FARS
Adam Kimple, MD, FARS
University of North Carolina School of Medicine

Introduction:

Conflicts of interest in the peer review process can bias the evaluation of research. Reviewers with personal or financial stakes might favor or criticize work based on their interests, rather than the merit of the research, undermining the integrity of the scientific process. We aim to evaluate the demographics of reviewers and editors in rhinology journals to assess the extent of industrial influence among these groups.

Methods:

Associate editors, editorial board members, and peer reviewers from 2 rhinology journals in 2023 were identified. Utilizing the Open Payments database and institutional websites, we gathered demographic and payment data for each identified US physician. Data was analyzed by sex, education, and journal role, and compared to national averages.

Results:

A total of 216 individuals were identified, comprising 78.2% male and 21.8% female. Among them, 94.0% held an MD or equivalent, 18.0% had a PhD, and 5.6% had an MPH. Of these, 139 (64.4%) were US-based physicians, and 132 (61.1%) had Open Payments data in 2023. Industry funding averaged \$42,329 for associate editors (n=19; median: \$33,714; Interquartile Range (IQR): \$1,973–\$51,422), \$35,495 for editorial board members (n=46; median: \$2,097; IQR: \$325–\$43,125), and \$16,122 for peer reviewers (n=67; median: \$401; IQR: \$167–\$3,864).

Conclusion:

Sponsored research and consulting are common in our field. In 2023, associate editors and editorial board members of 2 rhinology journals received, on average, \$42,329 and \$35,495, respectively, from industry interests. Transparency and caution regarding conflicts of interest in rhinology are essential to maintain the integrity of our journals.

10:52 am – 11:00 am

Impact of intraoperative microbreaks on pain and performance in rhinology

Shahed Mohamed, MD
Shaun Edalati
Tiana Saak, Medical Student
Matthew Spence
Shreya Mandloi, BS
Thomas Scharfenberger
Jade Andrade
Gasmelseed Ahmed
Satish Govindaraj, MD, MPH
Jonathan Overdeest, MD
Mohamed Darwishe, MD

Background:

Over half of surgeons report musculoskeletal injuries impacting career longevity and quality of life. Endoscopic surgeries in confined spaces pose higher risks, but effects specific to rhinologists remain underexplored.

Aims:

This study investigates the impact of intraoperative microbreaks with stretches on pain, physical performance and mental focus during rhinological procedures.

Methods:

This multicenter cohort study had participants rate pre and post-surgical pain, physical performance and mental focus using validated scales on intervention and non-intervention days. Intervention days included 90-120 second microbreaks with standardized stretches every 20-40 minutes. Descriptive statistics, logistic regression, t-tests and chi-square tests were utilized.

Results:

Participants completed 168 procedures: 92 intervention and 76 non-intervention. The intervention group reported decreases or stability in pain levels post-surgery compared to pre-surgery, particularly in the neck, left shoulder, both ankles, left wrist, and upper & lower back, when compared to the control group (P: <0.05).

Microbreaks/stretching significantly improved physical and mental performance, with increases of 68.75% and 51.90%, respectively (P: < 0.0001).

The non-intervention group reported increased pain across all body sites except the right hip, with a notable 55.8% surge in neck pain post-surgery. This rise correlated with a 21% and a 12% decline in physical and mental performance, respectively (physical=OR: 0.79, P: 0.08; mental=OR: 0.88, P: 0.34).

Conclusion:

Intraoperative microbreaks with stretches significantly reduce pain and enhance both physical performance and mental focus during rhinological surgeries.

11:01 am – 11:05 am

Q&A**Location: Celestin D**

11:08 am – 11:50 am

Introduction: Amber Luong, MD, PhD, FARS

“From breach to best practices: Lessons for ENT professionals on cybersecurity”

Gavin Setzen, MD, FARS; Terry Ray, VP of Product Strategy at Varonis

11:50 am – 11:55

Q&A

11:55 am – 12:00 pm

Closing Statements

Kevin Welch, MD, FARS, ARS President; Amber Luong, MD, PhD, FARS, ARS President-Elect and Program Chair

Posters

Poster #G001

20 Year delayed CSF leak

Twenty-year delayed CSF rhinorrhea after facial trauma

Kevin Li, MD

Ari Schuman

Meha Fox, MD, FARS

Objectives:

Cerebrospinal fluid (CSF) leak is a well-documented complication after facial trauma. Typically, traumatic CSF leaks are detected within days of injury. There have been few reports of delayed CSF leak. We present a case of delayed CSF rhinorrhea 20 years after the initial trauma.

Methods:

A comprehensive review of the patient's medical records and literature search was performed.

Results:

A 53-year-old male presents to the emergency room with three weeks of clear, right-sided rhinorrhea when leaning forward. No fevers, chills, vision changes, neck pain or stiffness. He has a history of right sided facial fracture following assault 20 years prior to presentation. He reportedly declined surgical repair on an orbital fracture at that time. He denies symptoms in the ensuing years or recent trauma. Computed tomography noted an age-indeterminate fracture extending from the right orbital floor to the lateral lamella with fluid in the maxillary sinus. Nasal secretions were positive for beta-2 transferrin. He underwent an endoscopic endonasal approach and fragments of the right fovea ethmoidalis were removed and exposed two dural defects with obvious CSF leak. The leaks were repaired with a left-sided nasal floor graft. He had no evidence of CSF leak up to one month post-operatively.

Conclusion:

Delayed CSF leak after untreated traumatic injury can occur decades from injury and without obvious etiology. A thorough history and high suspicion are needed for correct diagnosis. Multiple CSF leaks may occur along the fracture line. Swift surgical repair of the CSF leak may prevent complications and lead to positive outcomes.

Poster #G002

52-week outcomes from the Phase 3 ENLIGHTEN 1 trial for LYR-210 in CRS

Vineeta Belanger, PhD

Amber Luong, MD, PhD, FARS

Rakesh Chandra, MD, FARS

Brent Senior, MD, FARS

Robert Kern, MD, FARS

Marina Mihova

Misun Lee

Lyra Therapeutics Inc.

Background:

LYR-210 is a bioabsorbable sinonasal implant in clinical development for patients with chronic rhinosinusitis (CRS) who have failed current therapies and require further intervention. LYR-210 is designed to be administered bilaterally in an in-office procedure and deliver continuous anti-inflammatory therapy (7500µg mometasone furoate) for up to 24 weeks. Data through 24 weeks from the Phase 3 ENLIGHTEN 1 trial were previously presented. We now report results from the safety extension phase of the ENLIGHTEN 1 study through 52 weeks.

Methods:

One hundred ninety CRS patients without nasal polyps or with grade 1 polyps, who had not previously undergone ethmoid sinus surgery, were enrolled in the randomized, blinded, sham-procedure controlled Phase 3 ENLIGHTEN 1 trial to evaluate efficacy and safety of LYR-210. Patients were randomized 2:1 to LYR-210 or sham for the 24-week treatment phase. After 24 weeks, sham group patients received crossover LYR-210 treatment while LYR-210 group patients were re-randomized (1:1) to receive a sham-procedure or a second round of LYR-210 treatment; all patients were followed through 52 weeks. Safety and efficacy assessments, including change from baseline in composite score of the 3 CRS cardinal symptoms (3CS; nasal blockage, nasal discharge, and facial pain) reported by patients on daily diary and SNOT-22, were collected through Week 52.

Results:

136 patients entered the extension phase. No treatment-related serious adverse events were reported, and no safety concerns were elicited. Full results are pending and will be presented at the COSM meeting.

Conclusions:

LYR-210 was well-tolerated throughout the 52-week ENLIGHTEN 1 trial.

Poster #G003

A case of canine transmitted post-operative staphylococcus schleiferi sinusitis

Helena Cabrera, BA
Jeffrey Suh, MD, FARS
Jakob Fischer, MD
Rebecca Golgert, MD
UCLA

Introduction:

Staphylococcus schleiferi is a coagulase-negative staphylococcus predominantly associated with noninfected canine skin and outer ear infections. Rare cases of S. schleiferi in humans have been documented, predominately involving surgical site infections in immunocompromised patients. More recently, S. schleiferi has been identified as a zoonotic cause of infection in rare cases of osteomyelitis, endocarditis, sepsis, and pediatric meningitis. We present the first documented case of bacterial sinusitis caused by S. schleiferi.

Case:

A 58-year-old male with chronic rhinosinusitis with nasal polyposis underwent bilateral endoscopic sinus surgery with an uncomplicated recovery course. His first debridement was notable for significant edema for which his oral prednisone was extended an additional week. A few days later, his canine pet developed otitis externa, with culture-positive aural drainage for S. schleiferi and Corynebacterium sp. The patient started topical treatments for his dog and shortly after noted acute increases in his own aural fullness, facial pain, and purulent nasal discharge. Acute evaluation was notable for purulent drainage from multiple sinuses for which culture grew S. schleiferi. He was treated with trimethoprim/sulfamethoxazole with resolution of this bacteria on subsequent cultures.

Conclusions:

This is the first case of acute bacterial rhinosinusitis through canine transmission of Staphylococcus schleiferi in the postoperative period. This is an exceedingly rare infection in the human population but appears to have risks associated with exposure to animals, particularly those with infections. Caution with exposure to infected animals may be prudent to minimize the risks of zoonotic infection.

Poster #G004

A case report of persistent epistaxis due to acquired hemophilia

Lauren Storm, BS
Jason H. Lee, MD
Keonho Kong, MD
Vincent E. Herrin, MD
University of Mississippi Medical Center

Introduction:

Epistaxis can have several local and systemic etiologies. We describe previously undiagnosed acquired hemophilia presenting as epistaxis and highlight the indications for coagulopathy workup.

Case:

A 70-year-old male with coronary artery disease and prior cardiovascular accident on clopidogrel, and recent shoulder joint hematoma after steroid injection, presented to the emergency department for persistent epistaxis. The patient denied a personal or family history of easy bleeding or bruising. Coagulopathy workup included prolonged activated partial thromboplastin time, low factor VIII activity uncorrected with mixing, and elevated factor VIII inhibitor levels. Initially there was good control with nasal packing and recombinant Factor VIII, cyclophosphamide, and factor VIII inhibitor bypassing activity, but he re-presented with recurrent epistaxis. Ultimately, endoscopic left sphenopalatine artery ligation and cautery of the posterior septal artery and incisive foramen was performed. He has since done well without recurrent bleeding on maintenance prednisone and rituximab.

Discussion:

This patient's recurrent epistaxis four years after starting clopidogrel, coagulopathy studies, and resolution after immunosuppression support the diagnosis of drug-induced autoimmune Hemophilia A. The exact pathophysiology is not completely known, but it is hypothesized that immune dysregulation with subsequent sensitization and autoantibody formation is implicated, rather than clotting factor underproduction as in congenital hemophilia.

Conclusion:

It is imperative to determine both the anatomic location and systemic etiology of a patient's persistent epistaxis to determine when complete coagulopathy workup is needed.

Poster #G005

A case report prompting consideration for agammaglobulinemia as a differential diagnosis

Lauren Storm, BS
Michael Rockwell, MD
Charles E Grogan, MD
Keonho Kong, MD
University of Mississippi Medical Center

Introduction:

Agammaglobulinemia/hypogammaglobulinemia is a rare inherited immunodeficiency disorder commonly due to X-linked inheritance or autosomal recessive inheritance mutations. This case illustrates a newly found agammaglobulinemia with a confirmed autosomal recessive mutation in the IGHM gene.

Case:

A 27-year-old white active male with a history of recurrent sinus infections, otitis media, and upper respiratory infections beginning at a young age presented with complaints of chronic sinusitis status post two sinus surgeries by community otolaryngologist in 2014 and 2023. Due to a suspected immunodeficiency, the patient was referred to allergy/immunology for further workup. A newly found agammaglobulinemia was found, significant for severely low immunoglobulin levels of all classes in addition to a low absolute lymphocyte count including B-cells, T-cells, and natural killer cells within normal range – concerning for agammaglobulinemia/late onset combined immunodeficiency. Genetic testing confirmed a mutation in the IGHM gene. The patient is receiving intravenous immunoglobulin (IVIG) therapy.

Discussion:

Autosomal recessive agammaglobulinemia (ARAG) is caused by genes that affect B-cell development. ARAG involves multiple genes, one of which is IGHM. This patient's mutation in the IGHM gene resulted as "variant of unknown significance". It is currently inconclusive whether this variant is attributable to the patient's autoimmune deficiency. Management includes IVIG therapy and prophylactic antibiotics as needed.

Conclusion:

Keeping agammaglobulinemia on a differential is important when patients present with recalcitrant chronic rhinosinusitis especially with recurrent upper respiratory infections or otitis media.

Poster #G006

A rare presentation of bilateral dentigerous cysts of the maxillary sinus

Cynthia Koenigsberg, MD
Neal Godse, MD
Ebony Evans, Fellow
University of Minnesota

Background:

Dentigerous cysts are the second most common odontogenic cyst, and arise in the maxilla or mandible, resulting from the incorporation of epithelial remnants during odontogenesis. Bilateral dentigerous cysts are rare and often arise in the setting of syndromes including Gardner's syndrome and basal cell nevus syndrome.

Methods:

This is a case report of a patient with bilateral maxillary sinus dentigerous cysts, and a review of the literature examining the surgical approaches to odontogenic cysts of the maxillary sinus.

Results:

A 60-year-old male presented with nasal obstruction and a palpable mass of the right upper gingivobuccal sulcus. CT imaging demonstrated bilateral unerupted molars with associated odontogenic cysts. The patient underwent resection, with the surgical approach involving an endoscopic endonasal medial maxillectomy combined with a Caldwell Luc approach on the left, and an endoscopic endonasal resection on the right. Final pathology was consistent with dentigerous cysts, and the patient's genetic workup was significant for mutations within the PTCH1 and ALK genes.

Conclusion:

Here we present the surgical management of bilateral dentigerous cysts in a nonsyndromic patient. In our review of the literature, the most commonly utilized approach for maxillary odontogenic cysts was a Caldwell Luc approach. A combined Caldwell-Luc and endoscopic technique is a less common, but emerging technique for addressing this pathology.

Poster #G007

A realistic cadaver model for complex endoscopic retroinfundibular tumor resections

Eve-Marie Roy, MD

Pierre-Olivier Champagne, Dr.

Francesco Copes, PhD

Université Laval

Endonasal and minimally invasive techniques have increasingly advanced in recent years, demanding high technical skills and a substantial learning curve. Effective training ideally combines supervised surgery with in-depth laboratory practice, especially for complex procedures in challenging anatomical areas. Traditionally, this lab training relies on cadaveric dissections or artificial anatomical models, both of which typically replicate only normal anatomy. Few models have been designed to reproduce pathological states, creating a gap in training resources.

Recently, innovative approaches, such as those by Gragnaniello et al., have introduced the use of liquid polymers injected into specific areas to simulate pathological anatomy for surgical practice. We applied this approach to the field of endoscopic endonasal surgery focused on retroinfundibular tumors, a location known for its complexity, challenging access, and critical surrounding structures. The primary objective of our study was to establish a reproducible and accessible retroinfundibular tumor model that accelerates the learning curve for complex endonasal skull base surgery within an anatomically realistic pathological context.

To enhance this model, we introduced modifications for clearer differentiation on CT scans and added coloration to aid in intraoperative identification. We also incorporated a previously developed model by our team that simulates a CSF leak to add an additional challenge to the resection. The goal is to eventually compare the endoscopic skills of ENT and neurosurgery residents before and after practicing on our model. Hence, our study is one of the most realistic cadaver models for endoscopic endonasal resection of a skull base tumor.

Poster #G008

WITHDRAWN

Poster #G009

A three dimensional holistic staging for nasopharyngeal angiofibroma: Georgian experience

Anupam Mishra, MBBS, MS, DNB, FACS
Subhash Chandra, Professor
King George Medical University, Lucknow, India

Background:

The debatable staging of nasopharyngeal angiofibroma (NA) have shown variations in anatomical prioritization and also failed to assess functional aspect.

Methods:

In retrospective review of 145 patients, demography, clinical features and radiology were recorded. Through imaging, a composite anatomical status (CAS) was developed that comprised of extent of tumour in anterior, posterior, lateral and superior directions. In addition, a Composite symptom score (CSS) and functional performance status (FPS) was developed based upon symptomatology and subjective opinions of patient vs surgeon (considering feasibility of surgery). Eight staging systems were compared analysed and correlated with clinical parameters, CAS, CSS and FPS.

Results:

All staging systems correlated with one another and also with volume of tumour. CSS correlated with lateral and superior extensions while FPS with only anterior extension. Recurrence correlated with lateral extension and Onerci staging only. CSS suggested a reflection of advanced stage by CAS, lateral/ superior extensions, but not by any other classification. FPS (subjective preference) although parallels CSS does not reflect any staging-hierarchy. It showed correlation with anterior-extension component only. Many sub-sites that are not included in previous staging but deemed important in defining extensions are also defined in Holistic classification.

Conclusion:

Holistic staging assesses all '3 dimensions' (CAS, CSS & FPS) and hence overcomes limitations of staging in literature. The CAS truly denotes disease advancement in every direction suggesting increasing complexities of surgical considerations. It can provide a common platform to compare disease status across studies.

Poster #G010

AERD: Impact of patient demographics on optimal post-desensitization aspirin dosage

Krithika Kuppusamy, BS
Alan Workman, MD
Michael Kohanski, MD
James Palmer, MD, FARS
Nithin Adappa, MD, FARS
John Bosso, MD
Jennifer Douglas, MD

Objectives:

If different aspirin dosages stratified by patient's gender, age, or menopausal status impacts the outcomes to aspirin desensitization therapy, thereby setting new clinical guidelines for management of these patients.

Methods:

We conducted a retrospective chart review of AERD patients at our tertiary care center from 2016-2023. Data included demographics (gender, age, menopausal status), monthly aspirin dosage post-desensitization, and SNOT-22 scores. Aspirin dosages were stratified by menopausal status in women and by age (under/over 50) in men. Group differences were analyzed using ANOVA with Tukey post hoc tests ($p < 0.05$).

Results:

A total of 344 patients were included, with aspirin dosages stratified by menopausal status in women and by age (under/over 50) in men. Men under 50 required significantly higher aspirin dosages compared to men over 50 (mean difference [MD] = 176.86, $p < 0.001$) and Post-Menopausal women (MD = -257.47, $p < 0.001$). However, there was no statistically significant difference between men over 50 and Post-Menopausal women (MD = -80.61, $p = 0.143$), or between men under 50 and Pre/Peri-Menopausal women (MD = -44.43, $p = 0.686$).

Conclusion:

Menopausal status appears to influence aspirin dosage requirements, but these differences may be largely age-related, as similar patterns were observed in men over and under 50. While women generally required lower aspirin dosages across both age groups, gender differences were less pronounced. These findings suggest the need for individualized aspirin desensitization protocols based on both age and menopausal status.

Poster #G011

AI ChatGPT normal sinus CT scans

Anthony Saad, BA
 David Herz, BS
 George Bebawy, BA
 Wayne D. Hsueh, MD
 Jean Anderson Eloy, MD, FARS
 Andrey Filimonov, MD, PharmD
 Rutgers New Jersey Medical School

Objective:

To determine the ability of artificial intelligence (AI) to accurately recognize normal sinus anatomy from images of computed tomography (CT) scans.

Study Design:

Comparative analysis.

Methods:

The Cummings Otolaryngology Head and Neck Surgery: 7th Edition textbook was accessed. CT images of normal sinus anatomy were extracted. Coronal CT scans representing normal sinus anatomy, color-labeled to represent different anatomical sites, were given to ChatGPT 4o with no textual context. The AI model was then prompted to indicate the proper anatomical site for each label. Accuracy of the ChatGPT responses were graded by a board-certified rhinologist. Univariate analyses were used to identify statistical associations.

Results:

Fifteen labeled anatomical sites were extracted and given to ChatGPT to properly label. Of the total ChatGPT-generated responses, nine were labeled accurately (60.00%). Anatomical sites were grouped by pneumatization. Of the fifteen sites, ten were pneumatized (air-filled), including the sinuses, and five were non-pneumatized (solid structures), including the turbinates. ChatGPT labeled 80.00% of the pneumatized sites correctly and labeled 20% of the non-pneumatized sites correctly. On logistic regression, ChatGPT had increased odds of producing accurate results for pneumatized sites compared to non-pneumatized sites (OR 16.0, 95% CI [1.09–234.25], $p = 0.043$).

Conclusions:

AI shows promise in identifying normal sinus anatomy on CT scans, particularly with air-filled structures. Accuracy was significantly decreased in identifying solid structures. While AI tools may complement educational resources in sinus anatomy, further refinement is necessary for reliable clinical application.

Poster #G012

AI endoscopic and CT sinus anatomy

Anthony Saad, BA
 David Herz, BS
 Aman M. Patel, BS
 Wayne D. Hsueh, MD
 Jean Anderson Eloy, MD, FARS
 Andrey Filimonov, MD, PharmD
 Rutgers New Jersey Medical School

Objective:

To compare the ability of artificial intelligence (AI) to accurately recognize normal sinus anatomy from endoscopic images versus computed tomography (CT) scans.

Study Design:

Comparative analysis.

Methods:

The Cummings Otolaryngology Head and Neck Surgery: 7th Edition textbook was accessed. CT images and endoscopic images of normal sinus anatomy were extracted. All images were color-labeled to represent different anatomical sites. Each site on CT was directly matched with the same site on endoscopy. All images were given to ChatGPT 4o with no textual context. The AI model was then prompted to indicate the proper anatomical site for each label. Accuracy of the responses was assessed by a board-certified rhinologist. Univariate analyses were implemented to identify statistically significant associations.

Results:

Eleven anatomical sites were color-labeled on both CT images and endoscopic images for ChatGPT to properly identify. Of the total generated responses, six endoscopic images were labeled accurately (54.55%) and five CT images were labeled accurately (45.45%). Notably, there was no correlation between which anatomic sites were labeled correctly on both endoscopy and CT. On logistic regression, there was no significant difference in ChatGPT producing accurate results between endoscopic and CT images (OR 0.67, CI [0.11–3.92], $p > 0.05$).

Conclusions:

ChatGPT demonstrates a comparable ability to recognize normal sinus anatomy on both endoscopic and CT images, with no significant difference in accuracy between the two imaging modalities. Although AI can potentially support sinus anatomy education, its current limitations highlight the need for further advancements before considering clinical applications.

Poster #G013

AI large language model and skull-base guidelines

Anthony Saad, BA
 Ariana L. Shaari, BA
 Philopateer Y. Ibrahim, BA
 Jennifer Yanik, DO
 Ghayoor Mir, DO
 Wayne D. Hsueh, MD
 Jean Anderson Eloy, MD, FARS
 Andrey Filimonov, MD, PharmD
 Rutgers New Jersey Medical School

Objective:

To determine the ability of artificial intelligence large language models (LLMs) to provide up-to-date responses to questions regarding interventions for skull-base conditions and procedures.

Study Design:

Comparative analysis.

Methods:

The 2019 International Consensus Statement of Allergy and Rhinology (ICAR): Endoscopic Skull-Base Surgery guidelines were accessed. Policies were extracted and converted into a question format. Each question was independently entered into LLMs ChatGPT 4o and Google Gemini. Two independent reviewers graded the output for concordance and resource credibility between the LLM-response and the guidelines. Concordance and Resource Credibility were graded on a binary scale. Univariate analyses were used to identify statistical associations.

Results:

Forty-six guidelines were extracted, for a total of 46 questions. Of the total responses, 95.65% of ChatGPT-generated responses were concordant with the ICAR guidelines and 97.83% cited a credible resource. 76.09% of Gemini-generated responses were concordant and 86.96% cited a credible resource. On logistic regression analysis, responses from Gemini had decreased odds of being concordant compared to ChatGPT (OR 0.14, 95% CI [0.03–0.70], $p=0.016$). Credibility odds did not differ between ChatGPT and Gemini responses (OR 0.15, 95% CI [0.02–1.28], $p > 0.05$).

Conclusions:

Artificial intelligence LLMs are capable of providing up-to-date information regarding skull-base conditions and procedures. While this technology is promising for its ability to serve as educational adjuncts, clinicians and trainees must be aware of their limitations.

Poster #G014

AI sinus pathology diagnosis

Anthony Saad, BA
 Emma R. Thompson, BA
 Sree Chinta, BS
 Wayne D. Hsueh, MD
 Jean Anderson Eloy, MD, FARS
 Andrey Filimonov, MD, PharmD
 Rutgers New Jersey Medical School

Objective:

To determine the ability of artificial intelligence (AI) large language models (LLMs) to accurately diagnose sinus pathology from endoscopic images and histologic images.

Study Design:

Comparative analysis.

Methods:

The Rhinology and Endoscopic Skull Base Surgery (2014) textbook was accessed. Endoscopic and histologic images of different sinus pathology were extracted. Each image was independently entered into LLMs ChatGPT 4o and Google Gemini. The AI models were then prompted to provide the correct diagnosis. Accuracy of responses were graded based on the textbook designations and verified by a board-certified rhinologist. Univariate analyses were used to identify statistical associations.

Results:

Twelve images of different pathologies were given to ChatGPT and Google Gemini to diagnose. GPT had an overall accuracy of 50.00% while Gemini had 25.00%. When stratified by image type, GPT correctly diagnosed 37.5% of endoscopic images and 75.00% of histologic images, while Gemini diagnosed 0.00% of endoscopic images correctly and 75.00% of histologic images. Of the total GPT-generated responses, nine were labeled accurately (60.00%). On logistic regression, there was no significant difference between overall accuracy of GPT compared to Gemini (OR = 3.00, 95% CI [0.53–16.90], $p = 0.213$). However, both AI models had significantly increased odds of accurately diagnosing histologic images compared to endoscopic images (OR = 19.62, 95% CI [1.73–222.40], $p = 0.016$).

Conclusions:

ChatGPT and Google Gemini have similar overall accuracy in diagnosis of sinus pathology from endoscopic and histologic images. Accurate diagnosis of histologic images by AI models is significantly greater than that of endoscopic images.

Poster #G015

**AI-generated responses to complication queries:
A comparative analysis in rhinology**

Luke Schwetschenau, BS

Areeb Shah

Thi Nguyen

Kyle Davis

Eric Schwetschenau

Joe Brunworth

Background:

Artificial Intelligence (AI) and text-generative large language models (LLMs) may help reduce physician workload as well as burnout. This study compares LLM-generated responses from physicians' perspectives to patient-presented questions about complications, highlighting popular models' strengths and weaknesses.

Methods:

Responses from ChatGPT-3.5, Google Gemini, Microsoft Copilot, and Claude AI were analyzed using questions regarding three rhinologic pathologies: epistaxis, acute sinusitis, and allergic rhinitis. Two independent reviewers and three rhinology experts scored the responses using validated tools. A one-way ANOVA and Tukey's HSD test ($p=0.05$) were used for analysis.

Results:

Claude AI achieved the highest average scores in accuracy (4.7/5) and understandability (85.7) while Google Gemini held the highest average scores in quality (91.7) and actionability (56) and the lowest average Flesch-Kincaid reading level (10th grade). Significant differences were found between groups for quality ($p<0.001$, $F=21.2$), accuracy ($p<0.001$, $F=26.9$), actionability ($p<0.001$, $F=11.3$), and understandability ($p=0.004$, $F=4.7$) with Google Gemini or Claude AI statistically outperforming Microsoft Copilot but similar to ChatGPT for most comparisons. Significance was found between Flesch Reading Ease scores ($p<0.001$, $F=17.4$) with Google Gemini having the highest readability (47.4). Similar significance was seen in the Flesch-Kincaid Grade Level comparisons. Additionally, variability between rhinologic subgroups suggests more targeted research is necessary.

Conclusion:

Google Gemini excels in patient-friendly communication, while Claude AI may be more physician-friendly due to its high content accuracy and understandability.

Poster #G016

Air pollution exposure and sinusitis incidence in central New York secondary to increased wildfires

Christopher Bushnell, BS

Dhruv Patel, Dr.

Mark Arnold, MD

Objective:

Sinusitis significantly reduces quality of life, associated with pain, anxiety, depression, and sleep disturbances. According to the CDC, 11.6% of adults are diagnosed with sinusitis. Long-term exposure to particulate matter $\leq 2.5 \mu\text{m}$ (PM2.5) correlates with chronic rhinosinusitis (Zhang et al.), and PM2.5 affects acute sinusitis in a dose-dependent manner (Grimm et al.). Wildfire smoke, which contributes to increased PM2.5, impacts regions like Central New York, which has seen historic spikes in PM2.5 due to distant wildfires. This study aims to determine if PM2.5 exposure correlates with acute and chronic sinusitis cases in the Central New York region secondary to increased wildfires.

Methods:

Patients diagnosed with sinusitis from 2019 to 2023 at a tertiary healthcare network in Central New York were included. PM2.5 data were sourced from the EPA's Outdoor Air Quality Archive for monitor 360671015 in East Syracuse, with mean PM2.5 collected every third day. Quarterly moving averages of PM2.5 and moving sums of sinusitis cases were correlated, with statistical significance assessed using a Pearson test.

Results:

Preliminary analysis shows a correlation of 0.36 between quarterly moving averages of PM2.5 and moving sums of sinusitis cases from 2019 to 2023, with a Pearson p -value < 0.0001 .

Conclusions:

A moderate positive correlation exists between PM2.5 levels and new sinusitis cases, with a significant p -value, suggesting a meaningful relationship. Further investigation, accounting for confounding factors, is necessary for definitive conclusions. Future analysis will incorporate methods including conditional logistic regression, to adjust for additional variables including age, sex, and comorbidities.

Poster #G017

An uncommon etiology of chronic rhinosinusitis: Ectopic teeth in a patient with autoimmune disorders

Shahed Mohamed, MD
 Lisa Tian, MD
 Mohamed Darwishe, MD
 Ahmed Mohamed
 Mustafa Mohamed
 Satish Govindaraj, MD, FARS

Introduction:

Ectopic teeth, an uncommon cause of chronic odontogenic sinusitis, is typically associated with iatrogenic factors, particularly dental procedures. We report a case of chronic rhinosinusitis (CRS) associated with the presence of ectopic wisdom teeth in the left maxillary sinus, without prior history of dental procedures.

Case:

A 28-year-old female with a history of recurrent CRS and autoimmune conditions, including Crohn's disease, Hashimoto's thyroiditis, Hypogammaglobulinemia, Rheumatoid Arthritis, and Sjogren's syndrome, presented with worsening left facial pain and nasal purulent discharge. The condition had previously been managed with antibiotics.

A dental scan revealed a calcified cyst with two ectopic wisdom teeth in the left maxillary sinus, confirmed by CT scans. Despite prior indications to remove the left molar, she had no history of previous dental extractions due to autoimmune condition flare ups.

Intraoperatively, significant purulent drainage was observed from the left maxillary antrostomy. Using a reverse 70 degree endoscope, two ectopic maxillary molars were seen attached to the posteroinferior maxillary wall. A medial maxillectomy was performed to maximize access, and the teeth were extracted using angled drills and a cottle elevator.

Conclusion:

Patients with chronic rhinosinusitis and complex medical histories present unique diagnostic and therapeutic challenges, this case emphasizes the importance of considering underlying autoimmune conditions in the etiology of patients with chronic odontogenic sinusitis and no prior dental procedures. Endoscopic approach minimized invasiveness, increased exposure for access and precision while preserving surrounding tissues.

Poster #G018

An unusual case of pterygopalatine fossa angioleiomyoma

Leo Song, Medical Student
 Jakob Fischer, MD
 Jeffrey Suh, MD, FARS
 David Geffen School of Medicine

Introduction:

Angioleiomyomas (ALMs) are benign, pericytic tumors arising from vascular smooth muscle that can form in the sinonasal tract. Comprising only 1% of all ALMs, sinonasal ALMs are extremely rare. We present an unusual manifestation of ALM that presented as a mass in the Pterygopalatine Fossa (PPF) with skull base erosion, an exceedingly uncommon presentation for this already rare neoplasm.

Case:

A 39-year-old male presented with progressive left-sided nasal obstruction and headache. CT and MRI showed a mass in the left PPF extending into the posterior nasal cavity and nasopharynx. The tumor caused widening of the PPF, remodeling of the posterior wall of the maxillary sinus, erosion of the sphenoid sinus floor, and obliteration of the vidian canal. Endoscopy showed a submucosal mass arising from the lateral nasal wall. Due to concern for a vascular neoplasm or malignancy, the patient underwent an endoscopic excisional biopsy. Pathology demonstrated ALM of the PPF. The patient is currently doing well with improved nasal obstruction, congestion, and headaches. Endoscopic and radiographic surveillance shows no evidence of tumor recurrence to date.

Conclusion:

Sinonasal ALMs are extremely rare and should be included in the differential diagnosis of lesions in the PPF and paranasal sinuses. Endoscopic resection of sinonasal ALM tumors with clear margins and thorough post-operative surveillance is the recommended treatment.

Poster #G019

Analysis of postoperative length of stay following endoscopic endonasal pituitary surgery

Gaurav Jategaonkar, MS3

Devyani Lal, MD, FARS

Amar Miglani, MD

Michael Marino, MD, FARS

Mayo Clinic Alix School of Medicine

Introduction:

Discharge on the first postoperative day following endoscopic pituitary surgery is feasible, however, appropriate length of stay (LOS) remains incompletely defined. LOS may extend due to postoperative complications or known perioperative risk factors. This study assesses the association between LOS and postoperative complications while accounting for perioperative risk factors.

Methods:

The National Surgical Quality Program (NSQIP) was queried for patients undergoing endoscopic pituitary surgery from 2014-2022 (CPT 62165). Patients were grouped by LOS (0-1, 2-5, 6-10, >10 days). Univariate and multivariate analyses assessed associations between LOS, preoperative characteristics, and outcomes. ROC analysis determined the LOS threshold for 30-day reoperation rates.

Results:

A total of 355 patients were included (n=34 for 0-1 day LOS group, n=226 for 2-5 day, n=71 for 6-10 day, n=24 for >10 days). Extended LOS correlated with factors including functional dependence, ventilator use, ascites, heart failure, and lower albumin or hematocrit ($p<0.05$). Multivariate analysis also showed higher hematocrit was protective (OR=0.83, [0.71-0.96]). Longer LOS was linked to more 30-day complications, including reoperation, pneumonia, and mortality ($p<0.05$). No significant differences in outcomes were found between the 0-1 and 2-5 day LOS groups ($p>0.05$). ROC analysis identified an optimal threshold of 4.5 days for predicting reoperation (AUC=0.804).

Conclusion:

LOS under 5 days was not associated with higher complication rates, representing the majority of patients after endoscopic pituitary surgery. These patients may be candidates for shorter LOS without compromising outcomes.

Poster #G020

Analyzing intolerance to aspirin therapy after desensitization (ATAD) in AERD Patients

Lancelot Herpin, MD/MSTR Candidate

Alexa Finuoli

Aspirin Exacerbated Respiratory Disease (AERD) is characterized by asthma, eosinophilic chronic rhinosinusitis with nasal polyposis, and respiratory reactions to cyclooxygenase-1 inhibitors. Treatment often includes a combination of functional endoscopic sinus surgery (FESS), corticosteroids, aspirin therapy after desensitization (ATAD), and biologics targeting type 2 cytokines to address underlying inflammation. While ATAD has shown promise as cost-effective way to improve patient sinonasal and asthma symptoms, a small subset of patients are unable to tolerate the therapy.

In this retrospective chart review, we analyzed 274 patients from the Penn AERD Center followed for 2-3 years post-desensitization. Although the therapy remains highly effective for most patients, we found that 59 patients (22%) were unable to tolerate aspirin therapy after desensitization. Intolerance was attributed to gastrointestinal symptoms (40.7%), skin inflammatory reactions (6.7%), worsening asthma symptoms or anaphylaxis (20.3%), worsening nasal symptoms (3.3%), personal non-compliance (6.7%), failure to achieve initial desensitization (5.1%), failure to improve symptoms (3.3%), other unknown reasons (8.5%), or overlapping categories (5.1%). Notably, the rate of aspirin intolerance was 38% among African-American patients compared to 18% in White non-Hispanic patients ($p = 0.02$).

This study is the first to our knowledge to investigate the causes of ATAD intolerance in a large cohort of AERD patients and highlights a significant racial difference in intolerance rates. Our findings suggest that African-American AERD patients may benefit from targeted counseling regarding potential side effects and alternative therapies to aspirin.

Poster #G021

Anemia in orbital floor fracture

Joseph Celidonio, Medical Student
 Lucy Revercomb, BS
 Aman M. Patel, BS
 Ghayoor Mir, DO
 Andrey Filimonov, MD, PharmD
 Rutgers New Jersey Medical School

Objective:

Anemia has been associated with adverse outcomes in various traumatic injuries. Facial fractures, including orbital floor fractures, can present emergently with blood loss leading to anemia and may also occur in the setting of preexisting anemia. Our study evaluates the impact of anemia on outcomes of adult inpatient orbital floor fracture.

Design Type:

Retrospective database study.

Methods:

The 2010-2014 National Inpatient Sample was queried for adults with a primary diagnosis of orbital floor fracture. Patients with anemia were identified. Univariate and multivariate analyses were performed to identify associations between anemia status and outcomes.

Results:

Of the 9,471 adult inpatients with orbital floor fractures the majority were male (69.9%), ≤ 40 years (51.9%), and without anemia (91.9%). Anemic patients were more frequently older (mean age 52.8 vs 41.5 years), female (47.4% vs 28.5%), non-elective admissions (96.5% vs 74.5%), with comorbidities including coagulopathy (9.3% vs 1.0%), hypertension (43.1% vs 23.8%), and renal failure (12.3% vs 1.2%) versus non-anemic patients ($P < 0.001$). On multivariable analyses adjusting for patient demographics, admission status, fracture type, and comorbidities, anemic patients were associated with \$30,432 greater total charges, longer length of stay by 1.9 days, and greater odds for acute pulmonary failure (aOR 1.99, 95% CI 1.21-2.40), hemorrhage (aOR 5.29, 95% CI 2.14-13.11), and tracheostomy (aOR 2.10, 95% CI 1.45-3.06) ($P < 0.001$).

Conclusion:

Among inpatients with orbital floor fracture, anemia was associated with increased complications and healthcare utilization, underscoring the importance of addressing anemia when managing orbital floor fractures to improve outcomes.

Poster #G022

Antibiotic utilization for chronic rhinosinusitis

Larry Wang, MS
 Atsushi Kato, PhD
 Whitney Stevens, Assistant Professor
 Stephanie Shintani-Smith, MD
 Bruce Tan, MD
 David Conley, MD, FARS
 Kevin Welch, MD, FARS
 Leslie Grammar, MD
 Robert Schleimer, Professor
 Robert Kern, MD, FARS
 Anju Peters, Professor

Background:

Chronic rhinosinusitis (CRS) is an inflammatory disorder of the paranasal sinuses and nasal cavity affecting 6-10% of the US population. Despite a paucity of literature demonstrating clinical efficacy, CRS is a common reason for antibiotic prescriptions, raising concerns over antibiotic stewardship. As such, this study aims to characterize trends in antibiotic utilization for CRS.

Methods:

This study queried patient data from an institutional Electronic Data Warehouse (EDW) to identify CRS patients from 2006-2023 based upon positive sinus CT scans and International Classification of Diseases (ICD) 9/10 codes. Clinical data of interest included antibiotic prescriptions for CRS diagnosis, antibiotic types and duration, and receipt of sinus surgery.

Results:

19,921 CRS patients were queried and included in the study. Demographics included mean patient age of 45.9 years, Female-sex (61.6%), and White race (78.3%). Between 2006-2013, 68.3% of CRS patients received a first-line antibiotic within 30-days of a CRS diagnosis. Between 2014-2023, the rate of first-line antibiotic prescriptions fell to 51.1%. Of patients receiving a first-line antibiotic, 82.8% received an additional antibiotic course within 3-months. Following 3-months after CRS diagnosis, 61.1% received a secondary antibiotic. Amoxicillin-clavulanate was the most prescribed antibiotic across all groups, and 20.1% of patients received sinus surgery.

Conclusion:

In the past decade, there has been a decrease in rates of first-line CRS antibiotic prescriptions, suggesting increased antibiotic stewardship. However, the significant number of patients still receiving first-line antibiotics along with repeat antibiotics indicate substantial antibiotic burden.

Poster #G023

Artificial intelligence in chronic rhinosinusitis

Karena Zhao, BS

Sarah Wie

Michelle Demetres

Ashutosh Kacker, MD

Background:

Chronic rhinosinusitis (CRS) is defined as chronic inflammation of the sinus and nasal passages for more than 12 weeks and affects 1-5% of the population with serious effects on quality of life. With increasing interest in artificial intelligence (AI), this scoping review aims to map the current landscape of AI applications in CRS, identifying trends, gaps, and future opportunities.

Methods:

A comprehensive literature search was performed in the following databases from inception – April 2024: Ovid MEDLINE, Ovid EMBASE, Web of Science, and The Cochrane Library. Studies retrieved were then screened for eligibility.

Results:

573 records were screened, with 49 studies included in the final review. The earliest study was in 2003, which utilized an early form of AI (Principal Component Analysis). A plurality of papers were published in 2022 (34.7%). Most papers were published from China (40.8%) and the US (28.6%). AI tools were applied to a variety of use cases, including discovering CRS endotypes to group patients (14.3%) and predict outcomes (34.7%) and finding ways to automate and quantify CT scans (24.5%). Less commonly, studies also assessed the use of AI in diagnosis of CRS (10.2%). Several studies used variables such as nasal polyps, asthma status, and sinus CT scores to enhance model performance.

Conclusion:

AI is a promising tool in the management of CRS, though it remains in its early stages. Current applications show potential for patient selection through outcome prediction, but further research is needed to ensure clinical applicability and use in surgical planning. This review underscores the need for standardized evaluation metrics and external validation to realize the full potential of AI in CRS care.

Poster #G024

Assessment of lifetime inhalational exposure burden and associations with chronic rhinosinusitis

Nina Westcott

Michael Ly, Medical Student

Cameron Worden, MD

Ezer Benaim, Resident

Meghan Rebuli, PhD

Christine DeMason, MD

Charles Ebert Jr., MD, MPH, FARS

Cristine Klatt-Cromwell, MD

Ilona Jaspers, PhD

Brent Senior, MD, FARS

Adam Kimple, MD, FARS

University of North Carolina

Background:

Inhalational exposures (IE) are linked to chronic rhinosinusitis (CRS). We previously demonstrated that IE burden, assessed via the Sinonasal Occupational and Airborne Pollutant Exposure (SOAPE) survey, was linked to upregulation of pro-inflammatory pathways in the sinonasal mucosa of CRS patients undergoing endoscopic sinus surgery (ESS). Here, we compare SOAPE survey scores of CRS patients with history of ESS to patients with inflammatory sinonasal disease history without ESS and to control patients with no sinonasal disease history.

Methods:

Adult patients were administered the SOAPE survey in Rhinology and General Otolaryngology outpatient clinics. Vapors/mists, dusts/fibers, and smoke/fumes subgroup exposure scores and a combined SOAPE survey score were determined for each patient via a grading rubric. Extracted outcomes included history of sinonasal pathology, ESS, and asthma. A one-way ANOVA compared SOAPE survey scores across three groups and unpaired t-testing compared asthma scores.

Results:

113 patients were surveyed (45% male). Mean age was 53 years (SD 19.7). CRS surgery patients (n=49) had higher SOAPE scores (mean: 39.2, 95% CI: 30.0-48.3], compared to other sinonasal (n=36) and control (n=28) cohorts (19.1 [12.3-25.9]; 20.5 [15.0-26.0]), respectively (p<0.01). Patients with asthma history (n=50) had higher mean SOAPE scores (35.2 [27.1-43.4]) compared to non-asthma patients (n=63) (21.6 [16.2-27.5]) (p<0.01).

Discussion:

Patients with CRS who underwent ESS demonstrated elevated lifetime IE exposure burden compared to those with inflammatory sinonasal disease without prior sinus surgery and controls. Patients with asthma reported higher lifetime IE exposure than patients without asthma.

Poster #G025

Assessment of variability in sinonasal anatomic measurements relevant for nasoseptal flap harvest

Beatrice Katsnelson

R. Peter Manes, MD, FARS

Ryan Rimmer, MD, FARS

Yale School of Medicine

Background:

The nasoseptal flap (NSF) is an effective reconstructive technique for repairing skull base defects associated with endoscopic endonasal surgery; however, it is associated with nasal morbidity, such as nasal crusting and rhinitis, among others. NSF's are typically harvested according to anatomic landmarks, but this may provide more NSF than necessary for the defect. Exploring the relationship between nasal septum dimensions and sphenoid dimensions is important to better understand opportunities to preserve nasal mucosa while ensuring adequate reconstructive coverage of sellar and suprasellar defects.

Methods:

We analyzed key sinonasal anatomical landmarks on CT scans of 109 patients undergoing sinus or skull base surgery. Statistical analyses, including Welch's two-sample t-test, ANCOVA, and linear regression, were conducted to explore differences in sinonasal measurements based on patient factors.

Results:

The study found that taller patients (>1.80 m) had significantly longer nasal septum lengths compared to middle-height patients (1.65-1.80 m), and males had longer nasal septum lengths than females. There were no significant differences in sphenoid dimensions across height and sex. Linear regression analysis showed very weak correlations between sphenoid measurements and nasal septum dimensions.

Conclusions:

This study examined the variability in sinonasal anatomical measurements relevant to nasoseptal flap (NSF) harvest and its relationship to sphenoid sinus dimensions. While nasal septum length increased with patient height, sphenoid measurements showed minimal correlation with height or nasal septal length, suggesting there may be an opportunity to preserve more anterior mucosa in selected patients.

Poster #G026

Association between ultraprocessed food intake and sinusitis

Anthony Thai, MD

Noel F. Ayoub, MD, MBA

Introduction:

Ultraprocessed foods (UPF) are industrial formulations derived mostly from substances refined or extracted from foods. Recent studies have demonstrated possible associations between UPF intake and asthma, allergies, pro-inflammatory states, and immune dysregulation. We investigate the association of UPF intake with sinusitis and sinonasal symptoms.

Methods:

We retrospectively reviewed three cycles of the National Health and Nutrition Examination Survey (NHANES), ranging from 2005 to 2014, which includes dietary and sinonasal symptom data on a large, representative sample of the US population. Individuals were divided into quartiles based on the percent of daily caloric intake consisting of Nova category 4 UPF. Multivariable logistic regression was performed to assess the association of UPF intake with sinonasal symptoms, adjusting for demographic data and medical comorbidities.

Results:

10,068 individuals (mean age 54.2 years, 52.1% female) were studied. Compared to the lowest quartile of UPF intake, the highest quartile had a higher rate of asthma (16% vs 11%, $p=0.03$), obesity (40% vs 30%, $p<0.001$), emphysema (2.9% vs 1.8%, $p=0.02$) and food insecurity (26% vs 21%, $p=0.002$). On multivariable regression, UPF intake was associated with sinusitis (OR= 1.52, 95% CI 1.14-2.04, $p=0.008$) and dysgeusia (OR 1.73, CI 1.13-2.65, $p=0.03$) but not hyposmia, nasal congestion, allergies or hay fever.

Conclusions:

UPF intake is significantly associated with sinusitis and dysgeusia, although not with other sinonasal symptoms. These findings highlight the potential impact of dietary choice on sinonasal conditions and the need to explore whether reduced UPF intake could serve as a modifiable risk factor for sinonasal health.

Poster #G027

Association of asthma and allergic rhinitis with depression in chronic rhinosinusitis patients

Sherron Thomas, BSA

Ashley Choi

Christina Fang, MD

Albert Einstein College of Medicine

Background:

Chronic rhinosinusitis (CRS) is associated with significant healthcare costs and diminished quality of life, particularly when coexisting with asthma, allergic rhinitis (AR), or depression. Although these comorbidities are common, the true impact of asthma and AR on depression in CRS patients has not been fully understood.

Methods:

We conducted a cross-sectional analysis using the All of Us Research Database, 27,068 of whom had CRS. Diagnoses were identified through SNOMED codes from electronic health records. Multivariable logistic regression was used to assess the associations between CRS, asthma, AR, and depression, adjusting for age, sex, race/ethnicity, BMI, household income, and smoking status. Subgroup analyses by age, sex, and income were also performed.

Results:

CRS was associated with higher odds of asthma (aOR: 3.24-3.43), AR (aOR: 6.26-6.61), and depression (aOR: 2.57-2.72; all $p < 0.001$). CRS alone was linked to a 2.54-fold increase in odds of depression (95% CI: 2.44, 2.65). Individuals with CRS and lower household incomes ($< \$50k$) consistently showed higher odds of allergic rhinitis and depression compared to those with higher incomes. The combination of CRS and asthma was associated with a 1.65-fold increase in odds of depression, while CRS and AR raised it by 1.33-fold compared to CRS-only patients.

Conclusion:

CRS significantly increases the odds of comorbid asthma, AR, and depression, with the co-occurrence of asthma or AR further elevating the risk of depression. These findings emphasize the need for comprehensive approaches to address both physical and mental health in managing CRS.

Poster #G028

Association of preoperative vascularization patterns and embolization methods with recurrence in JNA

Brennan Olson, MD, PhD

Hafsa Aden

Jeffrey Graves, Medical Student

Eric Moore, Dr.

Janalee Stokken, MD, FARS

Joshua Wiedermann, Dr.

Carlos Pinheiro-Neto, MD

Mayo Clinic

Introduction:

Given the rarity of juvenile nasopharyngeal angiofibroma (JNA), the literature remains scant with in-depth descriptor studies of embolization methods with patient outcomes. Herein, we report a 15-year case series characterizing preoperative vascularization patterns and embolization techniques with outcomes in patients with JNA.

Methods:

We performed a retrospective review of 36 patients with JNA treated at our institution from 2010 to 2024. Collected data (demographics, tumor features, embolization data, operative blood loss, and recurrence) was analyzed by linear regression, univariate, and multivariate modeling.

Results:

All 36 patients that met inclusion criteria were male with a mean age of 21.4 years (SD, 4.97). Patients binned to UPMC stage I-III experienced less intraoperative blood loss compared to the UPMC IV-V group (164.3 vs 766.9 mL; $p=0.02$). Bilateral external carotid artery vessel involvement was associated with increased number of vessels embolized (3.3 vs 1.9; $p<0.001$), while patients with internal carotid artery contribution(s) exhibited increased post-embolization blush (12.4 vs 4.0% tumor blush; $p=0.04$). Finally, patients with JNA recurrence ($N=8$) exhibited an increased post-embolization blush compared to patients without recurrence ($N=28$; 18.6 vs 3.7% tumor blush; $p<0.01$).

Conclusions:

Consistent with prior reports and UPMC staging criteria, our data demonstrates that patients who recurred were more likely to have an increase in post-embolization tumor vascularity. Collectively, our study demonstrates the utility in quantifying post-embolization blush in risk-stratifying JNA patients and highlights the importance of effective pre-operative embolization in minimizing disease recurrence.

Poster #G029

Atypical eosinophilic angiocentric fibrosis

Eugene Oh, BS, MSE

Jakob Fischer, MD

Jeffrey Suh, MD, FARS

David Geffen School of Medicine at UCLA

Introduction:

Eosinophilic angiocentric fibrosis (EAF) is a rare IgG4-related inflammatory disorder of the sinonasal tract with less than 100 reported cases in the literature. EAF is characterized by progressive nasal obstruction due to an indolent, locally infiltrative nasal mass. We present a unique case of EAF in which the patient experienced severe facial pain and necrosis without a discreet nasal mass.

Case:

A 61-year-old female presented with rapidly progressive severe nasal pain, purulent rhinorrhea, nasal obstruction, and hyposmia. Nasal endoscopy revealed a large septal perforation and extensive bilateral sinonasal necrosis. CT imaging was notable for extensive sinonasal bony destruction. She was urgently taken to the OR for biopsy and debridement. Tissue examination showed mixed inflammation with plasma cells and eosinophils with perivascular fibrosis, consistent with EAF with atypical necrosis. Rheumatology and allergy evaluations were performed to rule out other vasculitis or autoimmune processes. Post-operative systemic treatments with azathioprine and corticosteroids have provided partial relief of her symptoms with gradual reduction in mucosal inflammation and facial pain.

Conclusion:

We present a unique clinical presentation of EAF, an already rare disease process. The absence of a discreet nasal mass, combined with substantial sinonasal necrosis and severe facial pain, has not been previously described in the literature. Despite surgical debridement and systemic therapies, the patient has remained recalcitrant to multiple treatments. This case highlights the diagnostic and therapeutic challenges of EAF that may present with atypical, severe features mimicking a malignancy or an aggressive fungal infection.

Poster #G030

Barriers to CRS care for sexual and gender minorities

Faizaan Khan, BS

Najm Khan

Heli Majeethia, BS

Jihwan Park

Roshan Dongre, BS

Masayoshi Takashima, MD, FARS

Anthony Brissett, Dr.

Omar Ahmed, MD, FARS

Texas A&M School of Engineering Medicine

Background:

Strides have been made to identify, understand, and address barriers to care experienced by sexual and gender minority (SGM) patients, but investigating disparities among SGM patients with chronic rhinosinusitis (CRS) is lacking. This study aimed to compare the prevalence of cost and non-cost barriers among SGM and non-SGM patients with CRS.

Methods:

The All of Us Research Program was queried from May 2017 to August 2023 for CRS patients, defined as having at least 2 diagnoses of chronic sinusitis (ICD10: J32.x). Patients were categorized based on questions regarding gender identity, biological sex, and self-descriptions. The primary outcome was cost and non-cost barriers. Multivariable logistic regression was used to examine SGM status and experiencing barriers to care.

Results:

8,047 patients with CRS were included, 928 SGM (median age 60; IQR 44.8 – 70.0) and 7119 non-SGM (median age 64; IQR 52.0 – 73.0). Compared to non-SGM patients, SGM patients were more likely to delay specialist care (OR 1.44, 95%CI 1.12 – 1.84) and mental health care (OR 1.64, 95%CI 1.26 – 2.12) due to cost. SGM patients were significantly more likely to delay care due to transportation problems (OR 1.55, 95%CI 1.20 – 2.01) and a health care practitioner with a different background (OR 1.39, 95%CI 1.10 – 1.75). SGM patients also reported not always being treated with respect by their health care practitioners (OR 1.36, 95%CI 1.14 – 1.63).

Conclusion:

SGM patients with CRS may disproportionately encounter cost and non-cost barriers. Rhinologists and other health care practitioners treating SGM patients with CRS should be mindful of these disparities in an effort to address these barriers at a patient and system level.

Poster #G031

Baseline healthcare resource utilization in patients with CRSwNP from the AROMA global registry

Scott Nash, MD
 David W. Jang, MD
 Jayant Pinto, MD
 Kathleen M. Buchheit, Dr.
 Marjolein E. Cornet, Dr.
 Changming Xia, Dr.
 Aakash Gandhi, Dr.
 Jason Wang, Dr.
 Mark Corbett, Dr.
 Amr Radwan
 Duke University

Background:

Chronic rhinosinusitis with nasal polyps (CRSwNP) is associated with high symptom burden, reduced health-related quality of life, and increased healthcare resource utilization (HCRU).

Methods:

AROMA (NCT04959448) is a prospective, global registry of adult patients with severe CRSwNP initiating dupilumab treatment in real-world clinical practice. This study describes work and activity impairment, assessed using the Work Productivity and Activity Impairment (WPAI) questionnaire, and HCRU among AROMA patients at baseline.

Results:

As of February 2023, AROMA had recruited 303 patients. Mean (standard deviation [SD]) age was 50.8 (13.36) years, and 49.5% were male. In the year prior to enrollment, patients visited an otolaryngologist/ear, nose, and throat (ENT) specialist a mean (SD) of 3.7 (3.77) times, an allergist 2.3 (3.33) times, a pulmonologist 1.0 (1.80) times, and had 2.8 (3.32) CRSwNP-related visits to a primary care physician. In the WPAI questionnaire, patients reported a mean (SD) of 3.7 (11.77) missed work hours due to CRSwNP in the past seven days. Baseline means (SD) for percent work time missed, percent work impairment, percent overall impairment, and percent activity impairment over the seven-day period were 5.9% (15.43), 34.7% (25.80), 37.6% (27.66), and 40.9% (28.15), respectively.

Conclusion:

Patients initiating dupilumab for CRSwNP have a previous history of high HCRU and loss of work productivity.

Poster #G032

Bibliometric analysis of top cited septoplasty publications

Jonathan Collard de Beaufort
 Shiven Sharma, Medical Student
 Dany Alkurdi
 Dev Patel
 Keshav Sharma
 Satish Govindaraj, MD, MPH, FARS
 State University of New York Upstate Medical University

Background:

Septoplasty is a rhinological procedure employed to correct a deviated septum. Despite research strides on this procedure, there are no comprehensive bibliometric analyses on various study topics within septoplasty, including treatment, diagnosis, and risk factors. This study examines the top 100 most-cited publications in septoplasty to evaluate the current state of research.

Methods:

Using the Scopus database, articles published between 1989 and 2019 with the keyword "septoplasty" were sorted by citation count and analyzed for study and authorship characteristics. Chi-square tests assessed gender distribution among first authors, and ANOVA tests evaluated differences in average citation counts across study topics, country affiliations, and publication types.

Results:

Publication types were article (71%), review (25%), conference paper (3%), and short survey (1%). Most common study topics focused on treatment (52%), diagnosis (20%), risk factors (9%), innovation (9%), and others (10%). Top contributing countries were the United States (37%), Turkey (16%), and Germany (8%), with the most represented journals being Laryngoscope (15%) and Rhinology (10%). Majority of first-authors were male (80%), which significantly differed from an equal gender distribution ($p < 0.05$). ANOVA tests for the average number of citations by study topic and publication type showed no significant difference in counts across categories.

Conclusion:

Septoplasty research does not vary significantly across study topics. However, this field of research is heavily dominated by specific demographics across genders and country of origin, calling for greater efforts to increase diversity of perspectives.

Poster #G033

Bibliometric analysis on Dupilumab and chronic sinusitis with nasal polyposis

Pauline Huynh, MD

Rijul Kshirsagar, MD

Jonathan Liang, MD, FARS

Kaiser Permanente Oakland Medical Center

Background:

Dupilumab brought on a paradigm shift in the management of chronic rhinosinusitis with nasal polyposis (CRSwNP), resulting in a rapidly growing number of publications.

Objectives:

To evaluate the rapid progress and interest regarding the role of dupilumab in the treatment of CRSwNP.

Methods:

The Web of Science Core Collection database was queried for publications using terms “dupilumab” and a combination of “chronic sinusitis”, “rhinosinusitis”, and “polyposis” without time restrictions. Document type, years, authors, countries with economic estimates, institutions, journal information, and keywords were analyzed and visualized using VOSviewer. Only original investigation and review articles are included for analysis. Further analysis of the top 20 cited articles were performed.

Results:

Following deduplication, 358 unique publications were abstracted from the Web of Science Core Collection. Most studies were published in the United States (25.7%), followed by Italy (17.9%) and Japan (9.4%). Studies were most frequently published in the International Forum of Allergy & Rhinology (n = 21) followed by the Journal of Allergy and Clinical Immunology-In Practice (n = 17). B. Claus was the most cited author pertaining to this topic, and the most frequent keywords and concepts spanned outcomes, immunology, allergy, and adverse events.

Conclusion:

Research regarding the use of dupilumab in the treatment of CRSwNP is rapidly evolving, highlighting the paradigm shift in treatment with the introduction of biologic therapy. This analysis showcases global interest in this topic, highlighting hallmark publications and prolific investigators, while also identifying areas for further exploration and collaboration.

Poster #G034

Biological subtypes of nasal polyps by laser-capture microdissected gene expression profiling

Shen Kai Ng, BSc. (Hons)

Shahana R, Medical Student

Joseph W. Foley, Senior Research Fellow

Wei Keat Teo, Research Assistant

Serene Siow, Senior Laboratory Executive

Xinni Xu, Consultant

Jaslyn Lee, Associate Consultant

Mark Thong, Associate Professor

Ming Liang Oon, Associate Consultant

Joshua K. Tay, Assistant Professor

National University of Singapore

Nasal polyposis, frequently associated with chronic inflammation of the nasal mucosa, has a high recurrence rate and negatively impacts patients' quality of life. Understanding its gene expression allows us to identify molecular pathways to guide the development of effective management strategies.

Formalin-fixed paraffin-embedded (FFPE) tissue blocks were retrieved from patients who had surgery for nasal polyposis. Annotation of the immune cell compartment of each polyp was performed by board-certified pathologists, followed by laser-capture microdissection (LCM) for histological purity, and library preparation for RNA-seq using an in-house method optimized for FFPE.

Our preliminary analysis included 27 gene expression libraries (18 lymphocyte-rich, 5 eosinophil-rich, 4 epithelial-rich). Cell activation and regulation of immune processes were enriched in lymphocyte-rich compared to epithelial-rich regions (NES 2.36 and 2.07 respectively), while cilium organization was dis-enriched (NES -2.47. p-adj < 2e-30 for all). Collectively, we identified inflammatory mechanisms and potential immune subtypes involved in the nasal polyp pathogenesis process.

Together with an independent patient cohort (n = 200), this study aims to integrate both molecular and clinical findings to establish a robust gene signature predictive of clinical recurrence. This allows for the selection of high-risk patients for early treatment while sparing low-risk patients from unnecessary treatments.

Poster #G035

Can sinonasal surgery decrease the risk of cardiovascular disease?

Sarah Ridge, MD
 Ross Rosen, BS
 Joseph Bogart
 Brian D'Anza, MD
 Kenneth Rodriguez, MD
 Sanjeet V. Rangarajan, MD, FARS

Introduction:

Chronic rhinosinusitis (CRS) has consistently been linked to increased risk of cardiovascular disease (CVD). While the presumed link between CRS and CVD is the inflammatory state of CRS, sinonasal disease as a whole has recently been associated with worse general health, prompting the question of whether treatment of sinonasal disease may improve cardiovascular outcomes.

Methods:

The database TriNetX was queried for patients with sinonasal disease and associated surgical treatments. Control groups with disease but no surgery were matched by demographics, substance use, comorbidities, and use of antihypertensive and antilipidemic medications. Cardiovascular outcomes were included if they occurred at least one year after surgery.

Results:

On matched cohort analysis, septoplasty (RR 0.87, $p < 0.001$), rhinoplasty (RR 0.63, $p < 0.001$), and functional endoscopic sinus surgery (RR 0.96, $p = 0.009$) were associated with decreased total CVD. All three of these procedures were associated with decreases in risks of heart failure (HF), stroke, and myocardial infarction, with HF showing the largest decreases in risk. Balloon sinuplasty was not associated with a decreased risk of total CVD (RR 0.92, $p = 0.233$) but was associated with decreased risk of HF (RR 0.77, $p = 0.027$). Turbinate reduction was only associated with decreased risk of CVD if the patient did not have sleep apnea (RR 0.75, $p < 0.001$); turbinate reduction was associated with increased CVD risk in patients with OSA (RR 2.33, $p < 0.001$).

Conclusions:

Sinonasal surgery appears to independently be associated with a decreased risk of CVD. Surgeons may consider including this understanding in their decision-making and patient counseling as a possible benefit of these surgeries.

Poster #G036

Cannabis use and chronic rhinosinusitis

Austin Lee, BS
 Michael Liu
 David Kaelber, Professor
 Mohamad Chaaban, MD, FARS
 Case Western Reserve University School of Medicine

While cannabis' link to asthma is well-studied, its impact on CRS is less clear. The few studies available do not use specific CRS clinical definitions nor explore the development of new-onset CRS. Recent evidence suggests an inverse relationship exists between cannabis use and sinonasal symptoms. This study explores the association between cannabis use and rates of new-onset chronic rhinosinusitis (CRS), chronic rhinosinusitis with nasal polyps (CRSwNP), and functional endoscopic sinus surgery (FESS) rates.

Methods:

The TriNetX Analytics Research Network was queried for cannabis users using the diagnosis code for Cannabis-Related Disorders, then propensity score matched to controls without cannabis use (no CRD) based on demographics and comorbidities. Primary outcomes were relative risks of new-onset CRS and CRSwNP encounter diagnosis and FESS 1, 2, and 5 years after initial cannabis use diagnosis.

Results:

The cannabis user and non-user cohorts each contained 155,467 patients. At 1 year, cannabis users showed reduced risk of diagnosis of new-onset CRS (aRR = 0.85, 95% CI 0.80-0.91), CRSwNP (aRR = 0.57, 95% CI 0.44-0.74), and FESS (aRR = 0.74, 95% CI 0.59-0.91). At 2 years, cannabis users had lower risk of new-onset CRS (aRR = 0.87, 95% CI 0.82-0.91), CRSwNP (aRR = 0.62, 95% CI 0.50-0.76), and FESS (aRR = 0.72, 95% CI 0.59-0.87). By 5 years, cannabis users had reduced risk of new-onset CRS (aRR = 0.82, 95% CI 0.79-0.86), CRSwNP (aRR = 0.71, 95% CI 0.60-0.83), and FESS (aRR = 0.68, 95% CI 0.57-0.82).

Conclusions:

Patients with cannabis use demonstrated significantly reduced risks in new-onset diagnoses of CRS and FESS compared to non-users. Further studies are warranted to examine the cause of this relationship.

Poster #G037

Cavernous carotid pseudoaneurysm case report

Josef Shargorodsky, MD, MPH

Lucas Ratiani

Coastal Ear, Nose and Throat

A cavernous carotid artery pseudoaneurysm is a rare type of vascular malformation in which a breach of the artery wall causes subsequent dilation in the cavernous portion of the carotid artery. Most cases are either traumatic or iatrogenic while idiopathic cases are exceedingly rare.

We report an unusual case of a male experiencing brisk recurrent spontaneous epistaxis. Nasal endoscopy revealed congealed blood originating from the sphenoid recess. A computed tomography angiogram was performed and revealed a lobulated hyperdensity arising from the cavernous right internal carotid artery, eroding the sinus wall and filling most of the sphenoid sinus. An endovascular approach was performed with embolization of the pseudoaneurysm and stenting of the affected portion of the carotid artery leading to durable hemostasis.

This case demonstrates the possibility of an exceptionally unusual pathology in a patient with an otherwise fairly common otolaryngologic presentation.

Poster #G038

CCI in SNSCC

David Herz, BS

Aman M. Patel, BS

George Bebawy, BA

Anthony Saad, Medical Student

Ghayoor Mir, DO

Andrey Filimonov, MD, PharmD

Rutgers New Jersey Medical School

Objective:

Objective preoperative risk assessment tools inform physician and patient decision making. Our study examines the relationship between the Charlson-Deyo Comorbidity Index (CCI) and overall survival (OS) following surgery for sinonasal squamous cell carcinoma (SNSCC).

Methods:

The 2004-2016 National Cancer Database (NCDB) was used to extract adult patients with pT1-4 N0-3 M0 SNSCC undergoing surgery. Kaplan-Meier survival analysis and Cox-Proportional Hazards modeling were used to analyze the impact of CCI on OS.

Results:

Of the 3,494 patients satisfying inclusion criteria, 2,749 (79%) were CCI=0, 575 (16%) were CCI=1, and 170 (5%) were CCI=2+. On univariate analysis, CCI groups differed by age (43% were ≥65 years old in CCI=0 vs 53% and 64% in CCI groups 1 and 2+, respectively, $p<0.001$). There was no significant difference between CCI groups in race, sex, T-stage, N-stage, margin status, primary site, radiation therapy, or systemic therapy. On Kaplan-Meier analysis, 5-year OS for CCI=0, CCI=1, and CCI=2+ was 44.3%, 41.5%, and 37.0%, respectively ($p<0.001$). However, CCI=1 (HR 0.81, 95% CI 0.52-1.27, $p=0.357$), and CCI=2+ (HR 1.55, 95% CI 0.81-2.98, $p=0.186$) were not associated with worse OS than CCI=0.

Conclusions:

In a cohort of adult patients with SNSCC undergoing surgery, increasing CCI was not associated with worse OS, although different groups did have significantly different OS. These findings indicate that CCI may not adequately capture the complexities of frailty in this population. Future studies should explore alternative frailty indices or more comprehensive risk assessment tools that better predict survival outcomes in SNSCC, potentially improving surgical decision making and individualized care.

Poster #G039

CFD modeling of swirling effect to the drug spray for sinus disease treatment

Zheng Li

Mohammad Hossein Doranehgard, Postdoc

Guiliang Liu, PhD Student

Adam Kimple, MD, FARS

Rui Ni

Morgan State University

This study presents a comprehensive numerical analysis of pharmaceutical spray atomization using OpenFOAM computational fluid dynamics software. The simulation captures the complete atomization process, from initial liquid sheet breakup to final droplet formation in a swirling spray configuration. The model successfully reproduces key physical phenomena including primary breakup mechanisms, secondary atomization, and droplet size distribution patterns. While some discrepancies with experimental data were observed, the simulation provides valuable insights into the fundamental dynamics of spray formation and atomization processes. The results demonstrate the capability to predict particle size distributions at various swirl numbers, offering a framework for optimizing spray parameters.

This work serves as a foundation for more sophisticated simulations of drug delivery in nasal cavities, where accurate prediction of spray characteristics is crucial for therapeutic efficacy. The methodology developed here can be particularly valuable for pharmaceutical formulation development and delivery device design, potentially reducing the need for extensive experimental testing in early development stages.

Poster #G040

Characterization and description of extra-olfactory REAH

Jakob Fischer, MD

Eugene Oh, Medical Student

Dipti Sajed, Pathologist

Daniel Beswick, MD, FARS

Jivianne Lee, MD, FARS

Marilene Wang, MD, FARS

Jeffrey Suh, MD, FARS

University of California, Los Angeles

Background:

Respiratory epithelial adenomatoid hamartoma (REAH) is an under-recognized, non-neoplastic entity of uncertain etiology that occurs in isolation or in chronic rhinosinusitis (CRS). Our goal is to evaluate our experience with REAH and characterize the subpopulation of extra-olfactory cleft REAH.

Methods:

Retrospective review of pathology-confirmed REAH at a single institution from 2009-2024. Charts and imaging were reviewed to characterize presentation and outcomes.

Results:

REAH was present in 88 patients who were 58.6 ± 15.6 years of age, 58% (n=51) male, and 75% (n=66) white. REAH was most commonly incidentally identified in CRS (58, 65.9%), within the olfactory cleft (OC) (16, 18.2%), or as a discrete mass outside of the OC (14, 15.9%). In patients with incidental REAH, 21 (36.2%) patients had no OC opacification on CT. Patients with OC REAH were older ($62.3 \text{ vs } 52.9$ years, $p=0.014$), had higher rates of comorbid allergic rhinitis ($62.2 \text{ vs } 37.1\%$, $p=0.020$) and asthma ($54.7 \text{ vs } 25.7\%$, $p=0.021$) compared to extra-OC REAH. There were 14 sinus/nasal masses identified as extra-OC REAH on biopsy. These were isolated lesions within the nasal cavity (7, 50%), the maxillary sinus (3, 21.4%), the middle meatus/ethmoid sinus (3, 21.4%), and the sphenoid sinus (1, 7.1%). The median follow-up time was 423 days (IQR 1202 days) with 11 (12.5%) patients undergoing revision surgery for CRS. REAH was not identified in any subsequent pathology and no patients had recurrence on endoscopy or imaging.

Conclusion:

REAH is a benign, incompletely understood entity with variable presentation. Patients with OC involvement are older with higher rates of allergic rhinitis and asthma. REAH also rarely presents as a discrete mass sparing the OC mimicking other sinonasal pathology.

Poster #G041

Characterizing the nasal vestibule swell body

Michael Werner, MD, PhD

Yosef Krespi, Professor

Victor Kizhner, Physician

Northwell Health

Objectives:

To understand the incidence, histopathology, and clinical significance of the nasal vestibular swell body in patients presenting with nasal obstruction.

Study design:

Retrospective chart review at a single tertiary academic hospital in an outpatient setting.

Methods:

Patients presenting to an otolaryngology office with nasal obstruction were reviewed. Patients with non-collapsing internal nasal valve dysfunction were included. Patients with acute upper respiratory infection, acute or chronic rhinosinusitis, and allergic or nonallergic rhinitis were excluded. The nasal valve was described in terms of static dysfunction versus dynamic collapse, subjective improvement in Cottle or modified Cottle maneuver, septal deviation, and inferior turbinate hypertrophy. Presence or absence of the vestibular swell body was reviewed on endoscopic and CT images. Imaging software was used to calculate the area of nasal valve obstructed by this tissue. A biopsy of this tissue was taken from one patient.

Results:

In patients presenting with nasal obstruction who were found to have a predominant nasal valve issue, we found that approximately 25% of patients have some degree of vestibular swell body hypertrophy based on review of available endoscopic and CT imaging. This tissue can be easily ablated using a diode laser as part of a comprehensive treatment of the nasal valve in the operating room or in-office setting. Adverse effects are limited to transient local pain and numbness. The histology of this tissue will be reviewed.

Conclusions:

Patients presenting with nasal obstruction due to a primary nasal valve issue may benefit from the treatment of soft tissue in the nasal sill termed the nasal vestibular swell body.

Poster #G042

WITHDRAWN

Poster #G043

Chronic sinusitis and rheumatoid arthritis flare following treatment of Cushing's syndrome

Sandhya Ganesan, BS
Alexander Bjorling, MD
Michelle Ceo, RN, CPN, CPNP-PC
Ghassan Samara, MD

Introduction:

Cushing syndrome (CS) is characterized by the presence of excess cortisol or glucocorticoids in the body. The treatment of CS reverses the immunosuppressive effect of excess glucocorticoids and can result in the emergence or exacerbation of autoimmune, inflammatory, or steroid-responsive conditions. Few cases have described the worsening of chronic sinusitis (CRS) following treatment of CS.

Case Description:

A 43-year-old woman with rheumatoid arthritis (RA) and CRS presented with new-onset hypertension, edema, hyperglycemia, and hypokalemia, coinciding with relief from her RA and CRS symptoms. Endocrinology evaluation revealed findings consistent with ACTH-dependent CS. Petrosal sinus sampling confirmed the presence of a pituitary microadenoma. She underwent transseptal, transsphenoidal resection of the tumor followed by improvement of her CS symptoms. At this time, her RA and CRS symptoms recurred, and she was prescribed a 3-week course of Augmentin after developing purulent nasal discharge and sinus pressure. Her sinusitis symptoms recurred one month later, and nasal endoscopy demonstrated polyps in the sphenoid and ethmoid sinuses in addition to purulent discharge with rare mold and bacteria on culture. She was treated with daily saline and budesonide nasal irrigation prior to undergoing polypectomy and irrigation with bilateral corticosteroid-eluting stent placement.

Conclusion:

The development or exacerbation of inflammatory conditions in the post-treatment period of CS may be attributed to adrenal insufficiency or glucocorticoid withdrawal syndrome, thereby delaying detection and treatment. Patients with these pre-existing conditions should be closely monitored for worsening or recurrence of their symptoms.

Poster #G044

Clinical factors for odontogenic maxillary sinusitis and endoscopic transnasal apicoectomy

Kenta Fukui, MD
Hiromitsu Hatakeyama
Yamato Oki
Nobuhiko Oridate
Yokohama City University Medical Center

Background:

Currently, there are no clear criteria for the treatment of odontogenic maxillary sinusitis (OMS). Preservation of the tooth is important for patients' quality of life. We examined the clinical factors contributing to OMS requiring FESS and report Endoscopic Transnasal Apicoectomy(ETA).

Case and Methods:

A total of 109 patients diagnosed with OMS were included in the study. Patients were divided into two groups: the no-FESS group (n=51), in which treatment was completed with conservative treatment, and the FESS group (n=58), in whom FESS was performed. CT findings were compared between the two groups. In addition, we tried to performed FESS and ETA at the same. ETA is a surgical method of drilling periapical lesion transnasal for the preservation of the tooth.

Results:

A high Lund-Mackay score (LM score) was identified as a significant risk factor in the FESS group. 74% of patients with LM score 4 or higher required FESS, while 96.9% of patients with LM score 3 or lower did not require FESS. Patients in whom ETA was performed have shown good progress.

Conclusion:

LM scores were critical predictors of the need for FESS in the treatment of OMS and we considered useful to perform FESS and ETA at the same time.

Poster #G045

Comparative analysis of fungal organisms in invasive fungal rhinosinusitis

Janice Chung, MD
UCLA

Background:

Acute invasive fungal rhinosinusitis (AIFRS) is a rare disease with high mortality. Multiple fungal organisms have been implicated, with mucormycosis postulated to cause the most aggressive disease. This study investigates fungal organisms in relation to underlying immunodeficiencies, socioeconomic factors, and patient outcomes.

Methods:

Retrospective review of 95 patients with AIFRS at UCLA between years 2010 and 2024. Logistic regression, ANOVA, and Student t-test were performed.

Results:

Mucormycosis accounted for 63% of cases, Aspergillus 36%, and Candida 5%. 41% of the patients were female, 67% spoke English, 40% identified as white, 61% had diabetes, 48% were on immunosuppressants, 17% had an organ transplant, 15% had liver disease, and 11% had chronic/end-stage renal disease. Following management, 22% were alive without neurologic deficits, 22% were alive with neurologic deficits, 51% were deceased, and 5% were lost to follow-up. HbA1c levels correlated significantly with mucormycosis ($p = 0.009$, OR 1.6, 95% CI 1.2-2.5) and Aspergillus ($p = 0.019$, OR 0.69, 95% CI 0.49-0.91). Average \pm SEM HgbA1c of mucormycosis, Aspergillus, Candida, and no fungal isolate were 10.1 ± 0.5 , 7.8 ± 0.6 , 7.6 ± 1.1 , 5.9 ± 1 , respectively. There were no correlations between fungal organism and patient outcomes. Notably, there was a significantly increased odds of mortality with history of transplant ($p = 0.023$, OR 19.2, CI 2.08-471.8).

Discussion and Conclusions:

Causative fungal organisms were differentially correlated with HgbA1c levels; however, organisms demonstrated no correlation with socioeconomic factors or prognosis. History of organ transplant portended significantly greater mortality.

Poster #G046

Comparison of NGS and traditional culture in identifying pathogenic bacteria in CRS

You Kim, BS
Artemis Markopoulos
Glen D'Souza, Dr.
Peter Papagiannopoulos, MD
Bobby Tajudeen, MD, FARS
Pete Batra, MD, FARS
Peter Filip, MD
Rush University Medical Center

Background:

Medical management remains the cornerstone of treatment for chronic rhinosinusitis (CRS). Culture-based antibiotic therapy is frequently used to refine treatment for infectious exacerbations. To date, there has been no study comparing the efficacy of these two methods to help guide antimicrobial therapy of patients with CRS.

Hypothesis:

Compared to standard culture-based techniques, next generation sequencing (NGS) may be more sensitive for identifying organisms and guiding treatment.

Methods:

This IRB approved retrospective chart review included 25 patients from a single institution with CRS who had bacteria identified by standard culture sensitivity and NGS within 3 months of each other. The change in symptoms were measured by a paired t test that analyzed SNOT-22 scores after changing antibiotics based on NGS report.

Results:

NGS identified new or different microorganisms in 13 (52%) patients, including pseudomonas aeruginosa and corynebacterium spp. This included two patients in whom the traditional culture did not show any growth. NGS resulted in a change in antibiotic therapy in 11 cases. The other two patients were newly started on antibiotics. SNOT-22 scores reduced significantly from 31.27 to 21.5 ($p=0.039$) following the initiation of antibiotic therapy based on NGS results ($p=0.039$).

Conclusion:

Our study shows that NGS can aid in identifying bacteria that are missed by traditional culture in patients with CRS and can guide antibiotic regimen. The change in antibiotics can result in a clinically significant difference in SNOT-22 scores. Further larger studies are required to identify if NGS is cost effective as a primary culture modality in patients with CRS.

Poster #G047

Concordance between at-home finger-prick and blood allergen-specific IgE allergy testing

Ezer Benaim, MD
 Aurelia Monk, Medical Student
 Adam Kimple, MD, FARS
 Brent Senior, MD, FARS
 Charles Ebert Jr., MD, FARS
 University of North Carolina

Background:

Direct-to-consumer (DTC) companies now offer sublingual immunotherapy (SLIT) through entirely virtual platforms, featuring at-home allergy testing with finger-prick blood samples, virtual consultations, and delivery of allergen drops to patients. This proposed study aims to determine the concordance of DTC skin prick testing with standard serum antigen testing.

Methods:

Five participants underwent allergen-specific IgE ImmunoCAP testing through an otolaryngic allergy clinic. They also completed at-home tests from two DTC companies (Company A and B). Concordance between finger-prick and serum IgE results was analyzed using Cohen's kappa to evaluate agreement for dichotomous outcomes (positive-negative).

Results:

The allergy tests cost \$200-\$250 out of pocket. Company A assessed 39 allergens, and Company B tested 41; both overlapped with 31 and 29 allergens tested by the clinic, respectively. Company A achieved 88.4% agreement with serum testing ($k=0.73$), substantial agreement), while Company B reached 80% ($k=0.56$), moderate agreement). The agreement dropped to $k=0.44$ (moderate) when comparing the two DTC companies. Both companies frequently recommended allergen immunotherapy differently from the clinic.

Conclusion:

At-home allergy testing via finger-prick blood shows reasonable but not perfect concordance with serum testing. However, variability between DTC companies suggests differences in panels or methods, raising concerns about clinical reliability. While DTC testing offers convenience, discrepancies highlight the potential need for confirmatory testing in traditional healthcare settings. Further research with larger sample sizes can validate and optimize DTC companies' role in allergy care.

Poster #G048

CRS and isolated orbital floor fractures

Katherine Yu, MD
 Mihai Bentan
 Lawrance Lee, Dr.
 Theodore Schuman, MD, FARS
 VCU Health

Background:

Orbital floor fractures account for 30-40% of all facial fractures. Given the anatomical relationship between the orbit and paranasal sinuses, orbital trauma may lead to sinus outflow tract obstruction. The purpose of this study is to evaluate the relationship between pre-existing sinonasal inflammatory disease and isolated orbital fractures on orbital complications and sinonasal disease severity.

Methods:

Electronic health records were queried using TriNetX Research Network to construct cohorts of adult patients with and without sinonasal disease. Both groups were further divided based on subsequent diagnosis of an isolated orbital floor fracture. The measured outcomes include rates of readmission, vision change, IV antibiotics, sinus surgery, and orbital infection (Chandler criteria).

Results:

After propensity matching, 1730 patients met inclusion criteria. There was a significant increase in both absolute (AR) and relative risk of all measured outcomes in patients with pre-existing sinonasal disease and subsequent orbital floor fracture compared to those without sinus disease. The greatest AR increase was with readmission rates [7.7 (4.7-10.6, $p<0.01$)]. Impact of orbital fractures on pre-existing sinonasal disease severity yielded similar results, with significant increase in all adverse outcomes in patients with diagnosed orbital fracture compared to those without fracture, with greatest AR increase in vision change [7.5 (5.0-10.0, $p<0.01$)].

Conclusion:

Patients with pre-existing sinonasal disease are at a higher risk of complications following isolated orbital floor fractures. Conversely, orbital fractures worsen sinonasal disease severity. Care should be taken when managing patients with concurrent diagnoses.

Poster #G049

ctHPVDNA for recurrence detection in HPV+ SNSCC

Elise Krippaehne, BS
Vivek Pandrangi, MD
Mathew Geltzeiler, MD, FARS
Oregon Health and Science University

Background:

Sinonasal squamous cell carcinoma (SNSCC) is a rare malignancy with a high recurrence rate. However, surveillance may be challenging in some patients as traditional imaging methods can have limitations. Plasma-based circulating tumor human papillomavirus (HPV) DNA (ctHPVDNA), or “liquid biopsy”, testing provides a non-invasive, real-time method for monitoring tumor burden and treatment response. Here we report a case of using this diagnostic aid for surveillance of a patient with SNSCC.

Case:

A 58-year-old male with a history of inverted papilloma (IP) and high-grade dysplasia underwent initial endoscopic resection at an outside institution in January 2020. He presented to our clinic 7 months later with concern for persistence/recurrence in the right middle meatus. He underwent revision endoscopic resection revealing a 2mm focally invasive SCC with negative margins. During a surveillance visit in December 2022, suspicious mucosal changes at the nasal septum were noted. Biopsies confirmed recurrent high-grade dysplasia with focal invasive carcinoma. PET/CT imaging showed mild FDG uptake, and ctHPVDNA (NavDx) testing was elevated (score: 5, p16+). He underwent repeat endoscopic resection revealing a field defect involving the ethmoid roof, sphenoid sinus, and nasopharynx with negative margins. Postoperatively, NavDx testing has consistently remained at zero, while surveillance endoscopy and imaging has been equivocal.

Conclusion:

Liquid biopsy may enhance accuracy of recurrence detection in HPV+ SNSCC, which comprises up to 62% of all SNSCC cases. This case underscores the potential of ctHPVDNA as an effective monitoring tool, especially when other surveillance methods may be challenging to utilize.

Poster #G050

Cytokine sampling in the sinonasal cavity

Yasine Mirmozaffari, BS
Michael Ly, Medical Student
Ezer Benaim, MD
Meghan Rebuli, PhD

Background:

Cytokines are crucial mediators in cell-to-cell communication, immune regulation, and the pathophysiology of rhinological diseases. Distinguishing cytokine profiles can elucidate inflammation types (e.g., Th1, Th2, and Th17) and guide therapeutic options among disease states. Various methods for cytokine sampling in the sinonasal cavity exist. This review aims to provide an in-depth overview of these methods, including their advantages, limitations, and costs, as well as analytical techniques.

Methods:

We will complete a narrative literature review using Medical Subject Headings (MeSH) keywords using PubMed & Google Scholar. Key MeSH terms include “cytokines,” “mucus,” “interleukins,” “biomarkers,” “sinonasal disease,” “chemokines,” “paranasal sinuses” “sampling,” and “sinusitis”.

Results:

There are many different methods of cytokine sampling in the sinonasal cavity. Common methods include nasal lavage, forced exhalation, nasosorption, nasopharyngeal swab, cytobrush, sponge/polyurethane brushes, and whole mucosa procurement. Each method used has advantages and limitations, such as type of sample collected, location specificity, invasiveness, sample dilution and volume variability, and utility for downstream analytical assays.

Conclusions:

Advancements in cytokine sampling and pharmacological targeting in sinonasal disease can be monumental in the diagnosis and management of patients. By harnessing the strengths of these assays and understanding the weaknesses, they can be applied to improve care of patients and identify targets for treatment development.

Poster #G051

Digital health access and use among patients presenting to a tertiary rhinology center

Elise Krippaehne, Clinical Research Fellow
 Vivek Pandrangi, MD
 Jess Mace, MPH
 Kara Detwiller, MD, FARS
 Timothy Smith, MD, MPH, FARS
 Mathew Geltzeiler, MD, FARS
 Oregon Health & Science University

Background:

There has been a dramatic rise in the use of digital tools within healthcare to facilitate disease management, termed digital health, which incorporates a variety of technologies including mobile applications and telemedicine. However, there are also concerns for disparities in access to these technologies. The purpose of this study was to investigate the ability and interest of patients presenting to a tertiary rhinology center to engage with digital health tools.

Methods:

Prospective study at a tertiary academic, rhinology center between February to October 2024. Patients completed the Digital Health Readiness Questionnaire (DHRQ, range 15-75), evaluating digital health measures across several domains including access and use.

Results:

There were 100 patients included, and mean \pm standard deviation (SD) age was 58 ± 16 years. Overall, 57% used health-related applications to follow-up on their health status, and older age was associated with worse DHRQ scores (> 50 years, OR=2.5, $p=0.012$). There were 64% of patients who felt that learning digital skills could positively impact their health, and among patients with CRS ($n=75$) there was a weak correlation between improved ability to use digital technology to reach information and lower Sinonasal Outcome Test-22 (SNOT-22) scores ($r=-0.3$, $p=0.01$). There were also 23% of patients identified with high motivation to engage with new technology but low DHRQ scores.

Conclusions:

Screening for barriers to digital health access and providing resources to improve digital health use/literacy may help address the growing digital divide as these tools are increasingly expanding in use within healthcare, and may facilitate patient quality of life.

Poster #G052

Direct-to-consumer customized nasal sprays for allergy relief: A market overview

Lauren Cook, BS
 Yasine Mirmozaffari
 W. Jared Martin
 Ezer Benaim, MD
 Michael Armstrong, MD
 Tom Raz Yarkoni, MD
 Brian Thorp, MD, FARS
 Brent Senior, MD, FARS
 Adam Kimple, MD, FARS
 University of North Carolina Chapel Hill

Background:

Direct-to-consumer (DTC) allergy medication companies have quickly evolved in the marketplace over the last five years, offering symptom questionnaires, telehealth, at-home labs, and prescriptions, aimed to simplify access and reduce costs. We aimed to evaluate the current DTC customized allergy intranasal (IN) spray market.

Methods:

We conducted a web-based search (including social media) to find companies advertising DTC allergy prescriptions. Companies were included if they offered a single bottle customized IN spray. Metrics evaluated included active and inactive ingredients, pricing, and company structure.

Results:

We identified two companies offering DTC customized IN sprays: Allermi and Nectar. Both share three active ingredients: triamcinolone, ipratropium, and oxymetazoline, but differ in the antihistamine included—Allermi uses azelastine, while Nectar uses olopatadine. Allermi lists dose ranges and highlights dose adjustability. Nectar offers a broader range of allergy-related services, including allergy testing and sublingual immunotherapy (SLIT) to consumers. Allermi charges \$35/month (including consultation, IN spray, saline spray, and provider access). Nectar's \$49/month includes a one-time at-home allergy test (valued at \$199) and the custom spray upon allergist review.

Conclusions:

Allermi and Nectar are currently the only DTC sellers of customized allergy-relief IN sprays. Both emphasize convenience, transparent pricing, and customized spray formulations, with ongoing provider support. Nectar further positions the customized IN spray as a bridge to SLIT.

Poster #G053

Disease severity as a predictor of Dupilumab response in patients with CRSwNP

Kelsey Limage, BS

Emma Tam

Kalena Liu

Samuel Shing, BS

Srihari Daggumati, Dr.

Marc Rosen, MD, FARS

Mindy Rabinowitz, MD, FARS

Elina Toskala, MD, FARS

Gurston Nyquist, MD, FARS

Background:

Patients with refractory chronic rhinosinusitis with nasal polyps (CRSwNP) are often treated with dupilumab, an IL-4 receptor antagonist. There is limited literature assessing the predictive value of clinical biomarkers and nasal assessments in this patient population.

Objective:

To determine the effect of baseline absolute eosinophil counts (AEC), IgE, nasal polyp scores (NPS) and clinical assessments on outcomes in patients with CRSwNP receiving dupilumab.

Methods:

A retrospective review of adults with CRSwNP treated with dupilumab was performed from 2019 to 2024. Pretreatment AEC, IgE, nasal assessment scores, and clinical outcomes up to 1 year after treatment were collected. Descriptive statistics, t-tests, and regression analysis were performed.

Results:

In our cohort of 68 patients, dupilumab treatment led to significant clinical improvement. Patients with high pre-treatment NPS (≥ 5) showed a greater degree of improvement in total SNOT score ($p=0.079$) and NPS at 1-year follow-up ($p<0.001$). Multivariate regression revealed baseline SNOT score ($OR=1.57$, $p<0.001$) and age ($OR=1.37$, $p=0.005$) significantly predicted follow-up SNOT score. Baseline AEC, IgE levels, and time from previous surgery did not significantly predict the degree of improvement in outcomes.

Discussion:

Patients with nasal polyposis requiring biologic therapy had significant clinical improvement at 1-year follow-up. NPS >5 predicted a greater reduction in polyp score at 1-year follow-up. In this cohort, only baseline NPS and SNOT scores showed significant predictive value. This suggests dupilumab effectively treats CRSwNP in patients with high disease severity, including those with variable eosinophil or IgE levels.

Poster #G054

Does superior ophthalmic vein thrombosis require anticoagulation?

Emily Sagalow, MD

Chappel Pettit, BS

Peter Kim, MD

Robert Wang, MD

Keonho Kong, MD

Background:

Superior ophthalmic vein thrombosis (SOVT) is a rare condition that can arise from various etiologies that align with Virchow's triad—vascular damage, stasis, and hypercoagulability—ranging from autoimmune disorders and facial trauma to acute sinusitis. Symptoms include orbital pain, swelling, proptosis, and vision changes. SOVT may occur concurrently with cavernous sinus thrombosis or orbital cellulitis. Diagnosis typically involves MRI or CT imaging. Treatment generally includes a combination of antibiotics, corticosteroids, anticoagulation, and surgery, tailored based on the underlying etiology. While empiric broad-spectrum antibiotics are recommended for infectious cases, the role of anticoagulation in SOVT is not well-established, though it is believed to mitigate progression to cavernous sinus thrombosis.

Case Presentations:

We present two cases of SOVT secondary to acute sinusitis of the ipsilateral sphenoid sinus—one treated with therapeutic anticoagulation and one without. Therapeutic anticoagulation was initiated preoperatively and continued until the first postoperative clinic visit. Both patients were treated with concomitant sinus surgery, antibiotics, and steroids with full restoration of vision deficits, orbital pain, and extraocular movement.

Conclusions:

In cases of SOVT secondary to acute sinusitis, anticoagulation is not universally necessary and should be carefully considered based on individual patient factors. Consultation with both neuro-ophthalmology and infectious disease specialists is recommended to tailor the treatment plan optimally.

Poster #G055

Does the modified endoscopic denker procedure impact aesthetic outcomes?

Felix Fernandez-Penny, BS
Katherine Mazingo, Medical Student
G. Nina Lu, Assistant Professor
Mahdi Algezi, Medical Student
John Paul Giliberto, Assistant Professor
Aria Jafari, MD, FARS
University of Washington

Background:

The modified endoscopic Denker (MED) procedure, involving the removal of the anteromedial pyriform process (APP) to enhance lateral endoscopic visualization of the maxillary sinus, minimizes the need for external incisions and is increasingly utilized. However, its potential aesthetic impact on the nose, nostrils, nasolabial folds (NLF), and face overall remains unexplored.

Methods:

Three MED patients (2M:1F) were compared to five patients (1M:4F) who underwent traditional endoscopic medial maxillectomy (EMM) with preservation of the APP. Demographic data and pre/post-procedure SNOT-22 scores were reviewed. Satisfaction with the nose, nostrils, nasolabial folds (NLF), and overall facial appearance was assessed using validated FACE-Q Aesthetics scales.

Results:

The mean follow-up period was 478 ± 214.3 days. The mean change in SNOT-22 scores was -21.0 ± 7.8 . All patients who underwent the MED and EMM procedures reported being "somewhat" or "very" satisfied with their nostril symmetry, with all MED patients indicating "very satisfied." There were no significant differences between the groups in perceived symmetry of the nose and face or in overall satisfaction with the nose, nostrils, nasolabial folds (NLF), and face overall.

Conclusions:

In our cohort, the MED procedure appears to improve surgical access without compromising aesthetic outcomes or patient satisfaction compared to EMM.

Poster #G056

Does total inferior and middle turbinectomy always lead to empty nose syndrome?

Nidhi Jha, BA
Jed Speers, BS
Ahmad Odeh, BS
Zhenxing Wu, PhD
James Mihalich, HSD
Bradley Hittle, MS
Bradley Otto, MD
Kathleen Kelly, MD
Gregory Wiet, MD
Kai Zhao, PhD
Ohio State University

Introduction:

Empty Nose Syndrome (ENS) is a rare, controversial complication often associated with aggressive turbinate reductions. Computational fluid dynamic (CFD) modeling has previously demonstrated that distorted nasal airflow patterns could contribute to ENS. However, no data has shown that aggressive turbinate reductions always lead to the development of ENS.

Methods:

We retrospectively recruited 5 nasal obstruction patients who underwent turbinate reduction surgery, and virtually performed total inferior and total middle turbinectomies on all patients. We compared the CFD modeling results to the patients' pre-surgical CT scans and 27 patients with confirmed ENS.

Results:

As expected, the virtual turbinectomy significantly altered nasal cross-sectional area of the inferior and middle turbinate regions, more than that of actual surgery (inferior: 0.9 ± 0.4 to 1.8 ± 0.3 cm², middle: 0.6 ± 0.3 to 1.0 ± 0.3 cm², all $p < 0.01$), however, it does not create the same distorted nasal airflow patterns as seen in ENS patients, with no significant difference in nasal resistance (actual surgery: 0.12 ± 0.04 ; virtual surgery: 0.10 ± 0.03 ; ENS: 0.11 ± 0.04 Pa/ml*s, $p > 0.05$) nor in regional wall shear force (WSF) distribution, an important indicator of air/mucosa stimulation (inferior turbinate WSF%: baseline 54.0 ± 11.9 , actual surgery: 51.5 ± 15.1 ; virtual: 46.5 ± 11.5 , $p > 0.05$), however all are significantly higher than that of ENS patients (WSF: $32.2 \pm 12.5\%$, $p < 0.001$). There are also no significant differences in WSF distribution between inferior turbinectomy only vs inferior + middle turbinectomy.

Conclusions:

ENS cannot be solely attributed to aggressive turbinate reduction surgeries since various factors may play a role in the disease.

Poster #G057

Drugs, money, and sex: An update on gender and industry sponsorship within otolaryngology

Emma Elbert, BS

Shreya Gaddipati

Kelly Schmidt

Christine Franzese, MD, FARS

University of Missouri School of Medicine

Introduction:

Prior studies analyzing early CMS Open Payments data revealed differences in industry payments made to male and female otolaryngologists from pharmaceutical and device companies. With an increasing number of female otolaryngologists, has there been a corresponding shift toward more equitable distribution of industry research payments?

Methods:

The 2021-2023 research payment datasets were downloaded from the CMS Open Payments Program website. According to CMS, research payments cover items such as time spent enrolling patients in studies, funding for research study coordination and implementation, study expenses, and direct physician compensation. These payments are separate from clinical trial funding. Payment results were compared between gender groups.

Results:

Thirteen unique female otolaryngologists (16.5% of study population) received industry research payments in comparison to 66 males (83.5%). Women received a median of 3 (interquartile range [IQR] 1-10) payment transactions totaling to a median value of \$5200 (IQR \$1109-\$14574), while men had a median of 2 (IQR 1-5) transactions totaling to \$3712 (IQR \$991-21488). However, mean payments were consistently higher than medians in both groups, likely secondary to a few high-volume outliers. When removing these outliers, the median payment amounts of female and male physicians decreased to \$1750 (IQR \$750-\$8730) and \$2625 (IQR \$820-\$11313), respectively, with no change in number of payment transactions.

Conclusion:

Some gender disparities persist in industry research payments. Although not currently publicly available, we plan to contact CMS for access to the clinical trial funding data for further analysis of potential gender disparities.

Poster #G058

Dupilumab for pediatric CRSwNP with immunodeficiency

Olivia Nieto Rickenbach, MD

Hassan Ramadan, MD, FARS

Ruifeng Cui, PhD

West Virginia University

Introduction:

The use of Biologic therapy for refractory and inadequately controlled Pediatric chronic rhinosinusitis with nasal polyps (CRSwNP) has been well-established in adults, but this has only recently been expanded to the pediatric population. To our knowledge, this is the first report of Dupilumab therapy to achieve remission in a case of pediatric CRSwNP with co-morbid immunodeficiency.

Case Presentation:

A 15-year-old male with a history of common variable immunodeficiency, IgA deficiency, asthma, and allergic rhinitis presented for evaluation of lifelong uncontrolled CRSwNP. Despite treatment with maximal medical therapy, monthly intravenous immunoglobulin infusions, and multiple endoscopic sinus surgeries (ESS), the patient continued to have an average Sinus and Nasal Quality of Life Survey (SN-5) score of 4.4, frequent sinus infections, and significant nasal obstruction. A decision was made to initiate an off-label trial of Dupilumab therapy. After six months of treatment, the patient was noted to be completely free of polyps on nasal endoscopy, with no evidence of disease on computed tomography scan, and completely free of sinus infections without antibiotic use. The patient's quality of life had also drastically improved during this time with SN-5 scores averaging 2.4.

Conclusion:

We present a case study highlighting the benefit of Dupilumab therapy for longstanding refractory CRSwNP in an immunodeficient child. Clinicians may consider dupilumab therapy for refractory pediatric rhinosinusitis, especially those who failed maximal medical management, including immune deficiency management and ESS.

Poster #G059

Ectopic olfactory neuroblastoma within the maxillary sinus: A case report and literature review

Ryan Hudnall, MD
Lindsey Ryan, MD

Introduction:

Olfactory neuroblastoma (ONB) is a rare neoplasm originating from olfactory neuroepithelium. It is locally destructive and commonly metastasizes.

Presentation includes nasal obstruction, epistaxis, headache, facial pain, sinusitis, and anosmia. ONB rarely presents ectopically. There have been 66 reported cases of ectopic ONB (EONB), 19 in the maxillary sinus. Treatment varies, but standard of care is surgery +/- radiation.

Methods:

Case report and literature review.

Results:

A 67-year-old female presented after endoscopic sinus surgery at outside hospital for right sinonasal mass. Pathology was consistent with ONB. Mass was incidentally found on imaging for headache work up. She denied any sinonasal symptoms. Endoscopy revealed no obvious tumor in nasal cavity, visible maxillary sinus, or olfactory cleft. CT and MRI revealed 2.3 x 1.6cm mass with attachment centered on medial wall of right maxillary sinus. Right endoscopic medial maxillectomy with Denker's approach was performed. Mass was removed completely. Margins were negative. Postoperative PET was without residual tumor or metastases. Tumor was Dulguerov T1N0M0, Kadish B, and Hyams I-II. Tumor board agreed to proceed with adjuvant radiation therapy.

Conclusions:

This is a rare case of maxillary EONB. Maxillary EONB may be more advanced at presentation due to lack of initial symptoms. In EONB cases, recurrence was reported in surgery in 1/3 cases, radiation 2/2 cases, surgery + radiation 1/7 cases. The role of chemotherapy is debated. We proceeded with surgery and radiation. EONB should be on the differential for maxillary sinus masses and treatment should be aggressive to reduce risk of recurrence.

Poster #G060

Effect of sinus surgery on nasal discharge

Erin Briggs
Ethan Kallenberger, Dr.
Shaun Nguyen, Dr.
Asher Ripp, Mr.
Alexander Duffy, MD
Rodney Schlosser, MD, FARS
Zachary Soler, MD, FARS
Isabella Schafer
Medical University of South Carolina

Background:

Nasal discharge is one of the cardinal symptoms of chronic rhinosinusitis, impacting over 50% of patients. For patients with symptoms refractory to standard medical therapy, endoscopic sinus surgery is an option. The objective of this study is to characterize how nasal discharge improves after surgery in patients with CRS.

Methods:

The literature was searched for articles reporting nasal discharge symptom data both at baseline and after surgery. Specific symptoms of interest on the SNOT22 were "Need to Blow Nose", "Runny Nose", "Post-nasal Discharge", and "Thick Nasal Discharge". SNOT22 scores ranged from 0-5 based upon severity. Visual Analogue Scale equivalents were recorded when available.

Results:

A total of 16 studies (n = 7193) were included in the analysis. All four nasal discharge questions on the SNOT22 saw significant improvement, with need to blow nose (-1.8 [95%CI: -2.3, -1.2]) and runny nose (-1.8 [95%CI: -1.9, -1.1]) seeing the largest benefit. Patients with nasal polyps saw more improvement than those without polyps. The difference between polyp and no polyp groups was significant for need to blow nose (-1.9 vs -1.0, p < 0.001) and runny nose (-1.8 vs. -1.0, p < 0.0001). Patients undergoing index or revision surgery all saw significant improvement in symptoms.

Conclusion:

Surgery for chronic rhinosinusitis improves nasal discharge globally, with particular benefit to need to blow nose and runny nose on the SNOT22. Patients with nasal polyps see larger degrees of improvement compared to those without polyps. However, patients without nasal polyps also experience significant improvement in discharge.

Poster # G061

Effectiveness of middle meatal spacers in reducing synechiae post-ESS: Updated meta-analysis

Raisa Chowdhury, MSc
Hamad Almhanedi, MD
Salman Hussain, MD
Mark Khoury, MD
Jafar Hayat
John Lee, MD

Background:

Middle meatal (MM) spacers are commonly utilized after endoscopic sinus surgery (ESS) to mitigate postoperative complications, particularly synechiae formation. The 2012 meta-analysis by Lee and Grewal suggested a potential benefit of MM spacers in reducing synechiae, though its findings were limited by sample size and heterogeneity across studies.

Objective:

To update the previous meta-analysis assessing the impact of MM spacers—both absorbable (AS) and non-absorbable spacers (NAS)—on synechiae formation post-ESS.

Methods:

A systematic literature search identified RCTs comparing MM spacers (AS and NAS) with no spacer in ESS patients. The primary outcome assessed was synechiae formation. Pooled analysis was conducted using a random effects model, with subgroup analyses for AS and NAS spacers. Sensitivity analysis using a one-study removed approach evaluated the robustness of the findings.

Results:

Seventeen RCTs were included in the updated meta-analysis. The pooled risk ratio (RR) for synechiae formation was 0.432 (95% CI: 0.264 to 0.705, $p = 0.001$), demonstrating a statistically significant reduction in synechiae risk with MM spacers. Subgroup analysis indicated a stronger reduction for NAS spacers (RR: 0.405, 95% CI: 0.271 to 0.606, $p < 0.001$) with substantial heterogeneity (I^2 : 75.8%) compared to AS spacers (RR: 0.451, 95% CI: 0.279 to 0.729, $p = 0.001$), which showed moderate heterogeneity (I^2 : 36.6%). Sensitivity analysis confirmed the protective effect of MM spacers, with reductions in heterogeneity when specific studies were excluded.

Conclusion:

This updated meta-analysis strengthens evidence that MM spacers, particularly NAS spacers, significantly reduce synechiae formation following ESS."

Poster #G062

Endoscopic resection of nasopharyngeal salivary neoplasm: Case report

Thant Zaw, MD
UC Davis School of Medicine

Among benign tumors of the major salivary glands, pleomorphic adenoma (PA) is the most common and presents almost exclusively in the superficial lobe of the parotid gland. Very rarely, PA may present in minor salivary glands of the palate, lip, sinuses, larynx, epiglottis, and trachea. To date, only 15 cases reports have been published of nasopharyngeal PA. In this case report, a 76 year old male presented with unilateral otitis media with effusion (OME) and acute hearing loss. Nasal endoscopy revealed a rounded mucosalized mass emanating from the left fossa of Rosenmüller, and computed tomography confirmed 16 x 14 mm nasopharyngeal tumor. We first performed a posterior septectomy to optimize the two-surgeons endoscopic approach, thereby minimizing surgical trauma and maximizing precision during the resection of the nasopharyngeal pleomorphic adenoma. The patient was symptom-free postoperatively, and no signs of recurrence were seen at 30 months follow up. This serves as an alternative surgical procedure to the existing literature to treat benign nasopharynx tumors. The posterior septectomy with two-surgeons endoscopic approach was associated with minimal morbidity and demonstrated favorable clinical outcomes.

Poster #G063

Endoscopic sinus surgery for recurrent acute sinusitis: A systematic review and meta-analysis

David Liu, MD, PhD

Lirit Levi, MD

Axel E. Renteria, MD, MA

Maxime Fieux, MD, PhD

Zara Patel, MD, FARS

Jayakar V. Nayak, MD, PhD

Noel F. Ayoub, MD, MBA

Peter Hwang, MD, FARS

Michael T. Chang, MD

Poster #G064

WITHDRAWN

Background:

Recurrent acute rhinosinusitis (RARS) is a significant healthcare burden that adversely impacts the quality of life (QoL) for affected individuals. Despite its recognition among otolaryngology specialists, there is limited consensus on the optimal approach regarding continued medical vs. surgical therapy. We analyzed published literature to assess the impact of endoscopic sinus surgery (ESS) on QoL parameters of patients with RARS.

Data Sources:

A systematic search for this meta-analysis was conducted across PubMed (Medline), Embase, ClinicalTrials.gov, Cochrane databases, and Google Scholar. Search terms included ("sinusitis" OR "rhinosinusitis") AND ("recurrent" OR "recurrent acute" OR "acute recurrent").

Review Methods:

English-language studies assessing QoL in RARS patients (defined as 4 or more acute sinusitis episodes per year with complete resolution) using validated questionnaires before and after ESS were included. Adults aged 18 and over were the target population. Effect sizes for each study were calculated using Cohen's method, with a standardized mean difference (SMD, Cohen's d) pooled across studies using a random-effects model.

Results:

From an initial 2,124 references, four studies met the inclusion criteria, encompassing 104 patients (mean age: 36 ± 4.9 years) with a mean follow-up period of 11.7 ± 6 months. The pooled SMD, Cohen's d, was -1.32 (95% CI: -2.07, -0.58), demonstrating a large clinical effect of ESS on QoL.

Conclusion:

The aggregate data suggests that ESS as a highly effective intervention for improving QoL in patients with RARS, reinforcing the role for surgery as a beneficial treatment option for this condition.

Poster #G065

Enhancing pituitary surgery patient education materials with language learning models

Samantha Spence, Medical Student
Jaladhija Chalichama, BS
Tyler Heaton, Medical Student
Joshua Smith, MD
Justin Antisdell, MD, FARS

The National Institutes of Health (NIH) recommends that online patient education materials (PEMs) should be written at or below a 6th-7th grade reading level. Artificial intelligence (AI) and large language models have been shown by other specialties to increase accessibility to PEMs. This study investigates whether ChatGPT can be used to improve readability and maintain quality of pituitary surgery PEMs.

The primary outcomes were the readability and quality of online PEMs before and after AI simplification. A Google advanced search for "Pituitary" AND "Surgery" AND "Transsphenoidal" OR "Endoscopic" was conducted, and the first 5 pages of PEMs were included (n=18). PEMs were copied into ChatGPT-4o mini with the prompt "translate to fifth-grade reading level while maintaining quality." The readability and quality of PEMs pre- and post-AI were assessed using the Flesch Reading Ease (FRE), Flesch-Kincaid Reading Level (FKGL), Simple Measure of Gobbledygook (SMOG) Index, and DISCERN tool.

The mean FRE score of PEMs pre- and post-AI was 42.7 and 60.4, respectively. AI improved the average reading level from "Difficult to Read" to "Plain English." The average grade level for PEMs pre- and post-AI (FKGL and SMOG combined) was 13.4 and 10.7, respectively. The FKGL and SMOG scores for 8 PEMs decreased by 4 or more grade levels, and went from undergraduate to high school grade level. The average DISCERN quality score (n=12) before using AI was 61.2 ("Good") and post-AI was 54.1 ("Good").

AI was shown to significantly increase the readability of PEMs which can help increase medical literacy. However, patients should continue to seek guidance from physicians, as AI simplifications of PEMs may negatively impact the quality of PEMs.

Poster #G066

Esthesioneuroblastoma of maxillary sinus: Obscure sinonasal source of hyponatremia in adolescent

Sarah Debs, MD
Rajanya Petersson
Austin DeHart
Joseph Jakowski

Introduction:

Esthesioneuroblastoma (ENB) is a paranasal sinus malignancy derived from olfactory epithelium and is rare in the pediatric population with an estimated incidence of 0.1/100,000. Typically located at the anterior skull base, the tumor often requires craniofacial resection. Resistant hyponatremia is a possible a paraneoplastic syndrome presentation. We present an unusual case of a 13-year-old female with unexplained hyponatremia leading to the diagnosis of ENB arising from the maxillary sinus with no skull base involvement and her subsequent 10-year clinical course.

Methods:

Case report and literature review of the PubMed database for terms "pediatric esthesioneuroblastoma," and "esthesioneuroblastoma" and "paraneoplastic syndrome".

Results:

ENB can present insidiously as epistaxis or benign-appearing nasal mucosal inflammation but can become locally aggressive and metastasize if left untreated. Additionally, ENB can result in syndrome of inappropriate antidiuretic hormone secretion (SIADH). We discuss a case of a 13-year-old female with acute onset confusion, nausea, and vomiting with hyponatremia resistant to hypertonic saline. Imaging revealed a left maxillary sinus mass. Pathologic analysis showed esthesioneuroblastoma Hyams grade 3 and Kadish stage B. The patient underwent left endoscopic medial maxillectomy, total ethmoidectomy and radiation 60Gy with resolution of SIADH and no recurrence for the 10 years since treatment.

Conclusion:

This case illustrates the importance of maintaining a wide differential for paranasal sinus masses, especially in the pediatric patient population. Familiarity with paraneoplastic syndromes can assist in early detection and treatment despite atypical presentations.

Poster #G067

Ethmoid sinus CSF leak repair in Puerto Ricans

Giovanny Pérez, MD

Karla Vélez Mojica, Medical Student

Javier Vilá Ortiz, Medical Student

Andres Gorbea, Medical Student

Luisam Tarrats, MD, FARS

University of Puerto Rico - School of Medicine

Background:

Transnasal endoscopic surgery has become a highly effective approach for managing anterior skull-base defects. However, in the case of ethmoid sinus CSF-leak repair, this technique may risk obstructing frontal sinus outflow, potentially leading to iatrogenic frontal sinusitis. Traditionally, the use of stents and hemostatic gelatinous agents have been poorly associated with preventing these complications. Here, we introduce an innovative application of the PROPEL implant, typically used for localized drug delivery in sinus surgery, as a graft scaffold to stabilize a nasoseptal flap while maintaining patency of the frontal sinusotomy.

Methods:

Inclusion criteria for surgery was based on increased risk of frontal sinus outflow obstruction from defect sizes >2 mm and elevated intracranial pressure (ICP).

Results:

Mean age of patients (n=11) was 43.2±9.6 years with BMIs between 29 to 51 kg/m². Average ethmoid defect size and ICP were 3.9±1.1mm and 26.1±5.1mmHg, respectively. All patients were unremarkable for frontal sinus outflow obstruction or sinusitis during follow-up period, as confirmed by nasal endoscopies performed at 1, 3, and 6 months post-op.

Conclusion:

This novel application of the PROPEL implant in ethmoid cavity CSF leak repairs proved to enhance graft stabilization while preventing frontal sinus obstruction and chronic sinusitis development. Additionally, the drug-eluting nature of the implant may reduce the risk of chronic inflammation and scarring associated with permanent stents. Future studies may expand on the safety and efficacy of this technique.

Poster #G068

Evaluating online patient materials regarding balloon sinuplasty

Shreya Bhalla, BS

Lauren Bancalari

Justin McCormick, MD

Rutgers Robert Wood Johnson Medical School

Objective:

An increasing number of patients are electing to undergo balloon sinuplasty for treatment of chronic rhinosinusitis due to its minimally invasive nature. The aim of this study was to evaluate the readability and understandability of online patient education materials related to balloon sinuplasty.

Methods:

A Google search was performed using 6 different search terms related to balloon sinuplasty. Relevant websites related to patient education materials for balloon sinuplasty were included. Four different measures of readability- were utilized to assess the readability of each website: Flesch-Kincaid Grade Level (FKGL), Flesch-Kincaid Reading Ease (FKRE), Gunning-Fog Index, and Simple Measure of Gobbledygook Index. Understandability was determined using the Patient Education Materials Assessment Tool (PEMAT).

Results:

Sixty-eight online patient education materials related to balloon sinuplasty were included. The average FKGL was 8.54 ± 2.7, which is higher than the recommended grade reading level for patient materials. The average FKRE was 48.44 ± 2.7, indicating they were difficult for the general public to read. The mean PEMAT was 45.3 ± 17.41% which is lower than the accepted standard of 80%, which indicates materials are not readily understandable. Materials from private medical clinics made up 61.8% of the sample (n=42).

Discussion:

The majority of online patient materials related to balloon sinuplasty are written above the recommended 6th grade reading level. Poor readability was seen across all readability measures and all material categories. Patients and clinicians alike should be aware of the shortcomings of online materials and consider the effects on patient understanding and decision making.

Poster #G069

Evaluation of a balloon dilation system: A cadaveric study

Yasine Mirmozaffari, BS

W. Jared Martin

Asha Nadabar

Ezer Benaim, MD

Lauren Cook, Medical Student

Tom Raz Yarkoni, MD

Michael Armstrong, MD

Brian Thorp, MD, FARS

Brent Senior, MD, FARS

Charles Ebert Jr., MD, MPH, FARS

Adam Kimple, MD

University of North Carolina Chapel Hill

Background/Aims:

We aimed to evaluate a balloon dilation system designed to treat nasal airway obstruction and potentially facilitate access for endonasal and transnasal procedures. We assessed the volumetric and anatomical changes of the sinonasal cavity in a cadaveric model.

Methods:

Six fresh cadaver heads underwent sinus computed tomography (CT) scans and fast anatomic mapping (FAM) on an image guidance navigation system, and detailed endoscopic videos before and after treatment with the balloon dilation system. The 16x40 mm balloon was inflated twice to 8 atm for 30 seconds between the inferior turbinate and inferior portion of the nasal septum under endoscopic guidance. Change in nasal airway width was measured between the inferior turbinate and the septum. Statistical analysis was conducted using a paired t-test.

Results:

CT revealed an average increase in airway width from 4.5 mm to 11.7 mm (p value = 0.0001) at the anterior aspect of the inferior turbinate and an increase in airway width from 4.0 mm to 7.9 mm (p value <0.0001) at the posterior aspect of the inferior turbinate. Utilizing FAM on the image guidance navigation system, the mean anterior width increased from 7.6 mm to 9.6 mm (p value = 0.0009), while the posterior width increased from 6.6 mm to 10.8 mm (p value < 0.0001).

Conclusions:

Statistically significant increases in both FAM widths and CT measurements were observed post-treatment, demonstrating the system's potential as a tool improving nasal airway obstruction.

Poster #G070

Feminization rhinoplasty surgery effect on nasal cavity volume

Narin Nard Carmel Neiderman, MD, MSc

Rasha Rabi

Shimrit Arbel

Avraham Abergel, MD

Introduction:

Male to female rhinoplasty feminization poses a significant challenge, in tr shaping the nose, reducing its size, narrowing the bony vault and lifting the tip. Some may claim that reduction of the overall nasal size will result in decrease of airflow in the functional regions in the nasal breathing and may risk one to an iatrogenic induced nasal obstruction.

Aims:

Assess calculated 3-dimensional volume of nasal cavity among CT scans of transgender females before and after feminization surgery.

Materials & Methods:

CT scans before and after surgery of transgender female undergoing feminization rhinoplasty were retrieved. Middle and inferior meatus 3-dimensional volume was recorded and calculated prior and after surgery.

Results:

16 transgender patients operated on in TLVMC by the multidimensional feminization team, and were found eligible to the study, with mean age of 32.06 \pm 8.45 years. No significant change in the functional 3D cavity was found before and after feminization rhinoplasty surgery. Patients reported high subjective satisfaction regarding both aesthetic and functional results.

Conclusion:

Rhinoplasty and Rhinoseptoplasty feminization pose a challenge both esthetically and clinically. Performed safely within consideration of the nasal anatomy, the nasal cavity volume will not change significantly.

Poster #G071

FESS indications in cystic fibrosis population on CTFR modulator therapy

Alec Straughan, MD
 Nobles Antwi
 Cynthia Koenigsberg, MD
 Neal Godse, MD
 Kolin Rubel, MD

Cystic fibrosis transmembrane conductance regulator (CTFR) modulator therapy, including elexacaftor/tezacaftor/ivacaftor (ETI), lumacaftor/ivacaftor (LI), and tezacaftor/ivacaftor (TI) are novel cystic fibrosis (CF) therapeutics that have demonstrated an improvement of sinus symptomatology and a reduction in the frequency of sinus surgery (FESS). However, some CF patients go on to need additional FESS after initiating therapy.

We sought to better understand the reasons for disease control failure in this cohort of patients: indications being symptomatic active CRS versus post-obstructive mucocoele formation. We performed a retrospective analysis of CF patients undergoing FESS at our institution by two academic rhinologists from 2014-2024. Forty-six patients underwent ninety-four total procedures. Seventeen patients were on CTFR modulator therapy prior to surgery. Three patients on ETI all had frontal sinus mucocoeles thought related to prior FESS and not active CRS. Nine patients were on LI, seven of whom had persistent symptomatic CRS disease (three isolated frontal, four multi-sinus) and two of which had mucocoeles in the sphenoid and frontal sinuses. Three patients on TI had multi-sinus recurrence of CRS. Two patients on ivacaftor therapy required surgery, one with multi-sinus CRS and another with a frontal mucocoele.

While statistical analyses are difficult to establish due to the low N of patients seen undergoing FESS in the modulator era, our data demonstrate that no patients on ETI required surgery for CRS recurrence, only for sequelae of prior FESS. CRS recurrence did occur in patients with LI, TI, and ivacaftor therapies. To our knowledge, this is the first assessment of specific reasons for FESS on CTFR modulator therapy.

Poster #G072

Frontal sinus auto-obliteration

Lucas Cruz, BA
 Matthew Wu
 Vivek Pandrangi, MD
 Kara Detwiler, MD, FARS
 Mathew Geltzeiler, MD, FARS
 Timothy Smith, MD, MPH, FARS
 John Schneider, MD
 Nyssa Farrell, MD
 Washington University School of Medicine

Background:

Frontal sinus auto-obliteration (FSAO) is a poorly understood sequela of chronic rhinosinusitis (CRS). This study describes the presentation, surgical management and radiographic postoperative changes of patients with FSAO at two tertiary medical centers.

Methods:

Case-series of 12 patients with FSAO. At time of abstract submission, complete data on 5 patients is available, with the remaining 7 to be included at presentation. Key clinical, imaging, and surgical details were captured. Extent of FSAO was assessed by subtracting remaining volumes of sinuses on the last post-surgical CT scan from prior volumes with new bone growth noted on first-available CT. Bony landmarks following extensive sinus surgery (e.g. Draf III) were used to estimate the FS/outflow tract (e.g. inferior extent=anterior ethmoid artery).

Results:

Of 5 patients with complete data, all presented with ipsilateral pain/pressure and severe CRS signs (e.g. mucocoele). Our cohort had few sinopulmonary comorbidities beyond CRSsNP (n=1 with allergic rhinitis, asthma). All patients underwent aggressive sinus surgery, postoperative budesonide irrigations, and Raines/propel stents. Four patients had postoperative CTs available. Six sinuses were volumetrically analyzed (4 right, 2 left). Six sinuses underwent partial FSAO with a median percentage difference change of 48.1% (Min-Max: 37.0-82.5%). The degree of FSAO suggests that despite undergoing surgery to maximize FS volume, significant bony growth occurred. Additionally, two FS were fully obliterated and excluded from volumetric analysis.

Conclusion:

FSAO is a rare and difficult to manage clinical entity requiring further research into underlying pathophysiologic mechanisms and improved treatment options.

Poster #G073

Gustatory dysfunction and volatile organic compounds in industrial and fuel emissions

Sophie Yu
 Mitali Banerjee
 Jonathan Zou
 Younsoo Jung
 Margaret Mitchell, MD
 Simon Chiang, Research Coordinator
 Kentaro Ikeda
 Stella Lee, MD
 Harvard Medical School

Introduction:

Volatile organic compounds (VOCs) are emitted from household products, cleaning agents, paint, vehicle exhaust, and industry, contributing to air pollution. We aimed to examine the relationships between urinary VOC concentrations and gustatory dysfunction (GD).

Methods:

Our data was derived from the 2013-2014 National Health and Nutrition Examination Survey (NHANES) which included urinary concentrations of 19 VOC metabolites (normalized and corrected for creatinine), subjective GD, and objective GD (whole mouth and tongue tip quinine and salt recognition). Using unsupervised machine learning, VOC metabolites were grouped exposure sources ("Industrial and Fuel Emissions", "Indoor and Household Goods", and "Occupational Contaminants"). Weighted univariate and multivariable logistic regression were used to evaluate the association between these factor scores and outcomes, adjusting for covariates (age, sex, race, family income, serum cotinine, and body mass index).

Results:

The analytical cohort included 881 adults (mean age=57, 52.9% female). Participants with objective GD were more likely to have higher levels of urinary VOC metabolites within the "Industrial and Fuel Emissions" cluster (OR=1.54, 95% CI=1.13–2.13, p=0.007). In contrast, exposure to "Indoor and Household Goods" and "Occupational Contaminants" demonstrated no significant association with whole-mouth GD. VOC metabolite exposure clusters were not significantly linked to subjective or tongue-tip GD.

Conclusion:

Everyday exposure to industrial and fuel emissions VOCs may result in an increased risk of objective GD. To better understand causation and clarify the mechanisms through which VOCs affect gustatory pathways, further studies are warranted.

Poster #G074

Gustatory dysfunction is associated with reduced dietary micronutrient intake

Sophie Yu
 Younsoo Jung
 Margaret Mitchell, MD
 Simon Chiang, Research Coordinator
 Mitali Banerjee
 Jonathan Zou, BA
 Kentaro Ikeda
 Stella Lee, MD
 Harvard Medical School

Introduction:

Reduced dietary intake of independent micronutrients is associated with gustatory dysfunction (GD). Given the complexity of dietary intake, we aim to assess the impact of overall and independent intake of micronutrients as part of a mixture.

Methods:

Data was extracted from the National Health and Nutrition Examination Survey (NHANES) 2013-14. Weighted multivariable logistic regression was performed to determine the association of 24-hour dietary recall data for 14 micronutrients and our outcome measures (subjective GD within the past 12 months and objective GD), adjusting for significant covariates (sex, age, race, smoking status [cotinine level], energy intake, and BMI). Bayesian kernel machine regression (BKMR) was also used to study this complex.

Results:

Our analytical cohort consisted of 2,545 participants (4.60% subjective GD, 15.6% objective GD, median age = 57, 51.5% female). On multivariable logistic regression, higher choline intake was negatively associated with subjective GD (OR=0.999, 95% Confidence Interval [CI]=0.999-0.999, p=0.006). On BKMR, cumulative vitamin intake was negatively associated with a history of subjective and objective GD. The number of reports of subjective GD increased with decreased niacin, choline, selenium, and zinc intake. Micronutrients were found to interact, suggesting that the intake of other micronutrients modulates the association between micronutrient intake and our outcomes.

Conclusions:

Reduced overall intake of micronutrients, including niacin, choline, selenium, and zinc, may be associated with a higher risk of subjective GD. Further research is necessary to elucidate underlying mechanisms and the role of clinical screening for GD.

Poster #G075

Histopathologic analysis of transplant patients with chronic rhinosinusitis

Abdulkader Yassin-Kassab, MD

Ali Baird, Dr.

Sushanth Neerumalla, BS

Saif Salih

Pete Batra, MD, FARS

Peter Filip, MD

Bobby Tajudeen, MD, FARS

Peter Papagiannopoulos, MD

Background:

Treatment of chronic rhinosinusitis (CRS) in transplant patients provides a unique challenge. The pathophysiology of CRS in transplant patients on immunosuppression is not well understood and may differ from that of immunocompetent patients. This study characterizes the histopathologic features of transplant patients with CRS and compares the findings to those of immunocompetent patients.

Methods:

A retrospective review of immunocompetent CRS patients without nasal polyposis (CRSsNP), with nasal polyposis (CRSwNP), and immunodeficient transplant patients with CRS who underwent endoscopic sinus surgery (ESS) at a single institution from June 2014 to September 2024 was performed. Demographic factors, clinical data, including type of transplant, and structured histopathology reports from intraoperative sinonasal specimens were collected. Variables were compared between transplant and non-transplant patients.

Results:

A total of 238 CRSsNP, 264 CRSwNP, and 9 transplant patients on immunosuppressive medications with CRS who underwent ESS were included. Patients in the transplant group demonstrated significantly less basement membrane thickening (11.1% vs 21.8% CRSsNP vs 39% CRSwNP, $p < 0.001$), less subepithelial edema (11.1% vs 14.3% CRSsNP vs 36.4% CRSwNP, $p < 0.001$), and an overall milder degree of inflammation.

Conclusion:

Our study demonstrates that immunocompromised transplant patients with CRS display less inflammation overall on histopathologic analysis compared to immunocompetent CRSsNP and CRSwNP patients.

Poster #G076

Hypoglossal nerve stimulator use in patients with hereditary hemorrhagic telangiectasia

Kathryn Mozzochi

Christopher Brook, MD

Michael Cohen, MD

Introduction :

Hereditary hemorrhagic telangiectasia (HHT) is characterized by severe epistaxis due to abnormal blood vessel formation. Sleep apnea is prevalent in patients with HHT. Continuous positive airway pressure (CPAP) can worsen epistaxis and prevent compliance. Hypoglossal nerve stimulators can improve sleep quality in patients with HHT and obstructive sleep apnea (OSA). We describe the off-label use of INSPIRE in a patient with HHT who had increased central apneic events.

Case :

A 53-year-old male with HHT and OSA had been unable to tolerate CPAP due to increased epistaxis. Tonsillectomy and UPPP resulted in minimal improvement. Sleep study showed an apnea-hypopnea index (AHI) of 42.7, with overall respiratory disturbance index of 44.7, central apnea index of 11.8 events/hour, and mixed apnea index of 5.0 events/hour. Total central to mixed component ratio was 16.8/42.7, representing 39% of his events, which exceeds the 25% threshold for INSPIRE. The increased central events were attributed to opioid use for chronic back pain. Given the patient's symptom burden and inability to tolerate CPAP, hypoglossal nerve stimulator implantation was pursued. The patient underwent uncomplicated device placement. A repeat sleep study showed a residual AHI of 2.8. The patient uses the device nightly and is pleased with his symptom improvement.

Discussion:

Given the increased incidence of epistaxis with CPAP use in patients with HHT, patients may have increased risk for undertreated OSA. INSPIRE is safe and effective for improving sleep quality in this population. Extrinsic causes must be considered when determining whether patients exceeding the central apneic event threshold of INSPIRE may still safely benefit from the implant.

Poster #G077
WITHDRAWN

Poster #G078
**Identification of key allergens associated with
 recalcitrant cough with and without asthma**

Claudia Cabrera, MD, MS
 Michael Benninger, MD, FARS
 Eulalia Amador, MD
 Rachel Taliercio, DO
 Paul Bryson, MD, MBA
 University Hospitals Cleveland Medical Center

Asthma-related cough exacerbated by environmental allergens presents a significant clinical challenge. Identifying key allergens triggering cough in asthmatic patients is crucial for effective management.

This study employs machine learning to pinpoint critical allergens and predict cough occurrence in asthma patients. We conducted a retrospective analysis of 369 patients with positive immunoglobulin E (IgE) allergy blood tests between 2014 and 2018, focusing on those with cough, with or without asthma. The dataset included various allergen exposures and their binary indicators, alongside chronic cough presence. A Random Forest model, optimized via GridSearchCV, was utilized for analysis. The model identified ten key allergens associated with asthma-related cough: Timothy grass, June grass, English plantain, short ragweed, box elder tree, cat dander, lamb's quarter, oak tree, house dust, and dog dander. The model achieved 70% overall accuracy (95% CI: 68%-72%) in predicting asthma-related cough. For asthmatic cough specifically, the model demonstrated high sensitivity with a recall of 0.81 (95% CI: 0.79-0.83), indicating its strength in identifying true positive cases. The model's discriminatory power was good, with an area under the ROC curve (AUC) of 0.75 (95% CI: 0.73-0.77). This study demonstrates the potential of Random Forest modeling in identifying allergens associated with asthma-related cough. The model's high recall for asthmatic cough suggests its particular utility in identifying at-risk patients.

By accurately predicting triggers such as Timothy grass, June grass, and English plantain, this model offers clinicians a valuable tool for developing targeted treatment and prevention strategies.

Poster #G079

Immunophenotyping chronic rhinosinusitis by flow cytometry of nasal and nasopharyngeal swab samples

Farhoud Faraji, MD, PhD
 Paul Lopez, Research Tech III
 Sydney Ramirez, Instructor
 Carol Yan, MD
 Adam DeConde, MD
 Shane Crotty, Professor and Chief Scientific Officer
 University of California, San Diego

Although the heterogeneity of cellular processes underlying chronic rhinosinusitis (CRS) have begun to be elucidated, histopathologic and biomarker-based classification systems have provided limited utility in guiding clinical decision making. Furthermore, it remains unclear to what extent endotypes remain stable over time and change in response to treatment. Addressing these knowledge gaps requires longitudinal sampling by a minimally invasive non-operative strategy.

We have established a method that enables minimally invasive, longitudinal collection of epithelial and immune cell populations from the nasal cavity and nasopharyngeal mucosa using nasal swab specimens that can be collected in clinic. We previously demonstrated that this method allows for high-resolution interrogation of viable cells using multiparametric flow cytometric, transcriptomic, and serologic analyses.

In the present study, we apply swab-based sampling to spectral flow cytometry capable of distinguishing >40 distinct innate and adaptive immune cell populations to illuminate the epithelial immune milieu in normal subjects (n=3) as well as those with CRS with (CRSwNP, n=8) and without (CRSsNP, n=9) nasal polyposis. Reassuringly, we find CRSwNP epithelia to be enriched for T2 features including increased eosinophils, mast cells, and Th2 cells. Interestingly, we observe that CRSsNP and CRSwNP exhibit distinct differences in central, effector, and resident memory T cell populations compared to non-CRS controls.

These preliminary findings suggest that nasal epithelial sampling may lead to a clinically tractable method for disease classification and prediction of therapeutic response in patients with CRS.

Poster #G080

Impact of depression on postoperative complications following septoplasty with turbinoplasty

Iman Adibi, BS
 Amala Nayak
 Suhas Velichala
 Brigitte Lieu
 Theodore Schuman, MD, FARS
 Virginia Commonwealth University School of Medicine

Introduction:

Patients with depression have a documented higher risk of postoperative complications, such as infection and pain, following procedures like functional endoscopic sinus surgery (FESS) than those without depression. Prior studies have investigated subjective quality of life measures (e.g., Sinonasal Outcome Test) alongside objective medical complications, but few studies have explored the impact of depression on objective postoperative outcomes after non-FESS surgical procedures. This study investigates depression's impact on postoperative complications in patients undergoing septoplasty with concurrent turbinoplasty using a large-scale database.

Methods:

Using the TriNetX Research Network, patients who underwent both turbinoplasty and septoplasty were identified. Propensity score matching for age, sex, BMI, race, heart disease, and immunodeficiency was used to match patients who had untreated depression to those who had no depression. We compared the 90-day incidence of epistaxis, anosmia, infection, ER visits, readmission, and prescription of opioids for pain, and 1-year incidence of septal perforation. Patients who underwent FESS and rhinoplasty and those taking depression medications were excluded.

Results:

Propensity score matching yielded a cohort of 2995 patients. No depression carried lower odds compared to untreated depression for infection (OR 0.597; p=0.0091), ER visits (OR: 0.593; p<0.0001), and septal perforation (OR 0.745; p=0.0063).

Conclusion:

Patients undergoing septoplasty with turbinoplasty who also had untreated depression showed increased odds of ER visits and postoperative infections within 90 days, as well as septal perforation within a year.

Poster #G081

Impact of immunosuppression on refractory CRS: Outcomes of topical antibiotic treatment

Bastien Valencia, MD
 Christopher Jabbour, MD
 Prishae Wilson
 Najmi Natasha
 Angela Donaldson, MD, FARS
 Janalee Stokken, MD, FARS
 Mayo Clinic Florida

Background:

Immunosuppressants, immunomodulators and immunodeficiency are factors that are associated with recalcitrant chronic rhinosinusitis (CRS). In a subset of patients with immune-related conditions, both medical and surgical modalities have been unsuccessful in controlling this disease. This has led to the emergence of treatments with topical antibiotic irrigations in an attempt to improve outcomes post-sinus surgery. This study investigates the outcomes of topical antibiotic irrigations in CRS patients who underwent endoscopic sinus surgery (ESS).

Methods:

A multi-site retrospective chart review was conducted on patients with CRS refractory to ESS, treated with postoperative topical antibiotic irrigations. Demographics, comorbidities, and symptomatologic, microbiologic, antibiotic and serologic data were systematically collected.

Results:

Four distinct populations were identified based on CRS phenotype and the presence of immune-related comorbidities. Patients with CRS without nasal polyps (CRSsNP) and immune-related comorbidities had the longest duration of topical antibiotic treatment (8.2 ± 11.5 weeks) and the highest frequency of treatment failures (13/53, 24.5%) among all groups. Obesity, diabetes mellitus, and immunosuppressive medication use were associated with treatment failure in both CRSsNP and CRS with nasal polyps (CRSwNP) phenotypes.

Conclusion:

Our data suggests that immunosuppressed patients with CRSsNP are the most challenging to treat. The presence of immune-related comorbidities was associated with topical antibiotic treatment failure, regardless of CRS phenotype.

Poster #G082

Impact of medication adherence on rhinosinusitis patient outcomes

Clifford Jiajun He, BA
 Omer Baker, BS
 Olivia LaMonte
 Philipp Verpukhovskiy
 Adam DeConde, MD
 Carol Yan, MD
 University of California San Diego School of Medicine

Background:

Topical steroid nasal rinses are often prescribed as the recommended medical therapy for rhinosinusitis. Despite evidence supporting this treatment, patient medication adherence and its impact on clinical outcomes remain poorly understood. This study investigates the effect of topical steroid nasal rinse adherence on patient outcomes.

Methods:

This prospective longitudinal study recruited 67 sinusitis / rhinitis patients from a tertiary rhinology clinic who were prescribed twice daily budesonide sinus rinses. Objective adherence data regarding medication usage was collected over 8 weeks. Patient outcomes were assessed via SNOT-22 scores, sinus discomfort VAS (0 – 100), and surgery desire level (1 – 5). Linear mixed-effects model was used to analyze the impact of adherence on symptom outcomes.

Results:

Budesonide adherence was associated with reduced patient discomfort and SNOT-22 scores. For each 1% increase in adherence, patient discomfort scores decreased by 0.16 points (95% CI [-0.24, -0.08], $p < 0.001$) and SNOT-22 scores decreased by 0.10 points (95% CI [-0.15, -0.05], $p < 0.001$). Subgroup analysis in a cohort with baseline SNOT-22 ≥ 20 demonstrated a greater degree of SNOT-22 improvement with increased adherence (-0.81 points with 1% increase in adherence, 95% CI [-1.08, -0.55], $p < 0.001$). Medication adherence did not have a significant impact on surgery desire level. Demographics did not independently impact changes in symptom score.

Conclusion:

Budesonide sinus irrigation adherence may improve sinusitis and rhinitis patient clinical outcomes particularly in the highly symptomatic cohort.

Poster #G083

Improvement of mouth breathing after nasal surgery

Ayham Alkarmi, MD
Yusuf Gulleth, MD, MPH, FACS
Boston Medical Center

Introduction:

This study aims to investigate whether surgery can improve or eliminate mouth breathing in patients with nasal obstruction.

Methods:

This prospective, single-arm, open-label study enrolled 70 patients aged 7 to 73 years with nasal obstruction and habitual mouth breathing. All participants underwent nasal surgery comprising uncinctomy, anterior ethmoidectomy, bilateral inferior turbinate reduction, nasal swell body reduction, septoplasty, and adenoidectomy as needed. Pre- and post-operative symptom scores were collected at 3 months using the NOSE and SNOT-22 for sino-nasal symptoms, and the validated Mouth Breathing Quality of life score (MBQ) and Mouth Breathing Sign Score (MBS). The primary outcome was the change in symptom scores across the four questionnaires post-surgery. Secondary outcomes assessed the correlation between sino-nasal and mouth breathing symptom scores. Data were analyzed using the Wilcoxon signed-rank test and Pearson correlation test in SPSS.

Results:

Of the 70 patients who completed the survey, 44 were male and 26 were female, with ages ranging from 7 to 73 years (Mean 31.83, SD 18.05). Post-surgical evaluation revealed statistically significant improvements in all four metrics: MBQ ($p < 0.001$), MBS ($p < 0.001$), SNOT-22 ($p < 0.001$), and NOSE ($p < 0.001$). Pearson correlation analysis revealed a statistically significant positive relationship between improvements in MBQ and MBS scores and those of SNOT-22 and NOSE.

Conclusions:

Surgical correction of nasal obstruction can significantly improve or eliminate mouth breathing in patients of all ages. Research has shown a strong link between nasal obstruction and mouth breathing.

Poster #G084

IMRIS for pituitary adenoma resection: A single-center 13-year review and observational study

Chad Purcell, MD
Indiana University

Background:

Despite advances in neuronavigation and high resolution endoscopes, distinguishing tumor from pituitary tissue can be difficult. Intraoperative MRI suites (IMRIS) present an opportunity for surgeons to radiologically evaluate extent of tumor resection and detect residual tumor prior to concluding the operation. The purpose of this study is to review the IMRIS program for endoscopic transsphenoidal cases at Indiana University Health.

Study Design:

Retrospective, case-control study

Participants:

Adults undergoing endoscopic transsphenoidal resection of pituitary tumor

Cases:

IMRIS transsphenoidal pituitary adenoma resection

Control group:

Non-IMRIS transsphenoidal pituitary adenoma resection

Outcomes:

The primary outcome will be rates of gross total resection and progression free survival following surgical resection using iMRI. Secondary outcomes include vision and endocrinologic stability, operative time and length of stay.

Results*:

Final results pending.

123 patients (52 female) underwent pituitary tumor resection in the IMRIS room at IU Health Methodist Hospital between 2011 and 2017. Primary cases made up 64% and nearly all were non-functioning adenomas. Cavernous sinus involvement was reported in 16/33 cases, all of which was grade 3 or 4. Median time of surgery was 3 hours and 41 minutes. The average length of stay was 5.6 days. Outcomes data and analysis of non-IMRIS cohort are pending.

Conclusion:

This work aims to identify patient subgroups that may benefit most from IMRIS, and help inform practice pituitary tumour surgical practice and resource allocation at our centre.

Poster #G085

Industrial and fuel emissions are associated with non-allergic rhinitis

Sophie Yu

Jonathan Zou

Mitali Banerjee

Younsoo Jung

Margaret Mitchell, MD, MS

Simon Chiang, Research Coordinator

Stella Lee, MD

Harvard Medical School

Introduction:

Non-allergic rhinitis (NAR) is a common and heterogeneous disease with a poorly defined mechanism. This study evaluates the association of volatile organic compounds (VOCs) emitted from sources like household products, vehicle exhaust, and industry with NAR.

Methods:

Our analytical cohort was derived from the 2005-2006 National Health and Nutrition Examination Survey (NHANES). Exposures include 19 urinary VOC metabolites. Diagnosis of NAR was defined as a history of "hay fever" and negative serum IgE, control subjects have no rhinitis or sensitization. Through unsupervised machine learning, VOC metabolites were grouped into clusters. Unweighted multivariable logistic regression, adjusting for age, sex, race, family income, and serum cotinine, was used to evaluate the association between these factor scores and NAR. Bayesian kernel machine regression (BKMR) was used to analyze the joint effects, individual effects, and interactions between VOCs in a complex mixture.

Results:

The analytical cohort included 2,801 adults (7.4% with NAR, median age=34, 52.4% female). On multivariable analysis, we found that exposure to "Industrial and Fuel Emissions" (consisting of metabolites of VOCs tetrachloroethylene, 1,3-butadiene, xylene, and acrylamide) was significantly associated with a higher odds of NAR diagnosis (OR = 1.014, 95% CI=1.001-1.026, p=0.038). On BKMR, we found that higher exposure to these same metabolites, when considered as part of a complex mixture, also contributed to a higher odds of NAR.

Conclusion:

Exposure to VOCs from industrial and fuel emissions may be associated with an increased risk of NAR. Further research is needed to clarify the role of VOC exposure in the pathophysiology of NAR.

Poster #G086

Inferior meatal antrostomy in select maxillary pathologies

Ronald S. Wang, BS

Seth Lieberman, MD

NYU Grossman School of Medicine

Background:

The role of inferior meatal antrostomy in conjunction with functional endoscopic sinus surgery for certain maxillary pathologies remains unclear. We investigated the use of inferior meatal antrostomies in select patients and their post-operative course.

Methods:

We performed a retrospective chart review for all patients undergoing inferior meatal antrostomy with middle meatal antrostomy. Demographics, clinicopathological characteristics, treatment outcomes, and post-operative courses were documented.

Results:

We identified 36 patients. Most were male (23, 63.9%), Caucasian (23, 63.9%), and the median age was 44. Most lacked seasonal allergies (26, 72.2%) and prior sinonasal surgery (22, 61.1%). Chronic rhinosinusitis or inflammatory lesion was the main pre-operative diagnosis (n=35). Surgical pathology was nasal/antrochoanal polyps (n = 16), fungal balls (n=4), inverted papillomas (n=2), and then foreign body (n=1). On the initial post-operative follow-up visit, 94.4% and 91.7% of middle meatal and inferior meatal antrostomies respectively were patent. Average post-operative follow-up time was 12.9 months. Average time to patient symptom resolution was 2.6 months and sinus mucosa normalization was 3.0 months. Only two patients required revision surgery, one for revision antrostomies for stenotic maxillary sinuses and the other requiring endoscopic medial maxillectomy for residual inverted papilloma.

Conclusion:

When appropriately used, inferior meatal antrostomies remain safe and effective in endoscopic sinus surgery by enhancing maxillary sinus surgical access and post-operative dependent drainage and debridement. Careful patient and pathology selection is needed to minimize the need for revision surgery.

Poster #G087

Institutional analysis of PLT in pituitary surgery

Thomas Scharfenberger, BS
Elizabeth Borowiec, Resident
Kareem Al-Mulki, Resident
Carina Himes, Assistant Professor
Vijay Agarwal, Associate Professor
Christina Fang, MD
Patrick Colley, MD
Nadeem Akbar, MD
Albert Einstein College of Medicine

Background:

Preoperative laboratory testing (PLT) is routine before many low-risk surgeries, yet its utility in transsphenoidal pituitary surgery remains uncertain. While some tests are essential for anesthesia management, reducing unnecessary testing may alleviate financial burdens. This study evaluates PLT in pituitary surgery and whether abnormal lab results are linked to surgical complications.

Methods:

We conducted a retrospective chart review of patients undergoing transsphenoidal pituitary surgery. Demographics, surgical complications, and PLT values were extracted from electronic records. Univariate analysis and multivariate regression assessed associations between abnormal PLT and outcomes, including length of stay (LOS), unplanned readmission, and surgical complications.

Results:

Of 236 patients, 97.5% (n = 230) had at least one preoperative lab, with abnormal results found in 83.5% (n = 197). Univariate analysis showed no significant association between abnormal PLT and surgical complications, unplanned readmission, or LOS (p > 0.05). Patients with abnormal PLT had a longer average LOS (8.17 vs. 4.94 days), though this was not statistically significant. Multivariable regression identified a significant association with surgical complications, showing 61.1% sensitivity and 84.6% positive predictive value. Significant predictors included female gender, abnormal hematocrit, ALT, potassium, hemoglobin, and glucose levels (p < 0.05).

Conclusions:

Our analysis suggests that routine PLT for all patients undergoing pituitary adenoma surgery may be overutilized. Selective PLT protocols could reduce healthcare costs without compromising safety. Further studies should refine protocols based on specific complication risks.

Poster #G088

Insurance and surgical intervention in CRS

David Herz, BS
George Bebawy, BA
Anthony Saad, Medical Student
Ghayoor Mir, DO
Andrey Filimonov, MD, PharmD
Rutgers New Jersey Medical School

Objective:

Chronic rhinosinusitis (CRS) is associated with disparities in healthcare access, influenced by socioeconomic factors. Previous studies link insurance type and access to surgical interventions in various medical conditions. Our study examines the role of insurance type in determining access to sinus surgery (SS) among CRS patients.

Methods:

The 2017 National Inpatient Sample (NIS) was queried to identify adult inpatients with a primary diagnosis of CRS. CRS was identified (ICD-10: J321-J324, J328, J329). Univariate and multivariable analyses were used to identify statistical associations between insurance type and SS status in CRS patients.

Results:

Of the 139,570 inpatients diagnosed with CRS, 39,580 (29%) had private insurance, 91,405 (67%) had public insurance (Medicaid/Medicare), and 5,115 (4%) had no insurance. On univariate analysis, private, public, and no insurance CRS patients differed by race (10% in the private insurance group were black vs 14% and 20% in the public insurance and uninsured groups, respectively, p<0.001), income quartile (p<0.001), and hospital region (p<0.001). On multivariable analysis, adjusting for patient demographics and comorbidities, odds for surgical intervention were decreased in CRS patients that had public insurance (OR 0.710, 95% CI 0.65–0.78, p<0.001) and uninsured patients (OR 0.494, 95% CI 0.49–0.74, p<0.001) compared to patients that had private insurance.

Conclusions:

In a cohort of adult CRS patients, public insurance and no insurance were associated with lower SS rates. During counseling for CRS, providers should address potential insurance-related barriers, ensuring patients are fully informed of their treatment options and factors that may impact access to SS.

Poster #G089

Intraoperative MRI assists in dissection of CVJ pathology

Alec Straughan, MD
Kolin Rubel, MD
Andrew Venteicher
Neal Godse, MD

A variety of compressive pathologies can affect the cranio-vertebral junction (CVJ). Recent advancements in surgical technique have allowed for novel approaches to this region, including the endonasal transclival, transodontoid approach to the upper cervical spinal cord, cervicomedullary junction, and posterior fossa. While minimally invasive, the extent of bony and soft tissue decompression required can be difficult to judge given the deep corridor, inflamed tissue, and inability to visualize the intradural structures.

Our institution offers intraoperative magnetic resonance imaging (iMRI), which our joint neurosurgical and rhinology team utilized in three cases of CVJ pathology between 2020 and 2024.

The first patient was a 77 year old male with progressive hemiparesis and a retro-odontoid lesion compressing the CVJ. An intraoperative non-contrast T2 image was obtained mid-dissection and identified additional lesion inferiorly which was causing compression. The second was a 72 year old male with progressive extremity numbness and fine-motor loss with a suspected compressive synovial cyst who underwent additional cyst resection following iMRI. The third patient was a 52 year old female with progressive gait instability found to have os odontoides following occipito-cervical fusion; iMRI confirmed adequate dissection and decompression.

To our knowledge, the use of iMRI for CVJ pathology has not been reported. We feel that iMRI provides valuable real-time information to gauge the depth of bony and soft tissue removal to optimize the decompression.

Poster #G090

Invasive fungal sinusitis due to candida auris

Carley Boyce, MD
Katelyn Robillard, MD, PhD
John Nicholas Poche, MD
Stephen Hernandez, MD

Background:

Invasive fungal sinusitis (IFS) is a rare but life-threatening condition, particularly affecting immunocompromised or elderly patients. The most common fungal pathogens responsible for IFS are *Aspergillus* and fungi of the order *Mucorales* (e.g., *Rhizopus* and *Mucor*), which are well-documented for their aggressive tissue invasion and high mortality rates. In contrast, *Candida* species are rarely implicated in IFS, making the present case extremely unusual. *C. auris* is an emerging, multidrug-resistant pathogen associated with severe invasive infections in healthcare settings. This case report presents a rare instance of IFS caused by *C. auris* in an elderly patient with significant cardiac history but otherwise immunocompetent.

Case Presentation:

An 83-year-old female presented to the emergency department following a fall and imaging revealed left maxillary sinusitis with bony erosion through the maxillary wall into the orbit and pterygopalatine fossa, raising concerns for IFS. Symptoms were limited to hypoesthesia of the second division of the trigeminal nerve (V2) and intermittent pressure and pain over the maxillary sinus. The patient was started on broad-spectrum antibiotics and fluconazole. Due to medical comorbidities, a Caldwell-Luc procedure was performed under local anesthesia, revealing extensive fungal debris in the maxillary sinus with involvement of V2, which was biopsied. The patient was initially treated with Amphotericin B but switched to micafungin after pathology confirmed *Candida auris*.

Conclusion:

This report highlights a rare case of IFS caused by *Candida auris*. Early recognition, prompt surgical intervention, and appropriate antifungal therapy are essential to improving outcomes in patients with IFS.

Poster #G091
WITHDRAWN

Poster #G092
**Ipsilateral versus contralateral nasoseptal flaps
 for repair of sphenoid lateral recess defects**

Kurt Mueller, MD
 Kelsey Doguet
 Kody Bolk, MD
 Peyton Simons
 Stephen Hernandez, MD
 LSU Health Sciences Center - New Orleans

Background:

Spontaneous CSF leaks commonly occur within the lateral sphenoid recess in well-pneumatized patients, where access for repair is challenging. Vascularized flaps have been found to be superior to free grafting techniques; however, transpterygoid approaches may require ipsilateral pedicle sacrifice, making contralateral flaps necessary. This study examines the impact of pedicle mobilization and preservation on flap length, size, and postoperative morbidity.

Methods:

In five cadaveric specimens, bilateral nasoseptal flaps were raised and a transpterygoid approach was used to access defects in the lateral recess of the sphenoid sinus. Required flap length for full defect coverage was measured for both ipsilateral and contralateral flaps. Flap length and size were also recorded. Additionally, we report on two in vivo cases using ipsilateral nasoseptal flaps for repair of lateral recess defects.

Results:

On average, ipsilateral nasoseptal flaps require 44% less flap length for coverage of a full lateral recess defect when compared to contralateral nasoseptal flaps (4.21cm vs. 7.7cm, $p = <0.001$). In both clinical scenarios, subjects underwent successful coverage of their skull base defects with preservation of the nasal septum.

Conclusions:

While ipsilateral nasoseptal flaps require advanced techniques and mobilization of the pedicle in transpterygoid approaches, there is a considerable reduction in length required for defect coverage. This may allow for preservation of nasal structure, improved healing, and preservation of the contralateral nasoseptal flap for a future salvage procedure in sphenoid lateral recess skull base reconstruction.

Poster #G093

Management of frontal sinus disease with mometasone stents and triamcinolone impregnated microsp sponge

Christopher Jabbour, MD
Janalee Stokken, MD, FARS
Richard Betancourt, Medical Student
Mayo Clinic, Rochester

Background:

Chronic rhinosinusitis (CRS) is a disease that greatly impacts patient quality of life. Mometasone eluting sinus stents (MESS) and triamcinolone impregnated microsponges (TIM) have been suggested to improve patient outcomes when deployed in the frontal sinus ostia during endoscopic sinus surgery (ESS). This study investigates the risk factors, sinonasal quality of life, and endoscopic findings in patients managed with either MESS or TIM.

Methods:

A retrospective chart review of all patients with CRS who underwent ESS and managed with either MESS or TIM was conducted. The type of implant used in frontal sinus surgery, patient demographics and comorbidities, preoperative and postoperative sinonasal outcome test 22 (SNOT-22) scores, postoperative Lund-Kennedy (LK) endoscopy scores, rate of stenosis and microbiologic data were systematically recorded.

Results:

A total of 44 patients met the criteria of inclusion with a male to female ratio of 1:0.57, and a mean age of 53.2 ± 16.1 years. Of these, 18 (41%) were managed with MESS and 26 (59%) with TIM. The mean preoperative SNOT-22 score was 41.1 (38.1 vs 43.1 for MESS vs TIM respectively), and the mean postoperative SNOT-22 scores were 28.5, 21.3 and 28.6 at the 1st, 2nd and 3rd postoperative visit respectively (23.3, 22.4 and 28.3 vs 32.1, 20.3 and 28.8 for MESS vs TIM respectively). The mean LK score at the 1st, 2nd and 3rd postoperative visits were 4.9, 5.6 and 5 respectively. 8 (18%) patients were found to have frontal sinus stenosis on endoscopy postoperatively.

Conclusion: While management of frontal sinus ostia during ESS with either MESS or TIM improve sinonasal quality of life, the objective endoscopic results may not be in line with the clinical findings.

Poster #G094

Maxillary sinus antrochoanal polyp recurrence following surgery in adults: A systematic review

Kimberly Oslin, MD
Carl Wilson, Mr.
John Craig, MD, FARS
Henry Ford Health

Background:

Antrochoanal polyps (ACPs) are cystic non-neoplastic lesions that most commonly originate from the maxillary sinus and extend posteriorly through the choana. Transnasal endoscopic removal is preferred when ACPs cause sinonasal symptoms. ACPs can recur after surgical removal, and while a 15% recurrence rate was published in a recent systematic review for pediatric patients, this has not been well-established in adults. The purpose of this study was to determine the recurrence rate of maxillary sinus ACPs in adults following surgical resection.

Methods:

A systematic review was conducted on ACP surgical management using Medline, Embase, and Web of Science databases from 1946 to July 2022. After excluding 255 duplicate articles and non-English articles, 329 abstracts were screened, and 58 were selected for full-text review. Articles were included if they were original studies reporting recurrence rates after surgical removal of maxillary sinus ACPs for patients ≥ 16 years old. Studies were excluded if patients had < 6 months minimum follow-up or mean follow-up < 12 months.

Results:

Of 16 studies meeting criteria, 439 patients were included for analysis. Mean age was 32.3 years and 43.9% were female. Endoscopic maxillary antrostomy with ACP removal was performed in 74.0% of cases. Patients experienced an overall recurrence rate of 10% (95% CI, 6-15%) following ACP resection, with a mean follow-up of 36.0 months.

Conclusion:

Based on systematic review, ACPs recurred in about 10% of adults following surgical resection. Additional research is needed to identify patient and surgical factors associated with recurrence, as well as optimal management of recurrences.

Poster #G095

Medication adherence in the allergic fungal sinusitis population: An institutional review

Diana Bigler, MD

Stilianos Kountakis, MD, FARS

Rachel Grimes

Objectives:

Medication compliance is a known factor in patient outcomes across various chronic conditions and is especially important in the rhinosinusitis population. Our objective was to assess the association between adherence to medication and the need for revision surgery in patients with allergic fungal sinusitis.

Study design:

Retrospective cohort study.

Methods:

A cohort of 126 patients was analyzed retrospectively, categorized by self-reported compliance with medication, gender, age, and incidence of revision surgery. Medical adherence, revision surgery, and age-related data were compared using chi-square tests and t-tests to determine associations across the variables.

Results:

Of the patients who reported medical adherence, 6 of 77 patients required revision surgery. Of the patients who reported non-compliance with medication, 20 of 49 required revision surgery. Among males, 40 of 67 patients (59.7%) were compliant. Among females, 37 of 59 patients (62.7%) were compliant. The p-values for gender-based comparisons of compliance and revision surgery were not statistically significant. Age did not seem to impact compliance in our patient population, 36.2 years compared to 33.7 years for compliant and non-compliant individuals, respectively ($p = 0.417$). Overall, self-reported non-compliance was associated with a significantly higher need for surgery ($p < 0.00002$).

Conclusions:

Medication adherence is significantly associated with a reduced need for revision surgery in patients with allergic fungal sinusitis. Efforts to improve compliance by increasing patient education and addressing socioeconomic factors are essential to management of this disease.

Poster #G096

Metachronous inverted papillomas

Kevin Li, MD

Ari Schuman

Meha Fox, MD, FARS

Objective:

Sinonasal inverted papilloma (IP) is a rare, benign tumor that typically presents unilaterally. Bilateral IPs are uncommon, reported as approximately 3% of cases, and are typically synchronous. Here, we present an unusual case of bilateral metachronous sinonasal IPs.

Methods:

A comprehensive review of the patient's medical records and literature search was performed.

Results:

A 41 year-male with a history of smoking and an anterior maxillary gingiva squamous cell carcinoma that was excised 14 years prior represents for follow up. He reported intermittent left nasal congestion without purulent rhinorrhea and underwent a maxillofacial computed tomography (CT) scan as part of his routine surveillance. He was found to have left maxillary sinus opacification and was started on saline irrigations and intranasal steroid sprays. An interval scan noted complete left maxillary sinus opacification with protrusion into the nasal cavity, concerning for a neoplastic process. Endoscopic biopsy revealed IP which was excised via a modified Denker's approach. A 6-month post-operative maxillofacial CT noted a new right maxillary sinus lesion, which grew on his interval scan 3 months later. Right ESS with biopsy again revealed IP. The lesion was completely excised from the right posterolateral maxillary sinus wall attachment. He had an uneventful recovery and is doing well 1 month post-operatively.

Conclusion:

Metachronous IPs are very rare given the low prevalence of IPs. Routine surveillance, clinical suspicion, and prompt surgical intervention can lead to favorable outcomes.

Poster #G097

Metastatic RCC in the nasal cavity

Anastasiya Stasyuk, MD

Jackson King

Anusha Gogulapati

Bryle Barrameda

Toby Steele, MD

Introduction:

Sinonasal masses represent a plethora of both benign and malignant disease. While metastases are rare, they represent a portion of sinonasal masses that are underrecognized.

Methods:

Case report and literature review.

Results:

An 84-year-old male presented for evaluation of recurrent, unilateral epistaxis from the right nostril for 4 months. The epistaxis was severe in nature and resulted in anemia and multiple blood transfusions. On nasal endoscopic exam, the patient was found to have a red, pulsatile mass in the middle meatus of the right nasal cavity. Maxillofacial non-contrast CT revealed a large soft tissue mass extending into the right ethmoid air cell with bony destruction of the cribriform plate and portions of the fovea ethmoidalis. He underwent a biopsy with debulking of the hypervascular mass in the operating room with greater than expected blood loss. Definitive diagnosis could not be made with frozen sections; therefore, definitive surgical therapy was deferred and residual tumor was left at the right skull base. Final pathology revealed clear cells in a nested arrangement surrounded by a highly vascular stroma, with antigen testing supporting a diagnosis of clear cell RCC. He was referred for Oncology evaluation and is pending a PET scan to assess for additional sites of metastases.

Conclusion:

Up to 15% of patients with RCC have metastatic disease to the head and neck region. Profuse epistaxis is the most common symptom, while the triad of hematuria, flank pain, and a palpable mass is seen in approximately 10% of patients. This case highlights the need to consider metastatic RCC in the differential for vascular sinonasal tumors for optimal preoperative planning and treatment.

Poster #G098

Microbiology of odontogenic sinusitis

Charles Tong, MD, FARS

Hunter Martin

Edward Mo

Yongjin Yoon

David Hirsch

Mark Chaskes, MD

Judd Fastenberg, MD

Aron Pollack

Northwell Health

Objectives:

ODS is a distinct form of rhinosinusitis that requires multidisciplinary treatment from oral surgeons and Otolaryngologists. The purpose of this study is to describe the microorganisms identified in cultures and propose optimal antibiotic coverage.

Study Design:

This is a retrospective cohort study of patients with ODS who presented to a large multi-center health system.

Methods:

Patient demographics, microbiology of the sinus aspirate, antibiotic prescribed are reported.

Results:

A total of 71 patients underwent surgery with OMFS and ENT from 2022 to 2024 were included. Preliminary analysis found that patients most often had ODS in the setting of infected implant, retained root tip, osteomyelitis, bisphosphonate-related osteonecrosis, or post extraction with persistent oroantral fistula (OAC). 14% of patients had surgery with OMFS only, 17% of patients with ENT only, and 69% had concurrent surgery. Patients were treated with debridement of the maxilla, ESS, and a buccal fat pad graft for wound closure. Intraop cultures identified polymicrobial infections in 89% of the patients. Gram-positive, gram-negative and anaerobic organisms were all represented in the cohort. Amoxicillin, azithromycin, and clindamycin were most commonly prescribed by dental providers prior to referral. Augmentin was the most common antibiotic of choice for discharge (96%).

Conclusions:

Based on the identified organisms, our Infectious Disease department has recommended Amoxicillin with Clavulanic acid to be the most appropriate outpatient antibiotic treatment, with Cefpodoxime plus Metronidazole reserved for patients with penicillin allergy.

Poster #G099

Middle turbinate medialization with absorbable packing after transsphenoidal skull base surgery

Mark Liu, MD

Matthew Kabalan, MD

Joyce Lee, Medical Student

Raj Sindwani, MD, FARS

Cleveland Clinic Foundation

Background:

Nasogastric tube (NGT) insertion can cause intracranial injury in patients with prior endoscopic skull base surgery (ESBS). A recent cadaveric study demonstrated middle turbinate medialization (MTM) can protect the skull base during blind NGT insertion. We routinely preserve the middle turbinate during transsphenoidal surgery and place a bioresorbable nasal packing (NasoPore: Stryker, Kalamazoo, MI, USA) in both middle meatuses to accomplish MTM.

Hypothesis:

Absorbable packing in the middle meatus following ESBS successfully and durably accomplishes MTM.

Materials and Methods:

A single-center retrospective review was performed of ESBS patients from 2023 to 2024. Patients with 2 available postoperative nasal endoscopies, including one ≥ 1 month after surgery, were included. Most recent endoscopies were reviewed by 2 independent surgeons and scored on middle turbinate station, measured in the medial to lateral dimension with apposition to septum scored as +2 and apposition to lateral nasal wall -2, and extent of surface area contact between turbinate and septum, scored as <50% or >50%.

Results:

30 consecutive patients (60 middle turbinates) were included. 54 turbinates (90%) had station +2 and 47 (79%) had >50% surface area contact with septum. Endoscopies were recorded 70 days (average) after surgery. Cohen's Kappa coefficient was 0.55 for station and 0.66 for surface area contact, signifying moderate to substantial inter-rater reliability.

Conclusions:

Our experience demonstrates that a simple technique with absorbable packing can achieve long-term MTM in a majority of patients following ESBS. This can help reduce the likelihood of inadvertent skull base injury in ESBS patients after surgery.

Poster #G100

Misdiagnosis of spontaneous CSF rhinorrhea

Matthew Liu, MD

Erin Lopez, MD

Bundhit Tantiwongkosi, Professor

Jason Lally, Associate Professor

Philip Chen, MD, FARS

University of Texas Health San Antonio

Background:

Spontaneous cerebrospinal fluid (CSF) rhinorrhea is commonly misdiagnosed due to overlapping symptomatology with other sinonasal diseases, leading to delay in diagnosis and increased risk of meningitis. The objective of this study was to examine the risk factors for the misdiagnosis of spontaneous CSF rhinorrhea.

Methods:

A single-institutional retrospective chart review of patients with spontaneous CSF rhinorrhea was performed. Patient characteristics, initial diagnosing provider type, and accuracy of radiology reads were compared between subjects initially diagnosed correctly versus those that were not.

Results:

Fifty-seven patients with spontaneous CSF rhinorrhea were included with 61% being initially misdiagnosed with rhinitis, sinusitis, or migraines. Being initially seen by a non-ENT provider was significantly associated with being misdiagnosed ($P < 0.001$). Only 32% of radiology reports correctly identified the skull base defect prior to a positive beta-2 transferrin. However, once the diagnosis of a CSF leak was established, subsequent reads by radiologists were more likely to identify the skull base defect ($P < 0.001$). Multivariable logistic regression revealed that being seen by a non-ENT provider increased the odds of misdiagnosis after adjusting for relevant confounders ($P = 0.035$).

Conclusion:

Spontaneous CSF rhinorrhea is commonly misdiagnosed by non-ENT providers. Moreover, the skull base defect on radiographic imaging is frequently missed by radiologists when the official diagnosis is not established. Further education for non-ENT providers on the proper differential diagnosis of sinonasal symptomatology is warranted to expedite the diagnosis and management of spontaneous CSF leaks.

Poster #G101

Multifocal chordoma: A case of clival and sacral involvement

Kelsey Limage, BS

Kalena Liu

Sri Daggumati, Dr.

Gurston Nyquist, MD, FARS

Christopher Farrell, Dr.

Background:

Chordomas are rare, aggressive bone tumors that develop from remnants of the notochord and have a predilection for the axial skeleton. This report presents a case of a multifocal chordoma, an uncommon variant of the lesion, affecting the clivus and the sacrum.

Case Presentation:

A 58-year-old male presented with an 8-day history of severe headaches, diplopia, and facial numbness. His medical history included a sacral chordoma confirmed by biopsy that was status-post resection, followed by radiation one year prior. Brain and spinal MRI revealed a lytic lesion of the right clivus and sacrum. The masses were T1 isointense and T2 hypointense with no significant enhancement. The patient underwent endoscopic debulking via a transnasal-transsphenoidal approach to the clivus and was found to have extensive encasement of the right internal carotid artery (ICA). Residual tumor was left circumferentially around the artery to prevent injury. Histopathology of the resected specimens showed evidence of a dedifferentiated chordoma.

Discussion:

We report a rare case of a patient with a multifocal chordoma, with a primary lesion in the sacrum and a secondary lesion in the clivus, raising suspicion for metastasis. Although reported rates of metastasis occur in 18-30% of chordoma cases, it remains unclear whether the clival lesion represents a metastasis from the sacral lesion or a distinct second primary chordoma. Furthermore, histopathology revealed a dedifferentiated chordoma, an uncommon and aggressive variant with a tendency to metastasize as evidenced by the extensive ICA involvement in this case. For this reason, these tumors may require more aggressive resection and radiation compared to conventional chordomas.

Poster #G102

Nail salon occupational exposures and sinonasal symptoms: A scoping review

Orli Weiss, BA

Rebecca Rosenzweig

Katherine Liu, Dr.

Maria Mavrommatis, Dr.

Guillermo Maza Malave, MD

Brian Pavilonis, Dr.

Anthony Del Signore, MD, FARS

Satish Govindaraj, MD, FARS

Alfred Marc Illoreta, MD

Icahn School of Medicine at Mount Sinai

Background:

Chemicals used in nail salons pose known health risks, but their impact on rhinology remains understudied. Prior studies identified high levels of methyl methacrylate and ethyl methacrylate using air monitors worn on nail salon technicians' (NSTs) collars, indicating high chemical burden near nasal passages. This review synthesizes current knowledge on occupational exposures in nail salons and associated rhinology symptoms.

Methods:

A scoping review was conducted per PRISMA-ScR guidelines. Five databases were searched with "nail salon employees," "occupational exposures," and health outcomes including "rhinitis," "sinusitis," and related terms. Studies reporting sinonasal symptom data in NSTs, published after 2000, and available in English were included.

Results:

15 studies met inclusion criteria. Cross sectional studies were most common (n=6), followed by case-control studies (n=5), single arm trials (n=2), case reports (n=1), and reviews (n=1). 13 studies used self-reported survey data to assess symptoms, consistently noting nose and throat irritation, allergies, and cough. One study also included medical interviews, identifying work-related nasal irritant reactions in 19% of NSTs. Nasal irritation was significantly more prevalent in NSTs than in office-based controls. Air monitors confirmed high chemical levels near NSTs.

Conclusions:

Sinonasal symptoms are prevalent among NSTs. The current literature relies on self-reported symptoms and air particle monitoring, with only one study incorporating medical diagnostic data. Given that 81% of NSTs in the U.S. are women and 79% are immigrants, there is a critical need for diagnostic-focused research to address occupational health risks in this demographic.

Poster #G103

Nasal dermoid resection

Walter Jongbloed
Gabrielle Caron
Kimberly Rutherford
Seth Brown, MD, FARS

Introduction:

Nasal dermoid cysts are rare congenital anomalies with an incidence of 1 in 20,000 to 1 in 40,000 live births, usually diagnosed in early childhood with characteristic presentations of a midline nasal mass, often with a tuft of hair. The lesions develop from incomplete closure of the nasal and frontal bones during gestational growth – resulting in dermal sinuses, encephaloceles, or cysts. Dermoid cysts can manifest as nasal or glabellar deformities, infections such as sinusitis and cellulitis, or complications related to intracranial extension.

Methods:

This is a case report of an 18-year-old male with a nasal dermoid involving the nasal and frontal bones who presented with a nasal abscess requiring intranasal drainage. This was electively resected using a combined endoscopic and open rhinoplasty approach.

Results:

Imaging was significant for a nasal dermoid in the frontal bone, extending through an osseous defect into the midline nasal septum and subcutaneous tissues with a punctate sinus opening over the nasal dorsum. Surgical treatment involved endoscopic skull-base and open rhinoplasty approaches resulting in a complete resection.

Discussion:

This case highlights: (1) the evolution of minimally invasive techniques for effective and aesthetic outcomes in patients with nasal dermoid cysts, (2) the individualized modern surgical approaches in managing nasal dermoid cysts of varied complexity, and (3) expands on the limited literature on nasal dermoid cysts with deep neofrontal sinus involvement at the skull base.

Poster #G104

Nasal endoscopy and acoustic rhinometry in the evaluation of nasal obstruction

Rafael Hijano, MD, PhD
Nadia Bernat, MD
Mireia Quer, MD
Pilar Ausin, MD, PhD
Hospital del Mar Barcelona

Introduction:

A lack of correlation has been observed between the results obtained in objective tests and subjective tests in the diagnostic process of nasal obstruction (NO) in patients attending a rhinology consultation. This study aims to describe the association between findings in endoscopy, acoustic rhinometry, and patient perception using VAS and the Nasal Obstruction Symptoms Evaluation (NOSE) test.

Materials and methods:

Observational study of 145 consecutive patients in the period from 2021 to 2023 visited by NO in a tertiary hospital rhinology consultation. Demographic data, nasal endoscopy, and acoustic rhinometry (AR) were recorded -taking the values of minimum cross-sectional area (MCA1) and minimum volumes (Vol1), before and after applying vasoconstriction-. Likewise, the VAS value for NO and the NOSE test was collected.

Results:

A statistically significant correlation was found between endoscopy and the MCA1 and Vol1 values of the AR ($p=0.001$); between the NOSE and VAS-NO tests, and between the presence of asthma and higher levels of VAS ($p=0.05$). No significant correlation was found between endoscopy and the NOSE and VAS; nor between the AR values and the measurements of VAS or NOSE.

Discussion/Conclusions:

Nasal obstruction is a subjective symptom of multifactorial cause, where not only anatomical factors influence. Objective and subjective tests for measuring NO assess different aspects of the nasal airways, which explains the lack of correlation in the same individual. This indicates that both methods are complementary and not exclusive. Their concomitant use allows for a correct comprehensive diagnosis and, consequently, treatment of NO according to the needs of every patient.

Poster #G105

Nasal endoscopy fellowship directors

Abtin Tabaei, MD, FARS
 Katelyn Willson
 Edward McCoul, MD, FARS
 Michael Stewart, MD, MPH, FARS
 Timothy Smith, MD, MPH, FARS
 Stacey Gray, MD, FARS
 Sarah Wise, MD, FARS
 Zara Patel, MD, FARS
 Weill Cornell Medicine

Introduction:

Routine nasal endoscopy is foundational to the clinical care of patients with nasal-paranasal sinus disorders. However, there is currently no standardization in the way the procedure and associated findings are documented. Variances in nasal endoscopy documentation may result in differences in the reporting of key aspects of the procedure.

Methods:

A blank, electronic copy of the nasal endoscopy template used in routine clinical practice was requested and obtained from Rhinology fellowship directors in the United States. The templates were reviewed for different aspects of procedural documentation including a description of the procedure as well as anatomic and disease findings.

Results:

26 of the possible 32 fellowship directors (81%) participated in the study. The overall structure of the template was free-text in 12(46.2%), structured with itemized inclusion of anatomic sub-sites in 8(30.8%), a combination of Lund-Kennedy staging system and structured fields in 2(7.7%), Lund-Kennedy staging system and free text in 2(7.7%) and a combination of Lund-Kennedy and Meltzer staging systems and free text in 2(7.7%). Variability was noted with regard to structured, routine inclusion of : diagnosis 13(50%), anesthesia 25 (96.2%), informed consent language 17(65.4%), endoscopic instrument 24(92.3%), description of the how the procedure was performed 24(92.3%) and complications/ tolerance of the procedure 19(73.1%). Significant variability was noted in the reporting of the various anatomic sub-sites and disease findings.

Conclusions:

To date, significant variability exists in the documentation of nasal endoscopy as noted in the current study of Rhinology fellowship directors. Further study and consensus development.

Poster #G106

Nasoseptal flap enhancement on MRI

Maria Espinosa, MD
 Sanjena Venkatesh, Medical Student
 Kimberly Wei, Medical Student
 Alison Yu, MD
 James Palmer, MD, FARS
 Michael Kohanski, MD, FARS
 Nithin Adappa, MD, FARS
 Jennifer Douglas, MD
 University of Pennsylvania

Objective:

To assess postoperative nasoseptal flap (NSF) enhancement on MRI following pediatric endoscopic skull base surgery.

Design:

A retrospective chart review was conducted of all pediatric patients undergoing endoscopic skull base surgery with NSF reconstruction at our institution between April 2009 and July 2024. T1-weighted post-contrast magnetic resonance imaging (MRI) was evaluated, both immediately and serially postoperatively, with specific attention to NSF contrast enhancement. Enhancement was graded as present or absent.

Findings:

80 patients (9.1 ± 5.1 years, range: 2 months to 23 years; 64% male) underwent 106 procedures and were included for analysis. Indication for surgery was craniopharyngioma in 88.8% of cases and other (i.e., glioma, prolactinoma, meningioma) in 11.2% of cases. 652 MRIs were analyzed across all cases. The majority of cases ($n=63$, 78.8%) demonstrated immediate postoperative NSF enhancement on MRI. A subset ($n=7$, 8.8%) showed no initial enhancement but developed enhancement over time, while a similar proportion ($n=10$, 12.5%) showed no enhancement at any point.

Conclusion: This study represents the largest cohort of pediatric skull base cases to date and is the first to analyze patterns of NSF enhancement both immediately and serially postoperatively within this population. Compared with the adult literature, the observed rate of immediate post-operative NSF enhancement is similar. However, we demonstrate that approximately half of all NSFs lacking initial enhancement develop enhancement over time. These findings establish a baseline for NSF imaging outcomes in pediatric patients, offering insights into expected post-surgical MRI patterns that may assist with postoperative monitoring.

Poster #G107

Nosebleeds and beyond and rhinology: Accuracy and impact of Instagram content

Ogechukwu Anwaegbu, BS
 Adannaya Ihediwa, BS
 Shobit Srivastava, BS
 Joshua Lewis, BS
 Michel Adeniran, BS
 Tyler Janz, MD
 Brian McKinnon, MD, MBA, MPH
 University of Texas Medical Branch

Background:

Instagram is a popular platform for healthcare providers to share educational information, but the accuracy and impact of content, particularly within ENT subspecialties like rhinology, remain unclear. Conditions such as epistaxis often face widespread public misconceptions. Our study assesses the quality and accuracy of rhinology-related educational videos on Instagram to evaluate their effectiveness and identify areas for improvement.

Methods:

A systematic search identified the top 150 Instagram videos from hashtags #Otolaryngology, #Otolaryngologist, and #ENTeducation, from September 2020 to January 2024. Videos were categorized by primary topic, and evaluated by an otolaryngologist. User engagement metrics measured content reach. The Patient Education Materials Assessment Tool for understandability and actionability.

Results:

54 Instagram videos were analyzed and categorized by their primary topic, with the majority focusing on rhinology (n=20) and primarily created by otolaryngologists. Rhinology videos averaged 405 likes, 25 comments, 130 shares, and 21345 views with an average length of 44 seconds. Among these, 95% were fully accurate, 5% contained inaccuracies. Frequently used hashtags included #nosebleeds, #sinussurgery, and #sinus. Rhinology videos showed the highest actionability (58%), with "nosebleeds" as a recurring theme, focusing on proper management to prevent complications until medical help is available.

Conclusions:

Rhinology-related educational videos on Instagram provide a valuable resource for public education, particularly in the context of nosebleed management. Our results show high accuracy and moderate public engagement, highlighting the potential benefit of providing valuable information to the public.

Poster #G108

Number of allergens present in chronic versus allergic rhinitis

Sofia Piperno
 Gabrielle Hyde
 David Lindsay, MD

Introduction:

Chronic and allergic rhinitis are common conditions in the pediatric population. These conditions are commonly tested for by an allergist through skin prick testing. The study's primary objective is to assess if there is an association between the number of allergens tested positive on a skin prick test and whether or not the child has been diagnosed with chronic rhinitis, allergic rhinitis, or both.

Methods:

A retrospective chart review was performed on children under 6 who had been diagnosed with either chronic rhinitis and/or allergic rhinitis by an allergist as well as who had a skin prick allergy testing performed. Charts from 9/1/23 to 8/31/24 were analyzed. Anova and Tukey Post Hoc test were used to analyze the data.

Results:

92 patients met the inclusion criteria. Of those, 68 were diagnosed with only chronic rhinitis (73.9%), 9 with allergic rhinitis (9.8%), and 15 with both allergic and chronic rhinitis (16.3%). 28 patients (30.4%) were diagnosed with chronic and/or allergic rhinitis and had a negative skin prick test. There was a significant difference between the number of allergens between groups ($p = 0.031$). Based on the Tukey Post-Hoc test, there is a difference between chronic rhinitis and both ($p = 0.030$), but not chronic and allergic (0.508) or allergic and both ($p = 0.695$).

Conclusion:

Chronic and allergic rhinitis are some of the most common chronic conditions in children. 30.4% of children diagnosed with chronic and/or allergic rhinitis had a negative skin prick test, but those that had a positive test had a significant difference in quantity of positive allergens between the groups. These results may yield insight into how valuable skin prick results are in determining

Poster #G109

Obesity is associated with an increased risk of new-onset allergic rhinitis

David Hoying, BS

Jamil Hayden, Resident Physician

Mohamad Chaaban, MD, FARS

Case Western Reserve University School of Medicine

Introduction:

Obesity is a well-known risk factor for the development of asthma. Higher body mass index (BMI) has also been associated with an increasing prevalence of other atopic diseases, such as allergic rhinitis (AR). In this study, we aimed to assess a temporal association between obesity and AR by determining if a higher BMI is associated with an increased risk of new-onset AR using a large population database.

Methods:

A retrospective cohort study was conducted using the TriNetX U.S. Collaborative platform to assess the association of obesity with new-onset AR. Adults with obesity (BMI ≥ 30) were compared to patients with normal weight (BMI 18.5–24.9), excluding those with a prior AR diagnosis. The primary outcome was the incidence of new-onset AR over 1- and 2-year follow-up periods. Propensity score matching (1:1) balanced age and sex between cohorts.

Results:

After matching, each cohort included over 11 million patients. At the 1-year follow-up, the risk of new-onset AR was 1.32% in the obesity cohort and 0.95% in the normal-weight cohort, yielding a relative risk (RR) of 1.38 (95% CI: 1.37-1.39). Extending the follow-up to 2 years, the relative risk remained similar at 1.38 (95% CI: 1.37-1.39).

Conclusion:

Obesity is associated with an increased risk of developing allergic rhinitis over a 1- and 2-year period. Given the limitations of large database studies, prospective analyses are needed to confirm these findings.

Poster #G110

Old age rhinitis: Pathophysiology and issues in treatment

Kamlesh Dubey, MS

Manipal University College (MUCM), Malaysia

Introduction:

With improvement in medical science, life expectancy has increased, percentage wise old age population is increasing on every continent. Rhinitis at the old age population is one of the diseases given less attention with respect to all the management steps including, diagnosis, examination, investigation, and treatment with respect to younger age population. Geriatric or old age rhinitis is peculiar in comparison to other age group nasal and paranasal inflammation in that, with age there is change in anatomy of nasal cavity for example cartilage lose strength, change in mucous gland viability and response to inflammatory agents on exposure. Another factor contributing to the different presentation of old age rhinitis after anatomical change is the physiological change, most important the change in the sympathetic and parasympathetic nervous system balance. It is now common knowledge that with age parasympathetic take precedence over sympathetic, this physiological changeover manifests in the form of patient's symptoms suggestive of rhinitis. One important factor contributing to the onset as well as severity of nasal and paranasal inflammation is the medicines patients take for cardiovascular system pathologies and other systemic diseases. These medicines themselves lead to neural and vascular changes in situ in nasal cavity and paranasal sinuses, and the change manifest as symptoms and signs suggestive of rhinitis and sinusitis.

Materials & Methods:

Authors reviewed articles from 1950-2023 related to concept, pathophysiology, issues during treatment of geriatric/old age rhinitis.

Result:

Despite of increasing percentage of old age population fewer studies are available. A systemic approach need of hour.

Poster #G111

Olfactory dysfunction impacts mental health among adults in the United States

Sidharth Sengupta, MS
 Jess Mace, MPH
 Kara Detwiller, MD, FARS
 Timothy Smith, MD, MPH, FARS
 Mathew Geltzeiler, MD, FARS
 Vivek Pandrangi, MD
 Oregon Health and Science

Background:

Olfactory dysfunction (OD) is associated with a significant impact on quality of life (QoL). This study aims to explore impact of OD on mental health among US adults.

Methods:

Cross-sectional study using the 2021 National Health Interview Survey (NHIS). Data regarding self-reported mental health and olfactory function were obtained. OD was identified if patients responded “a little”, “moderate”, “a lot”, or “cannot smell at all” to “During the past 12 months, have you had difficulty with your sense of smell or ability to detect odors?”.

Results:

Among the total weighted sample of about 240 million patients (raw sample size $n=27,669$), there were 26 million adults with reported OD (raw sample size $n=2,944$, 10.8%). Patients with OD were more often below the federal poverty line (12% vs. 9.5%, $p<0.001$). Patients with OD reported a higher prevalence of anxiety (22% vs. 16%, $p<0.001$) and depression (23% vs. 17%, $p<0.001$). Patients with OD also had lower rates of social support needs being met ($p=0.004$) and were more likely to report being dissatisfied or very dissatisfied with their lives (6.9% vs. 4.5%, $p<0.001$). On regression, presence of OD increased the odds of anxiety (OR=1.23, 95% CI=1.10–1.38, $p<0.001$), depression (OR=1.29, 95% CI=1.11–1.52, $p=0.001$), and life dissatisfaction (OR=1.28, 95% CI=1.07–1.54, $p=0.006$).

Conclusion:

In this study, approximately 11% of US adults reported OD. There was an increased prevalence of mental health conditions among patients with OD, and OD appears to impact overall life satisfaction. This suggests the importance of increased awareness and screening for OD, and continued development of strategies to facilitate evaluation and management of this complex condition.

Poster #G112

Olfactory dysfunction in patients with migraine

Erin Briggs
 Anuja Shah, Clinical Research Fellow
 Shaun Nguyen, Dr.
 Alexander Duffy, MD
 Zachary Soler, MD, FARS
 Rodney Schlosser, MD, FARS
 Medical University of South Carolina

Background:

Patients with migraine often experience accompanying symptoms of olfactory dysfunction (OD) among other sensory disturbances. Osmophobia, a little-known associated symptom of migraine, is described as a fear, aversion, or hypersensitivity to odors. The objective of this study is to determine the prevalence of OD in patients with migraine and further characterize osmophobia.

Methods:

The literature was searched for articles reporting prevalence of OD in patients with migraine. Primary outcome measures included proportions (%) and odds ratio (OR) with 95% confidence intervals (CI).

Results:

58 studies were included ($N=22,170$ patients). The prevalence of osmophobia among patients with migraine was 47.5% [95% CI: 42.0%-53.1%]. Olfactory hypersensitivity occurred during migraine attacks in 40.1% [95% CI: 23.1%-58.55] of patients. Migraine attacks triggered by odor occurred in 38.7% [95% CI: 32.1-45.5] of patients with perfume as the primary trigger. Patients that experienced osmophobia were at greater risk of experiencing other sensory disturbances, such as photophobia, nausea, and aura (OR = 1.45, 1.73, 1.66, respectively, all $p < 0.0001$).

Conclusion:

Olfactory dysfunction (OD) is a significant and underrecognized component of migraine. In this study, nearly half of patients with migraine reported osmophobia and over a third identified specific odorants, such as perfume, as a trigger of migraine attacks. Of note, true prevalence of OD is hard to discern as studies were selected based on reporting of OD. This study furthers the understanding that OD can be a concomitant symptom in patients with migraine, and has association with other sensory disturbances, which may guide both diagnosis and management of migraine.

Poster #G113

Online health resources and electronic health literacy among patients with sinonasal disease

Elise Krippaehne, Clinical Research Fellow
 Vivek Pandrangi, MD
 Morgan Terry
 Murray Bartho, Medical Student
 Michael Sabbaj
 Jess Mace, MPH
 Kara Detwiller, MD, FARS
 Timothy Smith, MD, MPH, FARS
 Mathew Geltzeiler, MD, FARS
 Oregon Health and Science University

Background:

Given the rapid development of Internet-based health resources, many patients are using these platforms for healthcare decision-making. The purpose of this study was to investigate the use of Internet resources and the relationship between overall health literacy and electronic health (eHealth) literacy among patients with sinonasal disease.

Methods:

Prospective study at a tertiary rhinology center between February and October 2024. Health literacy and eHealth literacy were assessed using the Brief Health Literacy Screening Tool (BRIEF, range 4-12: marginal, 13-16: limited, 17-20: adequate) and eHealth Literacy Scale (eHEALS, range 8-40).

Results:

100 patients were enrolled and the most common diagnosis was chronic rhinosinusitis (75%). Overall 72% of patients reported finding Internet resources useful in making health decisions and 84% believed in the importance of accessing online health resources, but only 65% reported the ability to differentiate high- vs. low-quality Internet resources. On regression, only adequate health literacy (OR=5.0, $p=0.012$) and female gender (OR=3.59, $p=0.02$) were associated with higher eHealth literacy, independent of education level ($p>0.05$).

Conclusions:

Patients with sinonasal disease often utilize online resources for healthcare decision-making. However, many patients have difficulty identifying high-quality online information, and overall health literacy appears associated with eHealth literacy. This suggests the need for national societies and academic institutions to promote high-quality online health resources, and for clinicians to be aware of how education efforts may influence patient use of online resources that may impact decision-making and disease management.

Poster #G114

Orbital pyoderma gangrenosum: A rare manifestation of chronic intranasal cocaine use

Cynthia Koenigsberg, MD
 Neal Godse, MD
 Alisha Kamboj
 Autefeh Sajjadi, Resident
 University of Minnesota

Background:

Pyoderma gangrenosum is a rare ulcerating skin condition that can rarely involve the eye and ocular adnexa. The pathophysiology is not well understood but thought to involve immune dysregulation, abnormal cytokine signaling, and necrosis, possibly triggered by local trauma to the tissue. Only about 20 cases of periorbital pyoderma gangrenosum are reported in the literature, and even fewer are reported in association with cocaine use.

Case Report:

We present a severe case of periorbital pyoderma gangrenosum in the setting of intranasal cocaine use, with a literature review of sinonasal manifestations of inhalational drug use and a discussion of the associated diagnostic challenges. The patient is a 52-year-old male who presented with a three-year history of cocaine use, and was found to have complete erosion of intranasal structures including the septum, turbinates, lamina papyracea with exposure of the lacrimal duct and medial rectus muscle, and progressive proptosis and gaze restriction. He underwent nasal debridement, with final pathology confirming a diagnosis of pyoderma gangrenosum. The patient was started on high dose steroids.

Conclusion:

Periorbital gangrenosum associated with cocaine use is rare. Cocaine-induced midline destructive lesion (CIMDL) is a well-known manifestation, and can present a diagnostic challenge as the signs and symptoms mimic those of other ulcerative sinonasal pathologies including Granulomatosis with Polyangiitis, atrophic rhinitis, tertiary syphilis, tuberculosis, fungal infections, and lymphoma. We present a case of periorbital pyoderma gangrenosum in association with intranasal cocaine use, with a literature review of sinonasal manifestations of chronic intranasal drug use.

Poster #G115

Outcomes of balloon sinus dilation vs. ESS in CRSsNP: Is the balloon value proposition overinflated?

David Hoying, BS
 Matthew Kabalan, MD
 Raj Sindwani, MD, FARS
 Case Western Reserve University School of Medicine

Introduction:

We aimed to compare long-term rates of revision surgery in patients with chronic rhinosinusitis without nasal polyps (CRSsNP) who underwent primary balloon sinus dilation (BSD) versus primary endoscopic sinus surgery (ESS). We also wanted to better understand the utilization of major healthcare resources between these groups.

Methods:

Retrospective cohort study using TriNetX platform to identify patients with CRSsNP undergoing BSD versus primary ESS. 1:1 propensity matching was performed to balance age and gender in each cohort. Patients were excluded if they had any prior BSD or ESS. Primary outcome was revision surgery rates at 1 and 5 years. Secondary outcomes were rates of hospital admission and emergency department (ED) visits post-procedure; and complications within 30 days.

Results:

After matching, each cohort had 2040 patients. At 1 year, revision ESS rate was 3.9% in the balloon cohort and 4.3% in the ESS cohort (RR = 0.92, 95% CI: 0.683-1.24, $p = 0.58$). Extending follow-up to 5 years, revision rates were 6% in the balloon cohort and 6.8% in the ESS cohort (RR = 0.88, 95% CI: 0.69-1.11, $p = 0.30$). Patients in the balloon cohort had a lower 30-day risk of inpatient admission (RR = 0.20, 95% CI: 0.13-0.26) and ED visits (RR=0.74, 95% CI: 0.55-0.99). No significant difference was observed in rates of CSF leak ($p = 1.0$) and epistaxis ($p = 0.3$).

Conclusion:

No significant difference was observed in revision surgery rates in CRSsNP patients who underwent primary BSD versus ESS after 5 years in this large database study. Findings suggest that in appropriately selected patients, BSD offers a durable response and a favorable value proposition in the management of patients with CRSsNP.

Poster #G116

Outcomes of endoscopic dacryocystorhinostomy in pediatric patients

Maya Hatley, BA
 Ronald S. Wang, Medical Student
 Joyce Khandji, MD
 Seth Lieberman, MD
 Zahrah M. Taufique, MD
 NYU Grossman School of Medicine

Background:

Nasolacrimal duct obstruction (NLDO) in children is typically self-limited. In cases that are refractory to medical and procedural management, the definitive surgical intervention is endoscopic dacryocystorhinostomy (eDCR). Reported revision rates of eDCR in children range from 0 to 22%. The objective of this review is to determine the complication, failure, and revision rates of eDCR in pediatric patients.

Methods:

A systematic review was conducted to evaluate outcomes of primary eDCR in pediatric patients. A comprehensive search was conducted using the Medline, Embase, and Cochrane databases. Studies were included if they investigated outcomes of children undergoing primary eDCR. Two independent reviewers identified relevant studies according to inclusion/exclusion criteria, and discrepancies in selected studies and extracted data were resolved through discussion.

Results:

29 relevant studies were included, involving 1034 ducts in 880 patients. The mean age of these patients was 5.48 years, and the study population was 57.7% male. The total complication rate was 18.74%, with the majority being minor complications such as tube extrusion and synechiae development. Total symptom relief was reported in 77.37% of cases ($n=711$), while operative failure occurred in 9.90% ($n=91$), and revision was performed in 6.28% ($n=57$). The mean follow-up time was 15.58 months.

Conclusions:

eDCR is an effective treatment for NLDO. The revision rate is lower than the surgical failure rate, which may be related to the short follow-up times of some studies or reluctance of patient families to undergo revision operations. Complication and revision rates may underestimate their true values as many studies had small sample sizes.

Poster #G117

Paramaxillary SPA ligation: Landmarks and techniques in cadaveric study

Richa Nathan, BS
Matthew Holdaway
Marcelo Pereira
Jordon Grube, DO
Albany Medical College

Epistaxis is a common emergency in otolaryngology, accounting for 1 in 200 ER consultations. Posterior bleeds often originate from branches of the sphenopalatine artery (SPA), which branches from the internal maxillary artery (Imax). SPA bleeding can lead to airway compromise and aspiration, and achieving hemostasis in posterior epistaxis can be particularly challenging.

Our study involved 10 cadavers (7 male, 3 female) for a total of 20 sides. A 4 cm mucosal incision was made superior to the upper third molar. Mucosa was dissected off the periosteum using a blunt instrument visualized with 0 and 30-degree endoscopes. Dissection continued until reaching the SPA and Imax. Measurements were taken between the zygomaticomaxillary suture (ZMMS), Imax, SPA, foramen ovale (OF), and base of the pterygoid hamulus (BPH) on each side of each head to assess the consistency and generalizability in accessing the sphenopalatine fossa and SPA for SPA ligation.

SPA and Imax ligation was successfully performed on both sides of all 10 cadavers. The average distance from the ZMMS to Imax across all subjects, males, and females was 3.005 ± 0.273 cm, 3.02 ± 0.317 cm, and 2.95 ± 0.176 cm, respectively. The average distance from the ZMMS to OF across all subjects, males, and females was 4.875 ± 0.162 cm, 4.907 ± 0.182 cm, and 4.800 ± 0.063 cm, respectively. The average distance from the BPH to SPA across all subjects, males, and females was 2.750 ± 0.510 cm, 2.843 ± 0.589 cm, and 2.533 ± 0.082 cm, respectively.

The endoscopic paramaxillary approach for SPA ligation using these consistent landmarks with low standard deviations is a feasible and potentially preferable method for SPA ligation, especially in challenging cases of posterior epistaxis.

Poster #G118

Patients with CRSwNP had fewer sinus procedures and less HCRU following Dupilumab initiation

Scott Nash, MD
Joseph K. Han, MD, FARS
Stella Lee, MD
Joshua M. Levy, MD, FARS
Zachary Soler, MD, FARS
Nehal Kamal, Ms.
Mark Corbett, Dr.
Amr Radwan, Dr.
Eastern Virginia Medical School

Background:

This study investigated dupilumab effectiveness in patients with CRSwNP in US real-world practice.

Methods:

This study was based on a retrospective observational cohort of adults with CRSwNP initiating dupilumab 300 mg between 2019 and 2022 using data from the Reg-ENTSM Registry and the OM1 Real World Data Cloud. HCRU was measured during the 12 months pre- and 12 months post-dupilumab initiation.

Results:

1016 patients were included. In the 12 months post- vs pre-dupilumab initiation, fewer patients had nasal endoscopy (47.5% vs 71.2%), debridement (3.6% vs 9.8%), and CT scan (4.5% vs 22.1%) (all $P < 0.001$). Annual mean [SD] number of outpatient visits was lower post- vs pre-initiation (5.0 [5.2] vs 7.1 [6.0]), including: ambulatory (urgent care or day surgery; 1.2 [2.0] vs 1.9 [2.4]), otolaryngologist (3.7 [6.7] vs 4.0 [6.1]) (all $P < 0.001$), and emergency department visits (0.1 [0.6] vs 0.2 [0.6]) ($P < 0.05$). Annual mean [SD] number of hospital days was lower post-initiation compared with pre-initiation (0.5 [6.5] vs 1.0 [16.2]); however, this difference was not significant ($P = 0.110$).

Conclusions:

CRSwNP patients on dupilumab had fewer sinus procedures and lower HCRU following dupilumab initiation vs pre-dupilumab treatment. These findings support the effectiveness of dupilumab in treating patients with CRSwNP in real-world practice.

Poster #G119

Pediatric clival chondrosarcoma

Viraj Shah, MD
Sriram Navuluri, MD
Brett Whittemore, Assistant Professor
Sei Chung, MD
University of Texas at Southwestern

Introduction:

Chondrosarcomas (CS) are rare malignant tumors of cartilage origin that rarely arise in the pediatric population. There have been only 16 cases reported within the head and neck region with most arising from the maxillary sinus and nasal cavity. To our knowledge, this is the first reported case of a clival CS in a pediatric patient.

Case Presentation:

An 11-year-old male presented with progressive right lateral rectus palsy and diplopia. MR brain imaging showed a 5.6 cm clival mass which was biopsied as a grade 1 CS. His case was presented at multidisciplinary skull base tumor board, which recommended surgery and adjuvant radiation therapy (RT). He underwent endoscopic endonasal transsphenoidal resection (TSSR) with a nasoseptal flap reconstruction in conjunction with neurosurgery. Post-operative imaging showed small residual disease along the right dorsal margin of the clivus abutting the posterior aspect of the cavernous segment of the right carotid artery. The patient recovered uneventfully without cerebrospinal fluid leak or complication. Final pathology showed evidence of a grade II CS in small a focus of the specimen, superseding the previous diagnosis. Most recently the patient was seen at his one month follow up and currently undergoing adjuvant proton beam therapy with a dosage of 70.2 gray equivalents (GyE) over 39 fractions.

Discussion:

This is the first reported case of a clival CS in the pediatric population. We demonstrate that TSSR of clival CS should be performed even in cases where negative margins may be unattainable with the goal to reduce the disease burden and limit adjuvant radiation exposure to the cavernous sinus contents and brainstem in pediatric patients.

Poster #G120

Pediatric poorly differentiated chordoma with aggressive cervical and skull base expansion

Michelle Yu, MD, MS
David Liao, MD
Catherine Han, Resident
Rachel Weitzman, Resident
Theresa Scognamiglio
Ashutosh Kacker, MD
Douglas Phillips
New York-Presbyterian Hospital

Background:

Poorly differentiated chordoma (PDC) is an extremely rare tumor of soft tissue and bone that arises from the axial skeleton region. Given the scarcity of cases—approximately 60 documented cases cited in most recent literature—there is limited information on management and outcomes. Only more recently has the tumor been recognized to have a distinct molecular and clinical profile compared to conventional chordomas. Importantly, this tumor subtype is associated with significantly decreased survival and calls for vigilance and aggressive multimodality therapy, therefore making timely and accurate diagnosis paramount to management of this tumor.

Case:

An 8 month old girl was brought to the hospital for 2 weeks of neck stiffness and head tilt. Imaging showed a 5.6 cm clival mass, extending from C3 to sella. A transoral biopsy was performed and frozen section was suggestive of possible hematologic malignancy. Surgical pathology with immunostaining then suggested an INI-negative malignant rhabdoid tumor versus chordoma. Brachyury stain confirmed chordoma diagnosis. The tumor was also found to be PDL-1 positive with a combined positive score of 90. The patient was found to have likely pulmonary metastases on imaging, and due to the unresectable extent of the tumor she was started on chemotherapy with vincristine, doxorubicin, dexrazoxane, and cyclophosphamide.

Conclusion:

PDC can be challenging to diagnose histologically and is an aggressive type of chordoma with poor survival. This case contributes valuable information on presentation, histology, and management of this exceedingly rare tumor."

Poster #G121

Pediatric sinusitis trends and COVID-19

Claire Chapel, MD
Romaine Johnson, MD
Felicity Lenes-Voit, MD

The advent of the COVID-19 pandemic in 2020 led to the adoption of masking, hand hygiene, and other non-pharmaceutical interventions (NPIs) in the general population. We sought to understand changes in the incidence and severity of sinusitis in the pediatric population before, during, and after the COVID-19 pandemic.

A retrospective review of a tertiary pediatric health system was performed to analyze pediatric emergency department and inpatient admissions for acute sinusitis. A total of 174,967 cases with an admission diagnosis of acute sinusitis were queried and separated into three time periods: pre-COVID (39.1%), COVID (11.0%), and post-COVID (50.0%). Severe cases were defined by ICU admission, length of stay greater than 3 days, requiring mechanical ventilation, brain abscess, or orbital cellulitis. The mean age in the cohort was 4.01 years (SD 4.29). A total of 5,781 (3.3%) of cases were classified as severe. There was a 62.7% decrease in average monthly sinusitis cases during the COVID period compared to the pre-COVID period. The post-COVID average monthly cases rebounded to only 75.7% of the pre-COVID average. A strong seasonal association with sinusitis cases was noted pre-COVID; this trend was not identified during the COVID or post-COVID eras. The average monthly severe sinusitis cases decreased by 30% in the post-COVID period.

This study highlights not only the decrease in incidence but a change in seasonal trends of sinusitis in the pediatric population following COVID-19. These results suggest that widespread adoption of NPIs may have lasting effects on the epidemiology of pediatric upper respiratory infections.

Poster #G122

Personalized surgery in allergic fungal rhinosinusitis

Shabih Jafri, Medical Student
Ryan Durgham, MPH
Vinay Rathi, MD
Shaun Nguyen, Dr.
Alexander Duffy, MD
Zachary Soler, MD, FARS
Rodney Schlosser, MD, FARS
Medical University of South Carolina

Introduction:

Allergic fungal rhinosinusitis (AFRS) often has unilateral or asymmetric disease. In cases with minimal disease on one side, the question remains as to the necessary extent of surgery. This study investigated the relationship between symmetry and clinical characteristics in AFRS patients, with a focus on implications for surgical management.

Methods:

Patients with AFRS managed surgically from 2012-2024 were reviewed. Disease severity was categorized as no/mild ($LM < 4$) or moderate/severe ($LM \geq 4$) per side. Asymmetry was defined as a Lund-Mackay (LM) score difference of > 2 between sides. We categorized extent of surgery into no/limited (< 2 sinuses) or extensive/full (> 2 sinuses) per side. Patient characteristics were compared between groups, revision rates were compared by severity and extent of operation.

Results:

Among 112 patients analyzed, the symmetric group ($n = 41$, 36.6%) trended towards older age (29.7 vs 24.6; $p = .052$) and male sex (62.0% vs 42.3%; $p = .087$). In moderate/severe disease, all sinuses showed similar rates of disease ($\geq 86.5\%$), while in mild disease maxillary and ethmoid sinuses were more frequently involved (55-58%). Mildly diseased sides had recurrence rates of 19% and 22% with limited and extensive surgery respectively, without significant difference, while 15% of sides with moderate/severe disease had recurrence following extensive surgery. Of 8 sides with $LM=0$ only 1 (12.5%) patient required revision.

Conclusion:

A surgical approach based on diseased sinus involvement in patients with limited disease may be appropriate, without increasing risk of recurrence risk. The overall recurrence rate of 17% underscores the need for surveillance regardless of surgical extent or disease severity.

Poster #G123

Pituitary tumor size and STOP-BANG score in endoscopic endonasal surgery

Edward Harwick, BS
 Andrea Xu, Medical Student
 Nathan Zwagerman
 Lauren North, MD

Introduction:

Obstructive sleep apnea (OSA) is a known complication of pituitary adenomas, often secondary to Cushing's disease or acromegaly. The STOP-BANG questionnaire, a validated OSA screening tool, may aid in perioperative management of patients undergoing endoscopic endonasal approach (EEA) surgery for pituitary adenoma resection. There is a limited understanding of the relationship between tumor size and EEA outcomes with respect to STOP-BANG score.

Methods:

Single-institution, retrospective chart review of patients who underwent EEA surgery for pituitary adenomas from 2017 to 2023. Preoperative STOP-BANG score and surgical variables were extracted from patient charts. Pre-operative MRI was used to measure tumor size. T-tests (95% CI) assessed outcomes in macro- vs. microadenomas, while linear regression evaluated the relationship between STOP-BANG scores and tumor volume.

Results:

A total of 264 patients underwent EEA surgery, with 83% having macroadenomas. Postoperative complications occurred in 3% of cases (n = 8), primarily CSF leaks (5/8). Reoperation was required in 10.6% of cases (n = 28), significantly associated with tumor volume (mean for reoperated tumors = 2.23 cm³ vs. 6.6 cm³ for non-reoperated tumors, p = 0.04). STOP-BANG scores were not significantly associated with reoperation (p = 0.65) or tumor volume (p = 0.09). However, patients with macroadenomas had higher STOP-BANG scores (3.1) than those with microadenomas (2.6, p = 0.05).

Conclusion:

Patients with pituitary macroadenomas may have a higher risk of OSA-related comorbidities, as indicated by increased STOP-BANG scores. These findings underscore the potential benefit of preoperative OSA screening and management in patients with macroadenomas.

Poster #G124

Post-COVID increases in intracranial complications from pediatric sinusitis and otitis

Pranav Patel, BS
 Asher Ripp, Mr.
 Shaun Nguyen, Dr.
 Alexander Duffy, MD
 Zachary Soler, MD, FARS
 Ramin Eskandari, Dr.
 Rodney Schlosser, MD, FARS
 Medical University of South Carolina

Objective:

This scoping review aims to evaluate the prevalence of intracranial complications in children following sinogenic or otogenic infection prior to and after the COVID-19 pandemic.

Methods:

A systematic search of CINAHL, Cochrane Library, PubMed, and SCOPUS was conducted in accordance with the PRISMA guidelines for Scoping Reviews. Primary outcome measures included continuous measures (mean), proportions (%), and comparison of proportions ($\Delta\%$) with 95% confidence intervals (CI).

Results:

Of 1,025 abstracts screened, 18 studies were included. The average age of the pre- and post-COVID cohort was 6.81 years (range 3.2 – 16.7) and 8.78 years old (range 2.2 – 18), respectively. Males comprised 60.6% (95% CI: 53.1 – 67.9) of the pre-COVID cohort and 64.2% (95% CI: 59.7 – 68.6, p = 0.87) of the post-COVID cohort. There was an increase in post-COVID neurologic deficits [11.4% (1.6 – 53.0) vs 50.1% (13.9 – 86.2), p < 0.01], cerebral venous sinus thrombosis (CVST) [14.1% (10.6 – 18.2) vs 40.5% (25.2 – 56.9), p < 0.01], intraparenchymal abscess [40.3% (43.9 – 72.2) vs 54.9% (25.2 – 87.1), p < 0.01], and meningitis [10.6% (0.0 – 39.4) vs 40.2% (13.4 – 70.8), p < 0.01]. There was increased use of metronidazole [38.7% (31.8 – 46.0) vs 71.9% (51.3 – 88.6), p < 0.01], craniectomy [16.1% (1.3 – 42.8) vs 37.4% (2.9 – 83.0), p = 0.02], and burr holes [16.8% (11.5 – 23.3) vs 26.6% (12.7 – 43.3), p = 0.02] in the post-COVID cohort.

Conclusion:

There are considerable differences in neurologic deficits, CVST, intraparenchymal abscesses, meningitis, and treatment modalities of pre- and post-COVID cohorts of children with otorhinogenic intracranial complications. Further research is required to determine the mechanism causing these differences.

Poster #G125

Postoperative complications of nasal surgeries in dysautonomia

Emaan Dawood, MS3

Arman Saeedi, Research Fellow

Theodore Schuman, MD, FARS

Disorders of autonomic dysregulation appear increasingly prevalent and associated with chronic rhinosinusitis (CRS). It is unclear whether autonomic dysfunction portends a riskier postoperative course in CRS patients undergoing nasal surgery.

A TriNetX analysis was conducted on two groups with CRS undergoing either Functional Endoscopic Sinus Surgery, Septoplasty, or Inferior Turbinate Reduction: with and without dysautonomia to determine measures of association. Cohorts were propensity-matched based on age, gender, race, and dysautonomia-associated diseases like fibromyalgia, mast cell activation, migraine, anxiety, depression, and Ehlers-Danlos syndrome. Another analysis was also performed without matching these diseases.

Main outcome measures were: ED utilization, inpatient admission, CSF leak, epistaxis, hypotensive episodes, ICU admission, and use of opioids, neuropathic medications, antibiotics, benzodiazepines, muscle relaxants, steroids, and IV fluids within 90 days of surgery. After matching, both groups contained 1,122 patients. The dysautonomia group had a higher risk of epistaxis (OR: 2.03; CI: 1.13, 3.66; $p=.016$) and neuropathic medication use (OR: 2.92; CI: 1.35, 6.31, $p=.005$).

Without matching the diseases specified above, the dysautonomia group had a higher risk of neuropathic medication use (OR: 2.36, CI: 1.22, 4.56; $p=.009$) only. Patients with CRS and dysautonomia are at a greater risk of postoperative epistaxis and pain medication use, suggesting a prolonged recovery process and increased pain sensitivity potentially related to dysautonomia.

The results further strengthen the association between dysautonomia and CRS outcomes but further research is needed to determine the exact mechanism of this relationship.

Poster #G126

Postoperative CSF leak secondary to early CPAP use following anterior skull base resection

Marcin Marciniak, BS

Sean Setzen, Dr.

Vidit Talati, MD

Glen D'Souza, MD

Bobby Tajudeen, MD, FARS

Pete Batra, MD, FARS

Rush University

Introduction:

Continuous positive airway pressure (CPAP) therapy is standard of care for obstructive sleep apnea (OSA) but is often discouraged after skull base surgery due to serious potential risks. Halting CPAP can negatively impact patients' quality of life and worsen postoperative cardiopulmonary complications. Identifying appropriate timing to resume CPAP following extended skull base approaches is essential, as recent literature mainly explores early CPAP safety after transsphenoidal surgery.

Case:

We report a 51-year-old male with OSA who developed a post-operative cerebrospinal fluid (CSF) leak from pre-emptive CPAP use following endoscopic ethmoid skull base and inverted papilloma resection. Dura remained intact without an intraoperative CSF leak and bilateral nasoseptal flaps (NSF) were used for skull base coverage. Despite counseling on CPAP avoidance, the patient restarted CPAP on POD21 and developed clear rhinorrhea. Computed tomography showed mild pneumocephalus. Urgent exploration revealed a right lateral lamellar dural tear and the NSF had separated in the midline. This was repaired with abdominal fat and NSF repositioning. The patient recovered well and was cleared for CPAP use on day 57 after repair without further issues.

Discussion:

Initial NSF positioning may have introduced a linear area of weakness in the repair in the midline. This case highlights the complexities and potential risks of resuming CPAP early after extended skull base approaches, for which standardized guidelines are lacking. Effective postoperative care is crucial for balancing CPAP benefits with risks, underscoring the need for further research on CPAP transmission to the anterior cranial fossa to optimize perioperative patient outcomes.

Poster #G127

Postoperative healthcare utilization and outcomes in radiation-induced CRS after ESS

Jaynelle Gao
Kevin Hur, MD

Objectives:

To evaluate postoperative healthcare utilization and outcomes in patients with radiation-induced chronic rhinosinusitis managed with endoscopic sinus surgery.

Study Design:

Retrospective cohort study

Methods:

The TriNetX US Collaborative Network was queried for patients greater than 18 years of age with a diagnosis of nasopharyngeal carcinoma or nasal cavity malignancy and a first-time diagnosis of chronic sinusitis at least three months after radiation therapy. Patients were stratified based on subsequent management with endoscopic sinus surgery (ESS) vs. no ESS. Measures of association were calculated after 1:1 propensity score matching for age, sex, and race. Patients were followed for five years.

Results:

Patients with radiation-induced CRS (rCRS) managed with ESS had a higher frequency of oral antibiotic use (74% vs. 60%, $p < 0.0001$) and oral steroid use (37% vs. 24%, $p < 0.0001$) postoperatively when compared to patients with rCRS without ESS. Patients with rCRS managed with ESS had a lower frequency of having a subsequent emergency department visit (22% vs. 28%, $p = 0.041$) and a lower likelihood of mortality within five years (OR 0.59, 95% CI [0.43, 0.83]).

Conclusion:

Management of rCRS with ESS is associated with increased oral medication use, decreased ED visits, and decreased likelihood of five-year mortality.

Poster #G128

Postoperative outcomes CSF leak repair

Matthew Liu, MD
Philip Chen, MD, FARS
University of Texas Health San Antonio

Background:

Surgical repair of the skull base defect in spontaneous cerebrospinal fluid (CSF) leaks is crucial to prevent meningitis. Previous postoperative outcomes research has focused on the recurrence of CSF leak with a paucity of data evaluating other common postoperative complications. The objective of this study was to examine the postoperative outcomes after repair of spontaneous CSF leaks using a nationally representative surgical database.

Methods:

A retrospective cohort study was performed of patients undergoing repair of spontaneous CSF leaks using the 2015-2021 American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP). The incidence of postoperative complications and risk factors were investigated.

Results:

One-hundred sixty-five subjects were included. The most common postoperative complications were prolonged hospital stay (9%), unplanned readmission (6%), and unplanned reoperation (4%). Surgical site infection (2%), wound dehiscence (1%), pneumonia (1%), unplanned intubation (1%), pulmonary embolism (1%), prolonged ventilation (1%), urinary tract infection (1%), postoperative blood transfusion (1%), deep vein thrombosis (1%), sepsis/septic shock (1%) were less common. Non-independent functional status ($P = 0.005$) was significantly associated with postoperative complications even after controlling for relevant confounders.

Conclusion:

Postoperative complications after repair of spontaneous CSF leaks are rare, with the most common being prolonged hospital stay, readmissions, and reoperations. Decreased functional status increases the risk of complications after repair of the skull base defect.

Poster #G129

Predictive value of postoperative patient outcomes for eustachian tube balloon dilation

Alexander Gomez-Lara, BA, BS

Emilie O'Banion

Jagatkumar Patel, MD

David Keschner, MD, FARS

Kaiser Permanente Bernard J. Tyson School of Medicine

Introduction:

Eustachian tube dysfunction (ETD) presents with ear symptoms that can be addressed with an endoscopic balloon dilation of the eustachian tube. To assess symptom score, a seven-item Eustachian Tube Dysfunction Questionnaire (ETDQ-7) is performed before the surgery and at two different follow up times. In this study, we hope to identify the use of two follow up appointments at our single medical center.

Methods:

We conducted a cross-sectional study at a single medical center with a single physician panel to analyze ETDQ-7 score at baseline, six week follow up, and twelve week follow up visits, for patients who underwent an endoscopic balloon dilation of the eustachian tube from 2017 to 2024. Paired t-tests and repeated measures ANOVA were performed to examine the effect of follow-up time on the ETDQ-7 score.

Results:

28 patients who underwent endoscopic balloon dilation of the eustachian tube were included (female 50%, mean age 51; 82% non-Hispanic White, 7.1% Hispanic, 7.1% Asian, 3.6% Black). From the repeated measures ANOVA, the main effect of follow-up time was significant, $F(2, 80) = 17.5$, $p < .001$. Post-hoc tests revealed patients had a statistically significant difference in mean scores at baseline ($M = 32.3$, $SD = 8.2$) versus six weeks ($M = 21.4$, $SD = 8.3$; $t(27) = 5.8$, $p < .001$) and baseline versus twelve weeks ($M = 20.6$, $SD = 8.3$; $t(27) = 6.5$, $p < .001$), but no significant difference between scores at six versus twelve weeks ($t(27) = 0.5$, $p = .63$).

Conclusion:

Patients had a statistically significant difference between baseline versus six weeks and baseline versus twelve weeks, but not between six and twelve weeks. These results can inform guidelines to move forward with a twelve week follow up only.

Poster #G130

Predictors of surgical intervention in patients with recurrent acute rhinosinusitis

Chadi Makary, MD, FARS

Ruifeng Cui, PhD

Obadah Tolaymat

West Virginia University

Introduction:

The need for surgical intervention in patient with recurrent acute rhinosinusitis (RARS) is not well defined. The goal of this study is to understand the different factors that predicts the need for surgical intervention in patients with RARS.

Methods:

Retrospective cohort study of adult patients presenting with RARS with at least one objective evidence of rhinosinusitis. Patients' characteristics and comorbidities were reviewed. The 22-items sinonasal outcome test (SNOT-22) and endoscopy scores were collected at baseline and follow up visits. Surgical intervention consisted of septoplasty, functional endoscopic sinus surgery (FESS), or both.

Results:

The sample consisted of 158 patients with RARS, of whom 42 underwent surgical intervention. Patients were predominantly middle aged (45.9 \pm 17.8 years) and female (68.4%) with 27.2% being current or former smokers and 58.2% having septal deviation. Common medical comorbidities included asthma (36.1%), allergic rhinitis (63.9%), primary antibody deficiency (14.6%), and obstructive sleep apnea (21.5%). Compared to patients who did not undergo surgery, surgical patients tended to be current or former smokers (41.9% vs 20.9%, $p < 0.01$), have septal deviation (32.6% vs 16.9%, $p = 0.03$) and had significantly higher Lund-Mackay CT scores (4.4 \pm 5.1 vs 2.1 \pm 3.4; $p < 0.01$) and Lund-Kennedy endoscopy scores (3.9 \pm 3.2 vs 2.5 \pm 2.9; $p = 0.04$). Surgical patients also had higher SNOT scores prior to surgery as compared to medical patients, however this difference was only marginally significant (56.1 \pm 20.1 vs 50.1 \pm 18.1; $p = 0.08$).

Conclusion:

RARS patients who proceed to surgical intervention have higher objective disease burden including evidence of septal deviation, higher

Poster #G131

Preoperative computed tomography for dacryocystorhinostomy: Practice patterns and outcomes

Tissiana Vallecillo, MS

Samuel Fallon

Jeffrey Graves, Medical Student

Anab Mohamed

Lilly Wagner, MD

Janalee Stokken, MD, FARS

Mayo Clinic Alix School of Medicine

There are no guidelines for CT use in pre-op planning for dacryocystorhinostomy (DCR). We describe pre-op CT use by rhinologists and oculoplastic surgeons, associated imaging findings and outcomes.

Our retrospective study includes DCRs by oculoplastic surgeons and rhinologists at a multi-site academic center from 2013-2022. We collected patient characteristics, surgeon subspecialty, anatomical variants, and outcomes in cases with maxillofacial or orbital CT on file. Descriptive statistics and Chi-square tests were used.

Of all DCRs, 13.5% had a CT ordered for pre-op planning ("CT orders") and 18.7% had an existing CT reviewed ("CT reviews"); 81.3% had a CT within 5 years pre-surgery but no review. Rhinologists ordered and reviewed pre-op CTs more than oculoplastic surgeons (orders: 54 v 23%, $p<0.01$; reviews: 71 v 36%, $p<0.01$). CT use was similar between revision and primary surgeries (orders: 35 v 40%, $p=0.8$; reviews: 52 v 54%, $p=0.5$).

Among patients with functional success, 104/237 (43.9%) had pre-op CTs ordered, compared to 21/61 (34.4%) with functional failure ($p=0.1$). CT order or review did not affect overall functional success (76.4 v 81.7%). However, in patients with sinonasal pathology, pre-op CT review correlated with higher functional success (91.6 v 67.9%, $p<0.05$).

Anatomical variants potentially associated with DCR failure were present in 43% of our cohort, and not significantly more common in cases with or without CT use.

CT imaging in pre-op DCR planning is underutilized, yet review may improve outcomes in patients with sinonasal pathology. Rhinologists' higher CT use may reflect greater awareness of sinonasal variants that may impact success. Surgical plan changes due to imaging findings warrant further study.

Poster #G132

Prescription patterns of topical antibiotic irrigation after sinus surgery in refractory CRS

Bastien Valencia, MD

Prishae Wilson

Christopher Jabbour, MD

Najmi Natasha

Angela Donaldson, MD, FARS

Janalee Stokken, MD, FARS

Mayo Clinic Florida

Background:

A substantial portion of chronic rhinosinusitis (CRS) patients have symptoms that remain refractory to endoscopic sinus surgery (ESS). Although controversial, the use of topical antibiotic irrigations may be considered for these patients. To date, limited information exists on patient characteristics, antibiotic compositions, dosages, treatment duration, and efficacy of these therapies. This study investigates the prescription patterns of topical antibiotic irrigations following ESS in refractory CRS patients.

Methods:

A multi-site retrospective chart review was conducted on patients with CRS refractory to ESS, focusing on prescription patterns of topical antibiotic irrigations. Demographics, comorbidities, and symptomatologic, microbiologic, and serologic data were systematically collected.

Results:

A total of 105 patients met inclusion criteria, with a M:F ratio of 1:0.78 and a mean age of 57.2 ± 14.4 years. Of these, 79 (75.2%) had CRS without nasal polyps, and 26 (24.8%) had CRS with nasal polyps. At least one comorbidity associated with secondary immunodeficiency was present in 81 patients (77.1%). The most commonly prescribed topical antibiotic was mupirocin (43.8%), followed by tobramycin (21.0%) and gentamicin (18.1%). The average treatment duration was 7.2 ± 9.8 weeks (range 1-81). Infection resolved in 61 patients (58.1%), while 27 (25.7%) had persistent symptoms despite treatment.

Conclusion:

Prescription patterns of topical antibiotics for refractory CRS following ESS are highly variable. A quarter of patients experienced persistent symptoms despite treatment, highlighting the need for standardized treatment guidelines.

Poster #G133

Primary chordoma of the posterior nasal septum in a pediatric patient

Hans Baertsch, MD

Kolin Rubel, MD

Yuna Kim, Fellow

Andrew Redmann, Assistant Professor

Chordomas are rare malignant neoplasms derived from notochord remnants of the axial skeleton, most consistently associated with the clivus. While extension anteriorly into the paranasal sinuses and nasal cavity is common, primary chordomas originating from and isolated to these areas are exceedingly rare, especially in the pediatric population.

We report the first case to our knowledge of primary chordoma of the posterior nasal septum in a 14-year-old female masquerading as nasal polyps. Primary treatment was carried out via endoscopic resection with no evidence of skull base or clival involvement. A primary subtotal resection was achieved, and the patient was asymptomatic without any complications postoperatively. Postoperative PET/CT was performed after discussion with oncology and was negative for residual avid foci. However, postoperative MRI demonstrated a small foci of lucency at the posterior nasal septum, and subsequent biopsy was found to be positive for residual chordoma. Adjuvant treatment with proton beam radiation was recommended by radiation oncology.

The tumor characteristics, diagnosis, and treatment are discussed in the context of similar reported cases to clarify their place in the differential diagnosis of pediatric sinonasal masses and to guide optimal treatment.

Poster #G134

Prognosis of chemosensory recovery among Long COVID-19 patients -- 3- and 6-month follow-ups

Lauren Gastineau, BS

Shivani Patel, BS

Veronica Formanek, BS

Ahmad Odeh, BS

Nidhi Jha, BS

Christopher Simons, PhD

Kai Zhao, PhD

Ohio State University

Introduction:

Chemosensory dysfunction is a hallmark symptom of COVID-19 infection, with many patients experiencing symptoms beyond initial infection. This ongoing study aims to capture the timeline in chemosensory recovery following post-acute sequelae of SARS-CoV-2 infection (PASC).

Methods:

This preliminary analysis includes 20 patients (30-74 years old, median 55.5) who contracted COVID-19 from 3/2020 to 11/2023, 8-47 months (median: 29) prior to the initial visit. All then completed a 3-month follow-up, with 12 completing a 6-month follow-up. Patients received objective testing of 1) smell function using the 9-Item NIH Toolbox Odor Identification (ID) Test, detection threshold (ODT) to phenyl-ethyl alcohol (PEA), and retro-nasal flavor identification (candy test); 2) taste function using the modified NIH toolbox.

Results:

Patients self-reported a high prevalence of smell (75%) and taste (65%) losses. 75% confirmed objective smell loss, while only 25% exhibited objective taste loss. At 3-month follow-up, patients exhibited significant improvements in objective taste (NIH toolbox, $p=0.0246$) and smell (Odor ID, $p=0.0247$) function, yet the number of patients exhibiting objective chemosensory losses remained high (smell 72%, taste 10%). From 3- to 6-month follow-up, patients showed significant decline in objective taste ($p=0.0496$) function.

Conclusion:

These findings suggest significant fluctuations in chemosensory function following COVID-19 infection, with prognosis prolonged and uncertain, and self-report being unreliable, especially for taste loss. Future work will continue to evaluate smell and taste for a larger sample size and longer time duration.

Poster #G135

Prolonged topical nasal decongestant usage

Marn Joon Park, MD, MS

Inha University Hospital, Inha University College of Medicine

Introduction:

Topical nasal decongestants (TNDs), commonly available as over-the-counter (OTC) drugs globally, are often sought to immediate relief of nasal obstruction, despite concerns and risks of rhinitis medicamentosa, psychological dependency, and cardiovascular side effects. This study assesses the frequency and patterns of prolonged TND use and explores differences in clinical features between prolonged TND-users and non-users in patients seeking academic rhinology practice.

Methods:

From June to December 2022, new patients at a senior author's rhinology clinic were surveyed about their use, duration, and frequency of OTC-TNDs, along with their past medical history and initial nasal symptoms. Patients reporting consecutive TND use for over one week were classified as prolonged TND-users. Additionally, sinus CT images and nasal cavity volumes measured by acoustic rhinometry were analyzed.

Results:

Out of 383 patients, 77 (20.1%) were identified as prolonged TND-users. No significant demographic differences were observed, except TND-users had a higher prevalence of autoimmune diseases, prior sinonasal surgeries, especially turbinate surgeries, and higher rates of both allergic and non-allergic rhinitis, compared to non-users who more commonly had chronic rhinosinusitis (CRS) (all $p < 0.05$). There were no significant differences in nasal symptom scores, nasacavity volume, septal deviation, or sinus opacification. Notably, prolonged TND-users exhibited a paradoxically wider internal nasal valve (INV) angle on the narrower side (11.1°) compared to non-users (9.7°) ($p = 0.007$).

Conclusion:

Our results emphasize the importance of reviewing patients' medication history on TND, to ensure a more comprehensive patient management.

Poster #G136

WITHDRAWN

Poster #G137

Psammomatoid juvenile ossifying fibroma (PJOF)

Sahil, MBBS

Pt. B. D. Sharma PGIMS, Rohtak

In the past, ossifying fibroma and fibrous dysplasia were traditionally grouped together because of their histologic similarities. But now they are regarded as different entity. Juvenile ossifying fibroma (JOF) is an uncommon fibro-osseous lesion with highly aggressive clinical behavior, higher incidence in young adults, and a strong tendency to recur. Psammomatoid juvenile ossifying fibroma (PJOF) is a benign condition that mainly affects the paranasal sinuses and periorbital bones. It frequently manifests as space-occupying lesion. Endoscopic findings are usually unremarkable, or they may consist of a lesion covered by intact mucosa, as with osteoma. It requires radical resection, in view of both the high rate of relapses and the aggressive behavior of recurring tumors.

Herein, I describe the clinical presentation and surgical approach of an extensive PJOF arising in the sphenoid sinus of an 11-year-old male.

Poster #G138

Psychedelics and sensory function

Angela Kaczorowski-Worthley, BSN

Jennifer Villwock, MD

Naomi Wang, Research Fellow

University of Kansas Medical Center

Introduction:

Sensory dysfunction represents significant morbidity and contributes to mortality in many conditions from depression to diabetes to traumatic brain injury. Treating sensory loss is crucial for mortality benefit and improving quality of life. Sensory dysfunction remains poorly understood and difficult to treat. Psychedelics exert their effects on sensory perception, cognition, and consciousness. In this narrative review, the known neuroanatomical effects of psychedelics on sensory function will be explored.

Methods:

Psychedelics under investigation as pharmaceuticals were identified using ClinicalTrials.gov, DoD, and NIH. A PubMed search was conducted using search terms of identified psychedelics, neuroanatomic studies, and sensory function. Primary studies and reviews were included. Animal studies were excluded unless there were no relevant human studies available. Studies not related to the neuroanatomic effects of psychedelics were excluded.

Results:

Search returned 1811 articles.

Discussion:

The neuroanatomical alterations induced by psychedelics are crucial to understanding their phenomenological effects and potential therapeutic applications. Alterations in sensory gating, data integration and cortical desynchronization may contribute to potential therapeutic benefits of psychedelics. Increased neuroplasticity and modulation of sensory processing, particularly in the thalamocortical and cortico-cortical networks, may underlie the therapeutic potential of psychedelics in treating sensory dysfunction.

Conclusion:

Understanding quantitative findings, such as changes in sensory function, that correlate with treatment represents an unleveraged opportunity to monitor the impact of psychedelic treatment.

Poster #G139

Racial and gender disparities in chronic rhinosinusitis treatment

Christina Zhu, BS
Wynne Zheng
Christopher Guirguis, Dr.
Daniel Spielman, MD

Objective:

To evaluate disparities in the management of chronic rhinosinusitis (CRS) across racial, ethnic, and gender groups, focusing on treatment differences and associated comorbidities.

Methods:

We analyzed the NIH All of Us database, including 28,278 patients diagnosed with CRS between 2018 and 2022. Treatments assessed included: systemic steroids, topical steroids, leukotriene modifiers, antibiotics, biologics, endoscopic sinus surgery, and balloon dilation. Multivariate logistic regression evaluated the relationship between treatment modalities and patient factors such as race, gender, ethnicity, CRS subtype (CRSwNP vs. CRSsNP), and comorbidities (asthma, allergic rhinitis, AERD, smoking history).

Results:

Significant racial and gender disparities in CRS management were observed. Black patients had higher odds of receiving systemic steroids (OR: 1.59, $p < 0.0001$) and antibiotics (OR: 1.67, $p < 0.0001$) but lower rates of biologic use (OR: 0.30, $p = 0.051$) and sinus surgery (OR: 0.67, $p = 0.016$) compared to other groups. Hispanic individuals had lower odds of sinus surgery (OR: 0.67, $p = 0.016$). Men were more likely to undergo surgery (OR: 1.37, $p < 0.0001$) but less likely to receive medical treatments compared to women.

Conclusion:

The study highlights disparities in CRS care, with Black and Hispanic patients facing differences in treatment access and management approaches. Addressing these gaps requires targeted strategies to improve equity in CRS treatment and outcomes.

Poster #G140

Real-world study of FDA-approved and off-label use of biologics in chronic rhinosinusitis

Nitish Kumar, MBBS, MS
Devyani Lal, MD, FARS
Pedro Lanca Gomes, MD
Amar Miglani, MD
Mayo Clinic – Arizona

Background:

RCTs of biologics in CRS were conducted on patients with significant polyp burden who had failed ESS. We investigated FDA-approved and off-label use of biologics for CRS in a real-world setting.

Methods:

Universal health records of a multi-state health system were reviewed (2016-2024) to study characteristics and outcomes of CRS patients on biologics.

Results:

234 CRS patients on biologics were identified [CRSwNP:202(86.3%); CRSsNP:32(13.7%)]. Asthma was present in 91.8% (CRSwNP:93.1%; CRSsNP:90.6%). SNOT-22 scores [Median(IQR)] improved meaningfully in the overall group [pre-biologic:43(28-57) vs. post:31(17-48); $p < 0.001$]. Post-biologic Lund-Mackay CT scores ($n=132$) significantly improved over pre-therapy scores ($n=169$) overall and in CRSwNP groups. In CRSsNP, no significant improvement was noted in CT scores [pre-biologic:6(1-13), $n=17$ vs. post:8(3-12), $n=23$]; $p=0.26$ or SNOT-22 scores [pre-biologic:61(52-62), $n=6$ vs. post:40.5(29-55), $n=22$]; $p=0.37$. Prior ESS had been performed in 75.6% patients. At median 47.5(25-72) months follow-up, 79 patients (33.7%) underwent further ESS, most commonly in EGPA (51.4% of patients) followed by unspecified CRSsNP (33.3%), CRSwNP (26.6%), AFRS (20%) and AERD (20%) patients. Upfront biologic was used in 24.4% ($n=57$; 36 CRSwNP, 21 CRSsNP); proportions by subtype included- CRSsNP:65.6%, EGPA:21.6%, unspecified CRSwNP:20.3% and AERD:8.7%. Of these 57 patients, 31 (54.4%) underwent subsequent ESS.

Conclusions:

In the real-world setting, CRSwNP was the most common indication for biologics. Asthma co-morbidity drove biologic use in CRSsNP patients with overall non-significant changes in CT or SNOT-22. Up-front biologic, used in 24.4%, was followed by surgery in half the patients.

Poster #G141

Recreational drug use & chronic rhinosinusitis

Grant Primer, Medical Student
 Rachel Akers, MS
 Thomas Cyberski, Resident Physician
 Ali Baird, Dr.
 Pete Batra, MD, FARS
 Peter Filip, MD
 Peter Papagiannopoulos, MD
 Bobby Tajudeen, MD, FARS
 Rush University Medical Center

Background:

Chronic rhinosinusitis (CRS) is a condition that impacts millions. Mucosal irritants, like allergens and bacteria, contribute to disease pathogenesis and produce distinct histopathological features. However, the literature on the impact of illicit drug use on CRS histopathology remains limited. This retrospective study identified CRS patients with history of drug use to further understand unique histopathological features.

Methods:

Patients with diagnosis of CRS and documented substance use who underwent endoscopic sinus surgery were included in the study. Demographics, type of substances used, and structured histopathology reports were collected. Data was compared to CRS control groups through Chi-square testing.

Results:

13 patients with a history of substance use were identified. Heroin, methamphetamine, cannabis and phencyclidine users were present; some used more than one drug. Most patients were White (69.2%) and male (76.9%). Subepithelial edema (53.8% vs 26.6%, $p=0.03$) and basement membrane thickening (69.2% vs 30.8%, $p=0.006$) were both significantly more common amongst the drug user group when compared with non-users. Drug users also had higher prevalence of fibrosis (38.5% vs 17.6%, $p=0.06$). No significant differences were found between other histopathological features.

Conclusion:

CRS patients with history of substance use had a higher prevalence of subepithelial edema, basement membrane thickening and fibrosis than those with CRS without a history of substance use. These findings suggest a higher level of acute and chronic sinonasal inflammation amongst drug-using patients. Future studies in this population are necessary to establish how these differences may impact management of CRS.

Poster #G142

Recurrent acute rhinosinusitis and anatomical variations

Harel Sofer, MD
 Narin Nard Carmel Neiderman, MD, MSc
 Avraham Abergel, MD
 TASMC

Introduction:

Recurrent Acute Rhinosinusitis (RARS) is characterized by multiple episodes of acute rhinosinusitis fully resolving between occurrences. Unlike chronic rhinosinusitis, RARS does not involve continuous symptoms or long-term inflammation. Variations of the sinonasal anatomy are wary to play a role in the pathophysiology of RARS. We aim to investigate the rate of anatomical variations among patients suffering from RARS and assess the odds ratio (OR) of anatomical variations among RARS patients versus healthy individuals.

Materials and Methods:

Meta-analysis. Screening the published literature by searching Base, Web of science and Pubmed databases. Measures: Pooled estimates of rate and OR, calculated by using random and fixed-effect models.

Results:

The literature search identified 444 records after removing duplicates, of which 5 studies met the inclusion criteria, encompassing 664 patients. Pooled proportion of nasal septum deviation, concha bullosa and Haller cells among patients with RARS was 0.73 [CI: 0.385, 0.972], 0.410 [CI: 0.3, 0.52] and 0.34 [CI: 0.21, 0.48] respectively. Pooled odds ratio of concha bullosa and Haller cells among patients with RARS versus healthy subjects were 1.1 [CI: 0.66, 1.87] and [CI: 0.59, 1.78] respectively, without significant differences.

Conclusions:

Our meta-analysis found a high pooled rate of anatomical variations among patients with RARS, however, no statistically significant differences were found between patients with RARS and healthy controls. This result suggests that anatomical variants may not be associated with the pathology of RARS. Further study is indicated to decipher their possible pathophysiological role in RARS.

Poster #G143
WITHDRAWN

Poster #G144
Retrospective review of post-irradiated nasopharyngeal carcinoma patients with osteoradionecrosis

Xian Yao Christopher Liao, MD
David Chun Man Yeung, Dr.
Brian Wing Hei Mak, Resident
Calvin Lai, Dr.
Samuel Man Wai Chow, Dr.
Hon Kwan Andy Chan, Dr.
David Ding, Medical Student
The Chinese University of Hong Kong

Objectives:

This study aims to investigate the prevalence and microbial profile of nasopharyngeal osteoradionecrosis (ORN) in patients who underwent radiotherapy for Nasopharyngeal Carcinoma (NPC) across multiple centres in Hong Kong.

Methods:

A retrospective analysis was conducted on patients with complicated nasopharyngeal ORN requiring intravenous antibiotics between 2001 and 2024. Clinical data, including demographic information, clinical examination findings, radiological investigations, treatment history, and microbial cultures from affected tissues, was collected from three major medical centres from Hong Kong. Microbial species were identified using standard microbiological techniques, and antibiotic susceptibility was assessed.

Results:

A total of 15 patients were included in the study, with a mean age of 64.8 years. The average time of symptom onset from completion of radiotherapy was 8.8 years. The most common presenting symptoms were headache (60.0%), cranial nerve palsy (40.0%) and fever (26.7%). Microbiological cultures revealed a predominance of *Klebsiella pneumoniae* (33.3%), followed *Pseudomonas aeruginosa* (26.7%) and *Enterococcus faecalis* (26.7%). The most commonly used intravenous antibiotics we used were Augmentin (46.7%) followed by Ciprofloxacin (40.0%) and then Meropenem, Vancomycin and Ceftriaxone (33.3%). The average presenting white cell count was $10.5 \times 10^9/L$ and presenting C-reactive protein was 88.4mg/L. 0 cases of mortality were documented.

Conclusion:

The findings highlight the complex interplay between radiation therapy and microbial colonization in complicated cases of nasopharyngeal ORN. The predominance of *Klebsiella pneumoniae* underscores the need for tailored antibiotic strategies and careful mo

Poster #G145

Review of health disparities in chronic rhinosinusitis

Russel Whitehead, BS

Abdel Metwally, Mr.

Evan Patel, Mr.

Thomas Cyberski, Resident Physician

Robin Powszok, Dr.

Peter Filip, MD

Peter Papagiannopoulos, MD

Bobby Tajudeen, MD, FARS

Pete Batra, MD, FARS

Rush University Medical Center

Background:

Current literature describing disparities in chronic rhinosinusitis (CRS) often analyzes race, gender, or socioeconomic status (SES) in isolation. Analyses encompassing a comprehensive range of disparities remain lacking. We conducted a systematic review to provide a detailed characterization of the CRS disparity landscape.

Methods:

A systematic review was conducted in Covidence, adhering to PRISMA Guidelines, to evaluate United States-based CRS disparity literature through September 2024. 690 publications were identified, and 27 met inclusion criteria. Studies were classified by pertaining health disparity (race, gender, SES, age, geographic region) and reported outcomes (disease incidence, severity, outcomes).

Results:

27 studies on CRS disparities were published between 2012 and 2024. 16 focused on SES, describing that lower SES was associated with reduced treatment adherence, resulting in poorer endoscopic findings and quality of life. 15 studies examined racial and ethnic disparities. Hispanic patients were more symptomatic than non-Hispanic patients, and Black patients had fewer health visits, leading to worse outcomes. Other studies discussed the impact of gender, age, and/or geographic region (n=12, 9, 4 respectively). Findings included a higher symptom burden among female patients and a higher incidence of CRS in regions of air pollution. Only 3 studies proposed solutions to disparities.

Conclusion:

Most literature on disparities in CRS describes the influence of SES and race on disease presentation and progression. Other disparities related to gender, age, and geographic region were identified. Further research should seek to uncover root causes and propose solutions to advance equitable care in CRS.

Poster #G146

Secondary validation of the parosmia olfactory dysfunction outcomes rating (DisODOR)

Andrew Peterson, MD, MSCI

Dorina Kallogjeri, Assistant Professor

Dean Adkins

Aseeyah Islam

Jay Piccirillo, MD

Lara Crock, Assistant Professor

Nyssa Farrell, MD

Washington University School of Medicine/Barnes Jewish Hospital

Introduction:

The DisODOR is the only validated disease-specific patient-reported outcome measure (PROM) for patients with parosmia. No published data supports the use of the instrument to monitor response after an intervention. The objective of this study was to secondarily analyze a randomized clinical trial (RCT) to assess the instrument's sensitivity to change.

Methods:

A double-blinded RCT with parosmic patients randomized to stellate ganglion block with bupivacaine versus saline injection was conducted. The DisODOR was completed at baseline and 3 months, and the Clinical Global Impression – Improvement (CGI-I) score, which is a 7-point Likert scale assessing response of smell distortion to treatment, was given at 3 months. The primary outcome measure of this study was the responsiveness to change of the DisODOR. The secondary outcome measure was test-retest reliability calculated by Pearson correlation.

Results:

A total of 46 participants completed the trial. There was a mean (SD) change in DisODOR score of 47 (15) for participants reporting much improved (n = 5), 35 (17) for moderately improved (n = 9), 29 (20) for slightly improved (n = 3), and 4 (13) for no change (n = 25). Four patients reported worsening of parosmia with a mean (SD) change in DisODOR score of -11 (16). Test-retest reliability was 0.85 (95% CI: 0.68 to 0.93).

Discussion:

This study provided RCT-level evidence for the DisODOR's strong responsiveness to change. The instrument is an ideal PROM for both clinical use and research, particularly given the difficulty in otherwise quantifying parosmia severity.

Conclusion:

The DisODOR is sensitive to change with good test-retest reliability and can be used as a disease-specific PROM for patients

Poster #G147

“Secret shopper study” comparing wait times for Medicaid and private insurance patients

Apurva Ramanujam, BS
 Annabel Sparano
 Aman M. Patel, BS
 Afash Haleem, BA
 David Wassef, MD
 Paul Cowan, DO, MS
 Cynthia Schwartz, MD
 Wayne D. Hsueh, MD
 Jean Anderson Eloy, MD, FARS
 Andrey Filimonov, MD, PharmD
 Rutgers New Jersey Medical School

Objective:

To examine discrepancies between Medicaid and private insurance patients in U.S. private rhinology practices.

Methods:

A secret shopper study design was utilized, in which researchers called practices on behalf of fictitious patients inquiring about appointment availability, telehealth and in-person options, and types of providers. Medicaid and private insurance patient interactions were compared. 65 private practice rhinologists who answered both calls were used to conduct a two-sample unequal variance T-test.

Results:

Private insurance callers' average appointment wait time was 16 days compared to Medicaid callers' being 29 days. The average call length was 6 minutes with private insurance calls compared to 4 minutes with Medicaid calls.

Conclusion:

Decreased reimbursement rates when treating Medicaid patients are one of the root causes of this socioeconomic difficulty of access to care since the decreased quality of care experienced by these patients is a downstream effect of this systemic issue. To improve patient outcomes, it is imperative to increase awareness of this data amongst office staff at private practice offices to increase the opportunity for timely diagnosis and treatment and improve the equitable access to care given to the Medicaid population to ensure future compliance and trust in the healthcare system.

Lay Summary:

Medicaid patients are at a disadvantage when it comes to receiving healthcare, and even more so specialty healthcare in the United States. The root causes of this systemic issue may be tied to decreased reimbursement rates when treating Medicaid patients for physicians, which must be addressed to lessen socioeconomic discrepancies in healthcare.

Poster #G148

Sensory and autonomic fibers in nasal nerves

John Craig, MD, FARS
 Desiree Hollemon, MPH
 Mark Hensley, PhD
 Noor Hason, MS
 Henry Ford Health

Background:

When rhinitis medical therapies fail, nasal neurectomies can decrease innervation to the nasal mucosa and reduce rhinitis-related symptoms. The sensory and autonomic nerve contributions to these intranasal nerves have been incompletely studied. This cadaveric study investigated the relative densities of sensory, parasympathetic, and sympathetic nerve fibers in different intranasal nerves, which could be important in exploring future rhinitis surgical interventions.

Materials and Methods:

Ten fresh cadaver heads were dissected and sections of posterior nasal (PNN), posterolateral (PLNN), and anterior ethmoid nerves (AEN) were harvested unilaterally via endonasal and transorbital approaches. Specimens were formalin-fixed, sectioned, and stained with hematoxylin and eosin (H&E), as well as for neuropeptides (substance-P, calcitonin gene-related peptide, neurokinins-A and B, vasointestinal peptide, neuropeptide Y), and enzymes (choline acetyltransferase and tyrosine hydroxylase). Nerve marker densities were calculated electronically. Autonomic and sensory nerve fiber marker densities were then compared within and between PNNs, PLNNs, and AENs.

Results:

In total, 10 PNNs and AENs, and 8 PLNNs were available for analyses. Sensory, parasympathetic, and sympathetic nerve markers were identified in every PNN, PLNN, and AEN specimen. There were no significant differences in sensory, parasympathetic, or sympathetic nerve marker densities within or between PNNs, PLNNs, and AENs ($p > 0.05$).

Conclusion:

Sensory, parasympathetic, and sympathetic nerve fiber densities were equivalent within and between PNN, PLNN, and AEN specimens across cadavers.

Poster #G149

Septoplasty opioid prescribing trends

Robert Africa, MD
 Delaney Clark, Medical Student
 Scott Hardison, MD
 Tyler Janz, MD
 Farrah Siddiqui, Associate Professor
 University of Texas Medical Branch

To evaluate the trends in opioid and nonopioid prescribing for septoplasty before and after the publication of guidelines by the American Academy of Otolaryngology-Head and Neck Surgery on opioid prescribing in April 2021.

Retrospective study utilizing data from 80 health care organizations in the United States that contribute electronic medical record data to the TriNetX database from January 2013 to December 2023.

The TriNetX database was accessed to collect deidentified patient data on patients who were prescribed either opioid or nonopioid analgesic within 1 to 5 days following septoplasty. Statistical evaluation and comparison of the prescription trends before and after the clinical practice guideline publication was performed by interrupted time series analysis in Statistical Analysis System (SAS) 9.4 with significant set at < 0.05 .

The trend of postoperative opioid prescriptions significantly changed following the publication of the new clinical practice guidelines. The trend was initially increasing by 4.50%, but after the publication, the trend was decreasing by 11.12% ($p = 0.01$). For nonopioid analgesics, the trend was increasing by 0.31% and decreasing by 1.2% after the publication, but this change was not significant ($p = 0.20$).

After recommendations regarding opioid prescription were published, there was an associated reduction in the opioid prescribing trend for septoplasty. No associated change was observed for nonopioid analgesics prescribing. Surgeons appear cognizant of the improvement initiative and prescribing trend.

Poster #G150

Silastic septal splints to manage refractory HHT epistaxis

Avraham Adelman, BS
 Eunice Im
 Anil Patel
 Nikita Chapurin, MD, MHS
 Christina Eagan, DNP, ARNP
 Ali Ataya, MD
 Marc Zumberg, MD
 Jennifer Mulligan, PhD
 Carl Atkinson, PhD
 Brian Lobo, MD, FARS
 Jeb Justice, MD, FARS
 University of Florida

Introduction:

Some patients with hereditary hemorrhagic telangiectasia (HHT) present with severe and refractory epistaxis. Silicone septal splints (SSS) can be placed after surgical intervention to stabilize the septal mucosa. We report HHT-related epistaxis patient outcomes after SSS placement.

Methods:

A retrospective chart review was done of 14 adult patients (age > 18) with HHT according to the Curaçao criteria who received SSS in conjunction with surgical intervention for recurrent epistaxis at the University of Florida Health's Ear, Nose, and Throat surgical center. Pre and post-treatment Epistaxis Severity Scores (ESS) were collected. The number of days patients tolerated SSS placement and the number of failed treatment modalities before treatment were recorded.

Results:

The patient cohort represented a group that had a baseline ESS of 5.87 and an average of 3.4 failed treatment modalities before initiating surgical intervention. Patients had SSS placed for an average of 128 days, with one tolerating SSS placement for 275 days. All patients had a decrease in ESS, with an average of -4.7 points. All pre-post ESS were larger than the minimal clinically important difference (MCID: 0.71) for ESS in HHT. Some patients reported congestion and intolerable odor with SSS but it was overall tolerated well.

Conclusion:

SSS may be an effective, safe, and well-tolerated option over an extended period of time to ameliorate moderate to severe epistaxis. It also may be a reasonable alternative to Young's procedure and other more poorly tolerated surgical options.

Poster #G151

Sinonasal biphenotypic sarcoma

Wilson Lao, MD

Ivan Vegar

Sarah Chan

Steve Lee

Purpose:

Among uncommon subtypes of sinonasal cancers, biphenotypic sinonasal sarcoma (BSS) is a rare and relatively new diagnosis, formally recognized in the 2017 World Health Organization (WHO) Classification of Head and Neck Tumors. Reportedly, there is a low incidence of nodal metastasis. The general consensus for primary treatment is surgical resection. Currently, there are no established guidelines for the use of radiation or chemotherapy administration. The purpose of this manuscript is to communicate our experience with this atypical and uncommon pathology.

Methods:

A 72 year old was found to have an expansile sinonasal mass centered around the left ethmoid air extending into orbit, abutting the medial rectus and extension into cribriform plate. Endoscopic biopsy was performed. Subsequent surgical resection revealed a rare atypical sarcoma.

Results:

Initial biopsy was interpreted as cellular schwannoma. After resection and larger volume of tissue available to analyze, the tissue demonstrated a spindled growth pattern. Further immunohistochemical analysis identified the tumor as a biphenotypic sinonasal sarcoma. Complete surgical extradural resection of the tumor was performed and reconstructed with a vascularized pedicled flap.

Conclusions:

Surgical resection is the current mainstay of treatment for BSS. Complete resection spared the patient of unnecessary chemotherapy or radiation therapy in the event that the pathology did not determine the biphenotypic subtype.

Poster #G152

Sinonasal fungus ball rhinosinusitis and anatomical variations

Harel Sofer, MD

Narin Nard Carmel Neiderman, MD, MSc

Roie Fisher

Ran Bilaus

Razan Masrawi

Yael Netanyahu Madar

Avraham Abergel, MD

Objectives:

Few studies investigated the relationship between Sinonasal fungal ball (SNFB) and variations of the sinonasal anatomy. In this meta-analysis, we aim to investigate the rate of SNFB and anatomical variations of the sinonasal area.

Review Methods:

Meta-analysis. Pooled estimates of frequency and odds ratio (OR) were calculated by using random and fixed-effect models.

Data Sources:

We Screened the literature by searching Google Scholar, Embase, and Pubmed data bases.

Results:

1482 records were identified, of which 10 studies met the inclusion criteria, encompassing 1288 patients. Pooled rates of the presence of naso-septal deviation (NSD), concha bullosa (CB), Haller cells (HC) with coexisting SNFB was 54.7%, 34.64% and 22.73% accordingly. Pooled OR of CB and HC among SNFB patients versus controls was 2.26 [95% CI:1.41-3.64] and 0.79 [95% CI:0.19-3.25] respectively. The pooled OR of the presence of CB, HC, and NSD ipsilateral to SNFB versus the same anatomic landmarks contralateral to SNFB, in the same patient were 0.52 [95%CI: 0.34, 0.80], 0.82 [95%CI: 0.48, 1.40], 1.0 [95%CI: 0.60, 1.64], respectively.

Conclusion:

Anatomical variations may alternate nasal airflow and contribute to SNFB formation. In this meta-analysis, we found an association between CB and contralateral presence of SNFB. Other parameters were not found significant.

Poster #G153

Sinus mucosal involvement of cutaneous facial vascular anomaly contributes to CRS

Alec Straughan, MD
 Nobles Antwi
 Neal Godse, MD

A 19 year old female with bilateral (L>R) V2 distribution port-wine stain (PWS), factor VII deficiency, and a history of unilateral left chronic rhinosinusitis (CRS) presented to our clinic with nasal obstruction, hyposmia, and left-sided facial pain. She had previously underwent endoscopic sinus surgery with recurrent debridements. Her symptoms continued to be poorly managed with medical therapy. CT imaging showed unilateral opacification on the left side within the maxillary sinus.

Nasal endoscopy showed two distinct populations of nasal polyps, one with thin linear vascular markings and one with thicker looped vessels; this distinction was enhanced on narrow band imaging. Pathology from prior surgery was reviewed and demonstrated "Vascular Malformation". Given the unilateral of the patient's symptoms, we feel mucosal involvement of port-wine contributed to her symptomatic CRS. To our knowledge, there have been no report of facial cutaneous vascular anomalies which have involved sinus mucosa and contributed CRS.

We aim to present this rare case report to spread knowledge of possible mucosal involvement of vascular anomalies, and to present reviewed literature regarding deep involvement of cutaneous vascular lesions. High-fidelity images and imaging studies will be shared.

Poster #G154

Sinus surgery and dementia in chronic sinusitis

George Bebawy, BA
 David Herz, BS
 Anthony Saad, Medical Student
 Andrey Filimonov, MD, PharmD
 Wayne D. Hsueh, MD
 Jean Anderson Eloy, MD, FARS
 Rutgers New Jersey Medical School

Objective:

Chronic inflammatory states such as that seen in chronic sinusitis have been associated with many complications. Previous studies have found a correlation between chronic sinusitis and risk of cognitive impairment. Our study investigates the influence of sinus surgery on mitigating risk of dementia in chronic sinusitis patients.

Study Design:

Retrospective database study.

Methods:

The 2017 National Inpatient Sample (NIS) was queried to identify adult inpatients with a primary diagnosis of chronic sinusitis. Chronic sinusitis (CS) was identified (ICD-10: J321-J324, J328, J329). A wide range of dementia ICD-10 codes were utilized to capture a spectrum of decline. Univariate and multivariable analyses were used to identify statistical associations with sinus surgery status in CS patients.

Results:

Of the 139,570 inpatients diagnosed with CS, the majority were female (54.9%), White (70.9%), and had Medicare (53.1%). Mean patient age was 60.1 years. On multivariable analysis, adjusting for patient demographics and comorbidities, odds for dementia were decreased in CS patients that underwent sinus surgery (OR 0.236, 95% CI: 0.168-0.332) compared to patients that did not undergo sinus surgery (p-value < 0.001).

Conclusions:

In a national CS cohort, inpatients that underwent sinus surgery had decreased odds for dementia, suggesting a potential protective effect.

Poster #G155

Smell training in southeastern Chinese adults

Brian Wing Hei Mak, MBBS

David Chun Man Yeung, Dr.

Samuel Man Wai Chow, Dr.

Calvin Lai, Dr.

Xian Yao

Christopher Liao, Dr.

Hon Kwan And Chan, Dr.

The Chinese University of Hong Kong

Background:

Olfactory dysfunction significantly impacts quality of life, and it is common, with a prevalence up to 22.2%. Smell training has emerged as a potential therapeutic intervention. This study aims to evaluate the efficacy of a structured smell training program in ethnic Chinese adults with various causes of olfactory impairment at Prince of Wales Hospital, Hong Kong.

Methods:

This single-center prospective cohort study was conducted from 2017 to 2023, involving participants who completed a smell training regimen with 4 scents (rose, eucalyptus, lemon, clove). The cohort included patients with sinonasal conditions, post-infective, post-traumatic, iatrogenic and idiopathic olfactory loss. The Sniffin' Sticks test was utilized to assess olfactory function at four time points: pre-treatment, 12 weeks, 26 weeks, and 52 weeks. The TDI (Threshold, Discrimination, Identification) scores were recorded and analyzed to determine changes in olfactory performance over time.

Results:

Twenty-four patients with a mean age of 56.5 were included in this study. Idiopathic olfactory loss was the most common cause. There is overall trend of improvement in TDI scores of all participants from 12.8 at baseline to 15.4 at 52-week follow-up but not statically significant ($p=0.057$). Subgroup analysis shows statically significant improvement in the TDI score of post-infective patients from 19.2 at baseline to 26.2 at 52-week follow-up ($p=0.005$).

Conclusion:

The findings of this study support the implementation of smell training as a viable intervention for olfactory dysfunction in ethnic Chinese adults, especially those with post-infective olfactory loss.

Poster #G156

Social perceptions and economic impact of proptosis in thyroid eye disease

Lazaro Peraza, MD

Aja Leatherwood

Forrest Fearington, BS

Gabriel Hernandez-Herrera, BS

Alexis Grover, BS

Jacob Dey, MD

Andrea Tooley, MD

Janalee Stokken, MD, FARS

Mayo Clinic

Background:

Thyroid eye disease (TED) is an autoimmune condition marked by proptosis, significantly impacting patients' appearance and social experiences. While the physical effects of TED are well understood, its broader social and psychological burdens remain understudied, particularly regarding the social perceptions of those affected.

Aim:

This study evaluates how differing severities of TED proptosis affect the perceived extent of facial deformity, quality of life (QoL), and the estimated value of corrective intervention.

Methods:

97 casual observers evaluated 8 images of female individuals with varying severities of TED alongside 4 controls. Respondents rated perceived deformity severity, QoL, perceived affect, willingness to trade years of life, and willingness to pay (WTP) for corrective intervention. Responses were analyzed with respect to demographic factors, including age, gender, and income.

Results:

Observers' WTP for corrective intervention was positively associated with proptosis severity ($p<0.001$) and income, with high-income respondents ($>\$100,000$) averaging \$16,313, compared to \$3,371 for those earning $<\$50,000$. Participants were willing to trade more years of life for higher proptosis severities, ranging from 2.6 years (Hertel = 23) to 9.2 years (Hertel = 26.5). Observers associated worse proptosis with worsened QoL ($p<0.001$), with mean ratings dropping from 79.3 (Hertel = 23) to 42.6 (Hertel = 26.5).

Conclusion:

From the general public's perspective, higher perceived proptosis severity in TED is associated with a substantial perceived social and economic burden, and corrective intervention has an estimated social value of thousands of dollars and many life-years.

Poster #G157

Suspected invasive fungal sinusitis in a healthy elderly patient

Alice Cheng, MBA
 Jaclyn Preece, MD
 Anh Mai, MD
 Melissa Warne, MD
 Drinnon Hand, MD
 Jordon Grube, DO
 Albany Medical Center

Introduction:

Invasive fungal sinusitis (IFS) is a rare, aggressive infection that presents with invasion of the mucosa, bone, and vessels. Acute IFS quickly spreads with progressive symptoms whereas chronic IFS may present with persistent sinus symptoms. We present a novel case of an otherwise healthy nonagenarian with signs and symptoms concerning for invasive fungal sinusitis.

Case:

A 96-year-old otherwise healthy female with no previous sinus history presented to the ED with sudden right eye swelling. She had right eye chemosis, proptosis, decreased vision, extraocular movement deficits, and normal intraocular pressure. CT revealed opacification in the right maxillary and ethmoid sinuses with bony erosion. MRI showed right periorbital swelling with rim-enhancing fluid collections and low T2 signal in the maxillary sinus concerning for fungal infection. Due to her quickly progressive symptoms and imaging findings, the patient was taken to the OR for urgent maxillary antrostomy and biopsy. There were no areas of necrosis within the nasal cavity and biopsy showed fungal elements with normal appearing mucosa. A fungal ball and polypoid tissue were found in the right maxillary sinus. Cultures were negative for fungus but instead grew gram positive rods. Post-operatively, visual symptoms improved and then worsened with right exotropia, prompting both antibiotic and antifungal therapy. On discharge she only complied with antibiotic therapy and had complete resolution.

Conclusion:

We highlight the possibility of mycetoma in an elderly patient who presents with proptosis and ophthalmoplegia and recommend treatment with surgical removal of the mass in addition to systemic antibiotics and antifungals.

Poster #G158

Systematic review of measured biomarker changes after biologic treatments for CRSwNP

Sai Nimmagadda, MD
 Isaac Schmale, MD, FARS
 Li-Xing Man, MD, FARS
 Jonathan Zou, BA
 Daniel Castillo, Director of Science and Engineering Libraries & Research Initiatives
 University of Rochester

Objective:

Overview of measured changes in biomarkers-nasal and systemic in CRSwNP patients treated with biologics.

Methods:

A systematic review was performed. After application of inclusion and exclusion criteria per PRISMA guidelines, 51 studies were analyzed to provide an overview of all currently identified changes in local and systemic biomarkers in CRSwNP patients treated with various biologics.

Results:

Of 51 included studies, breakdown by biologic was: Dupilumab- 26, Omalizumab- 8, Mepolizumab- 6, Benralizumab- 8, Reslizumab-1, and other-2.

Conclusions:

Current literature studying biologics in CRSwNP have predominantly focused on only a select few biomarkers known to be key mediators of type 2 inflammation. Systemic top 3- IgE (19), Eosinophils (37) and ECP (8). Nasal top 3- Eosinophils (10), IgE (7), ECP (7). Comparing changes in these biomarkers across the various biologics demonstrates a near uniform response in direction of change highlighting that while the specific targets may differ, the downstream effects are consistent. Dupilumab's effect of inducing hyper-eosinophilia was demonstrated as well as Omalizumab's increase in total IgE due to its formation of complexes with IgE molecules. With regards to nasal biomarkers, all biologics were in concordance with their effects on ECP, Eosinophils and IgE with significant decrease in analyzed secretions/tissue except for Mepolizumab which showed no significant change in all the above. More studies dedicated to measuring biomarkers beyond known eosinophilic markers would further delineate biologic effects on alternate mechanisms of CRSwNP pathophysiology (e.g. role of fibroblasts/ switch to neutrophilic phenotype/mast-cell mediated prostaglandin effects and more).

Poster #G159

The role of imaging findings and their impact on clinical outcomes for dacryocystorhinostomy

Jeffrey Graves, MS

Background:

The relevance of various sinonasal anatomical variants for dacryocystorhinostomy (DCR) outcomes continues to be subject of debate, and the need to correct such variants when associated with nasolacrimal duct obstruction (NLDO) has not been established.

Objectives:

- Describe incidence of relevant radiographic anatomical variants.
- Determine the impact of radiographic sinonasal anatomical variants on DCR outcomes.
- Provide guidance on need for concurrent sinonasal surgery to optimize DCR success.
- Identify a “cut off” for nasal septal deviation noted on radiology that is clinically relevant.

Methods:

Patients who underwent DCR at a Mayo clinic tertiary care center over a 10-year period (2013-2022) were identified. The subset of patients who had a head, orbit or sinus CT imaging within 5-years prior to surgery were reviewed for sinonasal anatomical abnormalities. Clinical outcomes were extracted from the electronic medical record. Clinical success of DCR is defined by improved or resolved epiphora at the last visit within the 3-6 months post-op timeframe.

Results:

265 patients were identified and included in our cohort, with an average age of 61 years old. The majority of patient were female (171, 47%). Overall, the clinical success rate was 53%. Additional statistical analysis is ongoing.

Conclusions:

Results from this study could help to identify sinonasal anatomical variants associated with failure of DCR, inform whether imaging should be obtained in all patients with NLDO prior to DCR surgery, and identify indications for multidisciplinary surgery including concurrent sinonasal procedures to correct anatomic abnormalities.

Poster #G160

The roles of sinonasal symptoms and olfactory dysfunction in cognitive impairment

Shahed Mohamed, MD

Adama Gamby

Ahmed Mohamed

Mustafa Mohamed

Jonathan Overdevest, MD

Satish Govindaraj, MD, FARS

Background:

Sinonasal symptoms and olfactory dysfunction are associated with cognitive decline. However, this association has not been explored in the NHANES database.

Aims:

This study examines the relationship between sinonasal symptoms, olfactory dysfunction and cognitive impairment.

Methods:

Data from the NHANES 2013-2014 survey was analyzed. Sinonasal symptoms were defined as positive responses to rhinological questions and olfactory dysfunction was Sniffin Test <6. Cognitive function was measured by CERAD Word Learning subtest scores, categorized into quartiles 1-4, with Q1 as the lowest scores and Q4 as the highest. Multivariable logistic regression models were used.

Results:

Sinonasal symptoms were significantly associated with cognitive impairment, with the strongest association seen with Q2 (OR 1.190, $P < 0.0001$) and a slightly weaker association to Q1 (OR 1.140, $P < 0.0001$).

In contrast, olfactory dysfunction was most strongly linked to Q1 (OR 1.506, $P < 0.0001$), with weaker associations for Q3 (OR 1.110, $P < 0.0001$), Q2 (OR 1.135, $P < 0.0001$), and Q4 (OR 1.196, $P < 0.0001$).

Individuals with both sinonasal symptoms and olfactory dysfunction had the strongest associations with cognitive decline, particularly with Q1 (OR 1.851, $P < 0.0001$) and Q2 (OR 1.300, $P < 0.0001$). Participants without either condition had a 44% reduced likelihood of Q1 (OR 0.558, $P < 0.0001$).

Conclusion:

Sinonasal symptoms are associated with below median cognitive scores and olfactory dysfunction with the lowest scores, while the presence of both conditions exacerbated risk. This suggests distinct mechanisms drive their associations with cognition.

Poster #G161

The statistical fragility of safety data on intranasal corticosteroids for AR

Olivia First, BA
 Shreya Deshmukh
 Rahul Guda, Medical Student
 Shiven Sharma, Medical Student
 Ronit Sethi, Medical Student
 Kaan Oral, Medical Student
 Mohammed Khan, Assistant Professor
 Icahn School of Medicine at Mount Sinai

Background:

Intranasal corticosteroids are a popular therapy for treating allergic rhinitis (AR). However, there is significant variability in their safety profile across different formulations, populations, and study outcomes. Fragility indices (FI) and quotients (FQ) evaluate the statistical robustness of randomized control trial (RCT) data that assesses the safety of corticosteroids for treating AR.

Methods:

RCTs published between January 2004 and November 2023 were identified by a systematic search of PubMed, MEDLINE, and Embase for studies assessing the safety of intranasal corticosteroids for AR. Fifty-four studies were included in the analysis. Fragility indices were calculated by determining the number of outcome reversals required to flip the significance of dichotomous variables. An inverse methodology was used to calculate reverse FIs (rFIs) for non-statistically significant variables. FQs and rFQs were assessed by dividing FIs and rFIs by effective study size.

Results:

Across 201 dichotomous efficacy outcome variables, the mean FI was 6.14 (SD 4.24) and the mean FQ was 0.015 (SD 0.015). Of those, nineteen outcomes were statistically significant ($p < .05$). These outcomes had a mean FI of 4.11 (SD 3.90) and mean FQ of 0.008 (SD 0.007). The remaining 182 nonsignificant outcomes had a mean rFI of 6.352 (SD 4.22) and mean rFQ of 0.015 (SD 0.015).

Conclusion:

Safety and adverse event data on intranasal corticosteroids for treatment of AR are statistically fragile, especially for statistically significant outcomes. Low fragility indices and quotients suggest that this data should be taken with caution by physicians. Reporting FI and FQs alongside p-values ensures accurate interpretation of RCT findings.

Poster #G162

The statistical fragility of saline nasal irrigation for rhinosinusitis: A systematic review

Ronit Sethi, BS
 Kaan Oral, Medical Student
 Rahul Guda, Medical Student
 Shiven Sharma, Medical Student
 Olivia First, Medical Student
 Shreya Deshmukh
 Mohammed Khan, Assistant Professor

Background:

High-volume saline nasal irrigation is frequently used in non-surgical rhinosinusitis treatment, though clinical evidence comes from a small set of randomized controlled trials (RCTs) with low sample size. Here, we employ fragility index (FI) to measure statistical robustness of these nasal irrigation RCTs.

Methods:

RCTs published from May 1998 to September 2024 investigating saline irrigation for rhinosinusitis were identified via systematic search of PubMed, MEDLINE, and Embase. FI, the number of outcome reversals needed to flip statistical significance, reverse FI (rFI), the parallel to FI for nonsignificant outcomes, and fragility quotient (FQ), FI normalized to sample size, were calculated for all outcomes.

Results:

Of 143 studies screened, five were included for analysis. Twenty dichotomous outcome variables were extracted, with a combined mean FI of 5.50 (SD 2.82) and FQ of 0.064 (SD 0.051). Four outcomes were statistically significant ($p < 0.05$) with a mean FI of 6.75 (SD 6.29) and FQ of 0.099 (SD 0.099). Sixteen outcomes were statistically insignificant, with a mean rFI of 5.19 (SD 1.28) and rFQ of 0.055 (SD 0.031).

Conclusion:

Dichotomous secondary outcomes from nasal irrigation RCTs for rhinosinusitis show low to moderate statistical fragility, suggesting moderately robust evidence both for and against treatment effect. Interestingly, although 80% of analyzed binary variables across studies were statistically insignificant, three of the five studies nonetheless concluded treatment efficacy based on a continuously-measured primary outcome. Future studies on rhinosinusitis should employ FI and FQ to qualify the statistical reliability of secondary binary outcomes when making holistic study conclusions.

Poster #G163

The surprising effect of priming on SNOT-22 and RSDI results: An international phenomenon

Ibtisam Mohammad, MD
Taylor Stack, Medical Student
Suleyman Cebeci
Ghanayem Almaz
Brent Senior, MD, FARS
UNC

Background:

Priming occurs when subconscious cues impact responses. It has been previously shown that priming impacts American patients' perception and reporting of their sinus disease. It is unknown if this occurs in other cultures.

Objective:

Determine impact of priming on self-reported CRS using SNOT-22 quality of life instrument in Turkish patients.

Methods:

Single-blind, randomized, prospective cohort study of 109 patients in Turkey with sinonasal disorders. Patients received "positive priming" or "negative priming" reading about the positive or negative aspects of CRS and its treatment respectively. Patients then completed SNOT-22 and results compared.

Results:

Positive priming group had lower median SNOT-22 score compared to negative priming groups' scores (Median = 1.5909 [IQR: 1.34] vs. 2.5455 [IQR: 0.88], $p < 0.001$). This was consistent regardless of age, sex, medical or surgical treatment history, diagnosis, or education level.

Conclusions:

Priming impacts Turkish patient's perception of sinonasal disease as determined by the SNOT-22. This has been previously confirmed in American patients suggesting that priming is a cross cultural phenomenon. Rhinologists must understand this when using the SNOT-22 instrument in research and in clinical decision-making for patients.

Poster #G164

WITHDRAWN

Poster #G165

**Tranexamic acid in anterior skull base surgery –
A scoping review**

Kevin Li, MD
Zachary Christian
Meha Fox, MD, FARS
Ali Jalali, MD
K. Kelly Gallagher, MD
Tran Locke, MD, FARS

Objective:

Tranexamic acid (TXA) is an antifibrinolytic agent used for hemostasis in trauma and neurosurgical procedures. However, few studies have investigated TXA for anterior skull base (ASB) surgery. This scoping review assesses the available literature.

Methods:

PubMed, Embase, and Google Scholar databases were queried from inception until August 23, 2024. 115 articles were identified, with 31 duplicates. Of the remaining 84 articles, 7 were relevant, with 1 excluded due to non-English language. A total of 6 articles were included for review.

Results:

The studies spanned 2016 - 2024. A 2016 retrospective cohort study comparing TXA vs. control in skull base procedures, not specific to ASB, reported decreased perioperative transfusions and no significant difference in thromboembolic events. A 2021 prospective study on ACTH-secreting pituitary adenomas developed a TXA dosing regimen and found no adverse events up to 3 months post-op. A 2022 randomized control trial comparing TXA vs. saline in transsphenoidal surgeries found an improved surgical field with reduced blood loss. Three systematic reviews/meta-analyses evaluated TXA in various sinonasal surgeries and intracranial neoplasm resections, noting decreased intraoperative blood loss with variable TXA dosing.

Conclusion:

The use of TXA in ASB surgery is still under investigation. The heterogeneity of study protocols, pathologies, surgical interventions, and outcome measures complicates interpretation of existing systematic reviews/meta-analyses. Further research, specifically prospective studies, are needed to understand the efficacy and safety of TXA in ASB surgery.

Poster #G166

Transoral dacrocystorhinostomy

Hector Perez, MD
Nada Ali, Resident
Aria Jafari, MD, FARS
University of Washington

Background:

Managing nasolacrimal duct obstruction in patients with complex craniofacial anomalies poses significant challenges, particularly when traditional surgical approaches are contraindicated. This case study highlights the application of a surgical technique in a 26-year-old female with median cleft facial syndrome, aimed at creating a functional lacrimal system with a sublabial fistula.

Methods:

The patient has a history of multiple previous craniofacial surgeries with bothersome left sided epiphora. Traditional endoscopic DCR was contraindicated due to a low lying skull base of the anterior cranial fossa, involvement of the infraorbital nerve in the path of the lacrimal sac to the nasal cavity, as well as having thick bone of the maxilla between the lacrimal fossa and the contralateral nasal cavity. The surgical approach involved establishing a fistula between the left lacrimal sac and the gingival labial sulcus via a sublabial incision. Stereotactic image guidance facilitated navigation through complex anatomy.

Results:

At follow-up, the patient reported significant improvement in tearing and overall symptoms, indicating enhanced quality of life. 4 months post-operatively, the patient required a return to the operating room for replacement of her lacrimal stent after migration. She remained satisfied with the post-operative outcome one year post-operatively.

Conclusion:

This case highlights the feasibility of DCR in achieving functional improvements for patients with complex craniofacial anomalies where traditional endoscopic DCR is not possible. Ongoing follow-up and a multidisciplinary approach are essential in optimizing outcomes, monitoring for scar formation and stent migration.

Poster #G167

Trigeminal trophic syndrome: A two-patient case series

Jamie Lewis, M4
 Brooks Lampkin, Dr.
 Eleni Mijalis, Dr.
 Kush Patel, Dr.
 John Schweinfurth, Dr.
 Randall Jordan, Dr.
 Keonho Kong, MD

Trigeminal trophic syndrome (TTS) is a rare cause of facial ulceration resulting from self-mutilation of skin following injury to the trigeminal nerve. It typically presents as a triad of CN V anesthesia, facial paresthesia, and ulceration of the lateral nasal ala, often mistaken for aggressive neoplastic or infectious processes. We present two patients with TTS and review the literature on etiology, treatment options, and outcomes.

Patient 1 is a 27-year-old female with a past medical history significant for craniopharyngioma (treated via subtotal resection and radiotherapy), radiation-induced WHO grade I cavernous sinus meningioma (treated with radiosurgery), and stroke. She presented with chronic left nasal irritation and crusting, ulceration at the alar base extending to the upper lip, erosion of the nasal floor and septum, and left-sided facial weakness. Patient 2 is a 79-year-old male with a history of Alzheimer's dementia, DVTs, diabetes, and tobacco use. He presented with erosion of the left nostril and upper lip, stinging, and pruritus near the alar base, with incomplete left eye closure and absent sensation in the V2 distribution. Biopsies were negative for malignancy or infections for both cases. They were treated with a combination of Mupirocin ointment or irrigation, Aquaphor, and saline nasal spray, with significant improvement.

Compulsive skin picking, driven by psychiatric disorders, neurodegenerative conditions, and CN V insults from stroke or tumors, along with poor wound healing from diabetes or tobacco use, contribute to TTS's complex pathophysiology. Recognition is crucial for proper diagnosis and management, requiring a multidisciplinary approach for optimal outcomes.

Poster #G168

Unilateral skull base approach to olfactory neuroblastoma resection

Dilan Shah, M3
 Diana Bigler, MD
 Salman Ali
 James Kenneth Byrd, MD

Background:

Olfactory neuroblastoma, or esthesioneuroblastoma, is a rare sinonasal tumor originating from the olfactory neuroepithelium's basal cells. Historically, its resection has involved a craniofacial approach, often resulting in compromised olfactory function. Advances in endoscopic skull base surgery have introduced the potential for unilateral approaches in select cases, with the possibility of preserving olfactory function.

Methods:

This review evaluates both institutional cases and relevant literature on the effectiveness of the unilateral skull base approach for olfactory neuroblastoma resection. A concise video shows an operative case at our institution demonstrating the unilateral endoscopic endonasal approach. A comprehensive literature review was conducted, starting with 1,210 studies; 7 were ultimately selected based on inclusion criteria of post-operative outcomes and olfactory preservation.

Results:

The included studies report encouraging outcomes for the unilateral approach, with some cases achieving disease-free survival and preserved olfactory function post-operatively. At our institution, 4 cases treated with the unilateral approach also suggest favorable outcomes in olfactory preservation in patients with early-stage disease.

Conclusions:

The unilateral skull base approach presents a potential alternative to traditional bilateral resection for certain patients with olfactory neuroblastoma, focusing on quality-of-life preservation through olfactory function. Additional studies are necessary to improve analytical power and to establish consistent long-term outcomes.

Poster #G169

UPSIT response patterns in skull base surgery patients with and without recent SARS-CoV-2 infection

Bastien Valencia, MD

Prishae Wilson

Najmi Natasha

Alaa Alhalabi

Osarenoma Olomu, MD, FARS

Angela Donaldson, MD, FARS

Mayo Clinic Florida

Background:

While the link between SARS-CoV-2 and hyposmia is well-documented, specific smells affected by recent infection before endoscopic skull base surgery (ESBS) remain unclear. This study compares smell identification patterns in ESBS patients with and without recent SARS-CoV-2 infection to identify smells more affected post-infection.

Methods:

This retrospective study included adults who underwent ESBS for pituitary lesions from 2021 to 2024. Olfaction was assessed pre- and postoperatively using the University of Pennsylvania Smell Identification Test (UPSIT). Patients were grouped into SARS-CoV-2 positive and negative cohorts based on self-reported or PCR-confirmed infection within 6 months before surgery.

Results:

16 patients had SARS-CoV-2 and 14 did not. The M:F ratio was 1:2.3 overall, with similar mean ages (51.69 ± 12.35 vs 56.36 ± 15.00 , $p=0.36$). Within each cohort, pre- and postoperative UPSIT scores showed no significant differences (34.50 ± 3.74 vs 34.06 ± 2.52 , $p=0.70$; 33.14 ± 3.11 vs 33.36 ± 3.48 , $p=0.86$). Scores were also similar between cohorts pre- (33.14 ± 3.11 vs 34.13 ± 3.56 , $p=0.43$) and postoperatively (33.36 ± 3.48 vs 33.93 ± 2.55 , $p=0.61$). Natural gas, lilac, and mint had the largest preoperative discrepancy between cohorts with 12/16 correctly identified in the positive group and 13/14 in the negative ($p=0.34$). Postoperatively, natural gas had the largest difference, with significantly lower identification in the SARS-CoV-2 positive group (9/16 vs 13/14, $p=0.04$).

Conclusion:

Patients with recent SARS-CoV-2 infection had a significantly reduced ability to identify natural gas following ESBS compared to those without infection, raising a potential health concern for this population.

Poster #G170

Utilization of healthcare resources among adults with sinusitis in the United States

Eric Wei, MD

Cherian Kandathil

Sam Most, Professor

Stanford University

Introduction:

Previous work has shown that sinusitis accounts for billions of dollars of healthcare costs, and is associated with significantly impaired functional, psychosocial, and quality of life outcomes. However, there is limited data on how individuals with sinusitis (and its subtypes) utilize various healthcare resources in the U.S.

Methods:

We performed an analysis of the National Health Interview Survey, a survey of noninstitutionalized households in the U.S. The independent variable was whether individuals had a diagnosis of sinusitis in the past year. The dependent variables were measures of healthcare utilization including the number of nights in the hospital in the last year, healthcare use 10 or more times in the past year, and use of specific healthcare resources in the past year.

Results:

Among 31,743 participants, 3,846 (12.1%) reported sinusitis in the past year. After controlling for sociodemographic factors and medical comorbidities, participants with sinusitis had significantly increased odds of receiving healthcare 10+ times in the past year (OR 1.97, 95% CI 1.76, 2.21). Individuals with sinusitis in the past year also had significantly increased odds of visiting the emergency room (ER) (OR 1.40, 95% CI 1.28, 1.54), eye doctor (OR 1.29, 95% CI 1.17, 1.42), mental health professional (OR 1.54, 95% CI 1.34, 1.76), general doctor (OR 1.89, 95% CI 1.66, 2.14), and specialist doctor (OR 1.54, 95% CI 1.41, 1.70) in the past year. Patients with sinusitis did not have a significantly increased number of hospitalization nights in the past year ($p = 0.27$).

Conclusions:

These findings demonstrate that individuals with sinusitis have significantly higher rates of utilization across several healthcare domains.

Poster #G171

Vivaer update: A correlation between symptom scores and objective findings

Auddie Sweis, MD

Joseph Raviv, MD

Riley Medenwald, Research Coordinator

Endeavor Health

Introduction:

Nasal obstruction that is unresponsive to standard medical therapy may be an indication for surgery. The minimally-invasive Vivaer procedure may be an effective alternative to traditional septoplasty and/or inferior turbinate reduction. We assessed objective improvement in nasal airflow secondary to the Vivaer procedure by administering objective measures and patient questionnaires before and after the procedure.

Methods:

From 10/2022 through the present, we conducted baseline measurements on or before the day of the procedure using PNIF meters and the SNOT-22 and NOSE questionnaires. Patients were then seen for follow up at 1, 3, and 6 months post-procedure. The same measurements conducted at baseline were repeated at these times. All necessary approvals were obtained by our IRB to conduct this research.

Results:

Participants (n=14) were 64% female and an average of 59 years of age. We continue to see trends of improvement in all measures. Patients experienced improvement in nasal patency, as assessed using PNIF meters, by the 3-month follow up ($p=0.0059$). Patients also experienced improvement in NOSE ($p=0.0391$) and SNOT-22 ($p=0.0039$) scores by 1-month follow up. All of these improvements persisted at 6-month follow up.

Conclusion:

Vivaer shows continued promise as a minimally-invasive alternative to traditional septoplasty and/or inferior turbinate reduction. The preliminary results of the study have shown positive trends in all measured outcomes. Patients experienced enhanced nasal patency, along with improvements in NOSE and SNOT-22 scores, attesting to the benefits of the procedure.



SAVE THE DATE

2025



Meeting Registration:

<https://web.cvent.com/event/0fcbfee4-67ea-48bf-a8cd-c71afb44ff2e/regPage:6d9ea4ac-5d3a-44d6-9561-5eae845c6415>

Housing: <https://www.hyatt.com/en-US/group-booking/SANRS/G-ARSS>

ARS 14th Annual Summer Sinus Symposium

*Best Sinus Course in the World:
Improving Rhinology from Office to OR*

July 10-12, 2025

**Manchester Grand Hyatt
San Diego, CA**

Highlights:

- Women in Rhinology Networking Event
- Cadaver Prosections
- Allergy Program
- Signature Event
- Symposia Sessions



ARS 71st Annual Meeting October 10-11, 2025 Indianapolis, IN

Highlights:

- Annual David Kennedy Lectureship
- Women in Rhinology, Mentorship, Residents & Fellows, and Diversity Programs
- Annual Hwang Family Lectureship
- Symposia Sessions
- Fall Film FESstival
- Guest Countries

Contact: Wendi Perez, ARS Executive Administrator
Tel: 973-545-2735, Ext. 4105 Email: wendi@american-rhinologic.org

american-rhinologic.org

Twitter / Facebook / Instagram: [@amrhinosociety](https://www.instagram.com/amrhinosociety)