



PROGRAM GUIDE

ARS 69th Annual Meeting

September 29-30, 2023 | Omni Nashville Hotel, Nashville, TN

The ARS Welcomes the
AAO-HNS Guest Countries
Canada, Dominican Republic,
India, United Arab Emirates



FALL FILM FESTIVAL

The ARS will again be featuring the **Fall Film Festival** - a **video seminar** featuring the most educational, unique and impressive videos of cases, complications and challenges submitted by the membership.

The videos were reviewed by an appointed committee and rated equally on rarity of pathology, technical complexity, novelty of procedure, educational value, and production quality. The top-rated videos (time-permitting) will be showcased at the meeting with an opportunity for the video editors to introduce each clip and respond to questions from the audience.

Friday, September 29, 2023
12:00 - 1:00 pm
Broadway Ballroom GHJK



SARAH WISE, MD, FARS

Presidential Welcome

Welcome to the 69th Annual Meeting of the American Rhinologic Society in Nashville! Pete Batra, ARS President-Elect and Program Chair, has formulated a superb educational program that highlights new rhinologic research, pathophysiology, innovations, patient care and procedural methods, work-life integration, and more.

A cornerstone of the ARS Annual Meeting is the David W. Kennedy Lectureship. This year, Dr. Brent Senior will be the honored Kennedy Lecturer – discussing his extraordinary international work. The title of Dr. Senior’s lecture is “Global Outreach in Rhinology: Lessons Learned from a Quarter Century in Vietnam.”

The Hwang Family Lectureship was initiated in 2022, with a focus on mentorship. We are excited to have Dr. Donald Lanza as the second Hwang Family Lecturer in 2023. Dr. Lanza has a long history of mentorship and teaching in rhinology – we are excited to hear his perspective on this important topic.

The remainder of the 69th ARS Annual Meeting program is filled with top-rated basic science and clinical research, as well as papers on chronic rhinosinusitis disease severity and impact, sinus surgery and postoperative therapies, skull base surgery, and more. Panels and targeted discussions will cover CRS endotypes and therapeutics, extramural funding, artificial intelligence in rhinology, pediatric skull base surgery, office based rhinologic surgery, and several other important topics. This meeting covers an incredible range of rhinologic areas and should be an excellent educational experience all-around.

Thank you for allowing me to serve as ARS President this year. I look forward to seeing everyone in Nashville.

Sarah K. Wise, MD, FARS
President, American Rhinologic Society



PETE S. BATRA, MD, FARS

Welcome from the President Elect and Program Chair

I am thrilled to welcome you to the 2023 American Rhinologic Society Annual Meeting!

As the memories of the pandemic and virtual meetings slowly recede from our memory, the ARS is thriving after hosting several successful in-person meetings. We will gather this fall in the beautiful city of Nashville to share exciting educational content and networking opportunities with our colleagues, trainees, and industry partners.

The meeting will take place on September 29-30, 2023 at the Omni Hotel Nashville. The meeting will showcase the best in clinical and translational science in the ARS and highlight the tremendous expertise on various panels and targeted conversations. The ARS Annual Meeting promises not to disappoint!

Original, innovative research is a bedrock of the foundation of the ARS. The program will highlight 67 abstracts for oral scientific presentation and well over 100 posters. These presentations will cover a myriad of salient topics including CRS diagnosis and medical therapies, sinus surgery, rhinosinusitis pathophysiology, allergy and immunology, and skull base surgery. Congratulations to the scientific teams from across the globe for sharing their cutting-edge research at this meeting. Many thanks to the Abstract Review Committee for their diligence to compile this high-quality scientific content.

We are extremely honored to have Professor Brent Senior present the David W. Kennedy lecture this year. He will share his vast experience in global health work titled "Global Outreach in Rhinology: Lessons Learned from a Quarter Century in Vietnam." I am equally honored to share that Dr. Donald Lanza will deliver the 2nd Hwang Family Lecture titled "The Meaningfulness of Paying it Forward: My 40-Year Journey."

The ARS Annual Meeting has 3 breakout rooms on Saturday morning, which are designed to grab the interest of meeting attendees across various aspects of rhinology. Our ARS Women in Rhinology, Allergy and Immunology, Skull Base and Orbital Surgery, and Rhinology in Private Practice Sections have been instrumental in planning educational sessions in these breakout rooms. The panels will highlight several thought-provoking topics across the specialty. Key panels will discuss Maintaining Balance & Achieving the Quadripartite Mission, Success in Early Career Extramural Funding, CRS Endotypes,

Subtypes, and Therapeutics, Pediatric Skull Base Surgery in the 21st Century, Postoperative Care in Skull Base Surgery, Setting Up and Maximizing an ASC for Success, and How to Build a Rhinology Niche in a Comprehensive ENT Practice. The ARS and AAOA will hold a joint panel on Saturday afternoon titled "Office-Based Procedures Update: Common Procedures & Difficult Cases." We will leverage our strong global partnerships in an International Collaborative Panel titled "Assessing Septoplasty Outcomes: An International Perspective."

Friday's session will be followed by the President's Reception, which offers a great venue for networking and camaraderie with colleagues. Additional learning opportunities are available at the Saturday morning Meet the Authors Poster Viewing and Breakfast, as well as several industry-sponsored satellite symposia occurring during breakfast and lunch hours throughout the meeting. Finally, I am excited to announce the DEI Luncheon on Saturday titled "Importance of Diversity and Improving the Pipeline in Medicine" that will feature Dr. Andre Churchwell, Vice Chancellor of Outreach, Belonging, and Inclusion at Vanderbilt University and Dr. James Hildreth, President of Meharry Medical College. I am grateful to Dr. Troy Woodard for his leadership in developing this amazing panel.

I hope it is readily apparent this will be another busy and informative meeting that is sure to engage attendees and stimulate conversation not only in the clinical aspects of rhinology and skull base surgery, but also the practice of medicine in both the academic and private practice realms. I want to extend in advance my sincerest gratitude to our speakers, planners, and attendees. We truly appreciate your continued support and engagement with the American Rhinologic Society. Have a great meeting, everyone!

Pete S. Batra, MD, FARS
President-Elect/Program Chair



American Rhinologic Society Executives - 2023



Sarah Wise, MD, FARS
 President
 Emory University
 550 Peachtree Street
 MOT 11th Floor
 Atlanta, GA 30308
 Tel: 404-778-3381
 Fax: 404-686-4540
 Email: skmille@emory.edu



Amber Luong, MD, PhD, FARS
 Second Vice President
 First Vice President
 McGovern Medical School
 part of UT Health
 6431 Fannin, MSB 5.036
 Houston, TX 77030
 Tel: 713-500-5421
 Email: amber.u.luong@uth.tmc.edu



Pete Batra, MD, FARS
 President Elect
 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



Rodney Schlosser, MD, FARS
 Immediate Past President
 Medical University of South Carolina
 135 Rutledge Ave., MSC 250550
 Suite 1130
 Charleston, SC 29425
 Tel: 843-792-7165
 Fax: 843-792-0546
 Email: Schlossr@musc.edu



Rakesh Chandra, MD, FARS
 Secretary
 Vanderbilt University
 Suite 7209, Medical Center E, South
 Tower
 Nashville, TN 37232
 Tel: 708-689-0933
 Email: Rakesh.Chandra@VUMC.org



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
 Treasurer
 UCLA Medical Center
 1131 Wilshire Boulevard
 Santa Monica, CA 90401
 Tel: 424-259-6559
 Email: jtlee@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



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



Wendi Perez
 Executive Administrator
 P.O. Box 269
 Oak Ridge, NJ 07438
 Phone: 973-545-2735
 Fax: 973-545-2736 x6
 Email: wendi@american-rhinologic.org

ARS Board of Directors



Benjamin Bleier,
MD, FARS



Seth Brown, MD,
FARS



Greg Davis, MD,
FARS



Stephanie Joe,
MD, FARS



Raj Sindwani,
MD, FARS



Marilene Wang,
MD, FARS



Bradford Woodworth,
MD, FARS



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

ARS Consultants to the Board



David Gudis,
MD, FARS



Thomas Higgins,
MD, FARS



Erin O'Brien,
MD, FARS



Zachary Soler, MD,
FARS

ARS Staff



Wendi Perez
Executive Administrator



Susan Arias
Development Liaison



Tammy Lorimer
*Administrative Assistant/
Office Coordinator*

ARS Committee Chairs



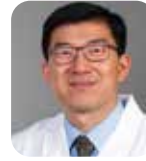
AUDIT
Justin Turner, MD,
FARS



AWARDS
Jean Kim, MD, FARS



BY-LAWS
Bradford Woodworth,
MD, FARS



CME
Kent Lam, MD, FARS



DEVELOPMENT
Brent Senior, MD, FARS



DIVERSITY & INCLUSION
Troy Woodard, MD, FARS



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



**EDUCATION
INNOVATION**
Abtin Tabaei, MD, FARS



ETHICS
Gretchen Oakley, MD, FARS



FELLOWSHIP
Stacey Gray, MD, FARS



HISTORIAN
Michael Benninger, MD,
FARS



**INTERNATIONAL
COMMITTEE**
Jivianne Lee, MD, FARS



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



**LIVE & ANCILLARY
COURSES**
Garret Choby, MD, FARS



MARKETING
Sanjeet Rangarajan, MD,
FARS



MEMBERSHIP
Daniel Beswick, MD, FARS



MENTORSHIP
Murugappan Ramanathan,
Jr., MD, FARS



NEWSLETTER
Jean Anderson Eloy,
MD, FARS



ONLINE EDUCATION
Jose Mattos, MD



PATIENT ADVOCACY
J. Peter Manes, MD, FARS



**PEDIATRIC
RHINOLOGY**
David Gudis, MD, FARS



QUALITY IMPROVEMENT
Zachary Soler, MD, FARS



RESEARCH
Vijay Ramakrishnan, MD,
FARS



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



**ALLERGY IN RHINOLOGY
SECTION**
Jean Kim, MD, FARS



**RHINOLOGISTS IN
PRIVATE PRACTICE
SECTION**
Greg Davis, MD, FARS



**SKULL BASE & ORBITAL
SURGERY SECTION**
Kibwei McKinney, MD



**WOMEN IN RHINOLOGY
SECTION**
Stacey Gray, MD, FARS

Program Committee

Pete Batra, MD, FARS
Program Chair

PROGRAM COMMITTEE

Rakesh Chandra, MD, FARS
Garret Choby, MD, FARS
Devyani Lal, MD, FARS
Kent Lam, MD, FARS
Michael Stewart, MD, FARS
Kevin Welch, MD, FARS
Sarah Wise, MD, FARS
Troy Woodard, MD, FARS

Program Abstract Reviewers

Benjamin Bleier, MD, FARS	Patricia Loftus, MD, FARS
Do Yeon Cho, MD	Nyall London, MD, FARS
Mindy Rabinowitz, MD, FARS	Amber Luong, MD, PhD, FARS
Adam Deconde, MD	R. Pete Manes, MD, FARS
Kara Detwiller, MD, FARS	Kibwei McKinney, MD
Angela Donaldson, MD, FARS	Caitlin McLean, MD
Carlos Ebert, MD, FARS	Pete Papagiannopoulos, MD
Matthew Geltzeiler, MD, FARS	Zara Patel, MD, FARS
David Gudis, MD, FARS	Katie Phillips, MD
Jose Gurrola, MD	Kenneth Rodriguez, MD
Ashleigh Halderman, MD, FARS	Lauren Roland, MD,
Elisa Illing, MD, FARS	Bobby Tajudeen, MD, FARS
Jean Kim, MD, FARS	Charles Tong, MD, FARS
Michael Kohanski, MD	Elina Toskala, MD, FARS
Edward Kuan, MD, FARS	Troy Woodard, MD, FARS
Stella Lee, MD	Carol Yan, MD
Victoria Lee, MD, FARS	William Yao, MD, FARS
Joshua Levy, 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

The ARS designates this live activity for a maximum of *10.50 AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

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.

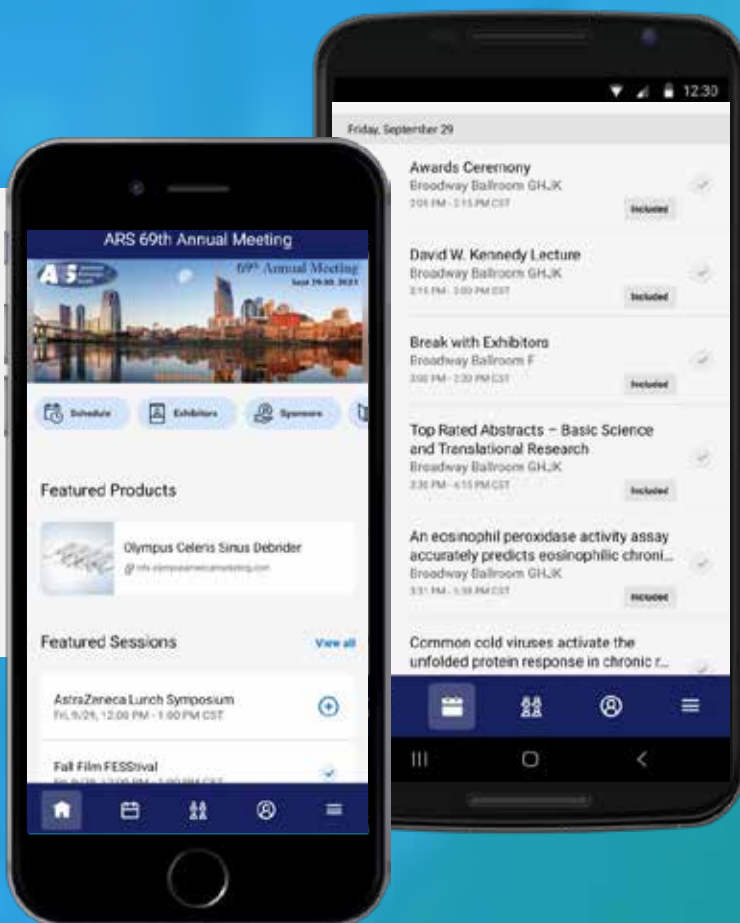
Learning Objectives

Upon completion of this session, participants should be able to:

- Advance the performance of clinical providers in the diagnosis and management of rhinology diseases, including improving procedural/operative skills and leadership/organizational skills
- Improve healthcare quality through research presentations and panel discussions that incorporate current health and practice data
- Recognize that the rhinologic health of populations involve factors beyond clinical care, including economic, social, and environmental factors; healthcare and payer systems; and health disparities



Download the Cvent Events App Now!



Scan this code with a QR reader to easily download the app.

by **cvent**

Search for "ARS 69th Annual" in the app

ARS 2023 FRIENDS IN RESEARCH DONORS

Thank you to all donors who have helped get the 2021 Friends in Research Campaign off to a great start! We thank you for your generosity! With the monies donated over the past few years the ARS has been able to continue the Friends in Research sponsored grant which is in addition to our traditional CORE efforts! New this year the ARS is also offering a three-year, multi-site Consortium Grant.

With your support, we can continue to fund the studies that provide clinical insights valuable to the care of our patients. This work not only advances the care of our patients through scientific innovation, but also generates important data establishing the efficacy and cost effectiveness of our care. In the current financial landscape, this is equally important to ensure that our patients have access to the treatment necessary to address their complaints. We thank you again for your help in this worthy endeavor!

Visit american-rhinologic.org and join us in our 2024 year campaign.

DIAMOND

Adam Folbe, MD, FARS
Michael Stewart, MD, FARS

PLATINUM

J. Noble Anderson, Jr. MD
Michael Armstrong, MD
Roy Casiano, MD, FARS
Greg Davis, MD, FARS
John Del Gaudio, MD, FARS
Charles Ebert, Jr., MD, FARS
Jeb Justice, MD, FARS
Robert Kern, MD, FARS
Donald Lanza, MD, FARS
R. Peter Manes, MD, FARS
James Palmer, MD, FARS
Douglas Reh, MD, FARS
Marc Rosen, MD, FARS
Mas Takashima, MD, FARS
Jonathan Ting, MD, FARS
Eugenia Vining, MD
Marilene Wang, MD, FARS
Sarah Wise, MD, FARS

GOLD

Omar G. Ahmed, MD, FARS
Nadeem Akbar, MD
Benjamin Bleier, MD, FARS
Do-Yeon Cho, MD
Noam Cohen, MD, FARS
Michael Cruz, MD, FARS
Subinoy Das, MD, FARS
Steven Davis, MD
Diag-Nose.io
David Gudis, MD, FARS
Yusuf Gulleth, MD
Corinna Levine, MD, FARS
Raj Sindwani, MD, FARS
Stephanie Smith, MD
Luisam Tarrats, MD, FARS
Elina Toskala, MD, FARS
Rhoda Wynn, MD, FARS

SILVER

John Craig, MD
John Chris Davis, MD
Brennan Dodson, MD
Judd Fastenberg, MD
Yusuf Gulleth, MD
Wayne Hsueh, MD
Aria Jafari, MD
Stephanie Joe, MD, FA
Kent Lam, MD, FARS
Andrew Lane, MD, FARS
Donald Lanza, MD, FARS
Ryan Little, MD
Brian Lobo, MD, FARS
Chadi Makary, MD, FARS
Michael Marino, MD, FARS
Edward McCoul, MD, FARS
Robert Pettis, MD
Hassan Ramadan, MD, FARS
B. Todd Schaeffer, MD
John Ulrich, DO
Andrew Victores, MD

BRONZE

Sanford Archer, MD, FARS
Richard Bailey, MD
Jay Chavda, MD
David Conley, MD, FARS
Thomas Edwards, MD
Meha Fox, MD
Rohit Garg, MD, FARS
Thomas Higgins, MD, FARS
Eric Holbrook, MD, FARS
Eyad Khabbaz, MD
Tran Locke, MD
Li-Xing Man, MD, FARS
Sonya McGhee, MD
Michael McGhee, MD
Daniel O'Brien, MD, FARS
Jonathan Overdevest, MD
Katie Phillips, MD
Nicholas Rowan, MD
John Schneider, MD
Kristine Smith, MD
Brian Song, MD
Jason Talmadge, MD
Michael Yim, MD, FARS

FRIEND

Dole Baker, MD
Martin Hopp, MD
Alissa Kanaan, MD
Ramy Mahmoud
Nora Perkins, MD
Katie Phillips, MD
Russell Reitz, MD
David Rosen, MD
Jessica Southwood, MD
Ron Swain, Jr., MD, FARS
Dennis Tang, MD, FARS

As of 9/17/23

Past Presidents

1954 - 1955	Maurice H. Cottle, MD*	1991 - 1992	Fred Stucker, MD, FARS
1955 - 1956	Ralph H. Riggs, MD*	1992 - 1993	David W. Kennedy, MD, FARS
1956 - 1957	Walter E. E. Loch, MD*	1993 - 1994	Sanford R. Hoffman, MD
1958 - 1959	Kenneth H. Hinderer, MD*	1994 - 1995	Richard J. Trevino, MD
1959 - 1960	Roland M. Loring, MD*	1995 - 1996	Vijay K. Anand, MD
1960 - 1961	Ivan W. Philpott, MD*	1996 - 1997	Dale H. Rice, MD
1962 - 1963	Raymond I. Hilsinger, MD*	1997 - 1998	Michael S. Benninger, MD, FARS
1963 - 1964	H. Ashton Thomas, MD*	1998 - 1999	William Panje, MD
1964 - 1965	Carl B. Spath, MD	1999 - 2000	Charles W. Gross, MD
1966 - 1967	Walter J. Aagesen, MD*	2000 - 2001	Frederick A. Kuhn, MD
1967 - 1968	Richard Hadley, MD*	2001 - 2002	Paul Toffel, MD, FARS
1968 - 1969	Henry L. Williams, MD*	2002 - 2003	Donald C. Lanza, MD, FARS
1970 - 1971	Charles A. Tucker, MD*	2003 - 2004	James A. Hadley, MD, FARS
1971 - 1972	Pat A. Barelli, MD	2004 - 2005	Joseph B. Jacobs, MD, FARS
1972 - 1973	Gerald F. Joseph, MD	2005 - 2006	Michael J. Sillers, MD, FARS
1973 - 1974	Manuel R. Wexler, MD*	2006 - 2007	Howard L. Levine, MD, FARS
1974 - 1975	George H. Drumheiler, MD*	2007 - 2008	Marvin P. Fried, MD, FARS
1975 - 1976	Joseph W. West, MD*	2008 - 2009	James Stankiewicz, MD, FARS
1976 - 1977	Albert Steiner, MD*	2009 - 2010	Stilianos Kountakis, MD, FARS
1977 - 1978	Anthony Failla, MD*	2010 - 2011	Brent A. Senior, MD, FARS
1978 - 1979	Clifford F. Lake, MD*	2011 - 2012	Michael Setzen, MD, FARS
1979 - 1980	W. K. Locklin, MD	2012 - 2013	Todd Kingdom, MD, FARS
1981 - 1982	Eugene B. Kern, MD	2013 - 2014	Timothy L. Smith, MD, FARS
1982 - 1983	Carlos G. Benavides, MD	2014 - 2015	Roy Casiano, MD, FARS
1983 - 1984	Leon Neiman, MD	2015 - 2016	Peter Hwang, MD, FARS
1984 - 1985	George C. Facer, MD	2016 - 2017	John DelGaudio, MD, FARS
1985 - 1986	Larry E. Duberstein, MD	2017 - 2018	Richard Orlandi, MD, FARS
1986 - 1987	Glenn W. Drumheiler, DO	2018 - 2019	James Palmer, MD, FARS
1987 - 1988	Alvin Katz, MD	2019 - 2020	Robert Kern, MD, FARS
1988 - 1989	Donald Leopold, MD, FARS	2020 - 2021	Joseph Han, MD, FARS
1990 - 1991	Pierre Arbour, MD	2021 - 2023	Rodney Schlosser, MD, FARS

*Deceased

Past Secretaries

2019 - Present	Rakesh Chandra, MD, FARS
2015 - 2019	Pete Batra, MD, FARS
2013 - 2015	James Palmer, MD, FARS
2009 - 2012	Peter Hwang, MD, FARS
2005 - 2008	Brent A. Senior, MD, FARS
1999 - 2005	Marvin P. Fried, MD, FARS
1995 - 1999	Frederick Stucker, MD, FARS
1990 - 1995	Frank Lucente, MD
1985 - 1990	George Facer, MD
1980 - 1985	Pat A. Barelli, MD
1975 - 1980	Glenn H. Drumhillier, MD
1970 - 1975	Ralph H. Riggs, MD

ARS 69th Annual Meeting Industry Supporters

The American Rhinologic Society gratefully acknowledges the following companies for their support of the 69th Annual Meeting

AstraZeneca
Gold Sponsorship

GlaxoSmithKline
Medtronic
Sanofi & Regeneron
Silver Sponsorship

Medtronic
Grant Support

Medtronic
19th Annual David W. Kennedy Lectureship

Acclarent
2nd Annual Hwang Family Lectureship

KARL STORZ Endoscopy-America, Inc.
Diversity & Inclusion/Women in Rhinology/Mentorship/Residents & Fellows Combined Program

Stryker
Residents Course

Stryker
Residents Reception

Hemostasis Fiagon
Rhinologists in Private Practice Cocktail Reception

Exhibitors

3NT Medical
Acclarent
Advanced RX Compounding
Pharmacy
Aerin Medical
Altus Biologics
AstraZeneca
Brainlab

GlaxoSmithKline
Hemostasis & Fiagon
KARL STORZ Endoscopy-America, Inc.
Lyra Therapeutics
Medical Center Specialty Pharmacy
Medtronic
Nasoneb

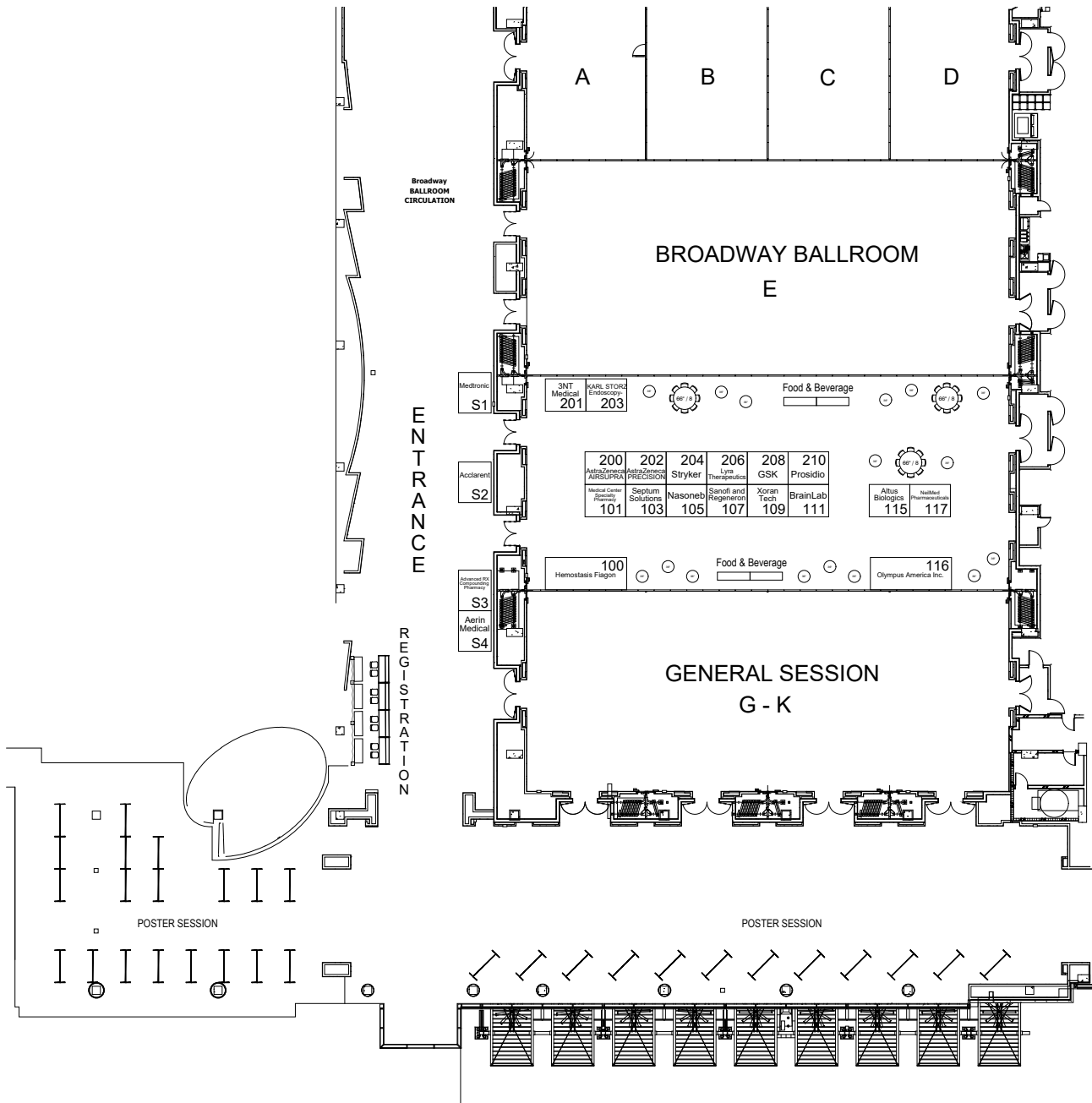
NeilMed Pharmaceuticals Inc.
Olympus America Inc.
Prosidio
Sanofi & Regeneron
Septum Solutions
Stryker
Xoran Technologies

Floor Plan & Exhibit Hall

2023 ARS 69th Annual Meeting

September 29 - 30, 2023

Omni Nashville Hotel - Broadway Ballroom - Nashville, TN



PROGRAM AT A GLANCE

**Thursday,
September 28, 2023**

Residents Didactic Course
Cumberland 1
12:00 pm – 5:00 pm
By Invitation Only

Residents Dissection Lab
Off Site Location
Details for Shuttle Service
forthcoming
12:00 pm – 5:00 pm
By Invitation Only

Residents Reception
Music Row 5
6:30 pm – 8:00 pm
By Invitation Only

**Friday,
September 29, 2023**

Residents Didactic Course
Cumberland 2
8:00 am – 12:00 pm
By Invitation Only

Residents Dissection Lab
Off Site Location
Details for Shuttle Service
forthcoming
8:00 am – 12:00 pm
By Invitation Only

**Friday,
September 29, 2023**

7:00 am – 12:00 pm
Broadway Ballroom ABC

7:00 am - 8:00 am
Board of Directors Breakfast

8:00 am - 12:00 pm
Board of Directors Meeting

**Friday,
September 29, 2023**

1:00 pm – 5:00 pm
General Session
Broadway Ballroom GHJK

12:00 pm - 1:00 pm
Fall Film FESStival
Broadway Ballroom GHJK
Moderators: Christopher Church, MD,
FARS;
Edward Kuan, MD, FARS

1:00 pm – 1:05 pm
Welcome & Introduction
Pete Batra, MD, FARS

1:05 pm – 1:20 pm
Presidential Address
Sarah Wise, MD, FARS

**Top Rated Abstracts –
Clinical Rhinology**

*Moderators: Kara Detwiler, MD, FARS;
Devyani Lal, MD, FARS; Bobby
Tajudeen, MD, FARS*

1:20 pm - 1:27 pm
**Topical platelet-rich plasma for post-
COVID olfactory dysfunction – A
randomized controlled trial**
Alexander Duffy, MD

1:28 pm – 1:35 pm
**Efficacy and safety of EDS-FLU in
chronic rhinosinusitis – Two
randomized controlled trials**
James Palmer, MD, FARS

1:36 pm – 1:43 pm
**All CRS endotype clusters
demonstrate improvement in patient
reported and objective measures after
endoscopic sinus surgery**
Nikita Chapurin, MD, MHS

1:44 pm – 1:51 pm
**Peri-operative air quality and post-
operative endoscopic sinus surgery
outcomes**
Amarbir Gill, MD

1:52 pm – 1:59 pm
**Optimizing topical nasal
corticosteroid irrigations: A
randomized double-blind clinical trial**
Zachary Root, BS

1:59 pm – 2:05 PM
Q&A

2:05 pm – 2:15 pm
Awards Ceremony
Jean Kim, MD, FARS

2:15 pm – 3:00 pm
David W. Kennedy Lecture
Introduction: Pete Batra, MD, FARS
Guest Speaker: Brent Senior, MD, FARS
**“Global Outreach in Rhinology:
Lessons Learned from a Quarter
Century in Vietnam”**

3:00 pm – 3:30 pm
Break with Exhibitors

**Top Rated Abstracts – Basic
Science and Translational
Research**

*Moderators: Benjamin Bleier, MD, FARS;
Do-Yeon Cho, MD; Elina Toskala, MD,
FARS*

3:30 pm – 3:37 pm
**An eosinophil peroxidase activity
assay accurately predicts eosinophilic
chronic rhinosinusitis**
Kristine Smith, MD

PROGRAM AT A GLANCE

3:38 pm – 3:45 pm

Common cold viruses activate the unfolded protein response in chronic rhinosinusitis

Elizabeth Sell, Medical Student

3:46 pm – 3:53 pm

Timing of surgery on tissue IL-13 expression in CRSwNP patients on dupilumab: A real-world study

Abdul Rahman Alenezi, MD

3:54 pm – 4:01 pm

Glutathione and bicarbonate nanoparticles improve mucociliary transport in cystic fibrosis epithelia

Nicholas Rivers, MD

4:02 pm – 4:09 pm

The effects of PM2.5 exposure on the presentation of acute bacterial rhinosinusitis

David Grimm, MS

4:09 pm – 4:15 pm

Q&A

4:15 pm – 5:00 pm

Panel: “Maintaining Balance & Achieving the Quadripartite Mission”**Moderator:** Nicholas Rowan, MD**Panelists:** Stacey Gray, MD, FARS; Peter Hwang, MD, FARS; Devyani Lal, MD, FARS; Rodney Schlosser, MD, FARS; Sarah Wise, MD, FARS*Sponsored by Residents and Fellows Committee and Women in Rhinology Section*

5:30 pm – 7:00 pm

**President’s Welcome Reception
Broadway Ballroom, 5th Avenue Pre-Function****Saturday,
September 30, 2023****8:00 am – 12:00 pm****Breakout 1****Basic Science and Clinical
Rhinology
Broadway Ballroom JK****Session Chair: Erin O’Brien, MD,
FARS**

7:00 am – 8:00 am

Meet the Authors Poster Viewing & BreakfastRoom: Grand View Terrace Foyer,
Second Level

8:00 am – 8:35 am

**Panel: “Success in Early Career
Extramural Funding”****Moderator:** Murugappan Ramanathan,
MD, FARS**Panelists:** Andrew Lane, MD, FARS;
Corinna Levine, MD, FARS; Timothy
Smith, MD, FARS; Carol Yan, MD
*Sponsored by the Mentorship Committee***Scientific Oral Presentations:
Pathophysiology and
Mechanisms***Moderators: Lauren Roland, MD; Nicholas
Rowan, MD; Kristine Smith, MD*

8:35 am – 8:40 am

**Acetate and propionate metabolism by
Pseudomonas aeruginosa contributes
to significant sinus inflammation in a
rabbit model of sinusitis**

Do-Yeon Cho, MD

8:41 am – 8:46 am

**Identifying 5-hydroxymethylcytosine
profiles in cell free DNA from serum in
patients with aspirin exacerbated
respiratory disease**

Tiffany Toni

8:47 am – 8:52 am

**Increased Staphylococcus abundance
in the sinus microbiome is associated
with chronic rhinosinusitis treatment
resistance**

David Hoying, BS

8:53 am – 8:58 am

**Long non-coding RNAs related to
extracellular matrix and proteins are
differentially expressed in chronic
rhinosinusitis**

Tripti Brar, MBBS, MD

8:59 am – 9:04 am

**Comparison between upper and lower
airway microbiome in chronic
rhinosinusitis patients**

Juan Carlos Hernaiz-Leonardo, MD, MSc

9:05 am – 9:15 am

Q&A

9:15 am – 9:45 am

**Panel: Generative Artificial Intelligence
in Rhinology****Moderator:** Chirag Patel, MD, FARS**Panelists:** Martin Citardi, MD, FARS; Brian
Lobo, MD, FARS; Martin Desrosiers, MD

9:45 am – 10:15 am

Break with Exhibitors**Scientific Oral Presentations:
CRS Impact and Disease
Severity***Moderators: Angela Donaldson, MD,
FARS; Amber Luong, MD, PhD, FARS;
Toby Steele, MD*

10:15 am – 10:20 am

**In vivo nasal micro-optical coherence
tomography imaging reveals
mucociliary dysfunction in chronic
rhinosinusitis**

Kadambari Vijaykumar

10:21 am – 10:26 am

**Multi-instance learning for eosinophil
quantification of sinonasal
histopathology images**

Yi-Tsen Lin, MD, PhD

10:27 am – 10:32 am

**Frailty is an independent predictor of
post-operative rescue medication use
after endoscopic sinus surgery**

Andrea Lopez, BS

10:33 am – 10:38 am

**Cognition and saccadic eye movement
performance are impaired in chronic
rhinosinusitis**

David Cvancara, BS

PROGRAM AT A GLANCE

10:39 am – 10:45 am
Q&A

10:45 am – 10:50 am
Sleep dysfunction is greater in aspirin-exacerbated respiratory disease than in other forms of chronic rhinosinusitis
David Cvanacara, BS

10:51 am – 10:56 am
Clinical characteristics and comorbidities associated with non-eosinophilic chronic rhinosinusitis
Tripti Brar, MBBS, MD

10:57 am – 11:02 am
Impact of chronic rhinosinusitis local exacerbations on granulomatosis with polyangiitis disease progression and systemic exacerbations
Trisha Shang, BA

11:03 am – 11:08 am
Endotype evaluation of Hispanic/Latinx-American patients with chronic rhinosinusitis with polyps
Arthur Wu, MD, FARS

11:08 am – 11:15 am
Q&A

11:15 am – 12:00 pm
Panel: “CRS Endotypes, Subtypes, and Therapeutics: Where are we and where are we going?”
Moderator: Amber Luong, MD, PhD, FARS
Panelists: Jeremiah Alt, MD, PhD, FARS; Robert Kern, MD, FARS; Stella Lee, MD; Justin Turner, MD, FARS

12:00 pm – 1:00 pm
Lunch with Exhibitors

12:00 pm – 1:00 pm
Diversity & Inclusion, Women in Rhinology, Mentorship, Residents & Fellows Combined Lunch Program
Broadway Ballroom A
“Breaking Barriers: Insights on Improving Diversity and the Pipeline in Medicine”
Moderator: Troy Woodard, MD, FARS
Panelists: Andre Churchwell, MD; Kimberly Vinson, MD

Saturday, September 30, 2023

8:00 am – 12:00 pm Breakout 2 Skull Base Broadway Ballroom CD

Session Chair: Bobby Tajudeen, MD, FARS

7:00 am – 8:00 am
Meet the Authors Poster Viewing & Breakfast
Room: Grand View Terrace Foyer, Second Level

8:00 am – 8:30 am
Panel: “Pediatric Skull Base Surgery in the 21st Century: Advances and Frontiers”
Moderator: David Gudis, MD, FARS
Panelists: Nithin Adappa, MD, FARS; Garret Choby, MD, FARS; Zara Patel, MD, FARS
Sponsored by Pediatric Rhinology Committee

Scientific Oral Presentations: Skull Base Surgery

Moderators: Mathew Geltzeiler, MD, FARS; Nyall London, MD, FARS; Peter Papagiannopoulos, MD

8:30 am – 8:35 am
Mutational landscape and predictors of survival in head and neck mucosal melanoma
Brandon Lehrich, BS

8:36 am – 8:41 am
Genomic and clinical analysis of olfactory neuroblastoma
Theodore Nguyen, BS

8:42 am – 8:47 am
Genomic mutational analysis and predictors of survival in nasopharyngeal carcinoma
Benjamin Bitner, MD

8:48 am – 8:53 am
SNOT-22 subdomain outcomes in sinonasal malignancy: A prospective multi-center study
David Grimm, MS

8:53 am – 9:00 am
Q&A

9:00 am – 9:05 am
Tranexamic acid in endoscopic sinus and skull base surgery: A systematic review and meta-analysis
Sarah Khalife, MD

9:06 am – 9:11 am
The use of aprepitant to reduce postoperative nausea and vomiting in endoscopic skull base surgery
Daniel Lee, MD, FRCSC

9:12 am – 9:17 am
Predictors of prolonged length of stay following intradural endoscopic skull base surgery
Jonathan Pang, BA

9:18 am – 9:23 am
Quality of life among patients undergoing endoscopic pituitary gland resection with and without middle turbinectomy
Narin N. Carmel Neiderman, MD, MSc

9:23 am – 9:30 am
Q&A

9:30 am – 9:45 am
Targeted Conversations on Important Topics: Next Generation Sequencing in Skull Base Surgery
Moderator: Sanjeet Rangarajan, MD, FARS
Panelists: Corinna Levine, MD, FARS; Peter Papagiannopoulos, MD

9:45 am – 10:15 am
Break with Exhibitors

Scientific Oral Presentations: Rhinology Potpourri

Moderators: Charles Ebert, MD, FARS; Edward Kuan, MD, FARS; Charles Tong, MD, FARS

10:15 am – 10:20 am
Stellate ganglion block for post-COVID-19 parosmia: Does it work?
Bitu Naimi, BA

PROGRAM AT A GLANCE

10:21 am – 10:26 am

Stellate ganglion block for the treatment of COVID-19-induced olfactory dysfunction: A prospective pilot study

Andrew Peterson, MD, MSCI

10:27 am – 10:32 am

Sinonasal pathogenic bacteria in patients with diabetes mellitus

Trisha Shang, BA

10:33 am – 10:38 am

The role of CCL19 and atypical cytokine receptor CCRL1 in chronic rhinosinusitis

Chengetai Mahomva, MD

10:39 am – 10:45 am

Q&A

10:45 am – 10:50 am

Real-world comparison of nasal obstruction outcome scores between medial flap turbinoplasty and inferior turbinate submucous resection during concurrent septorhinoplasty

Milind Vasudev, BS

10:51 am – 10:56 am

Cadaveric and computed tomography analysis of the arterial supply and mucosal dimensions of the anterior ethmoid artery flap

Lane Donaldson, MD

10:57 am – 11:02 am

Posterior nasal nerve ablation for management of postnasal drip: A single center case series

Daniel Gorelik, Research Fellow

11:03 am – 11:08 am

Insurance influence and reimbursement on common rhinological procedures

Tyler Janz, MD

11:08 am – 11:15 am

Q&A

11:15 am – 12:00 pm

Panel: “Postoperative Care in Skull Base Surgery: CPAP, Debridement, Rinses and More!”

Moderator: Mathew Geltzeiler, MD, FARS**Panelists:** Nyssa Farrell, MD; Edward Kuan, MD, FARS; Mindy Rabinowitz, MD, FARS; Bobby Tajudeen, MD, FARS

Sponsored by the Skull Base and Orbital Surgery Section

12:00 pm – 1:00 pm

Lunch with Exhibitors

12:00 pm – 1:00 pm

Diversity & Inclusion, Women in Rhinology, Mentorship, Residents & Fellows Combined Lunch Program

Broadway Ballroom A

“Breaking Barriers: Insights on Improving Diversity and the Pipeline in Medicine”

Moderator: Troy Woodard, MD, FARS**Panelists:** Andre Churchwell, MD; Kimberly Vinson, MD

Saturday, September 30, 2023

8:00 am – 12:00 pm

Breakout 3

Business of Medicine/Clinical Rhinology
Broadway Ballroom GH

Session Chair: Greg Davis, MD, FARS

7:00 am – 8:00 am

Meet the Authors Poster Viewing & Breakfast

Room: Grand View Terrace Foyer, Second Level

8:00 am – 8:30 am

Panel: “Setting Up and Maximizing an ASC for Success”

Moderator: Douglas Reh, MD, FARS**Panelists:** Karen Bednarski, MD, FARS; Leah Hauser, MD; Michael Sillers, MD, FARS

Sponsored by Rhinologists in Private Practice Section

Scientific Oral Presentations: Sinus Surgery and Postop Therapies

Moderators: Chadi Makary, MD, FARS; Katie Phillips, MD; William Yao, MD, FARS

8:30 am – 8:35 am

Outcomes and histopathologic features for chronic rhinosinusitis macrolide responders

Madelyn Frank, BA

8:36 am – 8:41 am

Outcomes of “full-house” versus limited endoscopic sinus surgery for chronic rhinosinusitis patients

Shreya Ramkumar, BS

8:42 am – 8:47 am

Factors impacting follow-up care in allergic fungal rhinosinusitis

Jorge Gutierrez, BA

8:48 am – 8:53 am

Efficacy of early postoperative debridement in sinonasal cavity healing after functional endoscopic sinus surgery: A randomized controlled trial

Juan Carlos Hernaiz-Leonardo, MD, MSc

8:53 am – 9:00 am

Q&A

9:00 am – 9:05 am

The effect of low-dose long-term doxycycline on postoperative outcomes in patients with eosinophilic chronic rhinosinusitis

Jin Young Min, MD, PhD

9:05 am – 9:10 am

High dose ciprofloxacin and azithromycin sinus stent for the treatment of chronic rhinosinusitis

Do-Yeon Cho, MD

9:10 am – 9:15 am

Quantification of retained budesonide dose from high-volume saline irrigation in post-operative chronic rhinosinusitis

Paige Shipman, MS1

9:15 am – 9:20 am

Medication adherence with intranasal corticosteroid irrigations

Jorge Gutierrez, BA

PROGRAM AT A GLANCE

9:20 am - 9:25 am

Evaluation of LYR-220 corticosteroid matrices at week 24 from the BEACON study in CRS

Brent Senior, MD, FARS

9:25 am – 9:30 am

Q&A

9:30 am – 9:45 am

Targeted Conversations on Important Topics: Correct Coding for Office-Based Rhinologic Surgery - Do's and Don'ts**Moderator:** R. Peter Manes, MD, FARS**Panelists:** Seth Brown, MD, FARS; Toby Steele, MD

9:45 am – 10:15 am

Break with Exhibitors**Scientific Oral Presentations: Diagnosis of Rhinosinusitis and QOL Measures***Moderator: Jean Kim, MD, FARS; Victoria Lee, MD, FARS; Mindy Rabinowitz, MD, FARS*

10:15 am – 10:20 am

Development and validation of the sinonasal endoscopic score (SINES) for chronic rhinosinusitis

Juan Carlos Hernaiz-Leonardo, MD, MSc

10:21 am – 10:26 am

Patient perspectives on recall period and response options in patient-reported outcome measures for chronic rhinosinusitis**symptomatology: An international multi-centered study**

Ahmad Sedaghat, MD, PhD

10:27 am – 10:32 am

The surprising impact of priming on the SNOT-22

Ibtisam Mohammad, MD

10:33 am – 10:38 am

Nasal symptoms, medication usage, nasal endoscopy and patient perspectives as determinants of physician assessment of chronic rhinosinusitis control

Ahmad Sedaghat, MD, PhD

10:39 am – 10:45 am

Q&A

10:45 am – 10:50 am

Variation in computed tomography opacification in sinus disease: A snapshot in time

Glen D'Souza, MD

10:51 am – 10:56 am

Determining the minimal clinically important difference for the questionnaire of olfactory disorders in people with cystic fibrosis and factors associated with improvement after highly effective modulator therapy

Jessa Miller, MD

10:57 am – 11:02 am

Optimization of diagnostic and procedural codes to identify patients with acute invasive fungal sinusitis

Marie-Ange Munyemana, BA

11:03 am – 11:08 am

Impact of recurrent acute rhinosinusitis on quality of life

Zayd Al-Asadi, MD

11:08 am – 11:15 am

Q&A

11:15 am – 12:00 pm

Panel: "How to Build a Rhinology Clinical Niche in a Comprehensive ENT Practice"**Moderator:** Greg Davis, MD, FARS**Panelists:** Mary Ashmead, MD; Michael Cruz, MD, FARS; Christopher Davis, MD; Michael Setzen, MD, FARS*Sponsored by Rhinologists in Private Practice Section*

12:00 pm – 1:00 pm

Lunch with Exhibitors

12:00 pm – 1:00 pm

Diversity & Inclusion, Women in Rhinology, Mentorship, Residents & Fellows Combined Lunch Program

Broadway Ballroom A

"Breaking Barriers: Insights on Improving Diversity and the Pipeline in Medicine"**Moderator:** Troy Woodard, MD, FARS**Panelists:** Andre Churchwell, MD;

Kimberly Vinson, MD

**Saturday,
September 30, 2023****1:00 pm – 5:00 pm****General Session****Broadway Ballroom GHJK**

1:00 pm – 1:15 pm

ARS Business Meeting and Presidential Citations

Sarah Wise, MD, FARS; Michael Stewart, MD, FARS; Pete Batra, MD, FARS

1:15 pm – 2:00 pm

Hwang Family Lectureship**"The Meaningfulness of Paying It Forward: My 40-Year Journey"****Introduction:** Richard Orlandi, MD, FARS**Guest Speaker:** Donald Lanza, MD, FARS**Scientific Oral Presentations: Nasal Polyps and Biologics***Moderators: Elisa Illing, MD, FARS; Kenneth Rodriguez, MD; Abtin Tabaei, MD, FARS*

2:00 pm – 2:05 pm

Medication use for chronic rhinosinusitis with nasal polyps (CRSwNP) pre and post dupilumab

Emily Garvey, BA

2:06 pm – 2:11 pm

Nasal nitric oxide to compare endoscopic sinus surgery versus dupilumab for CRSwNP

Daniel Lee, MD, FRCSC

2:12 pm – 2:17 pm

Quantifying patient preferences for treating nasal polyps: Biologics vs. surgery

Somtochi Okafor, MD

2:18 pm – 2:23 pm

Sinonasal symptom correlation with the postoperative polyp scale (POPS)

Arthur Wu, MD, FARS

2:23 pm – 2:30 pm

Q&A

PROGRAM AT A GLANCE

2:30 pm – 2:35 pm

Blood IgE and eosinophils are not reliable predictors of nasal inflammation

Andrew Thamboo, MD, MHSc

2:36 pm – 2:41 pm

Ocular surface adverse events associated with dupilumab for treatment of nasal polyps

Austin Swisher, BS

2:42 pm – 2:47 pm

Real world trial for weaning dupilumab from every 2 to every 4 week administration

Emily Garvey, BA

2:48 pm – 2:53 pm

Real-world adverse events after type 2 monoclonal antibody use in chronic rhinosinusitis with nasal polyps

Marisa Dorling, BSc

2:53 pm – 3:00 pm

Q&A

3:00 pm – 3:30 pm

Break with Exhibitors

3:30 pm – 4:15 pm

Combined ARS/AOA Panel: “Office-Based Procedures Update: Common Procedures & Difficult Cases”**Moderator:** Jean Kim, MD, FARS**Panelists:** Omar Ahmed, MD, FARS;

Charles Ebert, Jr., MD, FARS; Monica

Patadia, MD; Elina Toskala, MD, FARS

4:15 pm – 5:00 pm

International Collaborative Panel: “Assessing Septoplasty Outcomes: An International Perspective”**Moderator:** Michael Stewart, MD, FARS**Panelists:** Sean Carrie, MB, ChB, FRCS, FRCS(ORL); Chang-Hoon Kim, MD; Jern-Lin Leong, MD; Ramandeep Virk, MBBS, MS (ENT)*Sponsored by the International Committee*

5:00 pm

Meeting Adjourns

5:00 pm – 7:00 pm

Rhinologists in Private Practice Cocktail ReceptionDate Night Bar at Assembly Food Hall
5055 Broadway Place

POSTERS

Poster #001

A comparative analysis of nasal packing with and without bupivacaine for postoperative pain control after endoscopic endonasal transsphenoidal surgery

Karol Avila-Castano

Poster #002

A computational analysis to investigate anatomical factors associated with increased likelihood of epistaxis from intranasal sprays usage

Katherine Gonzalez, BS

Poster #003

WITHDRAWN

Poster #004

A rare case of chronic invasive curvularia fungal sinusitis

Samuel Hopper, BS

Poster #005

Academic productivity trends of fellowship-trained U.S. academic rhinologists

Michael Warn

Poster #006

Acinic cell carcinoma in the nasal cavity: A case report of a 69-yearold female complaining of nasal congestion

Aileen Beatrice Antonio, MD

Poster #007

An assessment of the quality of artificial intelligence-generated patient counseling for sinusitis

Gregory Hill, MD

Poster #008

Artificial intelligence based semi-automatic segmentation for orbital tumors radiomic measurement

Angela Zhu, BA

Poster #009

WITHDRAWN

Poster #010

Assessing nasal function after definitive rhinoplasty for unilateral cleft lip nasal deformity repairs: A pilot analysis

Elaine Lin, BS

Poster #011

Association of alcohol use with olfactory function among older adults

Khamis Suleiman

Poster #012

Association of chronic rhinosinusitis and autoimmune disorders

Chadi Makary, MD, FARS

Poster #013

Association of prior military service with olfactory function among older adults

Richard Chiu, BS

Poster #014

Baseline olfactory function and prospective assessment of patient-reported outcome measures in patients with nasal septal perforation

Shreya Ramkumar, BS

Poster #015

Biologic therapies for treating chronic sinusitis with nasal polyps: What do patients want to know?

Samuel Razmi, BS

Poster #016

B-LBL presents as sinonasal mass: A case report

Brandon Vilarello, BA

Poster #017

WITHDRAWN

Poster #018

Case report: Rare angiomylipoma of the nasal cavity

Akash Halagur, BA

Poster #019

Cavernous sinus immunoglobulin G4-related disease - A case report

Erika Bradley, RN, BSN

Poster #020

Characteristics of patients requiring revision endoscopic sinus surgery- An 11-year single-institution study

Madison Buras, MD

Poster #021

Characterization of chronic rhinosinusitis by associated medical comorbidities

Tiffany Toni

PROGRAM AT A GLANCE

Poster #022

Choosing wisely in ESS in the era of biologics (CHES)

Neil Verma, MDCM, MSc, FRCSC

Poster #023

Clinical outcomes and complications of endoscopic odonoidectomy: A single institution experience

Ann Powers, MD

Poster #024

Clinical outcomes of bioabsorbable nasal implants for nasal valve collapse: A meta-analysis

Felisha Li, BA

Poster #025

Clinical productivity of fellowship-trained academic rhinologists: An analysis of Medicare metrics

Michael Warn

Poster #026

Cohort study: Pluripotent pituitary adenomas are at higher risk for SIADH

Sabrina Goyal, BS

Poster #027

Combined transnasal, transoral approach for excision of odontogenic cysts offers reduced recurrence rates and favorable sinonasal outcomes

Jennifer Douglas, MD

Poster #028

Comparing physical and virtual “digital twin” models of endoscopic skull base disorders for preoperative planning

David Ahmadian, BS

Poster #029

Complications of novel radiofrequency device use in otolaryngology: A MAUDE analysis

Sina Torabi, MD

Poster #030

Comprehensive patient-focused medical illustrations to supplement the rhinology surgical consent process

Chase Kahn, MD

Poster #031

Contemporary update on the microbiology of paranasal sinusitis

Alan Workman, MD, MTR

Poster #032

Cranial neuropathies secondary to allergic fungal rhinosinusitis

Ashleigh Halderman, MD

Poster #033

Craniofacial pain locations and outcomes after endoscopic sinus surgery for unilateral sphenoid sinusitis: A multi-institutional study

Richard Pellizzari, BS

Poster #034

CRSwNP patients using biologics: real-world experience in a reference center

Wilma Anselmo-Lima, PhD

Poster #035

Current otolaryngologic applications of the novel self-assembling RADA-16 peptide matrix

Arthur Wu, MD

Poster #036

Development of a novel quantitative PCR assay for diagnosis of rhinocerebral mucormycosis

Tom Maxim, MD

Poster #037

Differences in patient characteristics with unilateral versus bilateral allergic fungal rhinosinusitis

Sei Chung, MD

Poster #038

Dupilumab improved objective and patient-reported outcomes in patients with chronic rhinosinusitis with nasal polyps (CRSwNP) and complete bilateral nasal obstruction in the sinus-24 and sinus-52 trials

Prof. Claire Hopkins

Poster #039

Efficacy of olfactory training after unilateral anterior skull base resection in patients with olfactory neuroblastoma: A single-center prospective study

Teppei Takeda, MD

Poster #040

Epithelial-myoeepithelial carcinoma of the nasal cavity. An interesting case report and review of the literature

Ariel Waitzman, MD

Poster #041

Eustachian tube recanalization via CO2 guidewire and ureteral stent

Christopher Pool, MD

Poster #042

Evidence for a role of metformin in preventing olfactory dysfunction among older adults

Sahar Assi, MD

Poster #043

WITHDRAWN

Poster #044

Extramedullary plasma cell neoplasm in the nasal cavity: Case presentation

Guillermo Antonio Ramirez, MD

Poster #045

Functional and structural correction of over-reduced noses by non-rib grafts

Mohsen Naraghi, MD, FARS

Poster #046

Gender differences in quality of life in patients with skull base pathologies

Parker Tumlin, MD

Poster #047

Granulomatosis with polyangiitis presenting with skull base inflammation mimicking petrous apicitis: A case report and literature review

Michael Castle, MD

Poster #048

Histopathologic features of patients with noninvasive fungal rhinosinusitis

Tamara Simpson, BA

Poster #049

WITHDRAWN

Poster #050

Impact of insurance status on CSF leak presentation

Ali M. Baird, BS

Poster #051

Impact of LYR-210 corticosteroid matrices on the incidence of acute exacerbations of chronic rhinosinusitis in patients from the LANTERN randomized controlled study

Vineeta Belanger, PhD

Poster #052

Impact of social determinants of health in chronic rhinosinusitis disease severity: A scoping review

Avigeet Gupta, MD

PROGRAM AT A GLANCE

Poster #053

Incident diagnosis of granulomatosis with polyangiitis in chronic rhinosinusitis receiving sinus surgery
Trisha Shang, BA

Poster #054

Insight into the mutational landscape of sinonasal squamous cell carcinoma
Arash Abiri, MS

Poster #055

Interleukin(IL)-4 induces loss of smell in mice without disrupting olfactory sensory neuron and epithelial integrity
Dr. Hamid Mattoo

Poster #056

Is it NPC? Endoscopic image recognition of NPC using narrowing band imaging versus white light using deep learning network analysis
Shuhui Xu, MBBS, MRCS (Ireland), MMed (ORL)

Poster #057

WITHDRAWN

Poster #058

Locally recurrent nasopharyngeal carcinoma treated with minimally invasive combined transoral robotic and transnasal endoscopic resection: A case report
Abdurrahman Al-Awady

Poster #059

Long term quality of life among patients undergoing endoscopic pituitary gland surgery
Narin N. Carmel Neiderman, MD MSc

Poster #060

WITHDRAWN

Poster #061

Metastatic anterior skull base adenocarcinoma presenting as hearing loss
Margaret Mitchell, MD, MS-HPed

Poster #062

Mutational landscape and predictors of survival in sinonasal undifferentiated carcinoma
Brandon Lehigh, BS

Poster #063

Nasal septal perforation endoscopy score correlates with symptom burden in patients with nasal septal perforations
Amar Miglani, MD

Poster #064

New techniques of reducing intraoperative bleeding in endoscopic sinus surgery for eosinophilic chronic rhinosinusitis cases with asthma
Yoichiro Narikawa, MD

Poster #065

WITHDRAWN

Poster #066

Novel use of urinalysis dipsticks for differentiating patients with diverse sinusitis complaints
Michela Borrelli, BA

Poster #067

Olfaction and neurocognition after COVID-19: A scoping review
Brandon Vilarello, BA

Poster #068

Open access artificial intelligence and rhinology patient education
Alice Huang, MD

Poster #069

Optimizing strategy for pre-operative sinonasal irrigation through 3D Printing
Kanghyun Kim, BS

Poster #070

Oral corticosteroid (OCS) burden and healthcare resource utilization (HCRU) in patients with chronic rhinosinusitis with nasal polyps (CRSwNP) undergoing functional endoscopic sinonasal surgery (FESS): A US real-world retrospective cohort study
Stella Lee, MD

Poster #071

Paranasal sinus and nasal cavity squamous cell carcinoma and adenocarcinoma: A SEER database analysis
Lacy Brame, DO

Poster #072

Perioperative strategies for improving quality of life and sinonasal morbidity after endoscopic skull base surgery: A systematic review
Satyan Sreenath, MD

Poster #073

Predictors of headache/facial pain associated with cryotherapy ablation of the posterior nasal nerve for the treatment of chronic rhinitis
Samuel Razmi, BS

Poster #074

Predictors of surgical intervention in children with complicated orbital cellulitis
Erica McArdle, MD

Poster #075

Proof of Concept: How to use Zoom to set up a remote telementoring experience for teaching endoscopic sinus surgery
Angela Yang

Poster #076

Purasinus, a novel self-assembling peptide, in a draf-III frontal sinusotomy
Kaitlynn Pak, MD

Poster #077

Radiographic enhancement of the longus colli muscle in skull base osteomyelitis
Grant Owen, BA

Poster #078

Rare case of a giant disfiguring frontal sinus mucocele causing globe subluxation
Caroline Christmann, MD

Poster #079

Readability and quality analysis of patient education materials in aspirin exacerbated respiratory disease
Kush Panara, MD

Poster #080

Real-world effectiveness of Mepolizumab on upper and lower airway diseases
Jonathan Bernstein

Poster #081

Reconstruction of sellar defects with laterally-pediced native sphenoid sinus mucosa
Samuel Floren, MD

Poster #082

Referral patterns: Number of providers and duration of loss before definitive intervention for olfactory disorders
Bruna Castro, MD

Poster #083

WITHDRAWN

PROGRAM AT A GLANCE

- Poster #084
Report of a novel reconstruction method using sternocleidomastoid flap and nasoseptal flap for nasopharyngeal tumors after nasopharyngectomy
Bita Naimi, BA
- Poster #085
WITHDRAWN
- Poster #086
Restarting antithrombotic drugs following functional endoscopic sinus surgery: A scoping review
Trinithas Boyi, MA
- Poster #087
Role of allergic rhinitis in recurrent acute rhinosinusitis
John Behnke, MD
- Poster #088
Safety of proton beam therapy in patients with sinonasal carcinoma: A systematic review
Srivatsa Surya Vasudevan, MD, MS
- Poster #089
Severe epistaxis after posterior nasal nerve ablation requiring surgical intervention: A single center case series
Yuki Yoshiyasu, MD
- Poster #090
Severe unilateral refractory epistaxis arising from the septal branch of the anterior ethmoid artery
Theodore Nguyen, BS
- Poster #091
Severity of chronic sinonasal symptoms after a major acute inhalational event: A world trade center retrospective cohort study
Jerlon Chiu, MD
- Poster #092
Sex-based differences in severity of chronic rhinosinusitis as reported by SNOT-22 scores
Snehitha Talugula
- Poster #093
Shared decision making for patients with nasal polyposis: Needs assessment utilizing social media and clinical cohorts
Isaac Schmale, MD
- Poster #094
Sinonasal renal cell-like adenocarcinoma: Learnings from a case in pregnancy
Andrew Lee, BS
- Poster #095
Stop scrolling: A social media quality review of sinusitis videos on TikTok
Rose Dimitroyannis, BA
- Poster #096
Surgical management of obstructive nasal polyposis in Cornelia de Lange syndrome
Trisha Ortiz, Medical Student
- Poster #097
Synergistic cytotoxicity of permethrin and N,N-Diethyl-Meta-Toluamide on sinonasal epithelia with or without chronic rhinosinusitis
Hong-Ho Yang, BS
- Poster #098
The direct impact of the COVID-19 pandemic on rhinology practice
Sarah Sutton, BS
- Poster #099
The effect of acupuncture therapy on COVID-19 related olfactory loss
Michael Armstrong, MD
- Poster #100
The impact of bundled codes on Medicare volume and reimbursements for endoscopic sinus surgery
Derek Liu, MD
- Poster #101
The impact of Dupilumab treatment on CRSwNP outcomes in patients with severe CRSwNP from the SINUS-24 and SINUS-52 studies
Martin Desrosiers, MD
- Poster #102
The impact of the lateral crural reversing on the primary concavity
Mohsen Naraghi, MD, FARS
- Poster #103
The influence of facility volume and type on sinonasal undifferentiated carcinoma treatment and outcomes
Amy Du, BS
- Poster #104
The influence of inhibitors of apoptosis proteins (IAPs) on chronic rhinosinusitis with nasal polyps
Wilma Anselmo-Lima, PhD
- Poster #105
The role of normal nasal anatomical variability on intranasal drug particle transport
Claire Washabaugh
- Poster #106
The validation of the readability enhanced sinonasal outcome test (reSNOT-22) disease-specific quality of life survey
Adam Kimple, MD, FARS
- Poster #107
Three cases of sinonasal organized hematoma
Sei Kobayashi, MD
- Poster #108
Triple-combination Cystic Fibrosis transmembrane conductance regulator (CFTR) modulator therapy and functional endoscopic sinus surgery in Cystic Fibrosis with chronic rhinosinusitis
Brian Kinealy, MD
- Poster #109
Utilizing 3D navigation to enhance endoscopic sinus educational dissection for Otolaryngology trainee
Tadeas Lunga, MD
- Poster #110
Voice quality changes follow sinonasal surgery
Meha Fox, MD
- Poster #111
Which intranasal corticosteroids can be used in patients on PrEP or HAART?
Meghan Nicole Norris, PA-C
- Poster #112
Wide resection of extradural skull base lesions requiring sacrifice of internal carotid artery: Preliminary surgical outcome at a single medical center
Sung-Woo Cho, MD

PROGRAM ABSTRACTS

Thursday, September 28, 2023

Residents Didactic Course

Cumberland 1
12:00 pm – 5:00 pm
By Invitation Only

Residents Dissection Lab

Off Site Location
Details for Shuttle Service forthcoming
12:00 pm – 1:00 pm
By Invitation Only

Residents Reception
Music Row 5
6:30 pm – 8:00 pm
By Invitation Only

Friday, September 29, 2023

Residents Didactic Course

Cumberland 2
8:00 am – 12:00 pm
By Invitation Only

Residents Dissection Lab

Off Site Location
Details for Shuttle Service forthcoming
8:00 pm – 12:00 pm
By Invitation Only

Friday, September 29, 2023

7:00 am – 12:00 pm Broadway Ballroom ABC

7:00 am - 8:00 am
Board of Directors Breakfast

8:00 am - 12:00 pm
Board of Directors Meeting

Friday, September 29, 2023

1:00 pm – 5:00 pm General Session Broadway Ballroom GHJK

12:00 pm - 1:00 pm
Fall Film FESStival
Broadway Ballroom GHJK
Moderators: Christopher Church, MD, FARS; Edward Kuan, MD, FARS

1:00 pm – 1:05 pm
Welcome & Introduction
Pete Batra, MD, FARS

1:05 pm – 1:20 pm
Presidential Address
Sarah Wise, MD, FARS

Top Rated Abstracts – Clinical Rhinology

Moderators: Kara Detwiller, MD, FARS; Devyani Lal, MD, FARS; Bobby Tajudeen, MD, FARS

1:20 pm - 1:27 pm
Topical platelet-rich plasma for post-COVID olfactory dysfunction - A randomized controlled trial

Alexander Duffy, MD
Bita Naimi, BA
Emily Garvey, BA
Ayan Kumar, Resident Physician PGY-4
Chase Kahn, MD
Douglas Farquhar, MD
Mindy Rabinowitz, MD, FARS
Elina Toskala, MD, MBA, PhD, FARS
Marc Rosen, MD, FARS
Gurston Nyquist, MD, FARS
David Rosen, MD
Thomas Jefferson University Hospital

Background:
Patients with post-COVID olfactory dysfunction (OD) face severe sequelae. Prior studies have demonstrated the effect of injected platelet-rich plasma (PRP) in treatment of post-COVID OD; however, topical, endonasal PRP has yet to be investigated.

Methods:
Randomized controlled trial from July 2022-present. Patients with OD (Brief Smell Identification Test (B-SIT) < 8/12 on presentation) of 6-24 months' duration following suspected or confirmed COVID infection were included. Patients were excluded if OD predated the patient's COVID infection. Patients were treated with three, once-monthly topical applications of PRP or placebo (saline) into bilateral olfactory clefts. Patients completed B-SIT and SCENTinel psychophysical tests and the Questionnaire of Olfactory Disorders–Negative Statements (QOD-NS) monthly, from months 1-12.

Results:
Of 104 screened patients, 81 qualified and participated in the trial. There were no significant differences in baseline B-SIT, SCENTinel, or QOD-NS scores. Patients with OD of 12-23 months (n=51) treated with PRP (n=27) demonstrated a statistically significant increase in B-SIT scores from baseline to month 4 compared to placebo (+2.3 vs +0.96, p=0.049). Regardless of OD duration, patients with parosmia (SCENTinel hedonic score < 50) treated with PRP

PROGRAM ABSTRACTS

(n=14) had an improvement in B-SIT from baseline to months 4 (+1.8, p=0.01), 5 (+2.3, p=0.007), 6 (+2.8, p=0.006), and 7 (+3.1, p=0.03), whereas those treated with placebo (n=14) had no improvement in BSIT at those timepoints.

Conclusion:

Topical PRP may be an efficacious treatment for post-COVID OD, particularly in those with parosmia. This is the first study to investigate the use of topical PRP and demonstrate an improvement in B-SIT scores.

1:28 pm – 1:35 pm

Efficacy and safety of EDS-FLU in chronic rhinosinusitis – Two randomized controlled trials

James Palmer, MD, FARS

ReOpen Steering Committee Members

Rationale:

The ReOpen program evaluated the efficacy and safety of the exhalation delivery system with fluticasone (EDS-FLU, XHANCE®) in chronic rhinosinusitis (CRS).

Methods:

Two 24-week, randomized, controlled trials enrolled patients with moderate-to-severe CRS with ≥ 2 symptoms for ≥ 12 weeks and sinus opacification on CT scan, with (CRSwNP) or without (CRSsNP) nasal polyps. Endpoints included combined symptom score (CSS); average percent ethmoid/maxillary opacified volume (APOV); frequency of acute exacerbations of CRS (AECRS); Sinonasal Outcome Test-22 (SNOT-22), and Pittsburgh Sleep Quality Index (PSQI).

Results:

Patients enrolled in ReOpen1 (CRSwNP and CRSsNP; n=332) and ReOpen2 (CRSsNP; n=223) received EDS-FLU one (n=182) or two (n=180) sprays/nostril, or EDS-placebo (n=185), twice daily. Co-primary symptom and sinus opacification outcomes improved significantly with EDS-FLU vs EDS-placebo (CSS LS mean, baseline to Week 4: -1.62 versus -0.70, $P < 0.001$; APOV LS mean, baseline to Week 24: -5.54 versus -0.06, $P < 0.001$). This pattern was observed in both CRSsNP and CRSwNP subgroups. APOV change associated with patient-reported improvement was -2.86 points. EDS-FLU reduced AECRS episodes significantly vs EDS-placebo (Incidence Rate Ratio=0.389; 95%CI=0.226-0.669). EDS-FLU also produced significantly greater improvement in SNOT-22 (Total Score LS mean, -18.02 versus -6.47; $P < 0.001$) and in sleep (PSQI Global Score LS mean, 1.49 versus -0.78, $P = 0.006$). Reported adverse events were similar to those reported with standard-delivery nasal sprays.

Conclusions:

EDS-FLU is the first medication shown in randomized trials to reduce AECRS and improve symptoms and quality-of-life in all CRS patients, including CRSsNP.

1:36 pm – 1:43 pm

All CRS endotype clusters demonstrate improvement in patient reported and objective measures after endoscopic sinus surgery

Nikita Chapurin, MD, MHS

Jorge Gutierrez, BA

Jess Mace, MPH

Sofia Khan, BS

Timothy Smith, MD, MPH, FARS

Rodney Schlosser, MD, FARS

Zachary Soler, MD, MSc, FARS

Medical University of South Carolina

Background:

It is unclear if chronic rhinosinusitis (CRS) endotypes show differential response to endoscopic sinus surgery (ESS). We explored mucus inflammatory cytokine clusters in a cohort with CRS and associations with both preoperative and postoperative outcome measures.

Methods:

Patients with CRS were prospectively recruited between 2016-2021 into a multi-center observational study. Mucus was collected from and evaluated for 26 biomarkers preoperatively. Patient reported outcome measures included the Sino-Nasal Outcome Test (SNOT-22) and Questionnaire of Olfactory Dysfunction (QOD). Additional clinical measures of disease severity included Threshold, Discrimination, and Identification (TDI) scores using Sniffin' Stick testing and Lund-Kennedy endoscopic scores (LKES).

Results:

A total of 128 patients were evaluated and grouped into type 2 inflammatory, non-type 2 inflammatory, non-inflammatory and 2 indeterminate clusters based upon individual protein levels. There was some variability within individual clusters. Overall, the type 2 inflammatory group was found to report the highest mean improvement in both SNOT-22 (-28.3 [SD±16.2]) and TDI (6.5 [SD±7.9]) scores after ESS. All endotypes membership group demonstrated improvement of all outcome measures after ESS on average, with no statistically significant between-group differences in SNOT-22 ($p = 0.738$), QOD ($p = 0.306$), as well as TDI ($p = 0.358$), LKES ($p = 0.514$) measures.

Conclusions:

All CRS endotype clusters appear to respond favorably to surgery and show improvement in patient reported and objective outcome measures. Thus, ESS is a more generalized therapy, and benefits are not limited to specific endotypes.

PROGRAM ABSTRACTS

1:44 pm – 1:51 pm

Peri-operative air quality and post-operative endoscopic sinus surgery outcomes

Amarbir Gill, MD
 Benton Tullis, BS
 Jess Mace, MPH
 Vijay Ramakrishnan, MD, FARS
 Daniel Beswick, MD, FARS
 Zachary Soler, MD, MSc, FARS
 Timothy Smith, MD, MPH, FARS
 Jeremiah Alt, MD, PhD, FARS
 University of Utah

Objective:

Poor air quality is linked to chronic rhinosinusitis (CRS) with numerous mechanisms by which airborne irritants negatively impact mucosal inflammation and wound healing. It is unknown if peri-operative pollutant exposure impacts endoscopic sinus surgery (ESS) outcomes. We assessed the impact of peri-operative particulate matter (PM) levels on sinonasal-specific and general quality-of-life (QOL) measures in a multi-institutional cohort of patients with CRS.

Methods:

Participants with CRS who self-selected ESS were prospectively enrolled. The 22-item SinoNasal Outcome Test (SNOT-22) and Medical Outcomes Study Questionnaire Short-Form 6-D (SF-6D) health utility values scores were recorded. Using residence zip codes, patient exposure to PM for the month of surgery was obtained from Environmental Protection Agency air quality monitors. Spearman's correlation coefficients (R) and 95% confidence intervals (CI) were used to determine bivariate association.

Results:

389 patients were enrolled with a mean follow-up of 7.2 months (SD +/-2.4). Patients with greater peri-operative PM_{2.5} exposure had less improvement in their SNOT-22 scores after ESS compared to those with less exposure (p=0.048, R=0.10, 95% CI (-0.002, 0.20). No similar association was noted with SF-6D scores. Specifically, the psychological (p=0.014) and sleep dysfunction (p=0.014) domains of the SNOT-22 were most significantly impacted by peri-operative PM_{2.5} concentrations. No correlation was found between pollutant levels and need for revision ESS (p=0.89).

Conclusion:

Certain types of pollutant exposure may negatively impact absolute improvement in sinonasal QOL after ESS. Larger population-based studies are needed to confirm these findings.

1:52 pm – 1:59 pm

Optimizing topical nasal corticosteroid irrigations: A randomized double-blind clinical trial

Zachary Root, BS
 Veronica Formanek
 Thomas Lepley
 Joseph Lee
 Sarah Sussman
 Kathleen Kelly, MD
 Bradley Otto, MD
 Kai Zhao, MD
 The Ohio State University Wexner Medical Center

Background:

The efficacy of topical corticosteroid irrigations in the management of chronic rhinosinusitis (CRS) can be variable due to differences in individual anatomy and ineffective head positioning. We conducted a randomized double-blinded clinical trial at a tertiary medical center in Ohio from November 2021 to March 2023 to determine if personalized, 3D-printed nasal models can optimize head positioning and improve patient outcomes.

Methods:

31 patients with CRS (22 with no prior sinus surgery) were randomized into either control (CG, N=10), backfill (BG, N=10), or model (MG, N=11) groups; daily 2 mg Mometasone irrigations were then performed for two months with either standard instructions, a head tilt of 90° to the side with fluid entering the lower nostril, or in an optimized position as determined by patient-specific 3D printed irrigation models, respectively.

Results:

Symptom improvements were mild in the CG (NOSE: 47.5±32 to 31.0±34, SNOT-22: 43.9±33 to 32.9±29, Visual Analog Scale (VAS) of nasal obstruction: 4.00 ±2.7 to 2.80±2.4, all p>0.05), moderate in the BG (NOSE: 54.5±22 to 33.0±20, SNOT-22: 35.8±15 to 26.5±18, VAS: 4.55±2.5 to 3.24±2.7, only NOSE p<0.05), and significant in the MG (NOSE: 52.3±14 to 16.1±12, SNOT-22: 39.8±17 to 12.4±10, VAS: 4.27±2.0 to 2.22±1.6, all p<0.05). Lund-Mackay scores significantly improved only in the MG (11.4±4.3 to 7.56±5.9, p<0.05). The MG also had the lowest patient dropout rate (25.0% vs BG 27.8% vs CG 41.2%).

Conclusion:

3D printing can significantly improve corticosteroid irrigation outcomes through improved patient education and optimized head positioning. 3D modelling also appears to encourage better treatment compliance.

1:59 pm – 2:05 PM

Q&A

2:05 pm – 2:15 pm

Awards Ceremony

Jean Kim, MD, FARS

PROGRAM ABSTRACTS

2:15 pm – 3:00 pm

David W. Kennedy Lecture

Introduction: Pete Batra, MD, FARS

Guest Speaker: Brent Senior, MD, FARS

“Global Outreach in Rhinology: Lessons Learned From a Quarter Century in Vietnam”

3:00 pm – 3:30 pm

Break with Exhibitors

Top Rated Abstracts – Basic Science and Translational Research

Moderators: Benjamin Bleier, MD, FARS; Do-Yeon Cho, MD; Elina Toskala, MD, FARS

3:30 pm – 3:37 pm

An eosinophil peroxidase activity assay accurately predicts eosinophilic chronic rhinosinusitis

Kristine Smith, MD

Amarbir Gill, MD

Chelsea Pollard

Shaelene Ashby, PhD

Paige Shipman

Michael Yim, MD, FARS

Joshua Levy, MD, FARS

Gretchen Oakley, MD, FARS

Richard Orlandi, MD, FARS

Jeremiah Alt, MD, PhD, FARS

Abigail Pulsipher, Dr.

University of Utah

Background:

A definitive diagnosis of eosinophilic chronic rhinosinusitis (eCRS) requires surgical tissue sampling and histologic enumeration of intact eosinophils. Eosinophil peroxidase (EPX) is an accurate biomarker of sinonasal tissue eosinophilia in CRS. A less invasive and rapid method that accurately identifies tissue eosinophilia would be of great benefit to patients. The objective of this investigation was to evaluate a new clinical tool that utilizes a nasal swab and colorimetric EPX activity assay to predict a diagnosis of eCRS.

Methods:

A prospective cohort study was conducted using nasal swabs and sinonasal tissue biopsies obtained from patients with CRS electing endoscopic sinus surgery. Patients were classified as non-eCRS (n=19) and eCRS (n=35) based on pathologically-determined eosinophil counts of <10 or ≥10 eosinophils/high-power field, respectively. Swab-deposited EPX activity was measured and compared to tissue eosinophil counts, EPX levels, and CRS-specific disease metrics.

Results:

EPX activity was significantly increased in patients with eCRS compared to in non-eCRS (p<0.0001). With a relative absorbance unit cut-off value of ≥0.80, the assay demonstrated high sensitivity (85.7%) and

moderate specificity (79.0%) for confirming eCRS. Spearman correlations between EPX activity and tissue eosinophil counts (rs=0.424), EPX levels (rs=0.503), and Lund-Kennedy endoscopy scores (rs=0.440) in eCRS were significant (p<0.05).

Conclusions:

This study evaluated a nasal swab sampling method and EPX activity assay that accurately confirms eCRS. This method could potentially address the unmet need to identify sinonasal tissue eosinophilia at the point-of-care and monitor eosinophil activity and treatment response.

3:38 pm – 3:45 pm

Common cold viruses activate the unfolded protein response in chronic rhinosinusitis

Elizabeth Sell, Medical Student

David Renner

Li Hui Tan, PhD

Michael Kohanski, MD, PhD

Susan Weiss, PhD

Noam Cohen, MD, PhD, FARS

University of Pennsylvania

Background:

Viral infections have long been implicated in the pathogenesis of chronic rhinosinusitis (CRS). Human coronaviruses (CoV) cause approximately 5-30% of the common cold. CoV replication causes endoplasmic reticulum (ER) stress and activates the unfolded protein response (UPR), a series of pathways that allow cells to alleviate stress or eliminate chronically stressed cells. The UPR has been shown to be upregulated in some patients with CRS; however, it is not known if CoVs can activate the UPR in the human sinonasal epithelium, or if pre-existing CRS affects CoV infection.

Methods:

Thus, we aimed to interrogate UPR activation by human CoV infection. We examined the three branches of the UPR and their downstream transcription factors in primary human nasal air-liquid-interface (ALI) cultures. We infected the ALI cultures with viruses 229E and NL63 and found that both viruses replicate and release infectious virions as quantified by plaque assay. We investigated activation of the UPR at both the mRNA and protein level using RT-qPCR and western blot analysis of the UPR sensors and downstream targets, respectively.

Results:

We found that 229E induces ER stress and triggers both the IRE1 and PERK branches of the UPR. In particular, 229E strongly triggers XBP1 splicing, which may correlate with increased interferon signaling. We further found that ALI cultures grown from patients with CRS cleared 229E faster than cultures grown from patients without CRS, and that viral clearance correlated with increased interferon production in the CRS cultures.

PROGRAM ABSTRACTS

Conclusions:

Our data suggest that CoVs activate the UPR stress response pathway, and that targeting this pathway could be used to develop novel therapies for patients with CRS.

3:46 pm – 3:53 pm

Timing of surgery on tissue IL-13 expression in CRSwNP patients on Dupilumab: A real-world study

Abdul Rahman Alenezi

Andrew P. Lane, MD, FARS

Heather Kulaga

Nicholas Rowan, MD

Johns Hopkins School of Medicine

Background:

Dupilumab is an effective option for CRSwNP recalcitrant to medical/surgical therapy. In the biologics era, the role and timing of surgery in CRSwNP is currently unresolved. On a molecular level, the impact of surgery relative to initiation of Dupilumab on cytokine gene expression has not been investigated.

Methods:

Retrospective analysis of prospectively obtained mucosal samples from 17 recalcitrant eosinophilic CRSwNP patients, before and after initiating Dupilumab. Subjects were divided into 2 cohorts, depending on whether therapy was initiated immediately after revision endoscopic sinus surgery. Real-time PCR was used to assess IL-13 mRNA in the samples. Nasal endoscopy, SNOT-22, and UPSIT were also performed.

Results:

All subjects had severe CRSwNP s/p multiple surgeries, and all had good clinical responses to Dupilumab plus INCS. In the 7 subjects with revision surgery immediately preceding Dupilumab, IL-13 mRNA expression underwent a sustained decrease from baseline over >6 months. In subjects in whom the last surgery had been performed remote to starting Dupilumab, IL-13 expression was noted to increase and be persistently elevated. This difference between groups was significant ($P < 0.0004$, Mann-Whitney U).

Conclusion:

In recalcitrant CRSwNP patients, revision surgery with debulking of polyps prior to initiating Dupilumab appears to prevent long-term elevation of IL-13 mRNA expression in the sinonasal mucosa. This finding may suggest that pre-treatment surgery reduces endogenous drivers of type 2 inflammation that otherwise persist on Dupilumab. Further studies are needed to determine whether Dupilumab therapy can be decreased or withdrawn in such subjects after mucosal normalization post-surgery.

PROGRAM ABSTRACTS

3:54 pm – 4:01 pm

Glutathione and bicarbonate nanoparticles improve mucociliary transport in cystic fibrosis epithelia

Nicholas Rivers, MD
 Shaoyan Zhang, PhD
 Daniel Lim
 Daniel Skinner, BS
 Lydia Yang
 Marie Ehrhardt
 Caitlyn Tomblin
 Jessica Grayson, MD
 Do-Yeon Cho, MD
 Steven M. Rowe, Professor and Director of CF Research Center
 Bradford A. Woodworth, MD, FARS
 University of Alabama at Birmingham

Introduction:

Cystic fibrosis (CF) is a respiratory disease characterized by the overproduction of thick mucus and ineffective mucus transport. While CFTR modulator therapy represents a partial solution, novel strategies are needed to improve its effectiveness, particularly for non-responders. Lack of functional CFTR decreases HCO₃⁻ secretion causing release of unexpanded, gel-forming mucins. Replacing HCO₃⁻ topically via irrigation or nebulization is ineffective at alkalizing the airway surface liquid due to rapid reabsorption and neutralization by carbonic anhydrase. Furthermore, the highly oxidative environment of CF airways causes mucin polymer crosslinking and has been targeted previously with GSH (cleaves disulfide crosslinking) in clinical trials although with mixed results. This study investigates a novel approach using GSH/NaHCO₃-nanoparticles to address mucus obstruction in CF.

Methods:

GSH (1 mM)/NaHCO₃- (24 mM) poly(lactic-co-glycolic acid) nanoparticles were tested on primary CF sinonasal (F508del/F508del) epithelial cultures, evaluating dose-release curves, surface pH, toxicity, and mucociliary transport indices using micro-optical coherence tomography.

Results:

The nanoparticles showed sustained release with no cellular toxicity over two weeks. The apical surface pH gradually increased from 6.63±0.21 to 7.11±0.39 at 24 hours (p<0.05). MCT (0.059±0.023 vs. 0.033±0.006 mm/min) and periciliary liquid depth (5.67±0.33 vs. 4.68±0.57 µm, p<0.01) were significantly improved over controls.

Conclusion:

These findings suggest that GSH/NaHCO₃-nanoparticles are a promising treatment option for viscous mucus in CF and other respiratory diseases of mucus obstruction such as chronic rhinosinusitis.

4:02 pm – 4:09 pm

The effects of PM2.5 exposure on the presentation of acute bacterial rhinosinusitis

David Grimm, MS
 Michael Yong, Dr.
 Z Jason Qian, Dr.
 Peter Hwang, MD, FARS

Background:

Exposure to particulate matter 2.5 (PM2.5) is an established risk factor for poor health outcomes. We sought to identify associations between PM2.5 exposure and incidence of acute bacterial rhinosinusitis (ABRS) over the past decade in California.

Methods:

The Merative® MarketScan® Research Databases were used to identify claims for ABRS in adult Californians between 2007-2020. Demographic information, asthma status, allergic rhinitis status, and a Charlson comorbidity index (CCI) were collected. A control population without ABRS was generated at a ratio of 3:1. For each presentation of ABRS a rolling statistical average of daily PM2.5 from the prior 6 months was mapped based on census-based statistical area provided by the EPA. Patients' PM2.5 exposure was classified as low, medium, or high based on cohort tertile.

Results:

369,711 ABRS encounters were identified (64.4% female, 35.6% male, mean age= 41). Mean daily PM2.5 exposure in the ABRS cohort was 11.90 µg/m³ (IQR 8.82-14.11) vs 10.35 µg/m³ (IQR 7.87-12.26) in controls (p<0.0001), with a total cohort exposure range of 1.86-31.63 µg/m³. Compared to patients in the low PM2.5 exposure tertile, medium exposure patients had an aOR of 1.40 [1.39-1.41], and high exposure an aOR of 2.23 [2.21-2.25]. On multivariable logistic regression, incidence of ABRS increased linearly with PM2.5 levels (aOR 1.11 [1.10-1.11] per 1 µg/m³ increase in PM2.5). Female sex (1.57 [1.55-1.58]), asthma (1.39 [1.37-1.41]), allergic rhinitis (2.02 [2.00-2.04]), and CCI (1.05 [1.05-1.06] per point) were also correlated.

Conclusion:

Exposure to PM2.5 is associated with increased incidence of ABRS in a dose-response fashion, adjusting for patient demographic and rhinologic comorbidities.

4:09 pm – 4:15 pm

Q&A

PROGRAM ABSTRACTS

4:15 pm – 5:00 pm

Panel: “Maintaining Balance & Achieving the Quadripartite Mission”**Moderator:** Nicholas Rowan, MD**Panelists:** Stacey Gray, MD, FARS; Peter Hwang, MD, FARS; Devyani Lal, MD, FARS; Rodney Schlosser, MD, FARS; Sarah Wise, MD, FARS*Sponsored by Residents and Fellows Committee and Women in Rhinology Section*

5:30 pm – 7:00 pm

President’s Welcome ReceptionBroadway Ballroom, 5th Avenue Pre-Function Area**Saturday, September 30, 2023****8:00 am – 12:00 pm****Breakout 1****Basic Science and Clinical Rhinology
Broadway Ballroom JK**

7:00 am – 8:00 am

Meet the Authors Poster Viewing & Breakfast

Grand View Terrace Foyer, Second Level

Session Chair: Erin O’Brien, MD, FARS

8:00 am – 8:35 am

Panel: “Success in Early Career Extramural**Funding:****Moderator:** Murugappan Ramanathan, MD, FARS**Panelists:** Andrew Lane, MD, FARS; Corinna Levine, MD, FARS; Timothy Smith, MD, FARS; Carol Yan, MD*Sponsored by the Mentorship Committee***Scientific Oral Presentations:
Pathophysiology and Mechanisms***Moderators: Lauren Roland, MD; Nicholas Rowan, MD; Kristine Smith, MD*

8:35 am – 8:40 am

Acetate and propionate metabolism by Pseudomonas aeruginosa contributes to significant sinus inflammation in a rabbit model of sinusitis

Do-Yeon Cho, MD

Daniel Skinner, BS

Shaoyan Zhang, PhD

Dong Jin Lim, PhD

Natalie Dorin

Jessica Grayson, MD

Bradford A. Woodworth, MD, FARS

University of Alabama at Birmingham

Background:

Understanding how Pseudomonas aeruginosa adapts to the in vivo nutritional environment has important

implications for treating airway infection. Anaerobe-derived nutrient (e.g., acetate(AC), propionate(PR)) acquisition by P. aeruginosa may contribute to its virulence. This study aims to assess the impact of Pseudomonas AC and PR metabolism on sinusitis pathogenesis.

Methods:Rabbit’s sinuses were infected with wild-type (WT) B. fragilis 638R on Day 0 after blocking the sinus opening (n=8). On day 4, either WT P. aeruginosa PA14 or mutantPA14 (Δ acsA Δ prpB, cannot metabolize AC and PR) was inoculated into the same sinus to induce co-infection (n=4 each). On day 10, blockage was removed, and rabbits were monitored for 5 more weeks. Endpoints included colony-forming units, computerized tomographic (CT) scores, histology, and chloride (Cl-) transport capability.**Results:**

All rabbits developed fulminant sinusitis by blocking the sinus opening on day 10. A significant weight loss was noticed in those rabbits infected with both WT bacteria (638R+PA14) than with 638R+mutantPA14 on Day 10. Mutant PA14 demonstrated growth defects relative to WT PA14 (p=0.02) when grown in co-culture with 638R at day 10. At week 6, subepithelia were significantly thicker in those infected with both WT bacteria (638R+PA14) than with 638R+mutantPA14 (p<0.01). Sinus potential difference revealed greater Cl- transport in the 638R+mutantPA14 compared to 638R+PA14 (p<0.05).

Conclusions:

Even with the restoration of sinus oxygenation on day 10, those sinuses infected with PA14 (metabolizing AC and PR) developed significant tissue inflammation and decreased Cl- secretion, compared to those infected with mutantPA14, when co-cultured with WT B. fragilis.

8:41 am – 8:46 am

Identifying 5-hydroxymethylcytosine profiles in cell free DNA from serum in patients with aspirin exacerbated respiratory disease

Tiffany Toni

Phillip Hsu, Dr.

Emily Papazian, Dr.

Marco Rivas

Diana West-Szymanski

Arpit Panda

Robert Naclerio, MD

Christopher Roxbury, MD, FARS

Nishant Agrawal, Dr.

Chuan He, Dr.

Jayant Pinto, Dr.

Background:

Aspirin exacerbated respiratory disease (AERD) is an airway disorder characterized by a proinflammatory state. Although there are genetic and environmental contributions, the molecular pathogenesis remains

PROGRAM ABSTRACTS

unknown. We hypothesized that patients with AERD would exhibit specific epigenetic (5-hydroxymethylcytosine [5-hmC]) profiles, which could identify dysregulated systemic pathways, aid in diagnosis, and predict response to therapy.

Methods:

We compared the 5-hmC profiles in adults with AERD (n=7) compared to control patients (n=6) without asthma or polyposis; subjects taking systemic steroids were excluded. Cell free DNA was isolated from peripheral blood serum and sequenced. Expression analysis identified differentially hydroxymethylated genes (DhMGs) and differentially hydroxymethylated regions (dhMRs). Metascape analysis of the resultant DhMGs was used to generate a list of statistically enriched functions.

Results:

AERD and control groups did not statistically differ by age (AERD 49.4 ± 13.2 vs. 47.0 ± 12.8 , $p=0.74$), sex ($\chi^2=0.93$, $p=0.34$), race ($\chi^2=0.07$, $p=0.97$), or smoking status ($\chi^2=0.03$, $p=0.85$). According to preset criteria, 275 DhMGs and 246 DhMRs were identified. Principle component and hierarchical clustering analyses demonstrated distinct clustering of AERD samples compared to control samples when both DhMGs and DhMRs were analyzed. The top 20 statistically enriched terms from Metascape analysis included differential expression of immune modulators, cellular development and differentiation, and response to exogenous damage.

Conclusions:

In this pilot study, we demonstrate that analysis of differential 5hmC profiles from cell free serum DNA is a feasible approach to investigate AERD

8:47 am – 8:52 am

Increased staphylococcus abundance in the sinus microbiome is associated with chronic rhinosinusitis treatment resistance

David Hoying, BS

Naseer Sangwan, Director of Microbiome Composition and Analytics Core

Mohamad Chaaban, MD, FARS

Case Western Reserve University School of Medicine

Introduction:

Chronic rhinosinusitis (CRS) significantly affects patients' quality of life. There is emerging evidence that the sinonasal microbiome plays a role in CRS phenotypes and treatment response. We performed a microbial analysis of CRS-involved tissue to correlate response to sinus surgery with the relative abundance of distinct microbial populations.

Methods:

Using 16rRNA gene sequencing, we characterized the microbiome of a cohort of adult patients with CRS with and without polyps with at least bilateral total ethmoid

sinuses involvement undergoing FESS. DAtest was used for differential abundance analysis using the random-forest algorithm, and PERMANOVA was performed on all principal coordinates. Resistance-to-treatment (RTT) was defined as a less than 20% reduction in post-operative SNOT-22 score up to four months post-operatively compared to the pre-operative baseline SNOT-22.

Results:

In the cohort of 25 CRS patients, there were four patients with RTT disease (2 CRSsNP; 2 CRSwNP) and 21 patients with a successful post-operative response (5 CRSsNP; 19 CRSwNP). There was no statistical difference in the mean age between the post-operative responder and non-responder cohorts (48.4 ± 15 vs. 45.5 ± 20.6 , $p=0.80$). At the genera level, the relative abundance of *Staphylococcus* was significantly higher in the non-responder groups compared to the responder groups ($p<0.05$). Additionally, *Klebsiella* was significantly decreased in the non-responder group ($p<0.05$). A receiver operating curve was able to accurately distinguish between responders and non-responders based on the sinus microbiome (AUC=0.92).

Conclusion:

The sinus microbiome could be a helpful predictor of treatment response with FESS.

8:53 am – 8:58 am

Long non-coding RNAs related to extracellular matrix and proteins are differentially expressed in chronic rhinosinusitis

Tripti Brar, MBBS, MD

Chantal McCabe, Bioinformatician

Hirohito Kita

Devyani Lal, MD, FARS

Mayo Clinic in Arizona

Background:

Long non-coding RNAs (lncRNAs) are RNA molecules greater than >200 nucleotides, without protein-coding capability. They interact with many molecules, regulate gene expression, genetic imprinting, histone modification, DNA methylation, posttranscriptional silencing etc and play a significant role in epigenetic regulation. A few studies from China, most using pre-existing GEO datasets, have investigated lncRNAs in CRS. We performed an original lncRNA study comparing CRS versus control tissue.

Methods:

RNA extraction and RNA-sequencing was performed on ethmoid mucosa of 16 CRS subjects and inferior turbinate mucosa of 4 control subjects. EdgeR software was used for bioinformatics analysis; FDR<5%, and log2 fold change >1.5 or <-1.5 was used to characterize differentially expressed (DE) lncRNAs. Pathway analysis was done with Metascape™ software.

PROGRAM ABSTRACTS

Results:

Between CRS and controls, 942 DE lncRNAs were identified; top pathways were Naba core matrisome [matrisome: ensemble of ≥ 1000 genes encoding extracellular matrix (ECM) and ECM-associated proteins], hydrogen peroxide catabolic process, ECM organization, sensory perception of bitter taste, and Naba proteoglycans. CRSwNP versus controls identified 2803 DE lncRNAs; top pathways were Naba core matrisome, ECM organization, response to wounding/burn healing. CRSsNP versus controls identified 511 DE lncRNAs; top pathways were Naba core matrisome, neuron projection development, Naba proteoglycans and oxygen transport.

Conclusion:

DE of lncRNAs with pathways related to ECM matrix, ECM glycoproteins, collagens and proteoglycans were identified between controls and CRS. We identified epigenetic mechanisms through which structural integrity disruption associated with CRS may occur.

8:59 am – 9:04 am

Comparison between upper and lower airway microbiome in chronic rhinosinusitis patients

Juan Carlos Hernaiz-Leonardo, MD, MSc
Changwan Ryu
Athenea Pascual, Research Coordinator
Judy Fan
Rogerio Pezato
Don Sin
Andrew Thamboo, MD
University of British Columbia

Background:

Dysregulation of the airway microbiota is thought to contribute to airway inflammation in both chronic rhinosinusitis (CRS) and asthma. However, the relationship between the upper and lower airway microbiome remains unclear.

Methods:

Sinus and lung swabs were collected from 29 CRS participants undergoing sinus surgery. DNA was extracted and submitted for 16s rRNA microbiome sequencing. Alpha and beta diversity metrics, taxonomic composition, and differences between individual taxa were compared for paired sinus and bronchial samples.

Results:

24 out of 29 participants had sufficient sample for analysis. The mean (SD) age was 51.59 (14.57) years, and 13 (40.6%) patients were female. Eighteen (56.3%) patients had comorbid asthma. Nasal swabs had significantly higher alpha diversity indexes (Shannon and Faith) compared to bronchial swabs ($p < 0.001$). Beta diversity metrics were not significantly different between bronchial and nasal samples. However, principal coordinate analysis showed no clustering of

paired nasal and bronchial samples. Nasal swabs had significantly more *Lawsonella* spp., *Corynebacterium* spp., and *Staphylococcus* spp. compared to bronchia swabs, while the latter were enriched in *Sphingomonas* spp. and *Bradyrhizobium* spp. (FDR adjusted $P < 0.01$). Finally, CRS patients with comorbid asthma had significantly higher *Pseudomonas* spp. and lower *Staphylococcus* spp. in nasal swabs and higher *Bradyrhizobium* spp. in bronchial swabs compared to non-asthmatics (FDR-adjusted $P < 0.01$).

Conclusion:

The nasal and bronchial bacterial microbiomes differ in important ways, with comorbid asthma being a significant effect modifier. Nasal swabs alone cannot predict the lower airway microbiome.

9:05 am – 9:15 am

Q&A

9:15 am – 9:45 am

Panel: “Generative Artificial Intelligence in Rhinology”**Moderator:** Chirag Patel, MD, FARS**Panelists:** Martin Citardi, MD, FARS; Brian Logo, MD, FARS; Martin Desrosiers, MD

9:45 am – 10:15 am

Break with Exhibitors**Scientific Oral Presentations: CRS Impact and Disease Severity**

Moderators: Angela Donaldson, MD, FARS; Amber Luong, MD, PhD, FARS; Toby Steele, MD

10:15 am – 10:20 am

In vivo nasal micro-optical coherence tomography imaging reveals mucociliary dysfunction in chronic rhinosinusitis

Kadambari Vijaykumar
Do-Yeon Cho, MD
Huimin Leung
Amilcar Barrios
Bo Liu
Heather Hathorne
George M. Solomon, MD
Guillermo J. Tearney
Steven M. Rowe, Professor
Bradford A. Woodworth, MD, FARS
University of Alabama at Birmingham

Background:

Chronic rhinosinusitis (CRS) is known to be associated with altered mucociliary transport (MCT). Micro-optical coherence tomography (μ OCT) has been used to determine cellular and functional dynamics of respiratory epithelia at the 1- μ m resolution, enabling quantification of ciliary motion and mucus transport.

PROGRAM ABSTRACTS

This study aims to compare the mucociliary parameters between healthy controls (HC) and those with CRS, with and without nasal polyps (CRSwNP, CRSsNP) using human μ OCT imaging.

Methods:

HC and subjects with CRSwNP and CRSsNP were enrolled. Clinical histories were obtained, and a nasal exam was performed prior to intranasal μ OCT imaging. Investigators blinded to the subjects' conditions analyzed the in vivo μ OCT parameters, including mucociliary transport (MCT), ciliary beat frequency (CBF), periciliary liquid depth (PCL), airway surface liquid depth (ASL), and epithelial thickness (ET).

Results:

Six HC participants (age, 38.7 ± 14.5 years) and 16 subjects with CRS (CRSwNP=6 (age, 42.3 ± 13.7 years), CRSsNP=10 (age, 49 ± 4.1 years)) were recruited. Of those with CRSwNP, 100% had a history of allergic rhinitis, and 67% had asthma. μ OCT analysis showed that MCT rates were significantly lower in the cumulative CRS group (MCT (mm/min), 4.32 ± 1.2 CRS vs 6.98 ± 0.9 HC, $P < 0.01$), and the decrement was similar in individual CRS groups (CRSsNP: 4.13 ± 1.7 mm/min, $P < 0.01$; CRSwNP: 4.68 ± 1.4 mm/min, $P = 0.051$). No differences in other μ OCT parameters were identified between groups.

Conclusion:

In vivo nasal μ OCT imaging demonstrated decreased MCT in CRS patients with and without NP. This novel imaging method represents a technologic leap forward and is feasible for assessing acquired MCT defects impacting the upper airway epithelium.

10:21 am – 10:26 am

Multi-instance learning for eosinophil quantification of sinonasal histopathology images

Yi-Tsen Li, MD, PhD

Ming-Sui Lee, Associate Professor

Te-Huei Yeh, Professor

National Taiwan University Hospital

Background:

Identification of eosinophilic chronic rhinosinusitis (CRS) subtype is critical for treatment decision making and prognosis prediction. Manual counting of eosinophils distributed in the sinonasal tissues is time-consuming and labor-intensive. In this study, we aimed to develop an automatic system for eosinophil quantification of sinonasal histopathology images using a deep learning approach.

Methods:

Pathologic images of sinonasal tissues from 40 patients with bilateral CRS were obtained and the number of eosinophils was counted and labeled by medical researchers. These images were randomly divided into two groups: training and validation. Candidate images were selected from each whole slide after filtering the

noise area and background. Each candidate image was divided into patch images and appraised based on intensity and colors. Through multi-instance learning, the training data was used for model construction, and the model was verified by test data.

Results:

A total of 83 whole slide images were processed, and there were 15153 training patches and 1894 validation patches. The validation performance was 86.99% in the mean of baseline and 88.84% by method of confusion. We compared the experimental results and pathologic reports, and the testing performance was 90.90% for the diagnosis of tissue eosinophilia and 91.67% for that of non-eosinophilia.

Conclusion:

We established computer-assisted eosinophil quantification of the sinonasal histopathology images. This quantification system can aid in determining the immunotypes of CRS and making treatment strategies for CRS.

10:27 am – 10:32 am

Frailty is an independent predictor of post-operative rescue medication use after endoscopic sinus surgery

Andrea Lopez, BS

Kolin Rubel, MD

Rory Lubner, MD

Kristen Yancey, MD

Rakesh Chandra, MD, FARS

Naweed Chowdhury, MD, MPH

Justin Turner, MD, PhD, FARS

Vanderbilt University School of Medicine

Introduction:

The modified 5-item frailty index (mFI-5) is a validated risk stratification tool for predicting adverse outcomes following surgery. In this study, we sought to use mFI-5 to assess the potential relationship between unhealthy aging and postoperative endoscopic sinus surgery (ESS) outcomes.

Methods:

A retrospective review identified patients who underwent sinus surgery at Vanderbilt between 2014 and 2018. Patients were assessed using the mFI-5, which is calculated based on the presence of five comorbidities: diabetes mellitus, hypertension requiring medication, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), and non-independent functional status. Multivariate analyses were performed to assess the association of mFI-5 score on need for rescue oral antibiotics, oral steroids, and antibiotic irrigations within one year following ESS, adjusting for relevant potential confounders.

Results: Four hundred and three patients met inclusion criteria. Within 6 months of surgery, 312 (77%)

PROGRAM ABSTRACTS

required rescue antibiotics, 243 (60%) required oral corticosteroids (OCS), and 31 (8%) required antibiotic rinses. Increasing mFI-5 scores were significantly associated with higher rates of postoperative use of rescue antibiotics ($p < 0.0001$), OCS ($p = 0.032$), and antibiotic irrigation ($p < 0.0001$). Frailty scores remained as an independent predictor of these outcomes after adjustment for age, polyp status, pre-operative sinonasal outcomes test (SNOT-22) score, and revision surgery status.

Conclusion: Modified frailty scores may be a useful clinical tool to predict the risk of postoperative rescue medication use after ESS.

10:33 am – 10:38 am

Cognition and saccadic eye movement performance are impaired in chronic rhinosinusitis

David Cvancara, BS
Heather Wood
Ashton Lehmann, MD
Waleed Abuzeid, MD, FARS
Ian Humphreys, DO, FARS
Yoshiko Kojima, PhD
Aria Jafari, MD
University of Washington

Introduction:

Patients with chronic rhinosinusitis (CRS) can have significant cognitive dysfunction. To date, these data mostly comprise self-reported measurements. The goal of this study is to utilize objective measures of cognitive function, including saccadic eye movement performance, to characterize brain function in patients with CRS.

Methods:

Subjects were enrolled from rhinology clinic and underwent sinonasal evaluation and quality-of-life assessment using Sinonasal Outcome Test-22 (SNOT-22). Twenty-four subjects met diagnostic criteria for CRS, and 23 individuals without CRS served as healthy controls. Cognitive performance was measured using the Montreal Cognitive Assessment (MoCA) and established eye movement paradigms (pro-, anti-, express-, and delayed-saccade tasks) using a video-based eye tracker.

Results:

Compared to controls, subjects with CRS performed worse on the MoCA overall and specifically within the executive functioning, language, and memory domains (all $p < 0.05$). Forty-two percent of subjects with CRS demonstrated at least mild cognitive impairment (MoCA < 26). Compared to controls, CRS patients performed worse on the anti-saccade task with comparatively less suppression of pro-saccades (62.2% vs. 77.4% correct, $p < 0.05$), and this performance correlated with SNOT-22 ($r = 0.32$, $p < 0.05$).

Discussion:

This study is the first to utilize objective, researcher-administered neuropsychiatric assessments to measure cognitive performance in CRS. CRS significantly influences cognition across several domains, including necessary inhibition of reflexive saccades. These results correlate with sinonasal-specific measures and suggest impairment in neural pathways that underlie response to stimuli and inhibitory control.

10:39 am – 10:45 am

Q&A

10:45 am – 10:50 am

Sleep dysfunction is greater in aspirin-exacerbated respiratory disease than in other forms of chronic rhinosinusitis

David Cvancara, BS
Ayush Sharma
Dhruv Sharma, MD
Ian Humphreys, DO, FARS
Aria Jafari, MD
Waleed Abuzeid, MD, FARS
University of Washington

Background:

Studies have previously demonstrated that patients with chronic rhinosinusitis (CRS) experience significant sleep dysfunction (SD). However, there is a paucity of literature on SD in aspirin-exacerbated respiratory disease (AERD). The purpose of this study was to evaluate the risk and severity of SD in patients with AERD and to compare this to SD in CRS with (CRSwNP) and without nasal polyposis (CRSsNP).

Methods:

This cohort study prospectively enrolled adult patients with CRSsNP ($n = 223$), CRSwNP ($n = 39$), and AERD ($n = 32$) from an academic tertiary care rhinology clinic. SD was evaluated using the Neuro-Quality-of-Life Sleep Function Short Form (Neuro-QOL). Sleep dysfunction equal to or greater than "moderate" on the Neuro-QOL is defined as > 1.0 standard deviation from the normalized population mean. Patient demographic data and additional QOL data were collected using the SNOT-22, Patient Health Questionnaire-2, and General Anxiety Disorder-2 tools. Statistical analysis involved bivariate analysis with the Student's t-test and multivariate logistic regression.

Results:

When adjusted for age, sex, SNOT-22 score, depression, and cognitive function, patients with AERD had worse Neuro-QOL scores than patients with either CRSsNP (OR 0.948 95%CI 0.90, 0.99; $p = 0.02$) or CRSwNP (OR 0.933 95%CI 0.88, 0.98; $p = 0.016$). The risk of at least moderate SD was significantly greater in the AERD population than in the CRSsNP (OR 2.9 95%CI 1.2, 6.2; $p = 0.008$) or CRSwNP (OR 2.7 95%CI 1.02, 7.17; $p = 0.046$) groups.

PROGRAM ABSTRACTS

Conclusion:

Compared to patients with CRSsNP and CRSwNP, patients with AERD reported significantly greater deficits in sleep. The risk of SD in AERD was independent of both disease severity and deficits in mental health or cognition.

10:51 am – 10:56 am

Clinical characteristics and comorbidities associated with non-eosinophilic chronic rhinosinusitis

Tripti Brar, MBBS, MD
Shreya Pusapadi Ramkumar
Christopher Dodoo
Claire Yee
Devyani Lal, MD, FARS
Mayo Clinic in Arizona

Background:

Non-eosinophilic CRS (neCRS) is classically believed to be less recalcitrant than eosinophilic CRS (eCRS). Studies on neCRS are limited. We compared clinical characteristics, histopathology, biomarkers and comorbidities of neCRS versus eCRS.

Methods:

CRS subjects who underwent ESS at a tertiary care center between 2011-2018 were studied. A cut-off value of 10 eosinophil counts per high power field (eos/hpf) in ethmoidal tissue was used to categorize subjects into neCRS (<10 eos/hpf) or eCRS (≥ 10 eos/hpf). Demographics, SNOT-22 and CT scores, tissue histopathology, blood absolute eosinophil counts (AEC), serum IgE, urinary LTE4 levels and performance of subsequent revision ESS was compared.

Results:

Of 426 CRS subjects, 191 subjects (44.84%) had neCRS and 235 (55.16%) had eCRS. Patients with neCRS were significantly older (Mean: 56.3 vs. 50.6 years; $p < 0.001$) with lower pre-operative SNOT-22 score (Median 39.5 vs. 48.0; $p < 0.001$), Lund-Mackay CT score (Median 9 vs. 13; $p < 0.001$), overall degree of inflammation ($p < 0.001$), blood AEC (Median 0.1 vs. 0.3; $p < 0.001$) and asthma (39.5% vs. 63.8%; $p < 0.0001$). Nasal polyps were noted in 27.7% of eCRS vs. 67.5% of eCRS ($p < 0.001$). Revision ESS rate was similar in both cohorts. neCRS tissue had significantly higher lymphocytic predominance (38.2% vs. 17%; p value < 0.001) but no differences for fibrosis or neutrophilia. No significant difference was detected for gender, depression status, urinary LTE4, serum IgE and previous ESS history.

Conclusion:

neCRS affects older individuals. Though neCRS subjects had lower objective and subjective disease burden, the need for revision ESS was similar to eCRS. Further characterization of neCRS and recalcitrant subtypes is warranted.

10:57 am – 11:02 am

Impact of chronic rhinosinusitis local exacerbations on granulomatosis with polyangiitis disease progression and systemic exacerbations

Trisha Shang, BA
David Kaelber, Chief Medical Informatics Officer
Mohamad Chaaban, MD, FARS
Case Western Reserve University

Introduction:

Granulomatosis with polyangiitis (GPA) often presents with chronic rhinosinusitis (CRS), and patients may receive CRS medication for managing local sinonasal flares. Our study aimed to determine the impact of CRS treatment/flares on GPA systemic exacerbations.

Methods:

We used the TriNetX US Collaborative Network platform to conduct a retrospective study. We searched for adults with an ICD encounter diagnosis of CRS with limited GPA (without renal involvement) and with a RxNorm/HCPSC code for CRS medication (oral bactrim, mupirocin, or budesonide). Then, we evaluated outcomes of systemic exacerbation and disease progression, including ICD encounter diagnoses of GPA with renal involvement and acute sinusitis, RxNorm/HCPSC codes of oral corticosteroid and antibiotic (Augmentin or oral Azithromycin) prescriptions, and CPT code of sinus surgery, within 1 month-5 years after patients met all search criteria.

Results:

After a 1:1 propensity match on sex, ethnicity, race, and age at index, we had 1,417 patients in each cohort. We found a significantly greater incidence of ICD encounter diagnosis of GPA with renal involvement (RR: 2.20, 95% CI [1.61, 3.01]) and of acute sinusitis (1.33, [1.02, 1.73]), RxNorm/HCPSC code prescriptions of oral corticosteroids (2.10, [1.66, 2.66]) and antibiotics (2.40, [1.92, 3.01]), and CPT code of sinus surgery (2.40, [1.75, 3.29]), in patients prescribed CRS medication compared to those who were not.

Conclusion:

Sinonasal exacerbations are associated with greater incidence of GPA systemic exacerbation and disease progression. Future studies are required to evaluate the impact of treating local sinonasal flare ups and their effect on systemic exacerbations and disease progression.

PROGRAM ABSTRACTS

11:03 am – 11:08 am

Endotype evaluation of Hispanic/Latinx-American patients with chronic rhinosinusitis with polyps

Arthur Wu, MD, FARS
 Dennis Tang, MD, FARS
 Kevin Hur, MD
 Aria Jafari, MD
 Omar Ahmed, MD, FARS
 Philip Chen, MD, FARS
 Anna Matthew
 Benjamin Tam, Medical Student
 Haodong Xu
 Luv Amin
 David Cvancara, MS4
 Cedars-Sinai

Background:

Despite being the largest minority group, Hispanic-Americans are underrepresented in the scientific literature in the US. Very little has been presented in terms of their CRS endotype, presentation, and outcomes. The goal of this study was to evaluate clinical factors and pathologic features in Hispanic-American patients with CRSwNP.

Methods:

A retrospective chart review including five academic centers was performed to review clinical and pathologic factors in Hispanic-American patients with CRSwNP. Preoperative SNOT-22, absolute eosinophil count, absolute neutrophil count, serum IgE, allergy and asthma status were reviewed when available. All patients' pathology was reviewed for overall degree of inflammation, eosinophils/high powered field (HPF), neutrophils/HPF, basement membrane thickening, subepithelial edema, fibrosis, and fungal elements.

Results:

42 Hispanic-American patients were included in the study. Using >10 eosinophils/HPF as a cutoff for tissue eosinophilia, 80% of Hispanic-American patients had tissue eosinophilia. Preoperative mean SNOT-22 score was 40.2. Mean absolute eosinophil count was 342 cells/ μ l with 31% of Hispanic patients having peripheral eosinophilia (>500 cell/ μ l). Mean serum IgE levels were 448. Comorbid atopic disease was common in Hispanic patients (69% allergy, 63% asthma).

Conclusion:

Hispanic-American patients with CRSwNP have a severe TH2 endotype based on more frequent tissue and peripheral eosinophilia and common atopic comorbidities of allergy and asthma. Further studies are required to investigate this population's treatment outcomes and further delineate disease endotypes.

11:08 am – 11:15 am

Q&A

11:15 am – 12:00 pm

Panel: "CRS Endotypes, Subtypes, and Therapeutics: Where are we and Where are we Going?"

Moderator: Amber Luong, MD, PhD, FARS
Panelists: Jeremiah Alt, MD, PhD, FARS; Robert Kern, MD, FARS; Stella Lee, MD; Justin Turner, MD, FARS

12:00 pm – 1:00 pm

Lunch with Exhibitors

12:00 pm – 1:00 pm

Broadway Ballroom A

Diversity & Inclusion, Women in Rhinology, Mentorship, Residents & Fellows Combined Lunch Program**"Breaking Barriers: Insights on Improving Diversity and the Pipeline in Medicine:**

Moderator: Troy Woodard, MD, FARS
Panelists: Andre Churchwell, MD; Kimberly Vinson, MD

Saturday, September 30, 2023

8:00 am – 12:00 pm

Breakout 2**Skull Base****Broadway Ballroom CD**

7:00 am – 8:00 am

Meet the Authors Poster Viewing & Breakfast

Grand View Terrace Foyer, Second Level

Session Chair: Bobby Tajudeen, MD, FARS

8:00 am – 8:30 am

Panel: "Pediatric Skull Base Surgery in the 21st Century: Advances and Frontiers"

Moderator: David Gudis, MD, FARS
Panelists: Nithin Adappa, MD, FARS; Garret Choby, MD, FARS; Zara Patel, MD, FARS
Sponsored by the Pediatric Rhinology Committee

Scientific Oral Presentations: Skull Base Surgery

Moderators: Mathew Geltzeiler, MD, FARS; Nyall London, MD, FARS; Peter Papagiannopoulos, MD

8:30 am – 8:35 am

Mutational landscape and predictors of survival in head and neck mucosal melanoma

Brandon Lehigh, BS
 Arash Abiri, MS
 Theodore Nguyen
 Edward Kuan, MD, FARS

PROGRAM ABSTRACTS

Background:

Head and neck mucosal melanoma (HNMM) is a rare and aggressive malignancy most commonly affecting the sinonasal tract and oral cavity. The genetic profile remains poorly understood.

Methods:

We interrogated the publicly available American Association for Cancer Research (AACR) Genomics Evidence Neoplasia Information Exchange (GENIE) database (v13.0-public) which is a cancer registry collecting de-identified clinico-genomic information across 19 cancer centers. Kaplan-Meier log-rank test was used to evaluate differences in overall survival (OS).

Results:

Of the 6,802 melanoma patients, 108 (1.6%) had HNMM. The average age of the cohort was 65.6 +/- 14.7 years. The average tumor mutational burden (TMB) was 6.1 +/- 5.2. The 1-, 2-, and 5-year OS rates were 84.2%, 69.6%, and 47.5%, respectively. The most common mutations were NRAS (n=19; 17.6%), NF1 (n=15; 13.9%), ROS1 (n=14; 13.0%), TERT (n=11; 10.2%), and BRAF (n=11, 10.2%). Of the 19 patients with NRAS mutation, 7 (47.4%) had Q61R mutation, 5 (26.3%) had Q61K mutation, 3 (15.8%) had G12A, and 2 (10.5%) had G12C. There were no differences in OS for NRAS (p=0.66), NF1 (p=0.41), TERT (p=0.26), and BRAF (p=0.47) mutated vs wild-type patients. However, ROS1 mutated patients had improved OS as compared to wild-type (5-year OS: 76.6% vs 41.8%; p=0.023) patients. Lastly, there was improved OS for patients with high vs low TMB (5-year OS: 66.7% vs 35.8%; p=0.026).

Conclusions:

We identify ROS1 mutation, an actionable driver oncogene, as a predictor of HNMM OS. Overall, our findings improve the understanding of the somatic mutational landscape of HNMM.

8:36 am – 8:41 am

Genomic and clinical analysis of olfactory neuroblastoma

Theodore Nguyen, BS
Benjamin Bitner, Dr.
Brandon Lehrich, BS
Jonathan Pang, BA
Arash Abiri, MS
Sina Torabi, MD
Edward Kuan, MD, FARS
University of California, Irvine

Introduction:

Olfactory neuroblastoma (ONB) is a rare, malignant neoplasm arising from the olfactory neuroepithelium and affecting the sinonasal tract. The goal of this study is to characterize the genomic pathogenesis of ONB.

Methods:

The American Association for Cancer Research (AACR) Genomics Evidence Neoplasia Information Exchange (GENIE) database (v13.0-public) was queried for genomic and clinical data. Kaplan-Meier analyses was performed to determine overall survival (OS). High tumor mutational burden (TMB) was defined as ≥ 5 mutations.

Results:

Of the 562 embryonal tumor samples, 31 (5.52%) were ONB. 12 samples belonged to female patients (38.7%) and mean age at time of sequencing was 55.97 \pm 2.53 years. Within these samples, 15 (48.39%) were from primary tumors and 13 were from metastases (41.94%). 1-, 3-, and 5-year OS was 96.2%, 64.9%, and 43.3%, respectively. The average TMB was 5.0 \pm 0.9. When comparing primary tumors vs. metastases, there was no significant difference in number of mutations (p=0.491) or fraction of genome altered (p=0.65). The three most common mutations were SMARCA4 (n=3, 9.7%), TP53 (n=3, 9.7%), and mTOR (n=2, 6.5%). There was one patient (3.3%) that had both SMARCA4 and TP53 mutations. There were no differences in OS for mTOR (p=0.501) or SMARCA4 (p=0.310) mutated vs. wild-type patients. However, TP53-mutated patients had worsened OS when compared to wild-type (5-year OS: 0% vs. 46.2 \pm 16.0%; p=0.021). When comparing high vs. low TMB, there were no significant differences in OS (p=0.516).

Conclusion:

Understanding the genomic mutational landscape of ONB may provide insight on potential therapeutic targets.

8:42 am – 8:47 am

Genomic mutational analysis and predictors of survival in nasopharyngeal carcinoma

Benjamin Bitner, MD
Theodore Nguyen, BS
Jonathan Pang, BA
Michael Warn, BS
Arash Abiri, MS
Brandon Lehrich, BS
Edward Kuan, MD, FARS
University of California, Irvine

Introduction:

Nasopharyngeal carcinoma (NPC) genetics is poorly understood limiting development of new effective therapeutic approaches. The objective of this study is to report common genetic mutations and impact on survival.

Methods:

We queried the American Association for Cancer Research (AACR) Genomics Evidence Neoplasia Information Exchange (GENIE) database (v13.0-public) for patient clinico-genomic information and determined differences in overall survival in patients affected by NPC.

PROGRAM ABSTRACTS

Results:

Of the 2,200 head and neck cancer samples, 107 (4.86%) were NPC. Mean age at time of sequencing was 51.42±1.32 years. Clinical and sequencing data included tissue from 37 (34.6%) primary tumors and from 61 (57%) metastases. Collectively, 1-, 3- and 5-year overall survival (OS) was 93.1%, 60.6%, 40.9%, respectively. Considering sequencing results, the mean fraction of the genome altered across samples was 0.19±0.03 with an average tumor mutational burden (TMB) of 3.94±7.47. When comparing sequenced tissue from primary tumors and metastases, there was no difference in number of mutations ($p=0.64$) or fraction of genome altered ($p=0.66$). The three most common mutations were KMT2D ($n=24$, 22.4%), TP53 ($n=20$, 18.7%) and CYLD ($n=10$, 9.3%). There was no difference in OS for CYLD mutated vs wild-type patients ($p=0.22$). TP53 and KMT2D mutations were associated with worse OS as compared to wild-type with a 5-year OS of 0% vs 44.7% ($p<0.001$) and 20.5% vs 45.9% ($p=0.04$), respectively. When comparing high vs low TMB, there was no significant difference in OS (5-year OS; 27.8% vs 50.4%; $p=0.26$).

Conclusion:

NPC is often driven by mutation of tumor suppressor genes indicating potential targets for future therapeutic strategies in treating NPC.

8:48 am – 8:53 am

SNOT-22 subdomain outcomes in sinonasal malignancy: A prospective multi-center study

David Grimm, MS

Daniel Beswick, MD, FARS

Eric Wang, MD, FARS

Nithin Adappa, MD, FARS

Garret Choby, MD, FARS

Mathew Geltzeiler, MD, FARS

Anne Getz, MD, FARS

Ian Humphreys, DO, FARS

Edward Kuan, MD, FARS

Christopher Le, MD, FARS

Peter Hwang, MD, FARS

Background:

Sinonasal quality of life (QOL) after treatment for sinonasal malignancy (SNM) is poorly characterized. Our previous work indicates that global sinonasal QOL improves with SNM treatment. This study aims to characterize SNOT-22 subdomain outcomes in patients with SNM.

Methods:

Patients with newly diagnosed SNM were prospectively enrolled in a multi-center observational patient registry. Demographics, histopathology, and SNOT-22 scores were recorded over the pre and post treatment period. Multivariable regression analysis was used to identify drivers of variation in SNOT-22 subdomains.

Results:

234 SNM patients underwent treatment with curative intent, with a mean follow up of 22-months. Rhinologic, Psychological, and Sleep subdomains improved significantly vs baseline (all $P<0.05$) while Extra-Nasal, and Ear/Facial symptoms did not. Multivariable linear regression showed that adjuvant chemoradiation was associated with worse outcomes in Rhinologic (adjusted odds ratio 2.49 [0.27, 4.72]), Extra-Nasal (1.85 [0.39, 3.3]) and Ear/Facial (2.47 [0.55, 4.38]) subdomains. Pterygopalatine fossa involvement was associated with worse outcomes in Rhinologic (3.88 [0.93, 6.96]), Extra-Nasal (1.51 [0.23, 2.78]), Ear/Facial (3.8 [1.89, 5.70]), and Psychological (2.96 [0.07, 5.85]) subdomains. Positive margins were associated with worse Psychological outcome (3.98, [0.17-7.79]). Adjuvant radiation alone was associated with worse Sleep outcome (1.46 [0.12, 2.81]).

Conclusion:

SNOT-22 improvement in SNM patients after treatment is driven by Rhinologic, Psychological, and Sleep subdomains. The degree of improvement is influenced by chemoradiation, pterygopalatine fossa involvement, and positive margins.

8:53 am – 9:00 am

Q&A

9:00 am – 9:05 am

Tranexamic acid in endoscopic sinus and skull base surgery: A systematic review and meta-analysis

Sarah Khalife, MD

Zahra Abdallah, BHsc, Medical Student

Phillip Staibano, Resident Physician

Kelvin Zhou, Resident Physician

Thomas Boi Vu Nguyen, Rhinology Fellow

Doron Sommer, MD

Objective:

Endoscopic sinus surgery (ESS) and endoscopic skull base surgery (ESBS) approaches have revolutionized the management of sinonasal and intracranial pathology. Maintaining surgical hemostasis is essential as bleeding can obscure visibility of the surgical field, thus increasing surgical duration, risk of complications and procedural failure. Tranexamic acid (TXA) acts to reduce bleeding by inhibiting fibrin degradation. This review aims to assess whether TXA improves surgical field quality and reduces intraoperative blood loss compared to control.

Methods:

We searched PubMed, MEDLINE, Embase, Web of Science, and Cochrane Library from inception until September 1, 2022. Two reviewers independently screened citations, extracted data, and assessed methodological quality using Cochrane Risk-of-Bias 2. Data was pooled using a random effect model, with continuous data presented as mean difference and dichotomous data presented as Odds Ratio.

PROGRAM ABSTRACTS

Results:

Seventeen ESS RCTS (n = 1377) and one ESBS RCT (n = 50) were reviewed. Significant improvement in surgical field quality was achieved with both systemic TXA (six studies, p < 0.00001) and topical TXA (eight studies) and topical TXA (three studies) both achieved a significant reduction in intraoperative blood loss compared to control (p < 0.00001). There were significant differences in operative times (p < 0.001) but no significant difference in perioperative outcomes (p = 0.30).

Conclusion:

This meta-analysis demonstrated that utilization of TXA in ESS can improve surgical field quality and reduce intraoperative blood loss. TXA use did not result in increased perioperative complications including thrombotic events.

9:06 am – 9:11 am

The use of aprepitant to reduce postoperative nausea and vomiting in endoscopic skull base surgery

Daniel Lee, MD, FRCSC
Jennifer Douglas, MD
Jeremy Chang
Jadyn Wilensky
Christina Jackson
John Lee, MD
M. Sean Grady
Daniel Yoshor
Michael Kohanski, MD, PhD
James Palmer, MD, FARS
Nithin Adappa, MD, FARS
University of Pennsylvania

Introduction:

Postoperative nausea and vomiting (PONV) are adverse effects following surgery, which may increase the risk of complications, particularly in endoscopic skull base surgery. Aprepitant is a neurokinin-1 receptor blocker, which reduces PONV in other surgical disciplines. However, its role in endoscopic skull base surgery remains unclear. The objective of this study was to investigate the effect of aprepitant in PONV following endoscopic skull base surgery.

Methods:

A retrospective chart review between July 2021 and February 2023 of 221 consecutive patients who underwent endoscopic transsphenoidal surgery (TSA), extended endonasal approach (EEA), transcribriform approach or spontaneous CSF leak repair (sCSF). Primary outcome was the incidence of PONV. Secondary outcome measures included the number of anti-emetic use, length of stay and postoperative CSF leak.

Results:

Out of 221 patients (114 in aprepitant and 107 in non-aprepitant), there were 162 in TSA, 34 in EEA, 8 in

transcribriform and 17 in sCSF cohorts. There were no baseline demographic differences across all the groups. In the overall cohort, the aprepitant group had a significantly lower incidence of postoperative vomiting than the non-aprepitant group (1.8% vs. 21.5%, p < 0.001). This trend was shown similarly in both TSA and EEA groups. Anti-emetic use decreased with aprepitant use in the TSA group (p < 0.05). There was a trend towards decreased length of stay with aprepitant in the EEA group (4.8 vs. 9.8 days, p = 0.07). Multivariate analysis demonstrated aprepitant decreased the incidence of postoperative vomiting with odds ratio of 0.064.

Conclusion:

Aprepitant may serve as a useful preoperative treatment to reduce PONV in endoscopic skull base surgery.

9:12 am – 9:17 am

Predictors of prolonged length of stay following intradural endoscopic skull base surgery

Jonathan Pang, BA
Madelyn Frank, BA
Kelsey Roman, BS
Jinho Jung, BS
Arash Abiri, MS
Theodore Nguyen
Benjamin Bitner, MD
Frank Hsu, MD, PhD
Edward Kuan, MD, fARS
University of California, Irvine

Background:

Establishing benchmarks for length of stay (LOS) may inform strategies to reduce nosocomial infections, improve resource efficiency, and decrease costs. We explore factors contributing to postoperative LOS in intradural endoscopic skull base surgery (ESBS).

Methods:

Retrospective chart review was conducted at a tertiary academic skull base surgery program including consecutive adult patients who underwent ESBS with intraoperative cerebrospinal fluid (CSF) leak and primary repair between July 2018 and February 2023. LOS comprised the primary outcome and was calculated as time between end of anesthesia to discharge from hospital.

Results:

150 patients were included, with mean LOS of 6.7 ± 9.7 days. LOS did not differ significantly between high-flow (n=86) and low-flow (n=64) CSF leak cohorts (7.0 ± 8.6 vs. 6.4 ± 11.0 days, p=0.697). Defects of the anterior cranial fossa (n=24, 8.0 ± 12.7 days), suprasellar region (n=64, 7.6 ± 9.8 days), sella (n=104, 6.3 ± 8.5 days), and posterior cranial fossa (n=13, 5.1 ± 3.0 days) had variable LOS (p=0.657). On multiple linear regression, after controlling for numerous patient, surgical, and postoperative factors, extended approach (B[95%CI]=4.27[0.91, 7.62]), length of bedrest

PROGRAM ABSTRACTS

(B=1.80[0.32, 3.29]), postoperative stroke (B=17.09[7.33, 26.85]), postoperative pneumonia/aspiration (B=5.07[0.06, 10.08]), and postoperative hyponatremia (B=4.23[0.25, 8.21]) independently predicted prolonged LOS.

Conclusion:

With healthcare utilization receiving increased attention, understanding and mitigating factors that extend LOS is important. The current study identified surgical approach, bedrest duration, and certain postoperative complications as key factors prolonging LOS in intradural ESBS.

9:18 am – 9:23 am

Quality of life among patients undergoing endoscopic pituitary gland resection with and without middle turbinectomy

Narin N. Carmel Neiderman, MD, MSc
Orr Raved
Shay Kaufman
Anat Wengier
Avraham Abergel
TASMC

Introduction:

The endoscopic approach to skull base lesions is considered less aggressive, and associated to improved tumor related and nasal related quality of life. However, there is an ongoing literature debate regarding the necessity to preserve the middle turbinate during the procedure.

Objective:

The aim of the study was to compare tumor and nasal related quality of life in patients undergoing endoscopic endonasal resection of pituitary tumors with or without middle turbinate 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 prior to surgery and 3-6 months post-operatively.

Results:

Our study included 56 patients, 46 patients underwent middle turbinectomy and 10 did not. The overall score difference of pre and post ASBS-Q score did not alter significantly between both groups (0.15±0.64 among those who underwent middle turbinectomy vs 0.19±0.74 among those who did not; p=0.87). SNOT-22 score difference also did not alter significantly (1.54±15.29 vs 3.92±16.84, p=0.32) post operatively.

Conclusion:

We found that middle turbinectomy did not cause significant deterioration in nasal and tumor related QOL in the post-operative course.

9:23 am – 9:30 am

Q&A

9:30 am – 9:45 am

Targeted Conversations on Important Topics: Next Generation Sequencing in Skull Base Surgery

Moderator: Sanjeet Rangarajan, MD, FARS

Panelists: Corinna Levine, MD, FARS; Peter Papagiannopoulos, MD

9:45 am – 10:15 am

Break with Exhibitors

**Scientific Oral Presentations:
Rhinitis Potpourri**

Moderators: Charles Ebert, MD, FARS; Edward Kuan, MD, FARS; Charles Tong, MD, FARS

10:15 am – 10:20 am

Stellate ganglion block for post-COVID-19 parosmia: Does it work?

Bitu Naimi, BA
Emily Garvey, BA
Megha Chandna, BS
Alexander Duffy, MD
Stephanie Hunter, PhD
Marc Rosen, MD, FARS
Mindy Rabinowitz, MD, FARS
Elina Toskala, MD, MBA, PhD, FARS
Adam Zoga, MD, MBA
Gurston Nyquist, MD, FARS
David Rosen, MD
Thomas Jefferson University Hospital

Aim:

Evaluate stellate ganglion block (SGB) as a treatment option for post-COVID olfactory dysfunction (OD) and parosmia.

Methods:

Retrospective study of patients who underwent unilateral (SGB1) or bilateral (SGB2) SGB for post-COVID OD. Patients completed Brief Smell Identification Tests (BSIT) before and after treatments, and a post-treatment survey investigating subjective symptom improvement.

Results:

43 patients with post-COVID OD underwent SGB. 30 patients had pre- and post-SGB BSIT scores (mean OD duration 1.93 ± 0.52 years); 19 patients completed surveys (mean OD duration 1.91 ± 0.46 years). Mean BSIT pre-SGB was 8.10 ± 2.40, post-SGB1 8.76 ± 2.41, and post-SGB2 9.00 ± 1.58, with no significant change in scores (p=0.224). Subjective parosmia severity on a scale from 1 (not present) to 10 (worst) improved from preSGB (8.95 ± 1.18) to SGB1 (6.37 ± 2.73) and to SGB2 (5.70 ± 2.45); differences were significant from preSGB to SGB1 (p<0.001) and

PROGRAM ABSTRACTS

preSGB to SGB2 ($p < 0.001$). On a scale of 1 (not present) to 5 (worst), there was a significant decrease in distorted tastes (median preSGB 4.0 vs. postSGB 3.0, $p = 0.003$), unpleasant odors in the nose (3.0 vs. 2.0, $p = 0.0042$), unpleasantness of smells (3.0 vs. 2.0, $p = 0.012$), and number of parosmia triggers (4.0 vs. 3.0, $p = 0.002$) after the procedure (SGB1 or SGB2). After SGB, patients reported significantly improved ability to enjoy food (5.0 vs. 2.0, $p = 0.001$), ability to prepare meals (4.0 vs. 2.0, $p = 0.002$), weight maintenance (4.0 vs. 2.0, $p = 0.002$), and upkeep of personal hygiene (2.0 vs. 1.0, $p = 0.008$).

Conclusion:

SGB may significantly improve subjective parosmia and QOL for patients with post-COVID OD. Large placebo-controlled trials are needed to further investigate this treatment

10:21 am – 10:26 am

Stellate ganglion block for the treatment of COVID-19-induced olfactory dysfunction: A prospective pilot study

Andrew Peterson, MD, MSCI
Brevin Miller, Medical Student
Dorina Kallogjeri, MD
Aara Kukuljan, Manager, Division of Clinical Research
Jay Piccirillo, MD
John Schneider, MD, MA
Lauren Roland, MD, MSCI
Lara Crock, MD
Nyssa Farrell, MD
Washington University School of Medicine/Barnes Jewish Hospital

Background:

There are few effective treatments for COVID-19-associated olfactory dysfunction (OD), but anecdotal evidence and case reports describe success with the use of stellate ganglion blocks (SGBs). The objective of this study was to explore the effectiveness and safety of SGBs for the treatment of persistent COVID-19-induced OD.

Methods:

In this single-arm, prospective pilot trial, adult participants with a COVID-19 diagnosis ≥ 12 months prior to enrollment with OD underwent bilateral SGBs. Subjects were followed for 1 month after completion of SGB. The primary outcome measure was the change in 7-point Likert Clinical Global Impression - Improvement scale for smell loss. Secondary outcome measures included change in University of Pennsylvania Smell Identification Test (UPSIT) and Olfactory Dysfunction Outcomes Rating.

Results:

Twenty participants were enrolled with a mean (SD) age of 46 (11) years and a mean (SD) duration of OD of 21 (5) months. At 1-month, 10 (50%) participants experienced at least slight subjective improvement in

their OD, 11 (55%) attained a clinically meaningful improvement in smell identification using the UPSIT, and 7 (35%) achieved a clinically meaningful improvement in olfactory-specific QOL. The median difference between UPSIT scores at baseline and 1-month was 6 (95% CI, 3 to 11), exceeding the MCID of 4. There were no serious adverse events.

Conclusion:

This study found that sequential SGBs for COVID-19-associated OD were safe and resulted in modest improvements in subjective olfaction, odor identification, and olfactory-specific QOL. A larger, placebo-controlled trial is warranted to determine the efficacy of SGBs for COVID-19-associated OD

10:27 am – 10:32 am

Sinonasal pathogenic bacteria in patients with diabetes mellitus

Trisha Shang, BA
David Kaelber, Chief Medical Informatics Officer
Mohamad Chaaban, MD, FARS
Case Western Reserve University

Introduction:

Diabetes mellitus (DM) is known to affect the microbiome and lower airway inflammation. Our study aims to examine how DM can impact the development of chronic rhinosinusitis (CRS) and its microbiome.

Methods:

We conducted a retrospective study using the TriNetX US Collaborative Network platform. We searched for adults that had an outpatient visit noted by CPT codes who had one or more ICD encounter diagnosis of DM and ever had an HbA1c $\geq 6.5\%$ in their LOINC code. We compared them to adults who had an outpatient visit and were never diagnosed with DM and never had HbA1c $\geq 6.5\%$. We evaluated an outcome of CRS encounter diagnosis by ICD code and detection of *Staphylococcus aureus*, *Haemophilus influenzae*, and *Pseudomonas aeruginosa* in the nose or cultured specimens by LOINC code. All outcomes were 1 month to 5 years after patients met all search criteria.

Results:

After performing a 1:1 propensity match for sex, age at index, and race, there were 1,770,623 patients in each cohort. Those with DM were significantly more likely than those without DM to have a CRS encounter diagnosis (Risk Ratio: 1.86, 95% CI [1.84, 1.89]). They were also significantly more likely to have the presence of *S. aureus* (3.96, [3.77, 4.16]) detected in nose samples, and *P. aeruginosa* (13.32, [10.38, 17.11]), and *H. influenzae* (3.58, [3.01, 4.25]) detected in specimen samples than those without DM.

Conclusion:

Patients with DM have a greater risk of developing CRS and *S. aureus*, *P. aeruginosa*, and *H. influenzae* infection than patients without DM. Further studies are

PROGRAM ABSTRACTS

needed to determine mechanisms behind the development of a pathogenic sinonasal microbiome in patients with DM.

10:33 am – 10:38 am

The Role of CCL19 and atypical cytokine receptor CCRL1 in chronic rhinosinusitis

Chengetai R. Mahomva, MD
Prince A.B. Minkah
Kristine Smith, MD
Gretchen Oakley, MD, FARS
Richard Orlandi, MD, FARS
Jeremiah Alt, MD, PhD, FARS
Abigail Pulsipher, MD
University of Utah

Background:

Chemokine CCL19 has been shown to predict disease severity in COVID-19 and treatment response in rheumatoid arthritis. CCL19 exerts both pro- and anti-inflammatory effects and can be degraded by receptor CCRL1. CCL19 is elevated in chronic rhinosinusitis (CRS) but its role in CRS is unknown. This study seeks to characterize the gene transcriptional changes of CCL19, its receptors, and associated cytokines and their correlations with disease severity in CRS.

Methods:

An established database was examined for patients with CRS and controls. Controls with asthma and allergy were excluded. mRNA was extracted from ethmoid tissues and subjected to multiplex gene expression analysis. Enrollment Lund-Kennedy, Lund-Mackay, Sinonasal Outcomes Test 22 (SNOT-22), and Rhinosinusitis Disability Index (RSDI) scores were collected. Gene transcripts copy numbers were compared to controls and correlated to disease severity.

Results:

Thirty-eight subjects (n=7 control; n=31 CRS) were included. CCL19, CCRL1, and TNFA were significantly elevated in CRS compared to controls ($p < 0.05$). CCL19 expression was positively correlated with IL1B and TNFA expression ($p < 0.05$). TNFA expression was positively correlated with SNOT-22 and RSDI scores ($p < 0.03$). CCL19 expression was positively correlated with SNOT-22 but did not reach significance ($p = 0.067$). CCRL1 expression was inversely correlated with RSDI ($p = 0.027$).

Conclusion:

In CRS, CCL19 and CCRL1 may modulate TNF- α driven pro-inflammatory signaling cascades and may be predictive markers of disease severity. Further mechanistic studies are needed to determine the functional consequences of CCL19 and CCRL1 and whether they can be identified as potential therapeutic targets in CRS.

10:39 am – 10:45 am

Q&A

10:45 am – 10:50 am

Real-world comparison of nasal obstruction outcome scores between medial flap turbinoplasty and inferior turbinate submucous resection during concurrent septorhinoplasty

Milinds Vasudev, BS
Amir Hakimi
Ashley Lonergan
Shannen Guarina
Sina Torabi, MD
Allison Hu
Theodore Nguyen, BS
Edward Kuan, MD, FARS
Brian Wong
University of California, Irvine

Objectives:

To compare longitudinal improvement in nasal obstruction quality-of-life outcomes between medial flap turbinoplasty (MFT) and inferior turbinate submucous resection (SMR) concurrently performed with functional septorhinoplasty.

Methods:

Retrospective review of a prospectively collected cohort of patients undergoing functional septorhinoplasty between 2015 to 2022 at a tertiary academic center. Outcomes were assessed using the Nasal Obstruction Symptom Evaluation (NOSE) questionnaire preoperatively and over 12 months postoperatively.

Results:

373 patients were analyzed with longitudinal NOSE questionnaires. Of these, 298 underwent SMR and 75 underwent MFT. The proportion of intraoperative techniques including rim graft, spreader graft, auto-spreader graft, intradomal sutures, interdomal sutures, and alar spanning sutures were similar between the two cohorts ($p > 0.05$). Patients in all surgical groups had a statistically and clinically significant improvement in NOSE scores between their preoperative and postoperative follow-up visits ($p < 0.001$). MFT patients had higher NOSE scores 1 month post-op (40.0 ± 30.5 vs. 31.0 ± 27.97 ; $p = 0.017$), but lower scores after 10 months (15.2 ± 13.3 vs. 25.4 ± 23.5 ; $p = 0.036$). Similarly, patients in the MFT cohort in primary rhinoplasty procedures reported higher scores initially but lower after 10 months ($p = 0.024$). Men in the MFT cohort reported significantly better NOSE outcomes than the SMR cohort, as early as 4 months post-surgery and sustained throughout the follow-up period (10.6 ± 12.3 vs. 22.6 ± 21.4 ; $p = 0.012$).

Conclusion:

MFT may offer better long-term nasal breathing outcomes compared to SMR for functional rhinoplasty patients based on superior long-term NOSE scores.

PROGRAM ABSTRACTS

10:51 am – 10:56 am

Cadaveric and computed tomography analysis of the arterial supply and mucosal dimensions of the anterior ethmoid artery flapLane Donaldson, MD
John Craig, MD, FARS
Robert Deeb**Background:**

The anterior ethmoid artery (AEA) flap has been successful for repairing anterior septal perforations, and has been presumed to be axially based from AEA branches traversing the cribriform plate (CP). However, limited evidence supports the flap's axial supply. The purposes of this cadaveric and computed tomography (CT) study were to assess the arterial anatomy from the CP to the septum, and to determine AEA flap length to predict ideal flap base width should the flap be random instead of axial.

Methods:

Ten fresh latex-injected cadavers were utilized for endoscopic dissection to identify arteries traversing the CPs on each side. First, arterial trajectories along the septum from the CP were recorded. Measurements were then made bilaterally along the septum from the middle turbinate (MT) axilla to the first dominant artery traversing the CP. Additionally, 100 sinus CTs were reviewed to measure AEA flap lengths bilaterally.

Results:

From the 10 cadavers, 20 sides were utilized for measurements. In all cadavers the AEA arterial branches coursed along the septum diagonally or horizontally, and never directly vertically from the CP. The mean distance from the MT axilla to the first artery traversing the CP was 1.24 ± 1.93 cm (range=1-1.5 cm). Based on CT, mean AEA flap length was 6.39 ± 5.95 cm.

Conclusions:

Based on the non-vertical courses of AEA septal branches, the AEA flap is more likely a random transposition flap. Assuming a 3-4:1 length:width ratio, a flap base width of 1.5-2.5 cm may be necessary to supply the AEA flap.

10:57 am – 11:02 am

Posterior nasal nerve ablation for management of postnasal drip: A single center case seriesDaniel Gorelik, Research Fellow
Yuki Yoshiyasu, Resident
Samuel Razmi, Medical Student
Masayoshi Takashima, MD, FARS
Omar Ahmed, MD, FARS
Houston Methodist Hospital**Background:**

Postnasal drip (PND) is a common concern among patients with chronic rhinitis and is multifactorial in nature. Posterior nasal nerve (PNN) ablation is an option for chronic rhinitis refractory to medical therapy

to typically treat symptoms of nasal congestion, rhinorrhea, nasal itching and sneezing. The purpose of this study is to review the efficacy of PNN ablation among patients that report PND as their primary symptom.

Methods:

Patients with chronic rhinitis undergoing PNN ablation at a single institution were reviewed from January 2022 to January 2023. Patients who reported PND as a primary concern were included in the case series. Wilcoxon signed-ranks test was used to compare patients with SNOT-22 pre- and post-procedure assessments of PND.

Results:

105 chronic rhinitis patients underwent PNN ablation, with 37 (35.2%) patients treated for a primary concern of postnasal drip. Follow-up data was available for 31 patients and median follow up was 51 days (IQR, 42-128). 22 (71.0%) patients underwent radiofrequency neurolysis and 9 (29.0%) patients underwent cryotherapy ablation. 25/31 (80.6%) patients noted subjective improvement at follow up. 11 (35.5%) patients were refractory to reflux treatment. Ten patients had pre- and post-procedure SNOT-22 assessments of PND. Mean SNOT-22 PND score significantly improved during follow-up assessment (4.3 vs. 2.1, $p=.006$).

Conclusion:

Our experience identified that PND is a primary concern in a substantial portion of chronic rhinitis patients and PNN ablation may offer an effective treatment option. This is the first study to look at the use of PNN ablation for PND as a primary symptom. Larger studies are needed to further assess the role of PNN ablation for PND management.

11:03 am – 11:08 am

Insurance influence and reimbursement on common rhinological proceduresTyler Janz, MD
Masayoshi Takashima, MD, FARS
Diane Bernahl, MHA
Michael Yim, MD, FARS
Murugappan Ramanathan, MD, FARS
Omar Ahmed, MD, FARS
University of Texas Medical Branch, Galves**Background:**

Rhinology procedures are often reimbursed via healthcare insurance. However, healthcare insurance's role in both the reimbursement and denial of common rhinology procedures remains unknown. Thus, the goal of this study is to better understand both initial denials and final write-offs of procedures and encounters within an academic rhinological practice.

Methods:

A retrospective chart review was conducted of patients

PROGRAM ABSTRACTS

who underwent rhinological intervention at a tertiary medical center from January 1, 2021 to January 1, 2023. Descriptive statistics and frequencies were then calculated using SPSS 28.0 (IBM Corporation, Armonk, NY).

Results:

After analysis, 21,767 procedures and encounters were identified within the study. Of all rhinological procedures and encounters, 2293 were initially denied (10.53% denial rate). In-office procedures accounted for 59.4% of denials. Final denials resulted in an estimated \$190,956.04 revenue lost. The three most costly denied procedures were: 1. Posterior Nasal Nerve Ablation (-\$47363.20), 2. Nasal Endoscopy with Debridement/Polypectomy (-\$21456.51), and 3. Diagnostic Nasal Endoscopy (-\$17337.87). Blue Cross-Blue Shield, Medicare, and AETNA had the highest percentage of denials for the above procedures.

Conclusion:

This study demonstrates the extremely complex nature of insurance processing and approval for common rhinological procedures and encounters. A moderate percentage of rhinological procedures and encounters were denied even at a high-volume tertiary center which accounted for a large loss in revenue. Rhinology practices must continue to remain knowledgeable of the changes and effects of insurance reimbursement on their practice.

11:08 am – 11:15 am

Q&A

11:15 am – 12:00 pm

Panel: “Postoperative Care in Skull Base Surgery: CPAP, Debridement, Rinses and More!”

Moderator: Mathew Geltzeiler, MD, FARS

Panelists: Nyssa Farrell, MD; Edward Kuan, MD, FARS; Mindy Rabinowitz, MD, FARS; Bobby Tajudeen, MD, FARS

Sponsored by the Skull Base and Orbital Surgery Section

12:00 pm – 1:00 pm

Lunch with Exhibitors

12:00 pm – 1:00 pm

Broadway Ballroom A

Diversity & Inclusion, Women in Rhinology, Mentorship, Residents & Fellows Combined Lunch Program**“Breaking Barriers: Insights on Improving Diversity and the Pipeline in Medicine:**

Moderator: Troy Woodard, MD, FARS

Panelists: Andre Churchwell, MD; Kimberly Vinson, MD

Saturday, September 30, 2023

8:00 am – 12:00 pm

Breakout 3**Business of Medicine/Clinical****Rhinology****Broadway Ballroom GH**

7:00 am – 8:00 am

Meet the Authors Poster Viewing & Breakfast

Grand View Terrace Foyer, Second Level

Session Chair: Greg Davis, MD, FARS

8:00 am – 8:30 am

Panel: “Setting Up and Maximizing an ASC for Success”

Moderator: Douglas Reh, MD, FARS

Panelists: Karen Bednarski, MD, FARS; Leah Hauser, MD; Michael Sillers, MD, FARS

Sponsored by Rhinologists in Private Practice Section

Scientific Oral Presentations: Sinus Surgery and Postop Therapies

Moderators: Chadi Makary, MD, FARS; Katie Phillips, MD; William Yao, MD, FARS

8:30 am – 8:35 am

Outcomes and histopathologic features for chronic rhinosinusitis macrolide responders

Madelyn Frank, BA

Nyein Nyein Htun, Dr

Beverly Wang, Dr

Edward Kuan, MD, FARS

University of California, Irvine

Background:

Macrolides, though classified as antimicrobial drugs, are known to have anti-inflammatory properties. Patients with chronic rhinosinusitis (CRS) without eosinophilic predominance have been proposed as potential macrolide responders (MR). The aim of this study is to evaluate outcomes and histopathological findings of CRS patients who were MR.

Methods:

Patients that received bilateral comprehensive sinus surgery for CRS followed by steroid irrigations were retrospectively reviewed. 10 patients were identified as potential MR and received low-dose azithromycin for >6 months. 34 patients were included as controls. Presumed macrolide response was made based on tissue eosinophil count <10/HPF and persistent mucus complaints despite steroid irrigations. Resected sinus tissue was evaluated using structured histopathology.

Results:

MR were older (54.4±16.9 vs 49.1±17.3; p<0.001) and had a lower rate of asthma (10% vs 62%; p=0.01).

PROGRAM ABSTRACTS

There was no difference in gender and smoking history ($p>0.05$). Histopathological differences between MR and controls included tissue eosinophil count (5.3 ± 8.4 vs 24.5 ± 16.0 ; $p<0.001$), basement membrane thickening (40% vs 79%; $p=0.04$), subepithelial edema (4% vs 29%; $p=0.03$), fibrosis (60% vs 12%; $p=0.006$), and eosinophilic aggregates (20% vs 70%; $p=0.01$). The MR group had lower preoperative SNOT-22 scores (39.4 vs 46.2; $p<0.001$), though there was no difference in subdomains (all $p>0.05$). At 12 months postoperatively, both groups had comparable degree of subjective improvement (-27.2 vs -27.0 , $p=0.864$).

Conclusion:

Despite initial modest improvement with surgery and steroid irrigations, MR, who have noted histopathologic features, eventually achieve comparable outcomes to other CRS subtypes.

8:36 am – 8:41 am

Outcomes of “full-house” versus limited endoscopic sinus surgery for chronic rhinosinusitis patients

Shreya Ramkumar, BS
Tripti Brar, Dr
Claire Yee
Michael Marino, MD, FARS
Amar Miglani, MD
Devyani Lal, MD, FARS

Background:

The extent of endoscopic sinus surgery (ESS) for CRS is often chosen at the surgeon's discretion. This study investigates outcomes from full-house (bilateral maxillary, ethmoid, sphenoid, and frontal sinusotomy) vs. limited ESS (anything not full-house) performed by a single surgeon. We study indications and outcomes of limited vs. full-house ESS.

Methods:

Adult CRS patients who underwent ESS between 2010 to 2018 were retrospectively reviewed. Demographics, Lund-Mackay CT scores, SNOT-22 scores, histopathology, and subsequent revision ESS were analyzed (SAS version 9.04).

Results:

In the study period, 556 patients underwent ESS; 290 underwent full-house and 266 underwent limited ESS. Median CT score correlated significantly with performance of full-house vs. limited ESS (13 vs. 8, $p<0.001$). Median SNOT-22 score between full-house (44) and limited ESS (40) was not clinically different. SNOT-22 improvement at 6 and 12 months was not significantly different between cohorts ($p=0.22$) by repeated measures ANOVA. Significantly more CRSwNP patients (62.4% vs. 24.4%, $p<0.001$) underwent full-house ESS. Overall, 21 patients (7.2%) underwent revision ESS in full-house vs. 20 (7.5%) in limited ESS, a non-significant difference ($p=0.9$). Limited ESS patients with eosinophil count <10 /high-

powered-field were more likely than full-house (11.5% vs. 5.6%) to undergo revision ESS. Rates of revision ESS were similar for those undergoing limited vs. full-house for both CRSwNP (6.2% vs. 7.2%) and CRSsNP (8.0% vs. 7.3%).

Conclusion:

CT scores appeared to correlate strongly with the extent of surgery. With this approach, no significant differences in SNOT-22 scores and revision rates were found between those undergoing full-house vs. limited ESS.

8:42 am – 8:47 am

Factors impacting follow-up care in allergic fungal rhinosinusitis

Jorge Gutierrez, BA
Sofia Khan, BS
Nikita Chapurin
Rodney Schlosser, MD, FARS
Zachary Soler, MD, FARS
Medical University of South Carolina

Introduction:

Allergic fungal rhinosinusitis (AFRS) is associated with high rates of revision surgery and requires long term medical management. The purpose of this study was to analyze barriers to medical care and follow up in patients with AFRS.

Methods:

Subjects with AFRS and a chronic rhinosinusitis with nasal polyps (CRSwNP) comparison were prospectively recruited for completion of the Barriers to Care Questionnaire (BCQ) and chart review.

Results:

Fifty-nine AFRS and fifty-one CRSwNP patients participated. AFRS patients were more likely to be lost to follow up within 6 months of surgery (35.6% vs. 17.7%, $p=0.04$) and no-show for at least one appointment (20.3% vs. 5.9%, $p=0.03$) compared to CRSwNP patients. Men with AFRS were more likely to have a single follow-up visit (37.0% vs. 3.1%, $p<0.001$) and be lost to follow-up within 6 months (66.7% vs. 9.4%, $p<0.001$) than women. There were no significant differences in the BCQ between groups; however, rate of questionnaire completion was lower in the AFRS group than the CRS group (62.7% vs 80.4%, $p=0.042$). AFRS patients who did not complete the BCQ were more likely to be male (63.6% vs. 35.1%, $p=0.034$), lost to follow-up (77.3% vs. 10.8%, $p<0.0001$), and have a single follow up visit (40.9% vs. 5.4%, $p<0.0001$). Decreasing age was associated with increased likelihood of having a single follow-up visit (odds ratio 1.143, 95% CI 1.022-1.276).

Conclusion:

Young, male AFRS patients are more frequently lost to follow-up after surgery and less likely to complete questionnaires assessing barriers to care. Further

PROGRAM ABSTRACTS

investigation is needed to assess barriers to follow-up and optimize post-surgical treatment in these at-risk groups.

8:48 am – 8:53 am

Efficacy of early postoperative debridement in sinonasal cavity healing after functional endoscopic sinus surgery: A randomized controlled trial

Juan Carlos Hernaiz-Leonardo, MD, MSc
Bader M. Alim
Marwan Alqunaee, Dr.
Athenea Pascual, Research Coordinator
Judy Fan
Amin R. Javer, MD, FARS
University of British Columbia

Background:

Postoperative debridement (PD) after functional endoscopic sinus surgery (FESS) is frequently recommended and performed to improve the healing process and prevent scar tissue (ST) formation. PD can be uncomfortable and painful for patients.

Methods:

This open label randomized controlled trial determined whether PD decreased ST formation compared to rinsing alone after FESS. We recruited adult patients with chronic rhinosinusitis (CRS) undergoing primary FESS. Patients with secondary causes of CRS, primary immunodeficiencies, or who underwent limited sinus surgery (i.e., middle meatal antrostomy) were excluded from the trial. The primary outcome was the presence of ST at 3 months post FESS. Secondary outcomes included middle turbinate (MT) lateralization, need for in-office ST excisions, and revision surgery.

Results:

Ninety-six patients met inclusion criteria for the trial. The mean age (SD) was 53(16) years, and 64(68%) were male. Fifty-three patients were randomized to early (i.e., within six days) PD and 43 received no debridement. At three months follow-up, 14(33%) non-debrided patients developed ST compared to 21(40%) of PD patients (RR 1.21; 95%CI 0.71 - 2.09; $p = 0.48$). Six (14%) non debrided patients had MT lateralization compared to 13(24%) PD patients (RR 1.76; 95%CI 0.73 - 4.23; $p = 0.21$). Five (12%) non-debrided patients required an in-office intervention compared to 10(19%) of PD patients ($p = 0.35$). One patient in the no-debridement arm required revision FESS compared to two patients in the PD group ($p = 0.74$).

Conclusion:

PD does not reduce the incidence of ST formation after FESS. If PD is necessary, we would advise against aggressive instrumentation given the high incidence of ST postoperatively.

8:53 am – 9:00 am

Q&A

9:00 am – 9:05 am

The effect of low-dose long-term doxycycline on postoperative outcomes in patients with eosinophilic chronic rhinosinusitis

Jin Young Min, MD, PhD
Hye Kyu Min
Hyun Ji Lee
Suk Ju Ryu
Kyung Hee University School of Medicine

Objective:

Doxycycline (Dc) is a broad-spectrum bacteriostatic antibiotic of the tetracycline class, which also has anti-inflammatory action including reduction of ECP and MMP-9, and antibiotic activity against *S.aureus*. The purpose of this study was to investigate the effect of Dc on postoperative outcomes in CRS patients.

Methods:

Of the CRS patients who underwent ESS from 2020 to 2021 December, 43 adult patients (18 patients taking Dc after ESS for average 12weeks [200mg loading dose, then 100mg daily] and 25 patients without Dc) showing eosinophilic CRS were enrolled in this study. Subjective symptoms (SNOT-22), postoperative endoscopic scores (Lund-Kennedy score), and olfactory outcome were compared between Dc-taking group and Dc-free group to investigate the effect of Dc on postoperative outcomes.

Results:

Compared to patients without Dc, there was a significant improvement in total scores of SNOT-22 in patients with Dc postoperatively (27.3 ± 5.4 vs 18.7 ± 7.7 , $P=0.04$). When we assessed 22 individual symptoms, statistically significant decreases were found in symptoms including post-nasal discharge and cough (all, $P<0.05$). Additionally, patients with Dc had significantly better outcomes in postoperative endoscopic scores regarding mucosal edema, compared to those without Dc ($P=0.03$). However, no significant differences were observed in postoperative olfactory outcomes between the two groups.

Conclusions:

Doxycycline may have a beneficial role for postoperative disease control status in eosinophilic CRS.

PROGRAM ABSTRACTS

9:05 am – 9:10 am

High dose ciprofloxacin and azithromycin sinus stent for the treatment of chronic rhinosinusitis

Do-Yeon Cho, MD
 Dong Jin Lim, PhD
 Daniel Skinner, BS
 Shaoyan Zhang, PhD
 Jessica Grayson, MD
 Bradford A. Woodworth, MD, FARS
 University of Alabama at Birmingham

Background:

Previously, a novel double-coated sinus stent containing ciprofloxacin (CPF, inner layer) and azithromycin (AZT, outer layer) (CASS) was developed but released drug concentrations were found to be insufficient for clinical usage. This study aims to improve drug release of CASS by increasing the concentrations of the two drugs and to assess its safety in the preclinical rabbit model.

Methods:

To create the CASS with 2mg CPF and 5mg AZT, dip-coating was used. Scanning electron microscopy (SEM) confirmed a uniformed double coating and allowed for visualization of the release patterns of both drugs, which were assessed over 14 days in saline solution. The safety of the CASS was addressed using the preclinical rabbit model through evaluating nasal endoscopy, histology, and biomarkers before and after CASS placement.

Results:

SEM confirmed the uniformity of the dual coating of CPF and AZT and thickness (μm) was found to be 14.7 ± 2.4 and 28.1 ± 4.6 , respectively. The inner coated ciprofloxacin showed a sustained release over 14 days (release %) when soaked in saline solution (Day 7, 86.2 ± 3.4 vs. Day 14, 99.2 ± 5.1 , $n = 3$). In vivo analysis showed that after seven days, $53.1\pm 8.2\%$ of CPF and $44.4\pm 3.4\%$ of AZT were released into the sinus ($n = 3$). There were no significant differences in body weight, white blood cell counts, and total protein/albumin levels before and after CASS placement. Mild subepithelial edema was noticed in the medial wall of maxillary sinuses with CASS placement.

Conclusion:

These findings suggest that the CASS stent is an effective method for delivering therapeutic levels of antibiotics for CRS. Further studies are needed to validate the efficacy of the stent in a preclinical model.

9:10 am – 9:15 am

Quantification of retained budesonide dose from high-volume saline irrigation in post-operative chronic rhinosinusitis

Paige Shipman, MS1
 Kristine Smith, MD
 Bhuvanesh Yathavan
 Amarbir Gill, MD
 Chelsea Pollard
 Venkata Yellepedi
 Hamidreza Ghandehari
 Abigail Pulsipher, Dr.
 Jeremiah Alt, MD, PhD, FARS
 University of Utah

Background:

Budesonide high volume saline irrigations (HVSIs) are used ubiquitously to treat chronic rhinosinusitis (CRS) due to improved sinonasal delivery and efficacy compared to intranasal corticosteroids sprays. The off-label use of budesonide is assumed to be safe, with several studies suggesting the systemically absorbed dose of budesonide HVSIs is low. However, the actual dose of budesonide to the sinonasal cavity following HVSIs is unknown. The objective of this study was to further quantify the retained dose of budesonide HVSIs.

Methods:

Adult patients with CRS who had undergone endoscopic sinus surgery (ESS) and had been prescribed budesonide HVSIs were enrolled in a prospective, observational cohort study. Patients performed budesonide HVSIs (0.5 mg dose) under supervision in an outpatient clinic and the irrigation effluent was collected. High-performance liquid chromatography (HPLC) was used to determine the dose of budesonide retained after HVSIs.

Results:

Twenty-four patients met inclusion criteria. The average retained dose of budesonide across the cohort was 0.221 mg (SD=0.087, 42%). Increased time from ESS significantly impacted the retained dose, with those <90 days post-ESS retaining 56% of administered budesonide and those >90 days post ESS retaining 32% ($p=0.0004$).

Conclusion:

The retained dose of budesonide HVSIs was found to be significantly higher than previously estimated and decreases with time since ESS. Given that budesonide HVSIs is a cornerstone of care in CRS, defining the retained dose and the potential systemic implications is critical to understanding the safety of budesonide HVSIs.

PROGRAM ABSTRACTS

9:15 am – 9:20 am

Medication adherence with intranasal corticosteroid irrigations

Jorge Gutierrez, BA
 Christian Shannon
 Nikita Chapurin, MD
 Rodney Schlosser, MD, FARS
 Zachary Soler, MD, MSc, FARS
 Medical University of South Carolina

Introduction:

The purpose of this study was to investigate real world adherence to intranasal corticosteroid irrigations using pharmacy data and assess factors associated with low adherence.

Methods:

Patients undergoing treatment with corticosteroid irrigations for any diagnosis during a 2-year period were prospectively recruited. Subjects completed a one-time set of questionnaires including the Barriers to Care Questionnaire (BCQ), 22-item Sino-Nasal Outcome Test (SNOT-22), and a questionnaire assessing their experience with corticosteroid irrigations. Pharmacy data was used to calculate the Medication Possession Ratio (MPR), a measure of medication adherence graded from 0 to 1, with 1 indicating the patient possessed the medication 100% of days in an observed period.

Results:

Seventy-one patients were enrolled. Patients diagnoses included chronic rhinosinusitis (CRS) without nasal polyps (n = 37), CRS with nasal polyps (n = 24), or a non-CRS diagnosis, most commonly chronic rhinitis (n = 10). The MPR for the overall group was 0.44 ± 0.33 . Just 9.9% of patients had a perfect MPR of 1. Despite low MPR, only 19.7% of patients reported problems taking the medication when directly asked. Lower education resulted in lower MPR (unstandardized B = 0.065, p = 0.046). Increasing BCQ score, indicating higher barriers to care, was associated with lower MPR (unstandardized B = -0.010, p = 0.033). The lower the MPR, the worse patient SNOT-22 scores (unstandardized B = -15.980, p = 0.036).

Conclusion:

Adherence to corticosteroid irrigations was low and patients underreported issues with their medication. Education and barriers to care were associated with lower adherence which, in turn, was associated with worse sinonasal quality of life.

9:20 am - 9:25am

Evaluation of LYR-220 corticosteroid matrices at week 24 from the BEACON study in CRS

Brent Senior, MD, FARS
 Vineeta Belanger, PhD
 Randall Ow, MD, FARS
 M. Scott Major
 Stacey Silvers, MD, fARS
 Jeffrey Rosenbloom, MD
 Lindsay Brayton, Clinical Project Manager
 Marina Mihova
 Ela Sajjadi, Clinical Research Scientist
 Richard Nieman
 Robert Kern, MD, FARS

Background:

Endoscopic sinus surgery often fails to directly manage the underlying inflammation in chronic rhinosinusitis (CRS), resulting in symptom recurrence within the first year following surgery in a significant number of patients. Thus, there is a need for long-acting, local, anti-inflammatory treatments for these patients. LYR-220, a corticosteroid matrix being developed to provide up to 24 weeks of treatment for CRS patients who have had prior ethmoid surgery, showed promising early feasibility data in the six patients enrolled in the uncontrolled Part 1 of the Phase 2 BEACON study. Here we report the primary analysis of safety and efficacy of LYR-220 through week 24 from the randomized, blinded, controlled Part 2 of the BEACON study.

Methods:

Forty-two symptomatic adult subjects with CRS who had prior bilateral ethmoidectomy were successfully enrolled in the multicenter, blinded, randomized, controlled Part 2 of the two-part BEACON study. Subjects were randomized 1:1 to receive bilateral administration of LYR-220 or sham-procedure. Primary analysis from the 24-week treatment period included summarization of adverse events and analyses of change from baseline in SNOT-22 and the composite score of the 3 cardinal symptoms of CRS (3CS; nasal blockage, nasal discharge, and facial pain) through week 24.

Results:

To be presented at the 69th Annual Meeting of the ARS.

Conclusions:

To be presented at the 69th Annual Meeting of the ARS.

9:25 am – 9:30 am

Q&A

PROGRAM ABSTRACTS

9:30 am – 9:45 am

**Targeted Conversations on Important Topics:
Correct Coding for Office-Based Rhinology Surgery
– Do's and Don'ts****Moderator:** R. Peter Manes, MD, FARS**Panelists:** Seth Brown, MD, FARS; Toby Steele, MD

9:45 am – 10:15 am

Break with Exhibitors**Scientific Oral Presentations:
Diagnosis of Rhinosinusitis and QOL
Measures***Moderators: Jean Kim, MD, FARS; Victoria Lee, MD, FARS; Mindy Rabinowitz, MD, FARS*

10:15 am – 10:20 am

**Development and validation of the sinonasal
endoscopic score (SiNES) for chronic
rhinosinusitis**

Juan Carlos Hernaiz-Leonardo, MD, MSc

Bader M. Alim

Athenea Pascual, Research Coordinator

Khalid Aldossari

Judy Fan

Saada Alsaleh, MBBS

Amin R. Javer, MD, FARS

University of British Columbia

Background:

Although there are several endoscopic grading systems for chronic rhinosinusitis (CRS), they are limited in their range and applicability. We aimed to develop and validate a SiNonasal Endoscopic Score (SiNES) applicable to all CRS subtypes and investigate its correlation with patient-reported outcome measures (PROMs).

Methods:

We recruited 79 CRS patients from two referral centres from September 2021 to February 2022. Each patient underwent a sinonasal endoscopy and completed multiple PROM questionnaires, including SNOT-22 and symptoms-specific VAS scores. Videos were graded using the SiNES and modified Lund-Kennedy (MLK) scores by three independent rhinologists. Inter-rater and test-retest reliability were assessed via the Intraclass correlation coefficient (ICC). SiNES and MLK scores were correlated with PROMs using a Spearman correlation.

Results:

The mean (SD) age was 54 (15) years, and 41 (51%) were female. Inter-rater reliability was excellent for the SiNES (ICC [95% CI]: 0.91 [0.87 to 0.94]) and good for the MLK score (ICC [95% CI]: 0.82 [0.73 to 0.88]). Test-retest reliability was excellent for both systems (ICC > 0.9 for all reviewers). No correlation was seen between endoscopic scores and SNOT-22 or VAS scores.

However, olfactory cleft edema assessed using the SiNES system was moderately correlated with self-reported olfactory loss (ρ 0.44, $p < 0.001$).

Conclusions:

The SiNES system is an accurate and reliable grading framework applicable to any type of CRS. It can be utilized in clinical and research settings and improves upon previously published systems.

10:21 am – 10:26 am

**Patient perspectives on recall period and response
options in patient-reported outcome measures for
chronic rhinosinusitis symptomatology: An
international multi-centered study**

Ahmad Sedaghat, MD, PhD presented by Katie

Phillips, MD

Armo Derbarsegian

Victor Yu

Ahmed Alsayed, MBBS

Benjamin Bitner, MD

David Liu, MD

Sven Schneider

Sarah Adams

Firas Houssein

Zoe Walters

Sidhant Tripathi, Medical Student

University of Cincinnati College of Medicine

Background:

Existing patient-reported outcome measures (PROMs) for chronic rhinosinusitis (CRS) use a variety of recall periods and response scales to assess CRS symptom burden. The global perspectives of CRS patients regarding recall periods and response scales for CRS PROMs are unknown.

Methods:

This was a multi-center, cross-sectional study recruiting 461 patients from sites across the United States, Saudi Arabia, New Zealand, and Austria. Participants chose which CRS symptom recall period (1 day, 2 weeks, 1 month, >1 month) was most reflective of their current disease state and upon which to best base treatment recommendations (including surgery) upon. Participants also chose which of six response scales (one visual analogue scale and five Likert scales ranging from 4–8 items) was easiest to use, understand, and preferred.

Results:

A plurality of participants (40.0%) felt the current state of their CRS symptoms was best reflected by a 1 month recall period. However, most patients (56.9%) preferred treatment recommendations to be determined by symptoms experienced over a >1 month period. The four- and five-item Likert scales were the easiest to use (26.2% and 25.3%, respectively) and understand (23.6% and 26.6%, respectively). The five-item (26.4% rating it most preferred and 71.0% rating it preferred) and four-item Likert (22.5% rating it most preferred and

PROGRAM ABSTRACTS

56.4% rating it preferred) response scales were also most preferred.

Conclusion:

Future PROMs for CRS symptoms should consider assessment of symptoms over a one-month period and use a four- or five-item Likert response scale to reflect global patient preferences.

10:27 am – 10:32 am

The surprising impact of priming on the SNOT-22

Ibtisam Mohammad, MD
Stack Taylor, Student
Meghan Nicole Norris
Meredith Alexandria Meyer, Student
Sulgi Kim, Student
Adam Kimple, MD, FARS
Abdullah Zeatoun, Researcher
Cristine N. Klatt-Cromwell, MD
Charles Ebert, Jr., MD, MPH, FARS
Brian D. Thorp, MD, FARS
Brent A. Senior, MD, FARS
UNC

Introduction:

Priming is a well-recognized phenomenon, impacting all facets of our lives. We are moved to react to situations based on subconscious cues in the environment. Well known in the world of marketing, it is less studied in medicine, and in particular, in how patients perceive their disease, and how standardized disease-specific quality of life forms may be impacted.

Methods:

206 consecutive patients with chronic rhinosinusitis (CRS) and CRS with nasal polyps and chronic rhinitis were blinded and randomized to be positively primed (103) or negative primed (103) prior to filling out the SNOT 22. Positively primed patients were administered text emphasizing the eminently treatable nature of CRS and how well people can do. Negatively primed patients read a description of the marked disability CRS causes, and possible complications of untreated disease.

Results:

Groups were matched in age and sex. Median SNOT 22 score in the negatively primed group was 49 and in the positively primed group 22, a significant difference of 27 points ($p < 0.001$).

Discussion/Conclusion:

Psychological priming, both negative and positive, has significant impact on how patient's fill out the SNOT-22. Studies utilizing the SNOT-22 as an outcome measure must take care to minimize this effect.

10:33 am – 10:38 am

Nasal symptoms, medication usage, nasal endoscopy and patient perspectives as determinants of physician assessment of chronic rhinosinusitis control

Ahmad Sedaghat, MD, PhD presented by Katie Phillips, MD
David Caradonna, MD, FARS
Rakesh Chandra, MD, FARS
Christine Franzese, MD, FARS
Stacey Gray, MD, FARS
Ashleigh Halderman, MD, FARS
Claire Hopkins, MBChB, PhD
Edward Kuan, MD, FARS
Jivianne Lee, MD, FARS
Edward McCoul, MD, FARS
Erin O'Brien, MD, FARS
University of Cincinnati College of Medicine

Background:

Herein, we identify CRS manifestations associated with how rhinologists assess CRS control, with a focus on patient perspectives (patient-reported CRS control).

Methods:

Fifteen rhinologists were provided with real-world data from 200 CRS patients. Rhinologists first classified patients' CRS control as "controlled", "partly controlled", and "uncontrolled" using 7 CRS manifestations reflecting European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS) CRS control criteria (nasal obstruction, drainage, impaired smell, facial pain/pressure, sleep disturbance, use of systemic antibiotics/corticosteroids in past 6 months, and nasal endoscopy findings) and patient-reported CRS control. They then classified patients' CRS control without knowledge of patient-reported CRS control.

Results:

CRS control classification was highly consistent across rhinologists. Rhinologist-assessed CRS control agrees with patient-reported CRS control significantly better when rhinologists have knowledge of patient-reported CRS control than not ($\kappa = 0.736$ vs. $\kappa = 0.554$, $p < 0.001$). Patient-reported CRS control, nasal obstruction, drainage, and endoscopy findings were most greatly associated with rhinologist-assessed CRS control. Rhinologist-assessed control weakly agreed with EPOS guidelines. Rhinologists classified CRS as more controlled than EPOS guidelines in almost 50% of cases.

Conclusions:

This study directly demonstrates the importance of patient-reported CRS control as a dominant influence on rhinologists' CRS control assessment. Knowledge of patient-reported CRS control may better align rhinologists' CRS control assessments and treatment decisions with patients' perspectives.

10:39 am – 10:45 am

Q&A

PROGRAM ABSTRACTS

10:45 am – 10:50 am

Variation in computed tomography opacification in sinus disease: A snapshot in time

Glen D'Souza, MD

Thomas Jefferson University Hospital

Aim:

To investigate the variability in paranasal sinus opacification on serial CT scans in patients with chronic rhinosinusitis (CRS) or recurrent acute rhinosinusitis (RARS).

Methods:

A retrospective longitudinal study involving adult patients who underwent functional endoscopic sinus surgery (ESS) for CRS or RARS and had at least 2 preoperative CT scans of the paranasal sinuses were included. We excluded patients with prior ESS or interval ESS between scans. We graded the 1st (CT1) and 2nd CT (CT2) images using Zinreich modified Lund-McKay staging system (ZLMS) and assessed the change in overall and individual sinus scores between time points.

Results:

Ninety-five patients were included with a median (IQR) age of 51.9 (31.7) years and 59 (62.1%) females. The median (IQR) time interval between imaging studies was 103 (329) days, and the median (IQR) change in ZLMS was 3.0 (7.5) between time points. Overall, 28 (29.5%) patients showed an interval change in their overall ZLMS between time points with a median (IQR) change of 5.0 (7.3). On assessment of individual sinus scores, 83 (87.4%) patients had a change in score between time points with 19 (20.0%) patients having a score change of 2. On comparison of CT 1 and 2, 35 (36.8%) patients showed change from some to no opacification within a sinus while 30 (31.6%) showed change from no opacification to some opacification within a sinus.

Conclusions:

CT scans provide valuable information on the state of sinuses on the day they were taken, but the pathology, such as mucosal thickening and opacification change from day-to-day. While vital for surgical planning, CT scans should not be the sole indicator for recommending ESS or determining extent of surgery for sinonasal disease.

10:51 am – 10:56 am

Determining the minimal clinically important difference for the questionnaire of olfactory disorders in people with Cystic Fibrosis and factors associated with improvement after highly effective modulator therapy

Jessa Miller, MD

Jennifer Taylor-Cousar, Professor

Jonathan Overdevest, MD

Aastha Khatiwada, Assistant Professor

David Gudis, MD, FARS

Jeremy Tervo, Medical Student

Emily DiMango, Professor

Claire Keating, Associate Professor

Douglas Li, Associate Professor

Jeremiah Alt, MD, PhD, FARS

Daniel Beswick, MD, FARS

University of California, Los Angeles

Introduction:

Olfactory dysfunction (OD) is a common comorbidity in people with cystic fibrosis (PwCF). The Questionnaire of Olfactory Disorders-Negative Statements (QOD) is a validated olfactory outcome measure. The QOD minimal clinically important difference (MCID) and factors associated with improvement after highly effective modulator therapy (elexacaftor/tezacaftor/ivacaftor (ETI)) have not been determined for PwCF.

Methods:

Prospective observational data was pooled from 7 institutions evaluating PwCF and chronic rhinosinusitis (CRS). QOD scores and disease characteristics were assessed. To evaluate internal consistency and calculate the MCID, Cronbach's alpha and 4 distribution-based methods were employed, respectively. For participants who enrolled prior to starting ETI, QOD scores were also obtained both at baseline and after ETI initiation. We used multivariable regression to identify factors associated with QOD improvement after ETI.

Results:

This study included 123 PwCF, 65 of whom received ETI. Mean QOD score at baseline for all participants was 6.5 (standard deviation (SD)=8.0). Mean Cronbach's alpha was ≥ 0.90 . The mean MCID calculated via distribution-based methods was 3.7 points. Of the 65 PwCF who received ETI, the mean QOD score after ETI was 4.1 for the cohort (SD=5.8). After ETI, QOD score improvement (decrease) surpassed the MCID in 22% of participants (14/65). Worse baseline QOD scores and presence of nasal polyps were associated with improved QOD scores after ETI (both $p < 0.035$).

Conclusion:

QOD scores have strong internal consistency among PwCF. QOD scores are relatively low and have a mean MCID of 3.7 in PwCF. Worse baseline QOD scores and nasal polyps were associated with improvement after ETI.

PROGRAM ABSTRACTS

10:57 am – 11:02 am

Optimization of diagnostic and procedural codes to identify patients with acute invasive fungal sinusitis

Marie-Ange Munyemana, BA
 Omar Ahmed, MD, FARS
 Dorina Kallogjeri, MD
 Lauren Roland, MD
 Washington University in St. Louis

Introduction:

Acute invasive fungal sinusitis (IFS) is a rare disease with high mortality. Research on IFS has been limited to small case series and the absence of a designated international classification of disease code (ICD) has hindered the use of administrative databases. This study proposes a novel method to accurately identify IFS cases using diagnostic and procedural codes complimented by medications.

Methods:

We identified IFS patients from 2018 to 2022 using Washington University of St. Louis's pathology database. Combinations of diagnostic and procedural codes were used to query medical records through EPIC's data exploration tool, Slicer Dicer. Identified cases were refined by combination of diagnostic codes and medications to optimize diagnostic accuracy. Each iteration of this model was compared to pathology database. Sensitivity, specificity, and predictive value were evaluated.

Results:

A total of 44 pathology proven cases were identified. The highest performing model for detecting IFS was an algorithm requiring immunocompromised, sinusitis, and fungal infection ICD codes, presence of sinus surgery codes and systemic antifungal for 10 days following sinus surgery, or until time of death. This optimized model had a positive predictive value of 92%(80%-98%), classified positive cases with sensitivity of 80%(66%-84%) and negative cases with specificity of 88%(72%-96%).

Conclusion:

Individuals with IFS can be identified with high sensitivity and specificity by optimizing diagnostic and procedural codes with duration of antifungal administration. This model can be applied to large database studies with high accuracy and is generalizable for identifying disease states for other conditions that lack designated ICD codes.

11:03 am – 11:08 am

Impact of recurrent acute rhinosinusitis on quality of life

Chadi Makary, MD, FARS
 Jack Dewey, MD
 Zayd Al-Asadi, BS
 Dominic Lombardo, BS
 Hassan Ramadan, MD, FARS
 West Virginia University

Background:

Recurrent sinusitis is a common reason for referral to otolaryngologists. Differential diagnosis includes chronic rhinitis (CR), recurrent acute rhinosinusitis (RARS), and chronic rhinosinusitis (CRS).

Goal:

To study the impact of RARS on the quality-of-life (QoL) of patients.

Materials and methods:

Cross sectional analysis of patients referred to West Virginia University from August 2020 to October 2022 for complaints of recurrent/chronic sinusitis was performed. These patients were divided into RARS, CRS, or CR according to published guidelines. Patients' characteristics, endoscopy scores, and SNOT-22 scores were collected at their presentation.

Results:

80 patients with RARS were compared to 336 CRS, and 530 CR patients. Patients with RARS had similar age to CRS and CR patients (48.8 vs 49.9 vs 46 years respectively, $p=0.237$), and were more likely to be female (72.5% vs 49.4 % vs 64.5% respectively, $p=0.02$). Median endoscopy scores in RARS patients were smaller than CRS but higher than CR (0 [IQR=3,0] vs 4 [IQR=6,3] vs 0 [IQR=0,0]; $p<0.0001$). Total SNOT-22 scores in RARS patients were similar to CRS patients but higher than CR patients (45.9+/-17.8, vs 41.7+/-20.9, vs 36.9+/-18.5 respectively, $p=0.03$). RARS patients had similar rhinological and extrarhinological domains to CRS patients but worse than CR patients ($p=0.038$). Ear/facial domain in RARS was worse than both CRS and CR patients ($p=0.0009$). There were no differences in the sleep and psychological domains among the three groups.

Conclusion:

QoL in RARS patients is affected similarly to CRS patients although the objective burden of disease in these patients is lower.

11:08 am – 11:15 am

Q&A

PROGRAM ABSTRACTS

11:15 am – 12:00 pm

Panel: “How to Build a Rhinology Clinical Niche in a Comprehensive ENT Practice”**Moderator:** Greg Davis, MD, FARS**Panelists:** Mary Ashmead, MD; Michael Cruz, MD, FARS; Christopher Davis, MD; Michael Setzen, MD, FARS*Sponsored by Rhinologists in Private Practice Section*

12:00 pm – 1:00 pm

Lunch with Exhibitors

12:00 pm – 1:00 pm

Broadway Ballroom A

Diversity & Inclusion, Women in Rhinology, Mentorship, Residents & Fellows Combined Lunch Program**“Breaking Barriers: Insights on Improving Diversity and the Pipeline in Medicine:****Moderator:** Troy Woodard, MD, FARS**Panelists:** Andre Churchwell, MD; Kimberly Vinson, MD**Saturday, September 30, 2023****1:00 pm – 5:00 pm****General Session****Broadway Ballroom GHJK**

1:00 pm – 1:15 pm

ARS Business Meeting and Presidential Citations

Sarah Wise, MD, FARS; Michael Stewart, MD, FARS; Pete Batra, MD, FARS

1:15 pm – 2:00 pm

Hwang Family Lectureship**“The Meaningfulness of Paying It Forward: My 40-Year Journey”****Introduction:** Richard Orlandi, MD, FARS**Guest Speaker:** Donald Lanza, MD, FARS**Scientific Oral Presentations: Nasal Polyps and Biologics***Moderators: Elisa Illing, MD, FARS; Kenneth**Rodriguez, MD; Abtin Tabae, MD, FARS*

2:00 pm – 2:05 pm

Medication use for chronic rhinosinusitis with nasal polyps (CRSwNP) pre and post dupilumab

Emily Garvey, BA

Bitá Naimi, BA

Alexander Duffy, MD

Chase Kahn, MD

Douglas Farquhar, MD

Marc Rosen, MD

Mindy Rabinowitz, MD

Damaris Pena Evertz, MD

Jessica Most, MD

Elina Toskala, MD, MBA, PhD, FARS

Gurston Nyquist, MD, FARS

Introduction:

This study examines the impact of dupilumab on total medication use for patients with chronic rhinosinusitis with nasal polyposis (CRSwNP) and comorbid asthma.

Methods:

Retrospective review of patients with CRSwNP and asthma at Thomas Jefferson University Hospital (TJUH). Patients 18 years > and treated at TJUH for at least one-year pre and post dupilumab initiation were included. Outcome measures included inhaled corticosteroid dosage, oral steroid dosage, topical/oral antibiotics, nasal steroid sprays/rinses, and leukotriene receptor antagonists (LTRA).

Results:

40 patients met inclusion criteria. The average age at the time of biologic therapy initiation was 50.81 +/- 16.02 years. 32.5% of the cohort was male. In the year after dupilumab initiation, patients required significantly fewer oral steroids for asthma (pre: 800.95 mg +/- 1285 vs. Post: 393.59 mg +/- 932.52, p=0.02) and CRS exacerbations (pre: 511.67 mg +/- 623.70 vs. Post: 91.03 mg +/- 155.76, p<0.001). Patients also required fewer antibiotic prescriptions for CRS exacerbations (3.08 prescriptions +/- 2.45 vs. 0.85 prescriptions +/- 1.29, p<0.001). Fewer patients required leukotriene receptor antagonists (LTRA) p=0.01 and nasal steroid sprays (p=0.05). There was no difference in steroid rinses (p=0.59), or topical antibiotics (p=0.52). There was also no difference in the number of patients on high, medium, or low dosed inhaled corticosteroids (p=0.54).

Conclusion:

Initiation of dupilumab for patients with CRSwNP and asthma had a significant impact on medication use including oral antibiotics, LTRA, and oral steroids for both indications. This is the first study to examine comprehensive medication use in patients with CRSwNP and asthma while on dupilumab.

PROGRAM ABSTRACTS

2:06 pm – 2:11 pm

Nasal nitric oxide to compare endoscopic sinus surgery versus dupilumab for CRSwNP

Daniel Lee, MD, FRCSC
 Giovanni Paoletti
 Gaia Giuletti
 Elysia Grose
 Roberto Pinto
 Enrico Heffler
 John Lee, MD
 University of Pennsylvania

Introduction:

There is a need for real-life comparative data between endoscopic sinus surgery (ESS) and dupilumab for patients with chronic rhinosinusitis with nasal polyposis (CRSwNP). The objective of our study was to compare the outcomes of ESS and dupilumab using nasal nitric oxide (nNO) as a biomarker of mucosal health, Lund-Kennedy endoscopy score (LKES), and Sino-nasal Outcome Test-22 (SNOT-22).

Methods:

A prospective observational cohort of CRSwNP patients who underwent endoscopic sinus surgery followed by standard postoperative therapy was compared with another prospective cohort of CRSwNP patients who underwent dupilumab therapy. In addition to baseline characteristics, nNO production levels, LKES and SNOT-22 levels were compared between the two cohorts at 1-month and 6-month post-treatment.

Results:

A total of 28 and 37 patients were included in the ESS cohort and the dupilumab group, respectively. At 1-month and 6-month post-treatment, nNO levels were comparable between two groups. Compared to baseline, the ESS cohort showed improvement of nNO improvement at 1-month post-treatment, while the dupilumab group did not. At 6-month post-treatment, both groups exhibited significant improvement of nNO levels. Similar trend was observed in LKES. SNOT-22 was improved at both 1-month and 6-month post-treatment compared to baseline.

Conclusion:

ESS and dupilumab confer comparable benefits in terms of changes in nNO, symptoms and endoscopy findings at 6-months post-treatment. ESS may result in more rapid improvement of the outcomes than dupilumab as evidenced by the 1-month post-treatment values.

2:12 pm – 2:17 pm

Quantifying Patient Preferences for Treating Nasal Polyps: Biologics vs. Surgery

Somtochi Okafor, MD
 Jessie Sutphin, Ms
 Arjita Deb, Dr.
 Jonathan Bernstein, Dr
 Jui-Chen Yang, Ms
 Matthew Wallace, Mr
 Ralph Abi Hachem, MD
 Shelby Reed, Prof
 David Jang, MD, FARS
 Duke University

Background:

Biologics are a relatively new treatment alternative to revision endoscopic sinus surgery (ESS) for patients with chronic rhinosinusitis with nasal polyps (CRSwNP). Patient preferences for biologics vs ESS have not been studied systematically. We conducted a discrete-choice experiment (DCE) to quantify preferences for treatment features and outcomes in CRSwNP.

Methods:

Subjects with CRSwNP and at least 1 previous ESS, completed a DCE survey comprised of 72 experimentally-designed choice sets. In 12 randomly assigned sets, subjects chose between 2 treatment options or no additional treatment. 4 features likely to influence patient decision-making were included: treatment type (biologic or ESS), oral steroid courses/year (0,1,2), symptom severity (none, mild, moderate), and probability of severe symptoms returning within 2 years (10%,30%,40%). Data were analyzed using mixed-logit (ML) and latent-class analysis (LCA).

Results:

ML (N=195) showed symptom severity had the highest relative importance weight. LCA revealed 3 unique classes. Class 1 (53% membership probability) prioritized outcomes (symptom improvement, reoccurrence) over treatment type. Class 2 (24%) preferred ESS and Class 3 (23%) preferred biologics, irrespective of outcomes. Class 2 & 3 would accept moderate symptom severity, 2 courses of oral steroids/year, or 40% chance of reoccurrence to have their preferred treatment type. Characteristics associated with class membership ($p < 0.05$) included age, education, and comorbidities.

Conclusion:

While many patients prioritize outcomes, others have strong preferences for ESS vs biologics. Quantitative patient data on treatment preferences offers a new dimension to decision-making in CRSwNP.

PROGRAM ABSTRACTS

2:18 pm – 2:23 pm

Sinonasal symptom correlation with the postoperative polyp scale (POPS)

Arthur Wu, MD, FARS
 Thomas Higgins, MD, FARS
 Dennis Tang, MD, FARS
 Elisa Illing, MD, FARS
 Taylor Carle, MD
 Missael Vasquez
 Jonathan Ting, MD, FARS
 Satyan Sreenath, MD
 Akaber Halawi, MD
 Philip Chen, MD, FARS
 Cedars-Sinai

Background:

Commonly used endoscopic nasal polyp grading scales have been shown to correlate poorly with symptom scores and quality of life metrics. The recently published Postoperative Polyp Scale (POPS) is a grading system that more accurately characterizes polyp recurrence in postoperative sinus cavities, describing incremental recurrence in relation to the opened sinus cavities. This study sought to determine if the POPS correlates with sinus symptoms.

Methods:

CRSwNP patients were prospectively administered SNOT-22 questionnaires and graded according to the POPS starting at their 1-month postoperative appointments. Total POPS scores (sum of each side) and Max POPS score (larger value of left and right) were correlated with SNOT-22 total scores and subdomains using Kendall correlation testing.

Results:

127 patients were enrolled in the study. Both Total POPS or Max POPS were significantly correlated to the SNOT-22 total score ($p < 0.001$, $p < 0.001$), Rhinologic ($p < 0.001$, $p < 0.001$), Extra-Nasal Rhinologic ($p < 0.001$, $p < 0.001$), Ear/Facial ($p < 0.001$, $p < 0.001$), and Psychologic ($p = 0.028$, $p = 0.017$) subdomains. Kendall's tau indicated strong correlation (> 0.3) with Rhinologic subdomain, moderate correlation (0.21-0.29) with Extra-Nasal Rhinologic and Ear/Facial subdomains, and weak correlation (0.1-0.19) with Psychologic subdomain.

Conclusion:

Previous endoscopic nasal polyp grading scales poorly correlate with symptoms and patient reported outcome measures. The new POPS moderately correlates with the total SNOT-22 score and strongly correlates with rhinologic symptoms.

2:23 pm – 2:30 pm

Q&A

2:30 pm – 2:35 pm

Blood IgE and eosinophils are not reliable predictors of nasal inflammation

Andrew Thamboo, MD, MHSc
 Judy Fan
 Rogerio Pezato, ENT Surgeon
 William Daniels
 Athenea Pascual, Research Coordinator
 Changwan Ryu, ENT Surgeon
 Masih Sarafan
 Miguel Soares Tepedino
 Richard Louis Voegels, Prof
 Marco Aurélio Fornazieri, Dr.
 Don Sin
 St. Paul's Sinus Centre

Background:

Chronic rhinosinusitis with nasal polyposis (CRSwNP) is a chronic inflammatory condition of the paranasal sinuses that is mainly associated with Type 2 inflammation. IgE and eosinophils in blood and nasal tissue have been suggested as biomarkers for prognosis and severity of CRSwNP as well as indications for biological treatment.

Objective:

This study aims to investigate if blood IgE and eosinophil concentrations can reliably predict nasal inflammation in CRSwNP by assessing their relationships with nasal polyp eosinophil concentration.

Methods:

Nasal polyps from CRSwNP patients (N=73) were collected for hematoxylin and eosin stain and eosinophil concentration measurement. Blood was collected to measure IgE and eosinophil concentrations.

Results:

Weak correlations were found between blood and tissue eosinophil concentrations ($p = 0.004$, $r = 0.367$) and blood IgE and eosinophil concentrations ($p = 0.007$, $r = 0.372$). There is no statistically significant correlation between blood IgE and tissue eosinophil concentrations. When dividing patients based on nasal polyp eosinophil concentration, blood eosinophil level was higher ($p = 0.002$) in the severely eosinophilic group (≥ 100 eos/HPF) than that of the non-eosinophilic group (< 10 eos/HPF).

Conclusion:

Grouping CRSwNP patients based on their tissue eosinophil level (eosinophilic vs. non-eosinophilic) and then comparing their blood IgE and eosinophil levels is not an accurate way to assess the relationships between tissue and blood biomarkers. Blood IgE and eosinophils are not reliable biomarkers to predict the inflammatory condition in CRSwNP and be adopted as indications for biological treatment. Further research is needed on the clinical roles of these biomarkers.

PROGRAM ABSTRACTS

2:36 pm – 2:41 pm

Ocular surface adverse events associated with dupilumab for treatment of nasal polyps

Austin Swisher, BS
Rijul Kshirsagar, MD
Priscilla Vu, MD
Jonathan Liang, MD, MPH, FARS

Objectives:

Dupilumab was approved to treat chronic rhinosinusitis with nasal polyps (CRSwNP) in 2019. Ocular surface reactions (OSR), such as conjunctivitis, have been associated with dupilumab for atopic dermatitis (AD) treatment. However, the association of dupilumab-associated OSR (DA-OSR) for non-AD treatment has not been adequately studied. We sought to evaluate DA-OSR for CRSwNP treatment using the FDA Adverse Event Reporting System (FAERS).

Methods:

FAERS was queried for any general ocular reactions (DA-GOR) from 2019Q1 to 2022Q4. DA-OSR were subcategorized from DA-GOR and quantitatively compared between treatment groups (CRSwNP, asthma, AD). Simple logistic regression was used to predict DA-OSR.

Results:

There were 60,198 total observations, of which 5344 were treated for CRSwNP. The prevalence of DA-GOR and DA-OSR was greatest for AD (15.3%, 7.7%), followed by CRSwNP (12.2%, 5.0%) and asthma (9.2%, 3.5%). The most commonly reported OSRs were dry eyes (35.9%), conjunctivitis (15.7%), increased lacrimation (11.0%), and eye discharge (5.5%). The reported odds ratio (ROR) of CRSwNP-treated DA-OSR was 0.84 [0.73-0.97, $p=0.015$], compared to 1.29 [1.20-1.40, $p<0.001$] for AD and 0.66 [0.59-0.73, $p<0.001$] for asthma. For CRSwNP treatment, the DA-OSR ROR was 0.97 [0.90-1.03, $p=0.3$] for men and 0.78 [0.73-0.83, $p<0.001$] for older adults (age >50).

Conclusions:

While there are limitations to FAERS, this database study confirms the association between dupilumab and OSR for AD treatment, and does not support a strong association between dupilumab and OSR for both CRSwNP and asthma treatment. Younger adults experience more DA-OSR in CRSwNP treatment without a specific predilection for gender.

2:42 pm – 2:47 pm

Real world trial for weaning dupilumab from every 2 to every 4 week administration

Emily Garvey, BA
Bitu Naimi, BA
Alexander Duffy, MD
Chase Kahn, MD
Paavali Hannikainen, BS
Douglas Farquhar, MD
Marc Rosen, MD, FARS
Elina Toskala, MD, MBA, PhD, FARS
Mindy Rabinowitz, MD, FARS
Jessica Most, MD
Gurston Nyquist, MD, FARS

Introduction:

Initial trials demonstrated that patients receiving dupilumab for chronic rhinosinusitis with nasal polyps (CRSwNP) that transitioned to every 4 week administration after six months experienced continued improvements. This study is real-world data for weaning from every 2 to 4 weeks for CRSwNP patients.

Methods:

CRSwNP patients treated with dupilumab for > 6 months with subsequent weaning from every 2 to 4 weeks were included. Outcomes included sinonasal outcome test (SNOT-22) and polyp scores (Meltzer Scoring).

Results:

13 patients were included, 12 had comorbid asthma. Median treatment prior to weaning was 612.5 days. Weaning rationale included remission (9) coverage/compliance issues (2), and adverse drug effects (1). The combined baseline polyp score before dupilumab was 3.46 +/- 1.55, prior to weaning: 0.15 +/- 0.36 and at 6 months after weaning: 0.11 +/- 0.33. Baseline SNOT-22 was: 40.08 +/- 19.12, prior to weaning: 13.78 +/- 14.35 and at 6 months after weaning: 12.33 +/- 10.12. Remission and 6 month follow up polyp scores ($p<0.001$, $p=0.003$) and SNOT-22 scores ($p<0.001$ and $p=0.001$) were significantly reduced compared to baseline. 5 patients' symptoms were adequately controlled with monthly injections. 1 patient reported subjective worsening of nasal obstruction, the remaining 6 returned to every 2 weeks due to subjective worsening of asthma. However, there were no changes in the asthma control test (ACT) ($p=0.49$) and FEV1% ($p=0.61$) for patients who failed. No patients required antibiotics or steroids for CRSwNP symptoms during weaning.

Conclusion:

Every 4-week administration of dupilumab is safe for a subset of CRSwNP patients to trial. No negative impacts were noted on objective or subjective measures of CRSwNP.

PROGRAM ABSTRACTS

2:48 pm – 2:53 pm

Real-world adverse events after type 2 monoclonal antibody use in chronic rhinosinusitis with nasal polyps

Marisa Dorling, BSc

Juan Carlos Hernaiz-Leonardo, Clinical Fellow

Athenea Pascual, Research Coordinator

Andrew Thamboo, MD

Amin Javer, MD, FARS

Arif Janjua, MD

University of British Columbia

Purpose:

To investigate the frequency and nature of adverse events related to type 2 biologic use in patients with chronic rhinosinusitis with nasal polyps (CRSwNP), including dupilumab and mepolizumab.

Methods:

This is a single-center retrospective study of real-world patient data. Patients were included if they have a diagnosis of CRSwNP, have undergone at least one endoscopic sinus surgery, and have taken at least two doses of dupilumab or mepolizumab. Data collected include demographic information such as age, sex, past medical and surgical history. The primary outcomes are the incidence of adverse events and the types of adverse events observed. Adjusted odds ratio was calculated to compare the two biologics using logistic regression modeling.

Results:

42 patients on dupilumab and 29 patients on mepolizumab were included in this study. 13 (31%) and 5 (17%) patients respectively encountered any adverse events. The adjusted odds ratio of the adverse event rates between these two treatment groups was 6.04 (95% confidence interval 1.29-39.15). The most common adverse events for dupilumab were arthralgia (12%), injection site reaction (10%), and conjunctivitis (7%). The most common adverse events for mepolizumab were headache (7%), arthralgia (3%), conjunctivitis (3%), cough (3%), and fatigue (3%). Two patients on dupilumab and one patient on mepolizumab experienced adverse events leading to discontinuation of therapy.

Conclusion:

Dupilumab and mepolizumab have significantly different adverse event profiles. This study contributes to available data to help guide clinicians' decision-making on the use of type 2 biologics in patients with CRSwNP.

2:53 pm – 3:00 pm

Q&A

3:00 pm – 3:30 pm

Break with Exhibitors

3:30 pm – 4:15 pm

Combined ARS/AAOA Panel: Office-Based Procedures Update: Common Procedures & Difficult Cases”

Moderator: Jean Kim, MD, FARS

Panelists: Omar Ahmed, MD, FARS; Charles Ebert, Jr., MD, FARS; Monica Patadia, MD; Elina Toskala, MD, FARS

4:15 pm – 5:00 pm

International Collaborative Panel: “Assessing Septoplasty Outcomes: An International Perspective”

Moderator: Michael Stewart, MD, FARS

Panelists: Sean Carrie, MB, ChB, FRCS, FRCS(ORL); Chang-Hoon Kim, MD; Jern-Lin Leong, MD; Ramandeep Virk, MBBS, MS (ENT)

5:00 pm

Meeting Adjourns

5:00 pm – 7:00 pm

Rhinologists in Private Practice Cocktail Reception

Date Night Bar at Assembly Food Hall

5055 Broadway Place

POSTERS

Poster #001

A comparative analysis of nasal packing with and without bupivacaine for postoperative pain control after endoscopic endonasal transsphenoidal surgery

Karol Avila-Castano, Research Fellow
 Andrea Otamendi-Lopez
 Anyull Dayanna
 Bohorquez Caballero
 Angela Donaldson, MD, FARS
 Osarenoma Olomu, MD

Introduction:

Postoperative pain control is important after Endoscopic Endonasal Transsphenoidal Surgery (EETS). While intravenous and oral methods for pain control are available, we examined a topical approach using routine nasal packing for decreasing systemic medication. Bupivacaine (BP), a long-acting topical analgesic was applied to the nasal packing used in the first 24 hours after surgery. We evaluated its effect on pain control and systemic pain medication use after EETS.

Method:

A retrospective cohort of 100 patients who underwent EETS at the Mayo Clinic in Florida between 2019 and 2022 was conducted. Groups were divided based on whether they received nasal packing soaked with BP vs no BP. The BP group had an inflatable sponge nasal packing (Merocel) inflated with BP. The control group had a non-adherent gauze nasal pack (Telfa). The use of acetaminophen, use of opiates, and subjective pain scores (Visual Analogue Scale (VAS)) was compared. Multiple linear regression models were used to identify factors influencing VAS postoperatively.

Results:

58% patients were male. The mean age at EETS was 57 ± 16.5 years. 45% received nasal packing with BP. There was a significant difference in VAS scores between the two groups at 12 to 24 hours after surgery with the BP group reporting higher scores for pain perception ($\beta=0.87$, $p=0.011$). There were no significant differences in analgesics used between the groups. Multivariate linear regression identified the length of surgery, and steroid use as potentially influencing pain perception after EETS.

Conclusion:

This study is the largest cohort describing the use of BP in nasal packing after EETS. BP was not found to reduce pain medications nor improve pain perception after surgery.

Poster #002

A computational analysis to investigate anatomical factors associated with increased likelihood of epistaxis from intranasal sprays usage

Katherine Gonzalez, BS
 Amanda Balash
 Sarah M. Russel, MD, MPH
 Dennis O. Frank-Ito, PhD
 Duke University Medical Center

Background:

Intranasal corticosteroids are often recommended as a first line of treatment for many sinonasal conditions. A known and potentially serious adverse effect of intranasal spray therapy usage is epistaxis. Despite following usage instructions correctly, some patients may have an increased predisposition of epistaxis. This study uses computational modeling to investigate the role of nasal morphology on intranasal drug delivery to the nasal septum.

Methods:

Radiographic images from four adult subjects were retrospectively selected for three-dimensional reconstruction of the nasal cavity. Three subjects (N1, N2, and N3) had a healthy normal nasal anatomy, and a subject who underwent functional endoscopic sinus surgery (FESS) for treatment of chronic rhinosinusitis. Airflow and intranasal spray drug transport were simulated in each nasal cavity at resting inspiration of 15L/min using computational fluid dynamics modeling. Intranasal drug delivery was simulated to mimic recommended usage instructions from manufacturers' package inserts, with the release of drug particles into the nasal cavity at 5m/s. Drug particles depositing at the anterior nasal septal (AS) wall were quantified.

Results:

Subjects N1, N2, and N3 had approximately zero deposition on the right AS. Left AS depositions were: N1=63%, N2=45%, and N3=83%. AS depositions in the subject who underwent FESS were: Left=29% and Right=87%.

Conclusion:

Preliminary results indicate that anatomical factors contributing to increased unilateral anterior septal wall drug depositions even under correct intranasal spray usage by patient include nasal cycling, septal deviation, and narrowing of the nasal vestibule.

POSTERS

Poster #003
WITHDRAWN

Poster #004
A rare case of chronic invasive curvularia fungal sinusitis

Samuel Hopper, BS
 Benjamin Stevens, MD
 Abdullah Shaheen, MD
 Gina D. Jefferson, MD, MS, FACS
 Charlotte S. Taylor, MD
 Keonho A. Kong, MD
 UMMC

Introduction:

Fungal rhinosinusitis (FRS) encompasses a wide spectrum of diseases that are classified via timeline and invasiveness. We present a case of a large fungal mass with osseus erosion without angioinvasion in an immunocompetent patient.

Case:

A 46 yo immunocompetent AAM presented with a left nasopharyngeal mass with two-years of left-sided nasal congestion, epistaxis, hyponasal voice, and ear fullness. Nasal endoscopy revealed friable tumor in both nares extending into the left maxillary sinus. MRI showed a nasopharyngeal mass extending into the oropharynx and left infratemporal fossa with osseous destruction of the left pterygoid process. Biopsy revealed fibroconnective granulation tissue, multinucleated giant cells, and fungal hyphae, without evidence of malignancy or angioinvasion. Flow cytometry was negative. In endoscopic resection the mass was debulked from the maxillary sinus, posterior nasopharynx, and the pterygopalatine and infratemporal fossa. Osseus erosion was noted in the posterior maxillary wall and pterygoid process. Final pathology was congruent with original biopsy, and speciation resulted in Curvularia. Follow up showed marked clinical improvement with no recurrence after oral voriconazole for 6 weeks.

Discussion:

Curvularia is generally associated with allergic fungal sinusitis (AFS). However, the lack of eosinophils excludes AFS. Chronic granulomatous invasive fungal sinusitis (CGIFS) due to Curvularia has been reported, but this case lacked the typically associated noncaseating granulomas. There has been report of AFS converting to CGIFS which is a consideration. This case doesn't fit into an already defined disease process highlighting the broad spectrum of FRS and limitations of current categorization.

POSTERS

Poster #005

Academic productivity trends of fellowship-trained U.S. academic rhinologists

Michael Warn, Medical Student
 Daniella Chan
 Theodore Nguyen, BS
 Sina Torabi, MD
 Benjamin Bitner, MD
 Edward Kuan, MD, FARS

Introduction:

Academic productivity is believed to be correlated with experience and institutional rank, yet there is paucity of granular academic data between faculty with regard to institutional rank and industry engagement, and how these relate to experience.

Methods:

Demographics, academic metrics (publications, citations, h-index), program rankings, and industry compensation for academic US rhinologists through June 2022 were collected and compared between academic rank and experience.

Results:

A cohort of 278 rhinologists were included. Full professors had greater academic metrics (all $p < 0.001$) and industry compensation (all $p < 0.05$) than associates, assistants, and private practice rhinologists. Full professors were also more likely to receive NIH-funding than other groups ($p < 0.001$). Experience and industry compensation positively correlated with each other and with academic metrics (all $p < 0.001$) with significant jumps between the 5-10th and 10-15th year of practice ($p < 0.001$). However, early career (≤ 8 years) rhinologists published more articles per year than late career (> 8 years) rhinologists ($p < 0.001$). Rhinologists at Doximity top 10 and 25 programs by reputation and research output and top 50 USNWR institutions had significantly greater academic metrics and NIH funding compared with those who were not ($p < 0.001$). Top 10 and 25 reputation was associated with increased industry compensation ($p = 0.024$).

Conclusions:

Although early career rhinologists published more frequently, ascending professorship rank, experience, and employment at a top-ranked institution were significantly associated with total academic productivity. Industry engagement was linked to reputation and experience.

Poster #006

Acinic cell carcinoma in the nasal cavity: A case report of a 69-year-old female complaining of nasal congestion

Aileen Beatrice Antonio, MD
 Amando Virgilio Santos, Dr.
 Cristina Nieves, Dr.
 Ospital Ng Makati

Acinic cell carcinoma (ACC) is a rare, low-grade primary salivary gland malignancy that represents 2.4 % of all salivary neoplasms. Salivary gland neoplasms are extremely rare in the nasal cavity. Pleomorphic adenoma is the most common benign salivary gland tumor type in the nasal cavity. ACC have been previously reported in minor salivary glands in the sinonasal cavity. About 18 cases of acinic cell carcinoma have been previously described in the sinonasal cavity. This case of ACC arising from the nasal cavity presented is the first reported case in this institution and the Philippines to the best of the researchers' knowledge.

The case is as follows: a 69 year old female came in with a chief complaint of right nasal mass. Two years prior to admission, the patient now had noticeable enlargement of fleshy mass with (+) epiphora on the right which prompted consultation. Biopsy and CT scan were requested which revealed inverted papilloma and the patient was advised for surgery. The patient underwent a medial maxillectomy via lateral rhinotomy with lip split on the right and excision of infected right lacrimal sac. Histopathology showed heterogeneous morphology with epithelial cells resembling ductal cells or myoepithelial cells arranged as irregular tubules. This led to it being reported as acinic cell carcinoma instead of the initial biopsy result of inverted papilloma.

Results showed that acinic cell carcinoma in the nasal cavity is extremely rare. Proper interpretation of the histomorphologic features of this type of tumors should be done. Acinic cell carcinomas are considered low-grade neoplasm thus complete surgical resection is curative but this tumor has shown to have local recurrence, thus, follow up is essential.

POSTERS

Poster #007

An assessment of the quality of artificial intelligence-generated patient counseling for sinusitis

Gregory Hill, MD
 Charles Alexander Riley, MD
 Jakob Fischer, MD
 Anthony Tolisano, Associate Professor
 Walter Reed National Military Medical Center

Background:

The quality of online health information is highly variable and source dependent. Artificial intelligence language models (AILMs) such as ChatGPT-4 (OpenAI) are likely to become another option for patients seeking health information.

Methods:

Ten commonly asked questions regarding sinusitis were derived from Google trends over the past 5 years using the keywords “sinusitis” and “sinus surgery”. Responses were generated from three sources: (1) published human expert source, (2) relevant text from the top 3 links derived from a Google search, and (3) ChatGPT-4. Three blinded experts scored the quality of information utilizing the DISCERN instrument. Fleiss’s kappa was used to assess interrater reliability. ANOVA one-way testing evaluated for differences in DISCERN scores by source type.

Results:

There was no significant difference in response word count by source type ($p > 0.05$). Interrater reliability showed moderate correlation (0.59) among the three blinded reviewers for overall DISCERN scores. The quality of each source was moderate (human expert source: 39.9 ± 6.1 ; Google: 39.2 ± 3.0 ; ChatGPT-4: 45 ± 9.9). No significant differences in total DISCERN score was detected among the sources ($p > 0.05$). The average DISCERN score was higher for treatment options compared to symptoms or diagnoses (difference 13.0 points; 95% CI 7.7, 18.3) for all information sources.

Conclusions:

Similar quality of health information was noted for a human expert source, Google search, and ChatGPT-4. All responses were judged to produce moderate quality information. This has potential implications for patient education and counseling, which warrants additional study.

Poster #008

Artificial intelligence based semi-automatic segmentation for orbital tumors radiomic measurement

Angela Zhu, BA
 Ryan A. Bartholomew
 Benjamin Bleier, MD, FARS
 Barak Ringel, MD
 Massachusetts Eye and Ear; Warren Alpert Medical School of Brown University

Objectives:

Imaging is essential in the classification and surgical planning for orbital lesions. New advanced artificial intelligence (AI) based platforms may allow for improved tumor assessment, management, and planning. This study aims to explore the feasibility of semi-automatic tumor segmentation and to determine the associations between tumor morphology, radiomic features, and presenting symptoms.

Methods:

The open-source 3D-slicer software was used for MRI-based three-dimensional tumor segmentation and radiomic features analyses for patients diagnosed with benign orbital lesions. Sphericity is a radiomic shape feature that describes how close a given volume is to a perfect sphere.

Results:

Of the 118 tumors, 94 (79.7%) benign intraconal tumors were identified. The average patient’s age was 52.7 ± 17.1 years, with slight female predilection (57.6%). The mean tumor volume was 336.4 mm^3 . Intraconal ORBIT class 2 tumors were larger than lateral compartment lesions (483.1 mm^3 vs. 230.9 mm^3 , $p < 0.05$). Class 3 tumors’ mean volume was 262.9 mm^3 . No significant differences in tumor volume nor sphericity were identified between tumors of the remaining ORBIT stages or those located lateral to the optic nerve. Intraconal tumors presenting with proptosis ($p < 0.05$) or orbital swelling ($p < 0.2$) tended to have larger tumor volumes. Tumors presenting with proptosis ($p < 0.2$), diplopia ($p < 0.2$), or orbital swelling ($p < 0.05$) tended to be less “spherical” in shape.

Conclusions:

Orbital tumors’ morphology and volume can correspond to specific symptom development and orbital compartment location. The utilization of 3-dimensional semi-automatic segmentation for treatment planning, outcome measures, and follow-up warrants further exploration.

POSTERS

Poster #009
WITHDRAWN

Poster #010
Assessing nasal function after definitive rhinoplasty for unilateral cleft lip nasal deformity repairs: A pilot analysis
Elaine Lin, BS
Dennis O. Frank-Ito, PhD
Duke University School of Medicine

Background:
Patients with unilateral cleft lip nasal deformity (uCLND) experience significant nasal obstruction and olfactory dysfunction, and very little is known of whether definitive cleft rhinoplasty improves patients' nasal function. This study aims to assess patient-reported satisfaction and objective assessments before and after surgery.

Methods:
Three patients (P1, P2, P3; 18-23 years) with uCLND were prospectively recruited. Data collected before and >6 months after definitive cleft rhinoplasty were: [1] Nasal Obstruction Symptom Evaluation (NOSE) scores; [2] Standardized Cosmesis and Health Nasal Outcomes Survey scores to evaluate nasal obstruction (SCHNOS-O) and nasal cosmesis (SCHNOS-C); [3] Nasal resistance (NR) measurement using the NR6 Clinical/Research Rhinomanometer; and [4] the University of Pennsylvania Smell Identification Test (SIT).

Results:
NOSE improvement post-surgery were: P1=20, P2=0 and P3=70. P1 was within one standard deviation (SD) of reported minimal clinically important difference (MCID; 24.4±15.3), P2 no improvement, and P3 over 2SD of MCID improvement. SCHNOS-O post-surgery improvement: P1=25, P2=-5 and P3=55. P1 and P3 were within 1SD of reported SCHNOS-O MCID (28.3±17.3) and P2 was worse. SCHNOS-C post-surgery improvement: P1=3, P2=17 and P3=80; reported SCHNOS-C MCID was 18.0±12.8. Post-surgery NR decreased by 40% (P1), 2% (P2) and 71% (P3), while SIT improved by 3% (P2) and 10% (P3) but worsened by 21% (P1).

Conclusions:
Preliminary findings suggest stronger agreement between patients' satisfaction and improvement in their nasal patency compared to their olfactory improvement. Further, definitive rhinoplasty for uCLND repairs may not adequately address patients' olfactory dysfunction.

Poster #011
Association of alcohol use with olfactory function among older adults
Khamis Suleiman, Medical Student
Richard Chiu, Medical Student
Sharmilee Nyenhuis
Kamal Eldeirawi
Victoria Lee, MD, FARS
University of Illinois College of Medicine

Background:
Olfactory dysfunction (OD) is a common condition predominantly affecting the elderly population. This study aims to explore the association between alcohol consumption and OD. Investigating the relationship between alcohol consumption and OD is crucial due to its potential consequences for public health and to gain insight into the mechanisms underlying OD.

Methods:
This cross-sectional study was conducted on data for 1,107 adults from Round 3 of the National Social Life, Health, and Aging Project. Normal olfactory function was defined as correctly identifying 4–5 odors in the 5-item Sniffin' Sticks test, and OD was defined as 0–3 odors correctly identified. Associations between alcohol use and olfaction were assessed using logistic regression, and adjusted odds ratios (OR) were calculated. Analyses were weighted to account for the sampling design.

Results:
OD was present in 18.9% of adults. The weighted average age was 76.5 ± 6.7 years among those with OD and 74.7 ± 5.7 years among those with normal olfaction. 37.9% of adults with OD reported alcohol consumption in the last 3 months, compared to 48.0% of adults with normal olfaction. After adjusting for age, gender, race, education, recent stroke, dementia, diabetes, and mental health, alcohol consumption was not associated with OD (OR: 0.77; 95% CI: 0.51–1.17).

Conclusions:
Alcohol consumption was not associated with OD after controlling for covariates. While this study provides insight into the relationship between alcohol consumption and OD, further research is needed due to conflicting results in previous studies. The inconsistencies in previous research were likely due to factors such as study population, study design, and confounding variables.

POSTERS

Poster #012

Association of chronic rhinosinusitis and autoimmune disorders

Chadi Makary, MD, FARS
Zayd Al-Asadi, BS
Dominic Lombardo, BS
Sairisheel Gabbi Reddy
Brian Peppers, Assistant Professor
Hassan Ramadan, MD, FARS
West Virginia University

Introduction:

Increasing evidence suggests that autoimmune disorders and their immunomodulating medications may increase the risk of rhinosinusitis.

Goal:

To determine if autoimmune disorders are associated with increased risk of rhinosinusitis.

Methods:

Cross-sectional study of patients referred to West Virginia University from August 2020 to October 2022 for rhinologic complaints was performed. These patients were diagnosed either with chronic rhinosinusitis (CRS) or recurrent acute rhinosinusitis (RARS) according to published guidelines. Patients' characteristics, diagnoses, and type and treatment of autoimmune disorders were reviewed.

Results:

544 rhinosinusitis (463 CRS and 81 RARS patients) were compared to 595 non-rhinosinusitis (530 chronic rhinitis and 65 facial pain/headache) patients. Patients with rhinosinusitis were older (50.1 vs 45.8 years old, $p=0.0001$), more likely to be males (46.7% vs 35.2%, $p<0.0001$), more likely to have asthma (33.6% vs 25.4%, $p=0.002$), and more likely to have current and past smoking history (14.3% vs 8.7%, $p=0.003$; 28.5% vs 19.7%, $p<0.0001$ respectively). Autoimmune disorders were more common in rhinosinusitis patients (16.4% vs 9.4%, $p<0.0001$). Psoriasis and rheumatoid arthritis were the most common autoimmune disorders in rhinosinusitis patients (2.9% and 2.5% respectively). Multivariate logistic regression adjusting for confounders showed that autoimmune disorders were strongly associated with rhinosinusitis [OR=2, CI=1.4-2.9]. Subgroup analysis showed CRS and RARS were equally associated with autoimmune disorders.

Conclusion:

Autoimmune disorders increase the risk of both CRS and RARS. Further studies are needed to explore their role in the treatment outcome of rhinosinusitis.

Poster #013

Association of prior military service with olfactory function among older adults

Richard Chiu, BS
Khamis Suleiman, Medical Student
Sharmilee Nyenhuis
Kamal Eldeirawi
Victoria Lee, MD, FARS
University of Illinois College of Medicine

Background:

Olfactory dysfunction (OD) is a common condition primarily affecting the elderly. Several factors have been implicated in OD, such as age, socioeconomic status, and neurocognitive disorders; however, the effect of military service on OD is unclear. It has been hypothesized that toxins and neuropsychological changes related to military deployment may negatively impact olfaction. This study aims to investigate this association.

Methods:

This cross-sectional study was conducted on data for 992 adults from Round 3 of the National Social Life, Health, and Aging Project. Normal olfaction was defined as correctly identifying 4–5 odors in the 5-item Sniffin' Sticks test, and OD was defined as 0–3 odors correctly identified. Associations between military service and olfaction were assessed using logistic regression, and adjusted odds ratios (OR) were calculated. Analyses were weighted to account for sampling design.

Results:

OD was present in 18.4% of adults. The weighted average age was 76.8 ± 6.6 years among those with OD and 74.6 ± 5.6 years among those with normal olfaction. About 20% of adults with OD served in the military, compared to 23.6% of adults with normal olfaction. After adjusting for age, gender, race, education, recent stroke, dementia, mental health, and smoking, participants with prior military service were less likely to have OD (OR: 0.48; 95% CI: 0.26–0.89).

Conclusions:

Prior military service was unexpectedly protective of normal olfaction after controlling for covariates. This may be a result of data limitations, as the military service variable is self-reported and does not capture length of service. Further research is needed to investigate mechanisms or confounders behind this result.

POSTERS

Poster #014

Baseline olfactory function and prospective assessment of patient-reported outcome measures in patients with nasal septal perforation

Shreya Ramkumar, BS
 Bansberg Stephen, Consultant
 Michael Marino, MD, FARS
 Amar Miglani, MD

Background:

This study evaluated baseline olfactory function and patient-reported outcome measures (PROMs) of conservative treatment (saline gel moisturization) followed by surgical closure in patients with nasal septal perforation (NSP) of any etiology.

Methods:

Patients who underwent NSP repair at Mayo Clinic between September 2022 and March 2023 were prospectively enrolled. Patients with <15 days between the date of presentation to surgery were excluded. NOSE-Perf scores, UPSIT scores prior to surgery, NSP size, and demographics were collected and analyzed using descriptive statistics.

Results:

Our cohort consisted of 15 patients (10 females, 5 males) with a median of 83 days (IQR: 37.0, 124.5) between presentation and surgery, during which patients were treated with saline gel moisturization. Most patients had normosmia (N=7) or mild hyposmia (N=5). Patients with normosmia were younger than patients with any degree of smell loss (median: 44.0 vs. 55.5 years). Most patients (63%) with perforation height >1cm had normosmia. Successful perforation closure was achieved in all patients using bilateral nasal mucosal flaps supported with an interposition graft. Median NOSE-Perf scores at presentation, pre- and post-operatively were 24 (IQR: 19.0,30.5), 25 (IQR: 13.5,31.5), and 9 (IQR: 7.0,17.0), respectively.

Conclusion:

Although NSP has been postulated to affect olfaction, most patients in our study had normosmia. NSP size may not correspond with the degree of olfactory loss, and further studies are warranted. In a cohort of NSP patients undergoing surgical repair, conservative management with saline gel moisturization provided little symptom benefit. NSP repair remains a promising option for perforation closure and improving PROMs.

Poster #015

Biologic therapies for treating chronic sinusitis with nasal polyps: What do patients want to know?

Samuel Razmi, BS
 Lexi Goehring, Medical Student
 Daniel Gorelik, Research Fellow
 Kenneth Sims IV, Medical Student
 Yuki Yoshiyasu, Resident
 Masayoshi Takashima, MD, FARS
 Omar Ahmed, MD, FARSTexas A&M School of Medicine – ENMED

Biologic therapies for chronic rhinosinusitis with nasal polyps (CRSwNP) are emerging as promising treatment options for patients with refractory disease. The objective of this study is to explore the questions patients are commonly asking online about these therapies and the quality of the available content.

Most common search terms were identified via Google Trends. People Also Ask (PAA) questions were identified and extracted with their associated website using a freely available program (SEO Minion). Questions were categorized according to Rothwell's criteria by two independent reviewers and organized into subtopics and categorized. Sources were evaluated using Flesch Kincaid Grade Level (FKGL) score for readability and JAMA Benchmark criteria for quality assessment (0-4, 4 = all criteria met).

A total of 143 unique questions from 143 unique websites were collected across 4 search terms. Questions regarding facts about biologics including side effects (38.5%) were most common, followed by facts about CRSwNP (37.8%), and finally treatment options for CRSwNP (23.7%). FKGL score gave a mean 12.2 (3.30) grade US reading level - much higher than the recommended 6-8th grade level. JAMA benchmark gave a mean of 0.95 (0.85). Sources answering the PAA questions were mainly commercial (60.1%) followed by medical practices (14.0%), academic (13.3%), and government (12.6%).

Given the novelty of biologic therapies as treatment for CRSwNP, patients are seeking more information about biologics. Existing online resources regarding biologics for CRSwNP should be improved with material that is easier to read. More academic sources and scholarly information is needed. Physicians should be aware of these areas and counsel accordingly.

POSTERS

Poster #016

B-LBL presents as sinonasal mass: A case report

Brandon Vilarello, BA

Patricia Jacobson, Medical Student

David Gudis, MD, FARS

Jonathan Overdevest, MD, PhD

Columbia University Vagelos College of Physicians
and Surgeons

Introduction:

B-cell lymphoblastic leukemia/lymphoma (B-ALL/LBL) is primarily a disease of childhood that presents with lymphadenopathy, fatigue, fever, night sweats, and weight loss. Initial presentations prompted by head and neck manifestations are exceedingly rare.

Case Report:

A 5 year-old girl with no significant past medical history presented with right facial swelling and mild proptosis on ophthalmologic evaluation. She was referred to a tertiary care facility by her local otolaryngologist for further management after CT imaging revealed right maxillary sinus opacification and erosion of the anterior maxillary bone. Her symptoms were initially responsive to prednisone and amoxicillin-clavulanate, and only right unilateral nasal discharge persisted with resolution of other sinonasal/systemic symptoms. Notably, laboratory values, including complete blood count, were within limits. Given concern for the etiology of the bony erosion, the patient presented for a second opinion, where imaging and recommendation for biopsy resulted in flow cytometry findings consistent with B-ALL/LBL. After bone marrow biopsy, the ultimate diagnosis was Murphy's stage III B-lymphoblastic lymphoma.

Conclusions:

Malignant neoplasms of the sinonasal region are rare in children, where primary sinonasal B-LBL is a unique occurrence. Clinical features of sinonasal B-LBL in the paranasal sinuses may masquerade as pathologies such as acute sinusitis, orbital cellulitis, and benign tumors or polyps that can lead to a confounding diagnosis. In this case presentation, an initial response to steroids and antibiotics should not provide false reassurance when other features and signs, such as maxillary bone erosion, may suggest the presence of malignancy.

Poster #017

WITHDRAWN

POSTERS

Poster #018

Case report: Rare angiolipoma of the nasal cavity

Akash Halagur, BA
Galit Almosnino, MD
Ryan Little, MD
Geisel School of Medicine at Dartmouth

We report a patient with a rare case of an angiolipoma (AML) arising from the nasal cavity presenting with nasal obstructive symptoms.

The mass was broadly pedicled to the right lateral nasal side-wall and excised endoscopically. The patient's post-operative course was complicated by epistaxis requiring Merocel placement but was without recurrent epistaxis. Immunohistochemical studies revealed positive SMA, S100, CD61 and MPO and negative HMB45 and Melan A staining indicating the presence of spindle smooth muscle cells, vasculature, lipomatous content, and lack of melanocytic markers consistent with previous reports of mucocutaneous AMLs.

Nasal AMLs are exceedingly rare with fewer than 21 cases reported in literature to date. The majority of the cases have been reported from Asia and the Middle East with fewer than five cases reported in the United States. The majority of non-tuberous sclerosis-related cases are immunophenotypically distinct from the family of perivascular epithelioid cell neoplasms (PEComas) typically associated with renal and extra-renal AML.

Our case highlights the clinicopathologic features of AML that are distinct from its broader family of PEComas, and provides support for their further classification to 'angiolipomatous hamartoma' as suggested by Wang et al. (2021) to distinguish their lack of epithelioid morphology, lack of melanocytic immunophenotype, and non-neoplastic nature from PEComatous AML. Although rare, based on both our experience and the recent literature, AML should be included in the differential diagnosis of unilateral nasal masses.

Poster #019

Cavernous sinus immunoglobulin G4-related disease- A case report

Erika Bradley, RN, BSN
Mark Arnold, MD
Upstate Medical University

Immunoglobulin G4- related disease (IgG4-RD) is a rare immune-mediated fibroinflammatory condition. Symptoms at presentation vary; however, each organ involved has tumor-like involvement. Diagnosis relies on biopsy showing histopathological findings including storiform fibrosis, large amounts of IgG4 plasma cells, and lymphoblastic infiltrates.

We report a rare presentation of IgG4-RD in a 68-year-old Caucasian male who suffered from left-sided facial pain, superior gaze deficit, left otalgia, and left-sided visual loss. CT showed left sphenoid opacification and osteitic changes, and MRI showed pachymeningeal enhancement of the bilateral cavernous sinuses, greater on the left side, left orbital apex, and optic nerve sheath. He underwent left endoscopic sphenoidotomy, and was treated with steroids and antibiotics. Tissue biopsies of the left sphenoid mucosa showed moderate lymphoplasmocytic inflammation and of the sphenoid-ethmoid polyp showed prominent IgG4 restricted plasma cell infiltrate. The IgG4/IgG ratio was greater than 90%, and blood serum IgG4 levels were elevated at 227 mg/dL, consistent with IgG4-RD. There was no storiform fibrosis of the biopsied tissue. Given his complex presentation, ophthalmology and rheumatology physicians were involved. His visual acuity improved with IV and later oral steroids. However, due to persistent pachymeningeal enhancement on MRI and changes to color vision, rituximab was given.

This is a unique case of IG4-RD due to a mass in the nasal cavity outside of the sphenoid sinus showing IgG4-RD and pachymeningeal enhancement causing inflammation of the cavernous sinus due to IgG4-RD. Increased awareness of this rare presentation of IgG4-RD will improve future patient outcomes.

POSTERS

Poster #020

Characteristics of patients requiring revision endoscopic sinus surgery- An 11 year single-institution study

Madison Buras, MD
Matthew Mitchell

Background:

Chronic rhinosinusitis refers to a sinonasal inflammatory process which commonly requires surgical intervention in patients who have failed medical management, sometimes requiring multiple revision surgeries to achieve disease control. This can significantly reduce quality of life and have a large socioeconomic impact.

Methods:

A retrospective review was performed to identify patients that underwent endoscopic sinus surgery at our institution between 2011-2022. The study included 448 patients who underwent one primary endoscopic sinus surgery and 307 patients who underwent multiple surgeries. Data collection included patient demographics and the presence of various co-morbidities. The patients who required only one surgery were compared to those who required multiple surgeries to determine characteristics that were predictive of the need for multiple procedures to achieve disease control.

Results:

In terms of demographics, males were only slightly more likely to require revision surgery (43% vs 38%). There was not a statistically significant difference between patients with diabetes, smoking or asthma. Patients with allergic fungal rhinosinusitis, polyps, Samter's triad, cystic fibrosis, and primary ciliary dyskinesia were all much more likely to require revision sinus surgery.

Conclusion:

This study has demonstrated that revision sinus surgeries were required more often in men and in patients with allergic fungal rhinosinusitis, polyps, Samter's triad, cystic fibrosis, and primary ciliary dyskinesia. These findings will help us have a more knowledgeable pre-operative discussion with at-risk patients, identify controllable characteristics in patients, and reduce the socioeconomic burden of this disease process.

Poster #021

Characterization of chronic rhinosinusitis by associated medical comorbidities

Tiffany Toni
Gengjie Jia, Dr.
Jay Shah, Dr.
Robert Naclerio, MD
Carole Ober, Dr.
Andrey Rzhetsky, Dr.
Jayant Pinto, Dr.

Introduction:

Chronic rhinosinusitis (CRS) is a multifactorial disease process theorized to arise through the complex interaction between the host genetic and inflammatory state induced environmental and infectious exposures. The relationship between CRS and other medical comorbidities remains an under investigated area of CRS research that we hypothesized would allow for patient disease stratification.

Methods:

In the following study, we utilized a multi-institutional database to investigate a total of 5,415,401 patients aged 18-70 with a diagnosis of CRS. Patients with respiratory congenital anomaly and cystic fibrosis were excluded from the study. Supervised machine learning was used to cluster patients based on medical comorbidities. These clusters were further analyzed individually to investigate the percentage of patients with severe disease, as characterized by CRS with nasal polyposis (CRSwNP).

Results:

Twenty-three distinct clusters emerged and were grouped according to similar pathogenesis into the following nine disease signatures: atopic, cell epithelial dysfunction, autoimmune, neuropsychiatric, metabolic syndrome, hormonal, vascular, immune deficiency, and infectious. Of patients with CRS, 4.0% of patients were also coded as having nasal polyposis. CRSwNP patients were more likely to be categorized as having an atopic or infectious disease signature as compared to chronic rhinosinusitis without nasal polyposis (CRSsNP) patients.

Conclusions:

Chronic rhinosinusitis can be classified into multiple subcategories by comorbidity mapping. Furthermore, CRSwNP is associated with a concomitant diagnosis of atopic and/or infectious sinonasal disease.

POSTERS

Poster #022

Choosing wisely in ESS in the era of biologics (CHESS)

Neil Verma, MDCM, MSc FRCS
 Martin Desrosiers, MD
 Centre Hospitalier de l'Université de Montréal

Background:

Chronic rhinosinusitis with nasal polyposis (CRSwNP) is a disease characterized by Th2 inflammation. Approval of biologic therapies has transformed the landscape of treatment for CRSwNP with modulation of the immune response to manage the disease. Endoscopic sinus surgery remains an important component in the management of CRSwNP and biologic therapy may influence the difficulty or complication rates seen in surgery and post-operatively with respect to surgical recovery. The goal of this study is to document and characterize the experiences of Canadian rhinologists with ESS for CRSwNP performed under biologic treatment that target Th2 inflammation.

Methods:

An online survey was sent to Canadian fellowship trained rhinologists to capture their experiences regarding ESS for patients under biologic therapy including intra-operative ease, bleeding and purulence during surgery as well as post-operative assessment of symptoms and endoscopy compared to non-biologic therapy standard ESS. We performed subgroup analysis based on demographic parameters, primary vs revision surgery and type of biological agent received.

Results:

We expect that the results of this exploratory assessment will offer novel and much-needed information on potential impacts of type-2 targeting biologics on ESS surgery and identify relevant items suitable for inclusion in a future clinical registry of ESS performed in patients under biologic therapy.

Conclusions:

There is a paucity of information on the effect of biologics on ESS and surgeons would benefit from recommendations and information when operating on patients with concomitant biologic therapies. Improved guidelines would help optimize surgical interventions and improve surgical outcomes.

Poster #023

Clinical outcomes and complications of endoscopic odontoideotomy: A single institution experience

Ann Powers, MD
 David Lerner, MD
 Janki Shah, MD
 Anthony Del Signore, MD
 Madeleine Schaberg, MD
 Satish Govindaraj, MD, FARS
 Raj Shrivastava, MD
 Alfred-Marc Illoreta, MD

Introduction:

Odontoideotomy is indicated for anterior decompression of the cervicomedullary junction to address a wide variety of pathologies. Endoscopic approaches reduce perioperative morbidity associated with the traditional open approaches, namely gastrostomy and tracheostomy tube placement.

Methods:

This is a retrospective review of patients undergoing endoscopic odontoideotomy between 2015-2022. The electronic medical record was reviewed for patient factors, operative variables, and post-operative complications.

Results:

8 patients underwent endoscopic odontoideotomy with a median age of 55yrs. Indications included basilar invagination (4), rheumatoid pannus (2), pathologic fracture with cord compression (1), and odontoid osteoradionecrosis (1). Endoscopic odontoideotomy was achieved via transnasal route in 5 patients, while 3 patients required a combined transnasal-transoral endoscopic approach. All patients undergoing a combined transnasal-transoral approach received a temporary tracheostomy at time of surgery, whereas only 2/5 patients undergoing the transnasal approach required a tracheostomy perioperatively. We found all patients undergoing a combined approach required at least a temporary gastrostomy tube compared to 2/5 patients undergoing a purely transnasal approach.

Discussion:

Endoscopic odontoideotomy is associated with reduced morbidity than the traditional open approach. Optimally resection is carried out endoscopically purely via a transnasal route but sometimes a transoral corridor is necessary to achieve decompression inferiorly. Our results suggest a purely transnasal route is preferred with better post-operative swallowing outcomes. We will expand on this series with patients from preceding years.

POSTERS

Poster #024

Clinical outcomes of bioabsorbable nasal implants for nasal valve collapse: A meta-analysis

Felisha Li, BA
 Matthew Saleem, BS
 Travis Peng
 Sarah Van der Els
 Carol Wang
 Tristan Tham
 Donald and Barbara Zucker School of Medicine

Introduction:

While Latera has been shown to improve NOSE scores long-term in patients, adverse events of the implant have not been extensively studied. To our knowledge, this is the first meta-analysis for clinical outcomes of Latera bioabsorbable implants for nasal valve collapse.

Methods:

English full-text articles were searched for on PubMed, Scopus, and Embase databases. Articles had to report the use of Latera implants; report adverse events such as complications, inflammation, and implant retrieval; be from a clinical trial, cohort, or case-control study. Two reviewers screened articles and a third settled disagreements. Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines and the Risk of Bias in Non-randomized Studies of Interventions tool were used. After Freeman-Tukey transformation, weighted proportions were analyzed in a random effects model.

Results:

Seven studies, three retrospective and four prospective, representing a total cohort of 513 patients were included in this study. Pooled adverse-event rate after Latera implant was 13.4% (95% CI: 6.0-23.1%) and implant retrieval rate was 6.8% (95% CI: 3.8-10.6%). Subgroup analysis found comparable implant retrieval rates between retrospective (2.5%, 95% CI: 0.1-8.2%) and prospective (8.7%, 95% CI: 6.2-11.6%) studies. There was moderate heterogeneity in pooled analysis for adverse events ($I^2 = 83.8\%$) and implant retrieval rate ($I^2 = 42.6\%$). Notably, there was no heterogeneity in the prospective subgroup for implant retrieval rate ($I^2=0\%$).

Discussion:

Implant retrieval is a relatively uncommon complication of Latera absorbable implant. While the adverse-event rate was higher, most events in these studies were mild such foreign body sensation.

Poster #025

Clinical productivity of fellowship-trained academic rhinologists: An analysis of Medicare metrics

Michael Warn, Medical Student
 Daniella Chan
 Theodore Nguyen, BS
 Sina Torabi, MD
 Benjamin Bitner, Dr.
 Edward Kuan, MD, FARS

Introduction:

Current data regarding reimbursement trends in Medicare services and the types of patients treated as physicians progress in their academic career is conflicting, and no such work has been undertaken for rhinologists.

Methods:

Demographics, professorship rank, and years of experience of US academic rhinologists were collected. Those with associated Medicare services, charges, and patient complexity risk scores (based on hierarchical condition category coding) were compared by rank and experience.

Results:

A cohort of 211 rhinologists were included. Private practice rhinologists performed the most services (791 [207-1036] vs 404 [182-572]; $p = 0.016$), while full, associate, and assistant professors billed more per service (\$791.53 [\$491.69-1,052.46], \$706.85 [\$473.48-941.15], \$590.34 [\$429.91-853.07] vs \$326.08 [\$223.37-482.36]; all $p < 0.001$). Full professors also had higher charges per service ($p < 0.001$) and total charges ($p = 0.012$) than associate and assistants, but lower risk scores than assistants (1.37 [1.26-1.52] vs 1.49 [1.29-1.68]; $p = 0.013$) and similar risk scores to associates (1.47 [1.25-1.64]; $p = 0.061$). Increasing years of practice was inversely correlated with risk scores ($R = -0.358$; $p < 0.001$). As a cohort, significant declines in risk scores occurred between the 5-10th and 10th-15th year of practice ($p = 0.032$) and after the 15th-20th year ($p = 0.038$).

Conclusion:

Academic rhinologists submitted fewer services than private practice colleagues but had greater total charges and charges per service. Full professors charged the most per service and treated patients with lower risk scores than more junior academic colleagues. Risk correlates negatively with experience with significant drops in mid and late career.

POSTERS

Poster #026

Cohort study: Pluripotent pituitary adenomas are at higher risk for SIADH

Sabrina Goyal, BS
 Jake Lee, MD, MSCI
 Kaleigh Roberts, MD, PhD
 Sonika Dahiya, MD
 Nyssa Farrell, MD
 John Schneider, MD, MA
 Albert Kim, MD, PhD
 Julie Silverstein, MD
 Lauren Roland, MD, MSCI

Introduction:

Plurihormonal pituitary adenomas (PPAs), tumors producing more than one hormone, are exceedingly rare. The natural history of PPAs, in comparison to single-secreting pituitary adenomas (PAs), is poorly understood.

Methods:

Data for 407 resected transsphenoidal PAs was obtained through a patient repository from a single tertiary level center. Primary outcomes including demographics, pre- and post-op endocrinopathies, tumor morphology, histology, and readmission were compared between monohormonal and plurihormonal tumors with bivariate analysis using Chi-square and unpaired nonparametric Mann-Whitney tests.

Results:

A total of 383 monohormonal and 24 plurihormonal tumors were identified between 2015-2023 with an average age of 51 years. Co-expression patterns included Prolactin/FSH/LH (n=7), Prolactin/GH (n=3), ACTH/FSH/LH (n=3), Prolactin/ACTH (n=2), Prolactin/TSH (n=2), ACTH/FSH/LH/TSH (n=2), Prolactin/ACTH/FSH/LH (n=2), Prolactin/ACTH/GH (n=2), Prolactin/ACTH/FSH/LH/TSH (n=1), Prolactin/GH/FSH/LH/TSH (n=1). Pre- and post-operative endocrinopathies were present in 16 and 18 cases, respectively. Ki67 was 2.8 on average with elevated proliferation in 3 cases. Crooke changes (n=3) and apoplexy (n=1) were identified. Readmission within 30 days occurred in 6 patients. Compared to monohormonal tumors, post-operative SIADH (p=0.024), prolactin (p<0.001), GH (0.0011), FSH/LH (0.0189), and TSH expression (<0.0001) were higher in PPAs.

Conclusions:

In this study, we describe our experience with a large series of PPAs. When determining appropriate post-operative care of PPAs, higher incidence of SIADH should be considered.

Poster #027

Combined transnasal, transoral approach for excision of odontogenic cysts offers reduced recurrence rates and favorable sinonasal outcomes

Jennifer Douglas, MD
 Kimberly Wei, Medical Student
 Kush Panara, MD
 Daniel Lee, MD
 Michael Kohanski, MD, PhD
 Rabie Shanti, Associate Professor
 Neeraj Panchal, Assistant Professor
 James Palmer, MD, FARS
 Nithin Adappa, MD, FARS
 University of Pennsylvania

Background:

Odontogenic cysts are fluid-filled, epithelial lined cavities of dental origin that damage the adjacent dentition, maxilla, and maxillary sinus, with standard of care being transoral excision. However, a high rate of recurrence (14-35%) has been reported. We present the largest series of odontogenic cysts managed jointly by rhinologic and oral and maxillofacial surgeons through a combined transnasal, transoral endoscopic approach.

Methods:

Retrospective case series of patients undergoing combined transnasal, transoral endoscopic approach for excision of odontogenic cysts from 2014-2023. Records were reviewed for demographics, radiology and histopathology reports, sinonasal outcomes (via the 22 item Sinonasal-Outcome Test), and perioperative course.

Results:

Twenty-three patients met inclusion criteria, 56.5% male with mean age 44.6 years. Cysts were 3.4 cm in average maximal diameter with varying pathology (47.6% odontogenic keratocysts, 28.6% dentigerous cysts, 14.3% cyst with ameloblastic transformation, 4.8% each ossifying fibroma and chondromyxoid fibroma). They demonstrated on average no changes in sinonasal outcomes above the SNOT-22 MCID and the majority reported improved scores compared with pre-operative baseline. There were two episodes of recurrence (9.5%) over a mean follow-up time of 2.7 years.

Conclusions:

A combined transnasal, transoral endoscopic approach for excision of odontogenic cysts is a safe alternative to the transoral approach with a reduced recurrence rate and favorable sinonasal outcomes. Herein we report the largest published case series of a combined approach, with the recommendation it be considered for improved treatment outcomes for odontogenic cysts involving the maxillary sinus.

POSTERS

Poster #028

Comparing physical and virtual “digital twin” models of endoscopic skull base disorders for preoperative planning

David Ahmadian, BS

Shireen Samargandy, Dr.

Nirushan Narendran, Research Specialist, Senior

Allan Hamilton, Dr.

Minsik Hong

Jerzy Rozenblit, Dr.

Christopher Le, MD, FARS

Michael Avery, Dr.

Eugene Chang, MD, FARS

University of Arizona, College of Medicine – Tucson

Introduction:

A significant challenge in preoperative planning of endoscopic skull base procedures is visualizing critical anatomical structures in 3D space.

We hypothesized that a “digital twin,” or dynamic personalized 3D image encapsulating biophysical properties of a patient’s anatomy might be beneficial in resident surgical training.

Methods:

Residents in an endoscopic skull base course were given a traditional curriculum-based lecture on the hierarchical task analysis (HTA) steps of an endoscopic approach to the pituitary gland. They were then exposed to three different methods of visualizing the patients’ anatomy: 1. DICOM viewer of 3-plane merged CT and MRI scans, 2. 3D printed model of the patient’s anatomy, and 3. A virtual reality model created in the UNITY platform. They were then assessed on their surgical performance during a cadaveric dissection of an endoscopic pituitary approach. Residents were asked to identify critical structures in the dissection, and their performance was graded using our published evaluation method by fellowship-trained attendings. Afterwards, the residents were asked to complete a Likert-based scale questionnaire on their opinions regarding the methods of preoperative planning.

Results:

All trainees completed the three different training methods. The majority of trainees felt that 3D printed models and VR simulation were superior in terms of spatial anatomy localization compared to viewing traditional 2-dimensional DICOM images. Residents had significant improvements in cadaveric dissections after preoperative training.

Conclusions:

3D printed and virtual models of patient-specific anatomy improves resident awareness of critical structures in endoscopic skull base surgery.

Poster #029

Complications of novel radiofrequency device use in otolaryngology: A MAUDE analysis

Sina Torabi, MD

Benjamin Bitner, Dr.

Eric Abello

Theodore Nguyen

Brian Wong

Edward Kuan, MD, FARS

University of California, Irvine

Introduction:

With the widespread development and adoption of intranasal radiofrequency (RF) devices, the objective herein was to report national adverse events associated with their use.

Methods:

The Food & Drug Administration’s Manufacturer and User Facility Device Experience was queried for adverse events reported after Celon ProBreath (Olympus), Vivaer (Aerin) and Rhinaer (Aerin) use since database inception to February 2nd, 2023. The event descriptions were reviewed and categorized by three independent reviewers, with any discrepancies discussed and resolved.

Results:

A total of 22 device-related adverse events were reported, 11 (50.0%) for Celon, 3 (13.6%) for Vivaer, and 8 (36.4%) for Rhinaer. 7 (63.6%) of the Celon-related complications were related to tissue necrosis, including a palatal perforation, that appeared to be related to user error. Notably, 1 (9.1%) episode of pediatric ocular palsy was also reported. Vivaer complications included synechiae formation that required excision, a mucosal perforation secondary to tissue necrosis, and a case of empty nose syndrome reported directly by the patient. 7 (87.5%) of the 8 Rhinaer complications were related to epistaxis. 3 (37.5%) of these epistaxis episodes required transfusions. Only 1 (14.3%) was successfully treated with packing, and 6 (85.7%) required operative intervention.

Conclusion:

Surgeons should exercise vigilance and tissue-appropriate device settings when utilizing RF devices. Epistaxis and tissue necrosis may occur, as well as more rare, but devastating, complications.

POSTERS

Poster #030

Comprehensive patient-focused medical illustrations to supplement the rhinology surgical consent process

Chase Kahn, MD
 Bitu Naimi, BA
 Alexander Duffy, MD
 Emily Garvey, BA
 Douglas Farquhar, MD
 Elina Toskala, MD, MBA, PhD, FARS
 Gurston Nyquist, MD, FARS
 Marc Rosen, MD, FARS
 Mindy Rabinowitz, MD, FARS
 Thomas Jefferson University

Introduction: Previous studies have demonstrated improved patient satisfaction and comprehension when patients are provided education in a focused manner. In surgical populations, supplemental media materials have been used to educate patients on disease pathophysiology and treatment and have been deemed of limited usefulness and poor overall validity for patient information. Anatomically accurate illustrations can be linked to written or spoken text, which can markedly increase a patient's attention, comprehension, and recall of clinical information. Currently, there are no studies that have investigated the practicality of medical illustrations to supplement the surgical consent process for rhinology surgery.

Objective: This study aims to investigate the benefits of incorporating specifically designed anatomic illustrations to improve patient health literacy during the surgical consent process.

Methods: Detailed anatomically accurate illustrations were developed in concert with the study PI and a medical illustrator. Pre-and post-operative images along with common disease states created to cover common rhinologic procedures including the surgical management of epistaxis, dacryocystorhinostomy, endoscopic sinus surgery, and endonasal pituitary surgery. Double-sided documents were created with illustrations on one side and a narrative on the reverse reiterating the surgical intervention associated with those images. These were designed to mimic the pre-operative surgical discussion.

Conclusion: Providers can use these documents during their surgical discussion to reiterate the highlights of the discussion and send the patient home with a visual reminder.

Poster #031

Contemporary update on the microbiology of paranasal sinusitis

Alan Workman, MD, MTR
 Margaret Mitchell, Resident Physician
 Richard Lu, Medical Student
 Neil Bhattacharyya, MD

Introduction:

Rhinosinusitis, whether acute, recurrent, or chronic, is thought to be at least in part be characterized by a disruption of microbiology. Existing studies on the microbiology of sinusitis, however, are limited by their sample size.

Methods:

We identified patients within a large health system that had sinus cultures taken by an otolaryngologist with a concurrent diagnosis of acute or chronic rhinosinusitis. These cultures were analyzed based on their culture type and result.

Results:

A total of 2,302 culture samples were collected, 2,012 (87%) of which were bacterial cultures and 287 (13%) which were fungal cultures. More than half (1142, 57%) of the bacterial cultures resulted positively, or with a named genus, while 592 (29%) were normal sinus flora, 16 (0.8%) resulted as normal oral flora, and 183 (9%) resulted as no growth. The most common genus identified was *Staphylococcus* (383, 34%), most commonly *S. aureus* (311, 81%), 42 of which (14%) showed methicillin resistance (MRSA). Of the positive bacterial cultures with named genera, those represented were *Propionibacterium* (145, 13%), *Haemophilus* (101, 9%), *Pseudomonas* (94, 8%), and *Streptococcus* (83, 7%). Of fungal cultures, 265 (92%) resulted in no growth.

Discussion:

Within a sample of over 2,000 sinus bacterial cultures, 57% resulted positively with identification of a named genus, highlighting the utility of this assay. Alternatively, the vast majority of fungal cultures showed no growth, suggesting a lack of utility when treating patients with sinus symptoms. This update on the microbiology of sinusitis offers both insight into the baseline nasal microbiology of a broad population as well as commenting on the potential utility of sinus culture data.

POSTERS

Poster #032

Cranial neuropathies secondary to allergic fungal rhinosinusitis

Ashleigh Halderman, MD, FARS

Sei Chung, MD

Kendra Stephen

Nina Stephen

Jenny Kim

University of Texas Southwestern

Background:

Though allergic fungal rhinosinusitis (AFRS) is a benign, noninvasive process, advanced disease can result in orbital and skull base erosion resulting in cranial neuropathies. This review examines the demographic and clinical characteristics of such patients.

Methods:

This review describes 55 patients with AFRS, of which 6 presented with cranial nerve (CN) deficits. Data on demographics, clinical findings, and patient anatomy were analyzed using independent t- and Pearson's chi-squared tests as appropriate.

Results:

The average age of AFRS patients who presented with cranial neuropathies was 36 years, which did not significantly differ from the remaining AFRS cohort (34 years). Among AFRS patients with CN deficits, 3 were Black and 3 were White, and there was an equal distribution by gender. AFRS patients with CN deficits had significantly higher eosinophil levels ($p=0.01$) and absolute eosinophil counts ($p=0.02$), compared to AFRS patients without cranial neuropathies. The total Lund-Mackay scores did not significantly differ between those with or without cranial neuropathies. Among AFRS patients with CN deficits, one patient demonstrated pansinus complete opacification, and all others had sphenoid-predominant disease with a posterior pattern of expansion and erosion. Patients presented with vision loss ($n=6$) secondary to optic canal dehiscence, or CN III or VI palsy ($n=2$) due to posteriorly erosive disease at the sphenoclivar skull base.

Conclusions:

AFRS can rarely present with cranial neuropathies when the disease pattern is sphenoid-predominant and expansile in a posterior direction towards the sphenoclivar skull base. There may be a propensity to develop this form of advanced AFRS in those with greater peripheral.

Poster #033

Craniofacial pain locations and outcomes after endoscopic sinus surgery for unilateral sphenoid sinusitis: A multi-institutional study

Richard Pellizzari, BS

John Craig, MD, FARS

Alberto Saibene, MD, MA

Luigi De Donato, MD

Benjamin Bitner, MD

Rijul Kshirsagar, MD

Jennifer Douglas, MD

Edward Kuan, MD, MBA, FARS

Nithin Adappa, MD, FARS

Jacob Eide, MD

Henry Ford Health

Introduction:

Unilateral radiographic sphenoid sinus opacification is caused by a variety of pathologies including inflammatory and infectious sinusitis, tumors, and encephaloceles. The purpose of this study was to report craniofacial pain locations and outcomes in unilateral sphenoid sinusitis (USS) patients who underwent endoscopic sinus surgery (ESS).

Methods:

A multi-institutional retrospective cohort study was conducted on all adult patients who had ESS for USS from 2015-2022. Patient demographics, presenting symptoms and nasal endoscopy findings, surgical extent, and craniofacial pain outcomes were recorded. Exclusion criteria included age <18 years, immunodeficiency, invasive fungal sinusitis, and neoplasia. Descriptive statistics were calculated.

Results:

Of the 52 study patients, mean age was 61 +/- 15 years, and 71.2% were female. Craniofacial pain was present in 65.4% of patients in the following locations: retrobulbar (47.1%), frontal/forehead (47.1%), whole head/face (17.6%), maxillary/cheek (17.6%), occipital (14.7%), and vertex (8.8%). Most patients had normal nasal endoscopies, while 26.9% had mucopurulence, 11.5% edema, and 7.7% polyps in the sphenoid recess. The most common pathologies were fungal ball (36.5%) and chronic rhinosinusitis without nasal polyps (23.1%). Of the 34 patients with craniofacial pain, 76.5% resolved by their first postoperative visits (mean 10.6 days) and 88.2% resolved by their second postoperative visits (mean 38.9 days).

Conclusion:

In USS patients, the most common craniofacial pain locations were retrobulbar and frontal/forehead, with a minority having occipital and vertex pain. ESS resolved the craniofacial pain in nearly 90% of patients.

POSTERS

Poster #034

CRSwNP patients using biologicals: real-world experience in a reference center

Wilma Anselmo-Lima, MD, PhD
 Vanessa Dinarti, PhD
 Gabriela Silveira, MD
 Otavio Mieli, MD
 José Lemos, MD
 Marcio Nakanishi, PhD
 Denny Garcia, PhD
 Luisa Arruda, PhD
 Fabiana Valera, PhD
 Edwin Tamashiro, PhD
 Ribeirão Preto Medical School of University of São Paulo

Background:

CRSwNP is predominantly a type 2 inflammatory disease in Western populations. In difficult-to-control patients, anti-type 2 biologicals have been shown to be an effective rescue treatment. However, there are limited data on CRSwNP patients undergoing biologicals outside Europe and the US. Aim: To evaluate outcomes in difficult-to-control CRSwNP patients undergoing dupilumab treatment in a reference center.

Methods:

24 patients from São Paulo, Brazil, unresponsive to conventional treatments who received dupilumab for at least 3 months were evaluated by blood eosinophil counts, Lund-Kennedy (LK) endoscopic score, SNOT-22, and olfactometry. Pre and post-treatment parameters were compared.

Results:

Patients presented a mean age of 49.4 years, 69% had AERD and 23.1% had asthma associated only. Median blood eosinophilia was 600 cells/uL (P25-75= 350-1000) Median time of Dupilumab use was 9 months (P25-75= 5.3-16 months). Dupilumab promoted a significant improvement in SNOT-22 scores ($\Delta=-34.5$, $p<0.0001$), LK score ($\Delta=-4.5$, $p<0.0001$), and olfactory test ($p<0.0001$). Length time of use was associated with better outcomes in LK and olfactory test, but not for SNOT-22. Three patients discontinued the use of dupilumab (despite sinonasal symptoms were controlled) due to adverse events.

Conclusions:

In our center, most of patients experienced a significant improvement in symptoms and objective measures in patients with CRSwNP treated with Dupilumab. Prospective follow-up is necessary to better elucidate long-term efficacy and incidence of side effects.

Poster #035

Current otolaryngologic applications of the novel self-assembling RADA-16 peptide matrix

Arthur Wu, MD, FARS
 Kaitlynn Pak
 Dennis Tang MD, FARS
 Satyan Sreenath, MD
 Christopher Ito, MD, FARS
 Brent Senior, MD, ARS
 Kent Lam, MD, FARS
 Thomas Higgins, MD, FARS
 Kevin Hur, MD
 Benjamin Tam
 Cedars-Sinai

Background:

PuraGel® is a novel RADA-16 based self-assembling peptide matrix gel intended to prevent adhesions between mucosal surfaces, control minimal bleeding following surgery or nasal trauma, and act as an adjunct to aid in the natural healing process. Current literature is sparse but includes use in nasopharyngeal stenosis, turbinate reduction, and sinus surgery. The goal of this study is to determine current use patterns and possible complications among US otolaryngologists.

Methods:

A list of current US academic institutions who have used RADA16 was obtained and a brief survey was distributed. Number and type of cases as well as complications were queried.

Results:

7 of the 13 current academic sites using the product responded, including seven academic rhinologists. The product was used in 174 cases including 84 FESS, 41 septoplasty/turbinate reduction, 11 nasoseptal flap donor sites, 4 Draf III, 14 medial maxillectomies, 6 sinonasal tumor resections (non-inverted papilloma), 8 tonsillectomies, and 5 nasal stenosis. There were 13 complications encountered. Complications mostly were related to stenosis and bleeding. There were 6 instances of sinonasal scarring/stenosis, 4 of which required reoperation. There were 2 tonsil bleeds and 3 episodes of epistaxis.

Conclusion:

As with any novel technology, there is a learning curve with the usage of this product. The RADA-16 gel appears to have novel uses for promoting mucosal healing, providing a matrix for migrating cells to repopulate and heal denuded tissue. However, when used in tight areas where it might fill potential space, there is a possibility for creating stenosis. Further studies will be helpful to determine appropriate use and applications of this novel product.

POSTERS

Poster #036

Development of a novel quantitative PCR assay for diagnosis of rhinocerebral mucormycosis

Tom Maxim, MD

Jivianne Lee, MD, FARS

Eri Srivatsan

Albert Ko

Ashraf Ibrahim

Yiyu Gu

David Beenhouwer

Nicholas Jackson

Daniel Manzoor

David Geffen School of Medicine at UCLA

Introduction:

Rhinocerebral mucormycosis (RCM) is an angioinvasive disease targeting the paranasal sinuses and surrounding soft tissues, typically in immune-compromised hosts. Frozen tissue analysis is relied upon for expedited diagnosis but suffers from reduced sensitivity (83-87.5%) in comparison to permanent pathology, risking false negative results and treatment delays. The Mucorales CotH3 protein is a key mediator of host cell invasion, representing a promising target for PCR development as an alternative diagnostic method.

Methods:

Four custom primers/probes were developed targeting highly conserved sequences of the CotH3 gene. Purified DNA from four of the most common invasive Mucorales strains (*Rhizopus delemar*, *Mucor circinelloides*, *Lichtheimia*, *Rhizomucor*) were used to test primer performance in quantitative PCR. *Aspergillus fumigatus* DNA served as negative control. Cycle threshold (Ct) values were established.

Results:

Average Ct values demonstrate primers 1, 2 and 4 amplified the target sequence of *Rhizopus delemar* DNA at cycle 26 and dilute *Rhizopus* DNA at cycle 30-32. Primers 1 and 4 are most sensitive to *Rhizopus delemar*, with Ct values 9-12 cycles lower compared to the other Mucorales strains. Primer 4 showed highest sensitivity to *Lichtheimia* and *Mucor circinelloides*. *Rhizomucor* was not amplified. *Aspergillus* DNA showed no amplification of the target sequence using primer 1, and non-specific low-level amplification in 1 of 3 wells using primers 2 and 4.

Conclusions:

A novel quantitative PCR targeting the CotH3 gene detects Mucorales DNA with high specificity and sensitivity. Primer 4 showed the best overall performance across multiple Mucorales strains and merits further testing in human subjects.

Poster #037

Differences in patient characteristics with unilateral versus bilateral allergic fungal rhinosinusitis

Sei Chung, MD

Kendra Stephen

Nina Stephen

Jenny Kim

Ashleigh Halderman, MD, FARS

University of Texas Southwestern

Background:

Allergic fungal rhinosinusitis (AFRS) is a noninvasive form of fungal sinusitis and is a subtype of chronic sinusitis with nasal polyps (CRSwNP). Unlike other forms of CRSwNP, AFRS can be unilateral or bilateral. While various demographic factors as they relate to disease severity and recalcitrance have been previously evaluated, little work has looked at potential differences between patients who present with unilateral versus bilateral AFRS.

Methods:

A retrospective review identified 55 patients with AFRS. Data on demographics, insurance status, comorbidities, anatomic features, and CT findings were analyzed using independent t- and Pearson's chi-squared tests.

Results:

32.7% had unilateral AFRS and 67.3% had bilateral AFRS. Those with bilateral disease were older (38 vs 28 years, respectively; $p=0.02$), more likely to be Black ($p=0.04$), and had active or prior tobacco use ($p=0.025$). There was no significant difference in insurance status. Neither septal deviation nor the presence of concha bullosa were associated with unilateral versus bilateral disease. There were no significant differences in the presence of asthma or self-reported allergic rhinitis. There was a trend towards greater peripheral eosinophilia in those with bilateral AFRS. Patients with bilateral AFRS were significantly more likely to present with cranial nerve deficits ($p=0.02$) secondary to expansile and erosive disease at the sphenoid, petrous, and clival skull base.

Conclusions:

Compared to patients with unilateral AFRS, those with bilateral AFRS were older, more likely to be of Black race, and have positive smoking history. To our knowledge, this is the first study to describe differences in patients with unilateral versus bilateral disease.

POSTERS

Poster #038

Dupilumab improved objective and patient-reported outcomes in patients with chronic rhinosinusitis with nasal polyps (CRSwNP) and complete bilateral nasal obstruction in the sinus-24 and sinus-52 trials

Prof. Claire Hopkins

Martin Wagenmann, MD, PhD

Asif Khan, Dr.

Claus Bachert, Dr.

Jerome Mshid, Dr.

Scott Nash, Dr.

Yamo Deniz, Dr.

Paul Rowe, Dr.

Harry Sacks, Dr.

Juby Jacob-Nara, Dr.

Düsseldorf University Hospital

Background:

In CRSwNP, a nasal polyp score (NPS) of 8/8 signifies complete bilateral nasal obstruction. Dupilumab is efficacious in severe CRSwNP; here we report outcomes in patients (pts) with NPS=8.

Methods:

Post-hoc analysis of pts with NPS=8 at randomization (after 28 days' intranasal corticosteroids [CS]) in SINUS-24/52 (NCT02912468/ NCT02898454), receiving dupilumab 300 mg/ placebo every 2 weeks.

Objective assessments:

NPS (0–8), peak nasal inspiratory flow (PNIF), Lund–Mackay computed tomography (LMK-CT; 0–24); pt-reported assessments: nasal congestion, loss of smell (NC, LoS; 0–3), 22 item Sino-Nasal Outcome Test (SNOT-22; 0–110).

Results:

98/724 (13.5%) pts had baseline NPS=8 (placebo/ dupilumab, 30/68). Mean (SD) baseline PNIF (L/ min), LMK-CT, NC, LoS, SNOT-22 were 33.8 (45.1), 18.9 (3.9), 2.7 (0.4), 2.9 (0.3), 56.9 (21.6), respectively. All assessments improved with dupilumab vs placebo at Week 24 (least squares mean difference [95% CI]): NPS -2.04 [-2.67, -1.40], PNIF 65.9 [39.4, 92.4], LMK-CT -4.97 [-6.50, -3.44], NC -1.30 [-1.72, -0.89], LoS -0.96 [-1.39, -0.54], SNOT-22 -25.3 [-34.1, -16.4], with similar results at Week 52. At Week 24, 69.1%/10.0% pts (dupilumab/placebo) achieved NPS improvement ≥ 1 ; 51.5%/0% LMK-CT improvement ≥ 5 ; 73.5%/16.7% NC improvement ≥ 1 ; 60.3%/20.0% LoS improvement ≥ 1 ; all $P < 0.0001$; 73.5%/40.0% SNOT-22 improvement ≥ 8.9 ($P = 0.001$). Fewer pts required systemic CS or sinonasal surgery through Week 24 with dupilumab than placebo (11.8%/36.7%, $P = 0.0005$).

Conclusions:

In pts with CRSwNP and NPS=8, dupilumab demonstrated significant, clinically relevant reduction in NPS, improved nasal inspiratory flow, symptoms, and health-related quality of life, and reduced need for systemic CS/surgery vs placebo.

POSTERS

Poster #039

Efficacy of olfactory training after unilateral anterior skull base resection in patients with olfactory neuroblastoma: A single-center prospective study

Teppeï Takeda, MD

Omura Kazuhiro

The Jikei University School of Medicine

Introduction:

Unilateral skull base resection for selected patients with olfactory neuroblastoma is useful in controlling the tumor while ensuring a minimally invasive approach to the patient. Furthermore, unilateral skull base resection has been reported to be useful in preserving the sense of smell. However, not all cases preserve the sense of smell. In the present study, we investigated whether postoperative olfactory training is useful in preserving the sense of smell after unilateral anterior skull base resection.

Methods:

This study is a single-center case-control study. At our institution, postoperative olfactory training has been offered to patients who have undergone unilateral anterior skull base resection since 2022. Patients who underwent unilateral anterior skull base resection only for ONB patients from 2018 to December 2021 were defined as the control group, while patients who underwent unilateral anterior skull base resection and postoperative olfactory training after January 2022 were defined as the case group, and the olfactory preservation rate in each group was examined. The same surgeon and anterior skull base resection reconstruction method were used. Olfactory function tests were conducted using Open Essence to evaluate olfactory identification ability.

Results:

Six patients in the control group and seven patients in the case group were analyzed. In an Open Essence olfactory function test, 2 out of 6 (33%) in the control group and 5 out of 7 (71%) in the case group had a preserved sense of smell.

Conclusion:

Although the number of cases in this study is limited, we believe that olfactory training intervention may improve the postoperative olfactory preservation rate.

Poster #040

Epithelial-myoepithelial carcinoma of the nasal cavity. An interesting case report and review of the literature

Ariel Waitzman, MD

Jacob Waitzman, Medical Student

Jeremy Powers Chief, Dept of Pathology

Rohan Deraniyagala, Assistant Professor

Epithelial-Myoepithelial carcinoma is an extremely rare malignancy. We present a case study of a patient with Epithelial-Myoepithelial carcinoma of the nasal cavity, with presentation of clinical, radiologic and pathologic images. The case report involves a 67 year old female presenting with nasal obstruction and recurrent mild unilateral epistaxis. CT and endoscopy demonstrated a friable polypoid mass involving the septum and middle turbinate on the right side. Endoscopic biopsy was consistent with an Epithelial-Myoepithelial carcinoma, intermediate grade. The case was presented at our Head and Neck Tumor Board with a recommendation for surgery, reserving radiation therapy for positive margins or recurrent disease. The patient underwent endoscopic resection with clear clinical margins. Final pathology (the pathologist did not feel frozen sections would be reliable with this tumor type) revealed microscopic positive margins in 2 areas. A second endoscopic resection was performed removing tissue up to the skull base, again with no clinically detectable tumor. Final pathology, however, again revealed a microscopic positive margin at the skull base. The patient subsequently underwent full course radiation therapy to the right nasal cavity including the skull base. The patient remains disease free at this time and is closely followed.

POSTERS

Poster #041

Eustachian tube recanalization via CO2 guidewire and ureteral stent

Christopher Pool, MD

David Keschner

Kaiser Permanente Orange County

Patulous eustachian tube dysfunction is a rare disorder that can be treated with different medications and procedures aimed at improving quality of life by decreasing or eliminating the diameter of the eustachian tube orifice. Complete obliteration of the eustachian orifice risks chronic serous otitis media which can itself create substantial morbidity. We describe a case of eustachian tube recanalization after prior obliteration using a CO2 laser guidewire and a ureteral stent. The patient underwent myringotomy with endoscopic placement of the guidewire through the hypotympanic eustachian tube orifice, combined with transnasal endoscopic balloon dilation of the eustachian tube, and subsequent retrieval in the nasal cavity. A ureteral stent was then placed via Seldinger technique. The stent was removed after three months and with long term patency and resolution of symptoms. This is the first case report to describe recanalization using both balloon dilation and ureteral stenting.

Poster #042

Evidence for a role of metformin in preventing olfactory dysfunction among older adults

Sahar Assi, MD

Wuyang Zhang

Nicholas Reed

Andrew P. Lane, MD, FARS

Murray Ramanathan, MD, FARS

Nicholas Rowan, MD

Johns Hopkins Bloomberg School of Public Health

Background:

Olfactory dysfunction (OD) is increasingly recognized as a hallmark of unhealthy aging and mortality, but therapies remain elusive. Recognizing the increased prevalence of OD in individuals with diabetes, and the potential anti-aging effects of metformin, we examined the association of metformin use with OD.

Methods:

Asynchronous cross-sectional study of participants with diabetes from the National Social Life, Health, and Aging Project (NSHAP), Waves 2 (2010-11) and 3 (2015-16). Olfactory sensitivity (OS), the ability to detect the presence of an odorant, and olfactory identification (OI), the ability to identify the odorant, were tested. Weighted multivariable logistic regression was used to examine the association between metformin use at Wave 2 and odds of OS/OI dysfunction at Wave 3, adjusted for age, sex, race/ethnicity, education, BMI, HbA1c, and years since diabetes diagnosis at Wave 2.

Results:

In a sample of 228 participants with diabetes (mean age=69 years, 53% female, 21% Black), 112 (49%) were metformin users. In the adjusted model, relative to nonusers, metformin users had 63% lower odds of OS dysfunction at Wave 3 (Odds Ratio [OR]=0.37, [95% Confidence Interval=0.15-0.90] p=0.030). A more pronounced association was observed in a subgroup of 61 participants with normal OS function at Wave 2, where metformin users had 96% lower odds of OS dysfunction at Wave 3 (OR=0.04 [0.01-0.16] p<0.001). While not statistically significant, metformin use was associated with lower odds of OI dysfunction (OR=0.56 [0.28-1.14]).

Conclusion:

Metformin use is associated with lower odds of OS dysfunction among individuals with diabetes, suggesting a potential protective effect mediated through peripheral mechanisms of olfac

POSTERS

Poster #043
WITHDRAWN

Poster #044

Extramedullary plasma cell neoplasm in the nasal cavity: Case presentation

Guillermo Antonio Ramirez, MD
Cesar Alfonso Gutierrez Espinoza, Dr.

Extramedullary plasmacytoma is a rare neoplasm, however when it occurs, the ENT area is the most frequently affected site. The few series of patients reported in the literature, and especially in our environment, mean that current management is not very widespread. Diagnosis is somewhat difficult to perform only with clinical elements, which makes the laboratory and histopathological study with specific techniques of vital importance. It is known that its transformation into multiple myeloma constitutes the main prognostic factor, hence the patient must undergo to rigorous monitoring.

The case of a 78-year-old woman is presented, who is registered as a secondary to a chest wall tumor corresponding to a plasma cell neoplasm, which is later evaluated due to presenting symptoms of nasal obstruction predominantly left with outlet of mucous discharge of months of evolution, which was diagnosed as an extramedullary plasma cell neoplasm

Clinically, they can manifest as a nasal mass, increased volume and facial pain, airway obstruction, epistaxis, rhinorrhea, proptosis, dysphagia or dysphonia. In relation to its extension, 3 stages are distinguished. The diagnosis of extramedullary plasmacytoma is based on histological evidence of a plasma cell tumor in an extramedullary location (not bone) and without clinical, histological or radiological evidence of multiple myeloma.

In the following work we address the presentation of a clinical case and follow-up of a patient with plasma cell neoplasia.

POSTERS

Poster #045

Functional and structural correction of over-reduced noses by non-rib graftsMohsen Naraghi, MD, FARS
Orphans World Wide

Introduction:

The selection of the ideal graft has been an issue of concern for its donor site morbidity and other possible problems such as graft visibility and irregularities, infection, and inflammatory reactions. This retrospective result describes the author's experience with non-rib diced cartilage fascia graft in over-reduced Noses.

Methods:

Thirty-seven secondary rhinoplasty cases underwent non-rib diced cartilage grafts with facia temporalis augmentation from 2015 to 2022. Combining open and endoscopic approaches provided good material for structural support and camouflage purposes exclusively from the non-rib sources, including septum and concha cartilage.

Results:

Functional and aesthetic results revealed significant improvement in all patients. Three cases with more resorption in the supra-tip area were managed non-surgically. Four cases underwent postoperative massage to refine the molding of cartilages up to two weeks after surgery. Improvement of over-resected dorsum on profile and restoration of parallel aesthetic lines were our cases' most common improvement items.

Conclusion:

Advantages of non-rib graft include: Avoiding any incision in the chest to harvest rib cartilage; Using minimal cartilage from different sources; Less visibility over time; Decreased risk of torsion and warping of the graft; Complete attachment of the graft to the recipient bed, ensuring more stability; More compatibility with an asymmetric bed with bony and cartilaginous irregularities and more effectively camouflaging such asymmetries; Flexibility and compliance of the soft cartilage fascia graft to be massaged and modified meticulously even in postoperative visits.

Poster #046

Gender differences in quality of life in patients with skull base pathologiesParker Tumlin, MD
Meghan Turner, MD
Hassan Ramadan, MD, FARS
Chadi Makary, MD, FARS

Background: Recent studies showed that female patients with chronic rhinosinusitis (CRS) suffer a worse disease-specific quality of life (QoL).

Goal: To investigate gender differences in QoL in non-rhinosinusitis patients with sinonasal and skull base pathologies.

Methods:

Cross-sectional analysis of patients presenting to West Virginia University Otolaryngology clinic from August 2020 to November 2022 with inverted papilloma (IP), spontaneous CSF rhinorrhea, Grave's orbitopathy (referred for orbital decompression), and skull base tumors was performed. Baseline QoL was measured using the sinonasal outcome test-22 (SNOT-22). Patients' demographics and comorbidities were reviewed. Patients with concomitant CRS were excluded.

Results:

98 patients were included (50 with skull base tumors, 19 Grave's orbitopathy, 15 CSF rhinorrhea, and 14 IP). Mean age was 53.6 years (12-4-81.5), 52% were female. There was no age difference between females and males. Smoking history, asthma, and allergic rhinitis were also similar between the two groups. Males were more likely to have nasal septal deviation (38.2% vs 17.8%, $p=0.04$). Overall SNOT-22 was similar between females and males (30.3 vs 22.7, $p=0.06$). However, females had significantly worse scores in the ear/facial, psychological, and sleep subdomains (5.2 vs 3.2, $p=0.019$; 12 vs 6.9, $p=0.004$; 10.1 vs 6.9, $p=0.035$ respectively). Similar results were obtained in patients with skull base tumors.

Conclusion:

Female patients with non-rhinosinusitis sinonasal and skull base pathologies show higher non-rhinological subjective disease burden. Further studies with larger sample sizes are needed to confirm these findings.

POSTERS

Poster #047

Granulomatosis with polyangiitis presenting with skull base inflammation mimicking petrous apicitis: A case report and literature review

Michael Castle, MD
 Matthew Carter, Medical Student
 Alexander Poulakis, Medical Student
 Li-Xing Man, MD, FARS
 Isaac Schmale, MD
 University of Rochester Medical Center

Background:

Granulomatosis with polyangiitis (GPA) is an autoimmune granulomatous disease. Non-classic clinical presentations of GPA can provide diagnostic challenges and lead to delays in diagnosis. We present a unique case highlighting rare manifestations of GPA including primarily skull base inflammatory findings.

Case Description:

A 29-year-old male presented with headache, right otorrhea, cranial neuropathies, and hearing loss. Labs showed an elevated ESR and CRP. Initial CT and MRI demonstrated enhancement of the petrous apex. Flexible laryngoscopy showed nasal crusting and a large septal perforation. Despite normal vital signs and normal white count, his initial management was for an infectious etiology. Further workup revealed proteinuria and c-ANCA positivity, and a kidney biopsy established a diagnosis of GPA. Later nasal endoscopy confirmed extensive nasal crusting and large septal perforation consistent with GPA.

Discussion and Review:

There are approximately 20 studies that describe GPA presentations involving the skull base. In the largest retrospective review of 29 patients, no patients had otorrhea. To date, otorrhea has been reported in 2 patients with GPA. In one report, otorrhea and skull base findings on imaging led to infectious treatment, thus highlighting the confusion seen in this rare pattern of GPA presentation.

Conclusion:

Autoimmune workup should be considered in patients with skull base enhancement on imaging that is not consistent with neoplasia or severe infection. Likely to be consulted in such cases, the otolaryngologist should keep a high index of suspicion for GPA in the setting of unexplained skull base inflammation, coexistent septal perforations, and nasal crusting.

Poster #048

Histopathologic features of patients with noninvasive fungal rhinosinusitis

Tamara Simpson, BA
 Ali M. Baird, Medical Student
 Pete Batra, MD, FARS
 Peter Filip, MD
 Hannah J. Brown, MD
 Sarah Khalife, MD
 Paolo Gattuso, MD
 Bobby A. Tajudeen, MD, FARS
 Peter Papagiannopoulos, MD
 Rush Medical College

Introduction:

Noninvasive fungal rhinosinusitis (FRS) can be subclassified into allergic fungal rhinosinusitis (AFRS) or fungal ball (FB). This study investigates the histopathologic features of noninvasive FRS to further understand its distinct pathogenesis from other types of chronic rhinosinusitis (CRS). Currently there are no studies that examine histopathologic features of noninvasive fungal disease.

Methods:

A retrospective review of 468 patients undergoing functional endoscopic sinus surgery (FESS) was performed. Data was collected on patient demographics, medical comorbidities, and structured histopathology reports consisting of 13 variables.

Results:

Of 36 patients with noninvasive FRS, 21 (58.3%) had FB and 15 (41.7%) had AFRS. Patients with AFRS had increased tissue eosinophilia (>5 per HPF) compared to FB (86.7% vs 19.0%, $p < 0.001$). 432 patients comprised the CRS control group. The mean age for the noninvasive FRS group was 54.1 years compared to 50.1 years for the CRS group. The noninvasive FRS group had higher rates of severe overall inflammation compared to the CRS controls (33.3% vs. 3.9%, $p < 0.001$). The noninvasive FRS group showed increased fungal elements (27.8% vs. 4.4%, $p < 0.001$), subepithelial edema (63.9% vs. 43.8%, $p = 0.02$), and Charcot-Leyden crystals (17.1% vs. 4.6%, $p = 0.002$).

Conclusion:

Histopathologic analysis of noninvasive FRS showed increased extra mucosal fungal elements, moderate to severe overall degree of inflammation, subepithelial edema, fibrosis, and Charcot-Leyden crystals compared to non-fungal CRS. These variables represent unique differences in the pathogenesis of noninvasive fungal disease; therefore, possible targets in diagnosis and treatment could benefit disease progression.

POSTERS

Poster #049
WITHDRAWN

Poster #050
Impact of insurance status on CSF leak presentation

Ali M. Baird, BS
 Jamie Masliah, Resident
 Peter Filip, MD
 Sarah Khalife, MD
 Peter Papagiannopoulos, MD
 Pete Batra, MD, FARS
 Bobby Tajudeen, MD, FARS
 Rush Medical College

Introduction:

Spontaneous cerebrospinal fluid (CSF) leaks are known complications of idiopathic intracranial hypertension (IIH), a disease that disproportionately affects Black and Hispanic women. Prior studies demonstrated that patients with IIH had lower median household incomes and lived in food swamps. The aim of this study is to identify relationships between health disparities, measured by insurance status, and the clinical presentation of CSF leaks in patients with IIH.

Methods:

A retrospective chart review was conducted of patients with IIH who underwent surgical management for spontaneous CSF leaks from 2009 to 2022. Data was collected on patient demographics, health insurance status (Medicaid, Medicare or private), zip codes, and CSF leak presentation.

Results:

50 patients undergoing treatment for spontaneous CSF leaks were analyzed with a mean age of 56.1 +/- 12.6 years and a mean BMI of 38.9 +/- 7.38. 13 patients had Medicaid insurance, 7 had Medicare insurance, and 30 had private insurance. Black (n=8, 61.5%) and Hispanic patients (n=3, 23.1%) made up the majority of the Medicaid group. Although not statistically significant, patients with Medicaid compared to patients with Medicare or private insurance were more likely to present with preoperative meningitis (38.5% vs 14.3% and 16.7%, p= 0.247) and have a higher number of skull base dehiscences (2.38 vs 1.86 and 1.87, p=0.441).

Conclusion:

Insurance status acts as one marker for the social determinants of health and may predict severity at presentation in patients with spontaneous CSF leaks. Patients with Medicaid coverage were more likely to present with preoperative meningitis or multiple skull base dehiscences, indicating a prolonged presentation.

POSTERS

Poster #051

Impact of LYR-210 corticosteroid matrices on the incidence of acute exacerbations of chronic rhinosinusitis in patients from the LANTERN randomized controlled study

Vineeta Belanger, PhD
 Brent Senior, MD, FARS
 Agnieszka Wrobel
 Anders Cervin, MD, PhD
 Lindsay Brayton, Clinical Project Manager
 Allison Gartung
 Lyra Therapeutics, Inc.

Background:

LYR-210 is an implantable corticosteroid matrix designed to provide up to 24 weeks of localized sinonasal treatment for surgically naïve chronic rhinosinusitis (CRS) patients. LYR-210 (7500µg) demonstrated safety and significant efficacy improvements compared to control at week 24 in the LANTERN study. This presentation reports the impact of LYR-210 on the incidence of acute exacerbations of CRS (AECS) in patients from the LANTERN study.

Methods:

Symptomatic adult CRS patients who failed previous medical management were enrolled in a multicenter, blinded, randomized, controlled Phase 2 LANTERN study, and received bilateral administration of LYR-210 (7500µg) (N=21) or LYR-210 (2500µg) (N=23) or sham-procedure control (N=23). Percentages of patients experiencing AECS, defined as a sudden worsening of symptoms resulting in the treating physician reporting an escalation of treatment, was prespecified as an exploratory endpoint and assessed at weeks 4, 8, 12, 16, 20, and 24. The number and proportion of patients experiencing AECS, along with two-sided 90% confidence intervals (CIs) vs. control were determined.

Results:

Two LYR-210 (7500µg)-treated patients (9.5%) [CI: -0.4, -0.019], five LYR-210 (2500µg)-treated patients (21.7%) [CI: -0.3, 0.13], and seven control patients (30.4%) experienced an AECS by week 24. The first incidence of AECS in the control group occurred by week 4, compared to week 20 for the LYR-210 (7500µg) group.

Conclusion:

There was a reduction in the occurrence of AECS in the LYR-210 (7500µg) group compared to control during the 24-week treatment period in the LANTERN study. This important clinical effect is being studied further in the pivotal Phase 3 trials of LYR-210 (ENLIGHTEN I & ENLIGHTEN II).

Poster #052

Impact of social determinants of health in chronic rhinosinusitis disease severity: A scoping review

Avigeet Gupta, MD
 Julian Purrinos, Medical Student
 Kibwei McKinney, MD
 Renata Grozovksy, Clinical Research Scientist
 Corinna Levine, MD, FARS
 The University of Oklahoma Health Sciences Center

Background:

While social determinants of health (SDoH) are known to influence chronic rhinosinusitis (CRS), little is known regarding the specific impact of SDoH on CRS disease severity. This comprehensive scoping review summarizes the existing body of literature to assess the size and scope of the current literature examining the impact of SDOH on objective markers of CRS severity.

Methods:

We performed a scoping review of the PubMed, Ovid, and EMBASE databases with assistance of senior librarian in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-Scr) checklist.

Results:

A total of 1516 references were identified, of which 1285 underwent title and abstract screening. 215 full-text articles were reviewed, and 21 articles met inclusion criteria for analysis of outcomes data. Several SDoH themes with regards to outcome measures for CRS were ascertained from the literature search including sex, race, ethnicity, socioeconomic status, behavioral and lifestyle outcomes, and environmental exposures. The majority of articles contained heterogenous outcomes without statistically significant differences for Lund-McKay and Lund-Kennedy Scores among the identified SDoH themes. Several articles found worse radiographic or endoscopic CRS disease severity associated with SDoH categories of male sex, African-American race, smoking, and lower socioeconomic status.

Conclusions:

This scoping review highlights the paucity of rhinology literature regarding the influence of SDoH on objective CRS disease severity. Further research efforts should be directed towards understanding these differences in various populations with CRS.

POSTERS

Poster #053

Incident diagnosis of granulomatosis with polyangiitis in chronic rhinosinusitis receiving sinus surgery

Trisha Shang, BA
David Kaelber, Chief Medical Informatics Officer
Mohamad Chaaban, MD, FARS
Case Western Reserve University

Purpose:

Granulomatosis with polyangiitis (GPA) is a disease that can first present with chronic rhinosinusitis (CRS). Patients are sometimes diagnosed with GPA after sinus surgery. Our study aimed to determine GPA incident diagnosis in CRS patients with and without sinus surgery.

Methods:

We conducted a retrospective study using the TriNetX US Collaborative Network platform. We used encounter diagnosis ICD codes and surgery CPT codes. We included adults with a CRS encounter diagnosis who had sinus surgery after a CRS encounter diagnosis versus those without sinus surgery. Our outcome was a GPA encounter diagnosis 1 month-5 years after CRS diagnosis and sinus surgery (if received). We analyzed time to GPA diagnosis by the proportion of patients with GPA in each group diagnosed annually for 5 years after their first CRS diagnosis. For GPA patients in each group, we also compared nasal septal perforation (NSP) incidence.

Results:

After a 1:1 propensity match on sex, ethnicity, and race, n=246,525 in each cohort. CRS patients with sinus surgery had higher incidence of a GPA encounter diagnosis versus those without sinus surgery (RR: 3.44, 95% CI [2.83, 4.17]). A significantly greater proportion of patients with sinus surgery had a GPA encounter diagnosis in years 1-3 post-CRS encounter diagnosis than those without sinus surgery. GPA patients with sinus surgery had significantly higher (4.88, [2.04, 11.66]) NSP incidence than those without sinus surgery.

Conclusion:

Incident GPA encounter diagnosis is higher and earlier in patients with at least one CRS encounter diagnosis and sinus surgery. With higher risk for complications like NSPs, more awareness and research are needed to help identify these patients preoperatively.

Poster #054

Insight into the mutational landscape of sinonasal squamous cell carcinoma

Arash Abiri, MS
Brandon Lehrich, BS
Theodore Nguyen, MD
Benjamin Bitner, MD
Edward Kuan, MD, FARS
University of California, Irvine

Introduction:

Genetic mutations play a crucial role in the development and progression of sinonasal squamous cell carcinoma (SNSCC). Understanding how these mutations drive disease progression and impact patient survival can help guide cancer management and patient counseling.

Methods:

We queried the American Association for Cancer Research (AACR) Genomics Evidence Neoplasia Information Exchange (GENIE) database (v13.0-public), which is a publicly available cancer registry collecting de-identified clinic-genomic data across 19 cancer centers. Cox Proportional Hazards and Kaplan-Meier analyses were used to evaluate differences in all-cause mortality and overall survival (OS), respectively.

Results:

Of 59 SNSCC patients, 34 presented with primary malignancies, 10 (29.4%) of whom were female. The average age of this cohort was 58.4 ± 14.9 years, and the median tumor mutational burden (TMB) was 6 (range: 1-59). The 1-, 2-, and 5-year OS of the cohort was 88.2%, 56.1%, and 35.6%, respectively. The most common gene mutations were TP53 (38.2%), FANCA (17.6%), PIK3CA (17.6%), KMT2D (17.6%), and FBXW7 (14.7%). Higher TMB was associated with increased all-cause mortality (HR 1.077; 95% CI, 1.008-1.151; p=0.029). Tumors with TP53 mutations were associated with lower OS (p=0.046).

Conclusions:

Higher tumor mutational burden and TP53 mutation were found to be predictors of lower OS in patients with primary SNSCC.

POSTERS

Poster #055

Interleukin(IL)-4 induces loss of smell in mice without disrupting olfactory sensory neuron and epithelial integrity

Hamid Mattoo, Dr.
Yannis Hara, PhD
Mithilesh Kumar Jha, Dr.
Scott Nash, Dr.
Asif Khan, Dr.
Jamie Orengo, Dr.
Alexandra Hicks, Dr.
Sanofi

Background:

Recent studies in mice showed that administration of IL-4, but not IL-13, induces loss of smell, and IL-4 has a dominant effect on transcriptome, including activation of immune pathways and impairment of olfactory neuronal signaling. Here, we conducted histological analysis of the effects of IL-4 and IL-13 in the olfactory epithelium to further explore the mechanism of IL-4-evoked loss of smell.

Methods:

BALB/cJ mice received intranasal administration of IL-4 and/or IL-13 daily for 5 days and the olfactory epithelium subjected to histological analysis. Immunofluorescence was used to detect immune cell infiltration (anti-CD45, anti-CD68, and anti-tryptase for total immune cells, macrophages, and mast cells, respectively), apoptosis (anti-cleaved caspase-3), proliferation (anti-Ki67), immature olfactory neurons (anti-GAP43), mature olfactory neurons (anti-OMP), and horizontal basal cells (anti-Krt5).

Results:

IL-4, but not IL-13, induced significant infiltration of immune cells, including mast cells and macrophages. Neither cytokine induced apoptosis, affected immature or mature olfactory neuronal integrity, or altered basal cell proliferation.

Conclusions:

IL-4 administration elicits loss of smell in mice without inducing structural modification of the olfactory mucosa, suggesting that a direct effect of IL-4 on olfactory neuronal signaling may underlie this pathophysiology. Furthermore, inflammatory cell mechanisms may play an additional role in IL-4 evoked loss of smell.

Poster #056

Is it NPC? Endoscopic image recognition of NPC using narrowing band imaging versus white light using deep learning network analysis

Shuhui Xu, MBBS,MRCS(Ireland),MMed(ORL)
Chwee Ming Lim, Senior Consultant
Neville Teo, MBBS
Singapore General Hospital

Purpose:

Develop an AI model that assists in cancer detection in the post-nasal space during nasoendoscopic using narrow band imaging versus white light.

Method:

Nasoendoscopy of patients with and without NPC were recorded in both white light and narrow band imaging. From each video, image frames were sampled at 5 images per second and subdivided into sub-directories based on the light source and nasal region with malignant/normal annotations. Of the 82 videos, image frames from 63 videos (44 normal and 19 with malignant lesions) were used to train the AI model and images from 17 videos (12 normal and 5 with malignant lesions) to test the model performance. Convolutional Neural Networks (CNN) (ResNet18 and ResNet50), and a transformer model (ViT) were used in the experiments. As the dataset is severely long-tailed for both "all region" and "Post-nasal space" only region experiments, a class-balanced sampling approach was adopted during the training regimen. In all experiments, all models were trained based on binary cross-entropy loss and using adam optimizer. All experiments followed a batch size = 64, a learning rate = 1×10^{-6} and trained for 41 epochs. The model performances were evaluated based on accuracy, recall, precision and F1 score.

Results:

ResNet50 model trained using class-balanced sampling was observed to perform better than the model models. It was observed that the model trained on a white-light source image performed better than models trained on blue-light source images. When we consider the class-specific accuracy, the malignant lesion detection accuracy was 83.7%.

POSTERS

Poster #057
WITHDRAWN

Poster #058

Locally recurrent nasopharyngeal carcinoma treated with minimally invasive combined transoral robotic and transnasal endoscopic resection: A case report

Abdurrahman Al-Awady, Mr.

David Lerner, MD

Michael Berger, MD

Alfred-Marc Iloreta, MD

Scott Roof, Dr.

Background:

Recurrent nasopharyngeal carcinoma (NPC) after treatment with radiation represents a surgical challenge due to the close proximity to skull base structures and difficult access. Traditionally, open approaches were employed, but are associated with significant morbidity. We present a case of locally recurrent NPC involving the clivus which was resected using a combined transoral robotic and endoscopic transnasal approach.

Case:

Patient is 73 year old male with history of cT3N2M0 EBV-related nasopharyngeal squamous cell carcinoma treated with chemoradiation, which recurred locally in the left nasopharynx and clivus 7 months after completion of treatment. Resection was performed using a combined transoral robotic and endoscopic approach, achieving negative margins. The transoral robotic approach allowed excellent visualization of the inferior and lateral margins (torus tubarii). The transnasal endoscopic portion was used to accomplish the superior extent of the nasopharyngectomy and drilling of the clival bone. Reconstruction was performed with anterolateral thigh free fascial flap (ATL) combined endonasal and transoral corridor. Microvascular anastomosis employed facial vessels at the facial notch, avoiding a standard neck incision. Patient is currently with no evidence of disease, velopharyngeal insufficiency or aspiration.

Discussion:

We present a case in which a combined transoral robotic and transnasal endoscopic approach was used to accomplish a salvage nasopharyngectomy. Reconstruction was performed using an ATL free fascial flap, with minimal invasive microvascular anastomosis. This combined approach allowed for superior visualization of the salvage resection as well as a minimally invasive reconstruction.

POSTERS

Poster #059

Long term quality of life among patients undergoing endoscopic pituitary gland surgeryNarin N. Carmel Neiderman, MD, MSc
TASMC

Introduction:

The endoscopic approach to Pituitary adenoma resection is less aggressive associated with decreased morbidity, yet to date it was not evaluated for long term nasal and tumor related quality of life (QOL).

Objective:

To evaluate long term quality of life in patients after endoscopic endonasal resection of pituitary tumors and detect predictors for poor quality of life.

Materials and Methods:

Prospective cohort study of all patients with pituitary adenomas who underwent transsphenoidal 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 prior to surgery, and 1, 2 and 3 to 5 years after surgery. Demographic and clinical data was collected.

Results:

Our study included 43 patients. The overall ASBS-Q and SNOT-22 scores did not decrease throughout the duration of the study. SNOT-22 Score difference between baseline and the year 1,3,5 was found to be 0.81[-4.84-6.58], 3.35[-4.32-11.02], 3.73[-2.22-9.68] accordingly, and were not found statistically significant. ASBS-Q score difference also did not alter significantly (0.24[0.02-0.45], 0.18[-0.05-0.404], 0.101[-0.12-0.32] accordingly). Factors such as secreting and non-secreting tumors, tumor size, intraoperative cerebrospinal fluid leak, gross tumor resection, endocrine remission, and the use of nasoseptal flap reconstruction did not have a significant effect on QOL.

Conclusion:

Patients undergoing extended endoscopic approach for pituitary lesions maintained high nasal and and tumor related QOL in the 5 post-operative years.

Poster #060

WITHDRAWN

POSTERS

Poster #061

Metastatic anterior skull base adenocarcinoma presenting as hearing loss

Margaret Mitchell, MD, MS-HPED

Lillian Dattilo, Dr.

Obinna Nwosu, Dr.

Bradley Welling, Dr.

Eric Holbrook, MD, FARS

Harvard Medical School/Mass Eye and Ear

Objective:

To describe a case of metastatic adenocarcinoma to the cribriform plate region and leptomeninges presenting as bilateral hearing loss.

Methods:

Retrospective chart and histopathological review were utilized.

Results:

A 62 year-old man presented to the emergency department with two months of progressive bilateral hearing loss, otalgia, and imbalance. His otologic exam was normal with audiogram demonstrating bilateral profound sensorineural hearing loss. He underwent CT imaging which showed no abnormalities of temporal bones but abnormal demineralization of the right fovea ethmoidalis and cribriform plate; MRI then demonstrated an enhancing lesion in this region extending intracranially as well as multiple nodularities of his anterior skull base and along cranial nerves III, V, VIII, IV and X. CSF fluid analysis was without diagnostic results.

He was thus taken to the operating room for endoscopy and biopsy of his right olfactory cleft region which was notable for polypoid edema. Final pathology returned as mucinous adenocarcinoma with signet ring features concerning for metastatic spread of a gastrointestinal primary malignancy. Subsequent imaging with PET CT revealed moderate uptake in the sigmoid colon. Given the leptomeningeal spread of the metastatic lesion, the patient underwent whole brain palliative radiation with plan for subsequent systemic chemotherapy pending further workup findings of the GI primary.

Conclusions:

This case demonstrates a metastatic skull base lesion presenting with an unusual symptom of bilateral hearing loss requiring endoscopic biopsy for diagnosis.

Poster #062

Mutational landscape and predictors of survival in sinonasal undifferentiated carcinoma

Brandon Lehrich, BS

Arash Abiri, MS

Theodore Nguyen, BS

Edward Kuan, MD, FARS

Background:

Sinonasal undifferentiated carcinoma (SNUC) is a rare primary neuroendocrine tumor of the nasal cavity and paranasal sinuses with limited data available on the mutational landscape and genetic drivers of disease.

Methods:

We interrogated the publicly available American Association for Cancer Research (AACR) Genomics Evidence Neoplasia Information Exchange (GENIE) database (v13.0-public) which is a cancer registry collecting de-identified clinic-genomic data across 19 cancer centers. Kaplan-Meier log-rank test was used to evaluate differences in overall survival (OS).

Results:

Of the 2,200 head and neck cancer patients, 25 (1.1%) had SNUC. The average age of the cohort was 52.4 +/- 17.9 years. The average tumor mutational burden (TMB) was 6.7 +/- 3.7. The 1-, 2-, and 5-year OS rates were 67.3%, 35%, and 29.1%, respectively. The most commonly mutated genes were TP53 (n=10; 40%), IDH2 (n=8; 32%), ARID2 (n=4; 16%), and PIK3CA (n=3; 12%). Only 1 (4%) patient had a mutation in SMARCA2, and 1 (4%) patient had a mutation in SMARCB1. Of the 8 patients with IDH2 mutations, 6 (75%) had R172S mutation, 1 (12.5%) had R172T, and 1 (12.5%) had R172M mutation. There were no differences in OS for TP53 mutated vs wild-type (p=0.34) and ARID2 mutated vs wild-type (p=0.22) patients; however, there was a trend towards increased OS in IDH2 mutated vs wild-type (p=0.056) patients. There was improved OS for patients with high vs low TMB (p=0.0019).

Conclusions:

SNUC diagnosis and classification of disease remains challenging, but high mutational burden may impact survival through higher likelihood of actionable mutations.

POSTERS

Poster #063

Nasal septal perforation endoscopy score correlates with symptom burden in patients with nasal septal perforations

Amar Miglani, MD
 India Rangel
 Cody Smith, MD
 Bansberg Stephen, Consultant
 Michael Marino, MD, FARS
 Mayo Clinic Hospital, Phoenix, AZ

Background:

Nasal septal perforations (NSP) are a heterogeneous group of disorders that may present with varying degrees of inflammatory changes observed during endoscopic examination. Recently, a validated NSP endoscopic scoring system was developed demonstrating fair-to-moderate interrater agreement and substantial intrarater agreement. The objective of this study was to determine correlation of NSP endoscopy scores with patient-reported symptoms.

Methods:

Video nasal endoscopy recordings were obtained for patients with NSP. Nasal endoscopies were independently reviewed using previously validated NSP endoscopy scoring system for the following physical exam findings: edema, crusting, scarring, granulation tissue, and septal deviation. Scoring for each exam finding was reported on a 3-point scale. Endoscopy scores were correlated with the NOSE-perf scores – a validated patient-reported outcome measure assessing NSP symptom burden.

Results:

Video nasal endoscopies for 33 patients with NSP were reviewed. The mean (+ SD) NOSE-perf score and mean (+ SD) NSP endoscopy score were 20.5 (+ 9.1) and 5.6 (+ 2.7), respectively. The NSP endoscopy scores were moderately correlated with NOSE-perf scores ($r=0.44$) ($p=0.008$).

Conclusion:

NSP endoscopy score is a validated endoscopic scoring system to assess NSP inflammatory changes. NSP endoscopy correlates moderately well with patient-reported symptoms. The NOSE-perf score and NSP endoscopy score may be useful tools for standardized assessment of NSP outcomes.

Poster #064

New techniques of reducing intraoperative bleeding in endoscopic sinus surgery for eosinophilic chronic rhinosinusitis cases with asthma

Yoichiro Narikawa, MD
 Yasuyuki Hinohira, Professor
 Naruo Shoji
 Takatoshi Tokudome
 Sei Kobayashi, Associate Professor

Introduction:

Eosinophilic chronic rhinosinusitis (eCRS) is known as refractory sinusitis with nasal polyps showing remarkable eosinophil infiltration. Nasal polyps frequently recur in eCRS cases with bronchial asthma even if endoscopic sinus surgery (ESS) was performed on. eCRS cases with asthma are classified into severe type by Japanese epidemiological study. Intraoperative bleeding disturbing surgical field is a significant factor to cause recurrence in surgical treatment of eCRS. Our new techniques of reducing intraoperative bleeding in ESS are shown, and the outcome is compared with previous method.

Cases & methods:

ESS was performed on 39 eCRS cases with asthma, under general anesthesia and image-guided system. Prior to ESS procedure, 1% lidocaine with 1:100,000 epinephrine was injected around sphenopalatine artery (SPA) and Ager nasi. In 20 cases (new group), hydrophilic urethane sponge (HUS) dipped in 0.1% epinephrine was put on the region injected for 3 to 5 minutes. After removing HUS, the contracted blood vessels in the mucosa were cauterized. SPA was also cauterized after dissected and identified. HUS was used for reducing bleeding instead of tampon gauzes on demand during surgery. In the remaining 19 cases (previous group), only regional injection and tampon gauze hemostasis were done during surgery.

Outcomes and conclusion:

No complication was found during and after surgery in all cases. Intraoperative bleeding was statistically reduced in the new group from 194.8 to 97.5 ml, compared with the previous group. Our new techniques of reducing intraoperative bleeding in ESS for severe ECR cases is considered as acceptable.

POSTERS

Poster #065
WITHDRAWN

Poster #066

Novel use of urinalysis dipsticks for differentiating patients with diverse sinusitis complaints

Michela Borrelli, BA
 Martin Hopp, MD, PhD
 Sarah Ustrell
 Jonathin Raskin
 Tasha Nasrollahi
 Cedars Sinai Medical Center

Introduction:

Various clinical diagnoses present themselves to ENT clinics with nonspecific “sinus” symptoms that require an in-depth history and physical exam for proper diagnosis. To make an accurate diagnosis, most physicians use costly diagnostic testing such as nasal endoscopy and computed tomography to differentiate between various clinical diagnoses. The objective of our study was to determine if using a urine dipstick provides a cost-effective tool that could help differentiate between the multitude of “sinus” disorders in otolaryngology clinics.

Methods:

Patients presenting with “sinus” complaints were prospectively enrolled in this IRB-approved study with a goal of 100 patients in total. Nasal mucus was sampled using a nasal culture swab from each patient that presented to the otolaryngology clinic. These cultured swabs were subsequently placed on a urinalysis dipstick to assess for leukocytes, nitrites, protein, and pH. Results were converted to a numerical score. Lund-Kennedy nasal endoscopy scores and Lund-McKay CT scores were documented when available. The final clinical diagnoses were recorded after the standard testing was completed.

Results:

Significant findings include reporting that ARS vs. normal using the whole dipstick score was significant. ARS vs. normal using the leukocyte value was close to significant with a p-value = 0.055. Further stat analysis may be valuable if a higher dipstick score correlates to a higher Lund-McKay score for all comers.

Conclusions:

Urinalysis dipsticks may be an incredibly valuable and cost-effective tool not only in the otolaryngology specialty but in many other specialties as well.

POSTERS

Poster #067

Olfaction and neurocognition after COVID-19: A scoping review

Brandon Vilarello, BA
 Patricia Jacobson, Medical Student
 Jeremy Tervo, Medical Student
 Nicholas Waring, Medical Student
 David Gudis, MD, FARS
 Terry Goldberg, Professor
 D. P. Devanand, Professor
 Jonathan Overdeest, MD
 Columbia University Vagelos College of Physicians and Surgeons

Introduction:

COVID-19 can include symptoms reflective of acute and chronic neurological changes. Prior research has identified that chemosensory changes, particularly olfactory loss, may reflect greater, central neurological dysfunction in neurodegenerative diseases like Alzheimer's. This review examines current literature to look at the relationship between neurocognition and olfaction in otherwise healthy, young to middle-aged adults following COVID-19.

Methods:

A systematic literature search of PubMed, Ovid Embase, Web of Science, and Cochrane Library was conducted with bibliographic review, per PRISMA-ScR guidelines. Published studies underwent title/abstract and full-text screening to identify those evaluating the coincident outcomes of cognition and olfactory deficits.

Results:

Seventeen studies were eligible for data extraction after the review process. Eleven studies found statistically significant poorer cognition in those suffering from olfactory dysfunction. Three studies showed no association, and one study reported lower anosmia prevalence in patients with cognitive impairment.

Conclusion:

To date, the majority of studies suggest that olfactory dysfunction is associated with poorer cognition. Higher level of evidence studies are needed to further elucidate the relationship between olfaction and cognition following COVID-19 illness.

Poster #068

Open access artificial intelligence and rhinology patient education

Alice Huang, MD
 Michael Chang, MD
 Jayakar Nayak, MD, PhD
 Peter Hwang, MD, FARS
 Zara Patel, MD, FARS

Background:

ChatGPT is a language processing tool launched by OpenAI, with more than 100 million users as of January 2023. This powerful artificial intelligence (AI) tool has unknown accuracy or reliability in medical settings. This study sought to analyze the accuracy of ChatGPT-generated responses to common rhinologic patient questions.

Methods:

Four rhinologists developed consensus a priori on responses to a list of 10 common questions from rhinology patients. The questions were posed to ChatGPT, with responses individually graded by the surgeons on a scale of 0 to 3: 0=incorrect information that could lead a patient to miss or misunderstand a potential diagnosis, or imply a treatment option that is not correct or possible; 1=incorrect information that would not significantly change a patient's understanding, OR correct but incomplete information; 2=complete and correct information; 3=correct information beyond the "expert" response.

Results:

Mean grade for ChatGPT responses was 1.65. For 3 questions, raters agreed that ChatGPT responses were equal to or better than expert responses. For 6 questions, ChatGPT provided responses that were incorrect or incomplete based on at least 2 rhinologists' scores, with 4 rated this way by mean rater grades. Interclass correlation coefficient (ICC) was 0.602, indicating only moderate reliability among raters.

Conclusion:

Open access AI tools will be resources for patients seeking health information. This preliminary study of ChatGPT responses to rhinologic questions demonstrates mixed accuracy and completeness as well as provision of incorrect information in some cases. Patient education and further study is needed to understand the limitations, role, and impact of this technology.

POSTERS

Poster #069

Optimizing strategy for pre-operative sinonasal irrigation through 3D Printing

Kanghyun Kim, BS

Raymond Wen

Kai Zhao, Associate Professor

The Ohio State University

Background:

While topical sinus irrigation remains a key strategy in management of sinonasal disease, the variability in nasal structure among patients often demands an individualized strategy. We investigate different permutations of irrigation strategy to optimize outcomes through 3D printing.

Methods:

Eleven pre-operative models were 3D printed with a FormLabs Form 3 SLA printer based on individual CT scans. Irrigations were performed by squeeze bottle through a silicon putty water tight seal. The four head positions of 45° to-the-side, 90° to-the-side, 45° forward and 45° to-the-side and 45° forward were filmed, with varying fluid entry through the upper (conventional) or lower (backfill) nostril.

Results:

Due to restrictive ostia, all models showed filling of the maxillary sinus only. Among the different head positions, optimal penetration was recorded for 90° to-the-side backfill (n=6), 90° to-the-side conventional (n=4), 45° to-the-side backfill (n=2), 45° to-the-side conventional (n=2), 45° forward and 45° to-the-side backfill (n=3), and 45° forward (n=1). The average penetration score for the optimal position across all models was significantly higher ($p < 0.05$) for all head position permutations with the exception of 90° to-the-side backfill, which saw a notable but not significant increase.

Conclusions:

Nasal anatomy variation among patients is not conducive to a one-size-fits-all irrigation strategy. Even though 90° to-the-side backfill showed the highest average score among the standard positions, optimal individualized head positions demonstrated a higher average score. Therefore, 3D printing can serve as a method to identify an individual optimal strategy and improve irrigation outcomes.

Poster #070

Oral corticosteroid (OCS) burden and healthcare resource utilization (HCRU) in patients with chronic rhinosinusitis with nasal polyps (CRSwNP) undergoing functional endoscopic sinonasal surgery (FESS): A US real-world retrospective cohort study

Stella Lee, MD

Danielle Isaman, Ms.

Asif Khan, Dr.

Anju Peters, MD

Peter Hwang, MD, FARS

Sietze Reitsma, MD

Natalia Petruski-Ivleva, Dr.

Scott Nash, Dr.

Juby Jacob-Nara, Dr.

Sanofi

Background:

The impact of FESS on OCS burden and HCRU for patients (pts) with CRSwNP is understudied.

Methods:

Retrospective cohort study of adult CRSwNP pts undergoing vs not undergoing FESS, using US claims data (Optum; 2011–2021). Pts were propensity score matched to adjust for confounding. OCS burden (cumulative dose in mg prednisone equivalents), other medications, procedures/diagnostic tests, HCRU, and costs were compared among FESS vs non FESS pts in the 1 year post index date. Intervention/follow-up periods were defined as Day 0–44/45–365, respectively.

Results:

Each group included 8,909 pts. During follow-up, OCS cumulative dose was 18% lower in FESS vs non-FESS pts (mean difference in mg prednisone equivalent dose: -40 mg [95% CI -64 to -16] per pt). In pts who filled an OCS prescription (34.6% [FESS] vs 36.0% [non-FESS]), OCS burden remained high in both groups (mean [SD] cumulative dose: 521 [786] vs 612 [906] mg). Mean total healthcare costs in FESS vs non-FESS pts were \$28,832 vs \$2,537 per pt during the intervention period, but similar during follow-up (\$15,659 vs \$15,926, respectively). During follow-up, HCRU was similar between FESS and non-FESS pts, except that FESS pts had higher odds of visiting an otolaryngologist (odds ratio [OR] 2.9 [95% CI 2.7, 3.1]). FESS pts had higher odds than non-FESS pts of polypectomy (OR [95% CI] 5.7 [4.9, 6.7]) and airway endoscopy (3.6 [3.4, 3.9]) during follow-up. Overall, 20.7%, 22.5% and 29.2% of all pts filled a prescription for leukotriene antagonists, NSAIDs, and oral antibiotics during follow-up, respectively.

Conclusion:

In real-world US practice, pts with CRSwNP who underwent FESS had similar OCS and HCRU burden to those who did not, and similar costs during follow-up.

POSTERS

Poster #071

Paranasal sinus and nasal cavity squamous cell carcinoma and adenocarcinoma: A SEER database analysis

Lacy Brame, DO
 Spencer Hall, MPH
 Daniel Zhao, PhD
 Aniruddha Parikh, MD
 Kibwei McKinney, MD
 Lurdes Queimado, MD, PhD
 Oklahoma State Center for Health Sciences

Background:

Paranasal sinus malignancies are rare and make up 3% to 5% of head and neck cancers in the United States. They are aggressive malignancies with poor prognosis. Previous studies have reported poorer survival with advanced age, stage, and other social factors. In our study, we sought to identify factors associated with worse survival for squamous cell carcinoma (SCC) and adenocarcinoma (AC) specifically.

Methods:

Data was collected from the Surveillance, Epidemiology, and End Results (SEER) database from 2000-2019. SCC and AC of the paranasal sinuses and nasal cavity were included in the study. Variables such as gender, age, marital status, income, race, and stage were collected. Kaplan-Meier curves were generated and log-rank tests were performed to analyze variables associated with survival.

Results:

A total of 5,810 individuals with SCC and 84 individuals with AC of the nasal cavity and paranasal sinuses were identified. Sixty-six percent of patients were male and 87% were older than 50 years. Median overall survival was 53 and 133 months for SCC and AC patients, respectively. Among SCC, survival was significantly different by age ($p < 0.0001$), race ($p < 0.0001$), marital status ($p < 0.0001$), and stage ($p < 0.0001$). No significant differences in survival were identified by income or gender.

Conclusions:

Consistent with the literature, overall survival was higher for AC than for SCC patients. Of importance, this analysis demonstrated that several individual factors such as age, race, marital status, and stage impact survival. Understanding the factors associated with poor survival from these tumors will aid in guiding treatment and understanding disparities that exist among this patient population.

Poster #072

Perioperative strategies for improving quality of life and sinonasal morbidity after endoscopic skull base surgery: A systematic review

Satyan Sreenath, MD
 Walter Fitschen, Medical Student
 Elisa Illing, MD, FARS
 Vijay Ramakrishnan, MD, FARS
 Jonathon Ting, MD, FARS
 Indiana University School of Medicine

Background:

Though the endonasal corridor in endoscopic skull base surgery (ESBS) avoids invasive approaches, significant postoperative morbidity exists. Several studies have explored surgical techniques, nasal dressings, and perioperative management for optimizing quality of life (QOL) following ESBS. This systematic review provides a global understanding of strategies for optimizing sinonasal healing and morbidity following ESBS.

Methods:

Using PRISMA guidelines, PubMed, Ovid, and Cochrane databases were searched for articles reporting QOL measures and/or endoscopic grading of sinonasal healing after ESBS. Articles were stratified based on intervention including operative technique, donor site grafting after nasoseptal flap (NSF) harvest, nasal dressings, and use of topical irrigations.

Results:

27 studies comprising 1775 patients were included. QOL measures included the ASK-12, SNOT-22, and olfactory testing. Endoscopic grading of healing was scored on Likert and visual analog scales. Modifications to the EEA with preservation of sinonasal structures decreased morbidity with improved QOL. Reconstructive techniques and grafting of the NSF donor site improved mucosalization rates and decreased crusting. Few studies exist on the impacts of nasal dressings and nasal irrigation on healing and QOL.

Conclusions:

This systematic review provides a landscape of current techniques for improving QOL and morbidity after ESBS. Modifications to the EEA and grafting approaches allow for preservation of sinonasal structures with the intent of decreasing crusting and preserving mucociliary function. Further study is required to understand the impact of intranasal dressings and nasal irrigations on postoperative QOL following ESBS.

POSTERS

Poster #073

Predictors of headache/facial pain associated with cryotherapy ablation of the posterior nasal nerve for the treatment of chronic rhinitis

Samuel Razmi, BS
 Daniel Gorelik, Research Fellow
 Yuki Yoshiyasum, Resident
 Masayoshi Takashima, MD, FARS
 Omar Ahmed, MD, FARS
 Texas A&M School of Medicine

Cryotherapy ablation of the posterior nasal nerve is an effective treatment for patients with chronic rhinitis but is associated with postoperative headache/facial pain in some patients. The purpose of this study is to understand factors that may be associated with this complication.

Patients who underwent cryotherapy ablation at a single institution from January 2021 to January 2023 were included. Demographics and information regarding clinical characteristics were collected and reviewed. Mann-Whitney U and Chi-square tests were used to assess significance in quantitative and categorical data, respectively ($\alpha = 0.05$).

29 patients underwent cryotherapy ablation. None of these patients received preoperative pain medication. Thirteen (44.8%) patients reported having a severe headache/facial pain occurring immediately after the procedure, with a mean duration of 57.1 minutes (SD=50.5). The average age of patients experiencing this adverse event was 53.4 years (SD=21.5) which was significantly lower ($p=0.03$) than patients who did not experience headache/facial pain (69.9 years, SD=9.4). Headaches/facial pain occurred most in Caucasians (84.6%) and females (65.1%), but neither association was statistically significant ($p>0.05$). There was no association of previous medication use or sinus surgery, nor smoking status with headaches/facial pain.

Postoperative headaches/facial pain are more common in our cohort compared to previously reported rates in the literature. In our sample, younger age appears to play a significant role in likelihood of headache/facial pain. Physicians should consider this factor when counseling patients, though larger studies are needed to confirm these findings.

Poster #074

Predictors of surgical intervention in children with complicated orbital cellulitis

Erica McArdle, MD
 John Behnke, Resident
 Amani Kais, Post Graduate Research Fellow
 Chadi Makary, MD, FARS
 Hassan Ramadan, MD, FARS
 West Virginia University

Background:

Orbital cellulitis in children, while rare, can lead to serious complications, sometimes requiring surgical intervention.

Objective:

To evaluate specific variables at presentation that can predict when surgical intervention will be required for pediatric orbital cellulitis.

Methods:

Retrospective case-control study of children referred to West Virginia University children's hospital from January 2012 to July 2022 was performed. Children who were diagnosed with preseptal cellulitis, orbital cellulitis, and orbital abscess were included. Diagnosis was based on clinical presenting symptoms, physical exam findings and CT imaging. Patients' characteristics, CT imaging, inflammatory markers and associated acute bacterial rhinosinusitis were reviewed. Orbital cellulitis secondary to trauma, tumor, cutaneous infection were excluded.

Results:

118 children were identified. Mean age was 7.3 years and 65 (58.1%) were males. Mean Lund-McKay (LM) CT score was 5.3. 53 (44.9%) children had orbital cellulitis/abscess with the remaining having preseptal cellulitis. 18 (15.3%) children required surgery; 17 (94.4%) were for orbital abscess and 1 (5.6%) for pre-septal cellulitis ($p<0.0001$). Univariate analysis showed a high CRP, large abscess volume, female gender, high LM CT score, older age were predictors of surgery. Multivariate logistic regression analysis showed age older than 10 years, LM CT score higher than 5, female gender, large abscess volume were predictors of surgery.

Discussion:

Females older than 10 years, large abscess, high LM CT score had higher rates of surgery for complicated orbital cellulitis. This may be valuable for clinical decision making in attempt to provide timely care and reduce length of stay.

POSTERS

Poster #075

Proof of concept: How to use Zoom to set up a remote telementoring experience for teaching endoscopic sinus surgery

Angela Yang
 Rachel Daum
 Michael Yong, Dr.
 Michael Chang, Dr.
 Peter Hwang, MD, FARS

Background:

Remote surgical training remains an unmet need in the field of rhinology. This is especially valuable for learners who are geographically distant from highly-skilled instructors. Our study aimed to validate a telementoring model for endoscopic sinus surgery (ESS), and develop an accurate description of the technical setup.

Methods:

Surgical trainees at Stanford University (SU) underwent live-virtual teaching sessions of ESS taught by a remote mentor. An endoscopic view of the surgery was live-streamed through Zoom, a secure cloud-based video platform. Interviews were conducted and surveys were administered to trainees and mentors after each session.

Results:

2 post-graduate senior surgical resident trainees and 2 remote mentors were included, and a total of 4 live-virtual sessions were conducted. Surgical trainee and mentor satisfaction for the in-progress model were moderate. Participants indicated that the experience approximated in-person mentorship moderately well, with all participants indicating that they would use the system again for remote mentoring. Highlights from interviews included the good audio quality and the ability for remote 2-way feedback through both still-image capture and telestration. Live annotation was noted to be better than still-image capture, and occasionally better than in-person verbal guidance. Areas for improvement included ergonomics of screen placement, video lag, and video resolution.

Conclusion:

ESS lends itself well to live-telementoring, with the operative field being projected remotely through a high-definition endoscope with 2-way audio and video feedback. Establishment of a reliable telementoring model will aid future surgical training as the set-up improves over time.

Poster #076

Purasinus, a novel self-assembling peptide, in a draf-III frontal sinusotomy

Kaitlyne Pak, MD
 Arthur Wu, MD, FARS
 Dennis Tang, MD, FARS
 Cedars Sinai Medical Center

Introduction:

Stenosis and adhesions are known complications in a Draf-III frontal sinusotomy. Various techniques have been proposed to maintain patency but no technique has been proven as more superior. RADA16 hydrogel is a self-assembling synthetic peptide shown to promote wound healing and prevent adhesion formation. RADA16 has been studied in animal models, which shows wound healing and tissue regeneration properties through creation of an extracellular matrix; however, there's a paucity of described application in patients. Presently, there are no reports of RADA16 use in a Draf-III frontal sinusotomy. We report two successful cases of a patient with history of chronic rhinosinusitis who underwent sinus surgeries with Draf-III frontal sinusotomies.

Cases:

A 59F with aspirin-exacerbated respiratory disease presented with recurrent polyps. A revision sinus surgery was performed with a Draf-III using RADA16 and a steroid eluting stent in the Draf-III cavity. At 3 week postop, there was no exposed bone and the cavity remained widely open with minimal debridement. Cavity was patent at 2 months postop. A 62M with recurrent nasal polyps with prior sinus surgery presented with recurrent polyps. He underwent a Draf-III and RADA16 and silastic stents were placed. The silastic stent was removed at 2 weeks postop. No exposed bone was seen and the cavity remained widely open. At 5 months, the cavity remained open, but polyps had recurred and were managed with biologic injections.

Conclusion:

We present the first described cases of using RADA16 after a Draf-III in combination with both dissolvable and nondissolvable stents. This technique can help in accelerating mucosalization of denuded bone during sinus surgery.

POSTERS

Poster #077

Radiographic enhancement of the longus colli muscle in skull base osteomyelitis

Grant Owen, BA

Peter Filip, MD

Alana Ravasio, Medical Student

Jamie Masliah, Resident

Peter Papagiannopoulos, MD

Bobby Tajudeen, MD, FARS

Rush Medical College, Rush University Medical Center

Introduction:

Several radiographic findings have been reported in skull base osteomyelitis (SBO). However, the role of longus colli muscle enhancement has not been reported. This study aimed to determine the frequency of longus colli muscle enhancement on imaging in SBO.

Methods:

A retrospective institutional chart review examined patients with SBO between January 2017 and February 2023. Along with demographic information, computerized tomography (CT) and magnetic resonance imaging (MRI) reports were reviewed for infection location (rhinologic origin, otologic origin, other origin) and longus colli enhancement. Scans reporting enhancement of the longus colli, prevertebral musculature, or prevertebral space were considered positive. Fisher's exact test was used to compare rates of enhancement by infection location.

Results:

22 patients with confirmed SBO were included, average age was 69.1 years (range 23-89 years). Otologic origin was the most common site of infection (n=9, 40.9%), followed by rhinologic (n=8, 36.4%) and other origin (n=5, 22.7%). Longus colli enhancement was observed in 11 patients (50.0%), with most being rhinologic origin (n=8) followed by otologic (n=2) and other origin (n=1). The rate of longus colli enhancement was significantly higher in rhinologic origin compared to otologic and other origins (100.0% vs 22.2% vs 20.0%, p=0.001). CT was positive in 4 of 9 cases, while MRI was positive in 9 of 11 cases.

Conclusion:

This case series suggests a potential link between longus colli muscle enhancement on radiographic imaging and SBO, particularly in cases of rhinologic origin. Further research is needed to determine biostatistical significance and overall clinical utility of this finding.

Poster #078

Rare case of a giant disfiguring frontal sinus mucocele causing globe subluxation

Caroline Christmann, MD

James Eng, Dr.

Sunthosh Sivam, Dr.

Baylor College of Medicine

Background:

Mucoceles are expansile lesions of the paranasal sinuses that may cause compression and remodeling of surrounding structures. Giant mucoceles are rare but may cause vision impairment, erosion of the anterior and posterior tables, and disfigurement.

Learning Objectives:

Understand the natural history of mucoceles, discuss multidisciplinary approaches to repair, and identify open approaches that best preserve future cosmesis.

Methods:

The case of a 28-year-old male with a frontal sinus mucocele was reviewed. A literature review was performed to find similar cases of frontal mucoceles with orbital complications.

Results:

The patient presented with a 7-year history of an enlarging forehead mass causing compression of the nasal bones and subluxation of the right globe with exposure keratopathy, microbial keratitis, and corneal perforation. CT scan revealed a 15.8x11.8x10.0cm frontal mucocele with foci of posterior table erosion and an eggshell remnant of the anterior table. The patient underwent emergent open resection, including frontal sinus obliteration and reconstruction with titanium mesh by Facial Plastics and Reconstructive Surgery. Neurosurgery assisted with posterior table repair, and Oculoplastic Surgery performed a temporary tarsorrhaphy.

Conclusion:

Giant frontal sinus mucoceles are rare, with only one other case report of a frontal mucocele causing globe subluxation. Multidisciplinary management in an open approach to the frontal sinuses was critical in providing a safe outcome and creating the foundation for a cosmetic result in subsequent stages.

POSTERS

Poster #079

Readability and quality analysis of patient education materials in aspirin exacerbated respiratory disease

Kush Panara, MD
 Daniel Lee, Fellow Physician
 Elysia Grose
 Jenelle Safadi
 Jennifer Douglas, Fellow Physician
 Michael Kohanski, MD, PhD
 James Palmer, MD, FARS
 John Lee, MD
 Nithin Adappa, MD, FARS
 John Bosso, MD

Background:

Aspirin exacerbated respiratory disease (AERD) is a complex disease that requires patients to strictly adhere to treatment regimens for successful outcomes. Therefore, patient education is integral in the successful management of AERD. We aim to evaluate the readability and quality of online patient education material (PEMs) on AERD.

Methods:

An online search for PEMs on AERD was conducted. PEMs were categorized based on origin from either academic medical institutions/hospitals or government, private, or professional organizations. Readability was evaluated with the Flesch-Kincaid Grade level (FKGL), Flesch Reading Ease (FRE), Coleman Liau Index (CLI), and SMOG Index. The DISCERN tool with two raters was used to calculate quality. Summary statistics were calculated and unpaired two-tailed t-tests was used to evaluate continuous variables.

Results:

Out of 99 initial results, a total of 34 PEMs were included after excluding non-education materials. The average FRE score was 39.6 equivalent to a "difficult" interpretation. The average grade level of the PEMs was above the twelfth grade with FKGL, CLI and SMOG index. Most of the studies (26/34, 76.4%) had DISCERN scores indicative of good or excellent quality. There were no significant differences between PEMs originating from medical institutions and PEMs originating from other sources in terms of quality or readability.

Conclusion:

PEMs on AERD are good or excellent quality. However, the interpretation of the educational material may be difficult to comprehend for an average individual. We highlight the need for quality improvement and optimization of readability of PEMs.

Poster #080

Real-world effectiveness of Mepolizumab on upper and lower airway diseases

Jonathan Bernstein, Dr.
 Elizabeth Packnett, Ms.
 Carolyn Lew, Dr.
 Yvonne Robles, Ms.
 Arjita Deb, Dr.
 University of Cincinnati

Background:

Asthma and nasal polyps (NP) frequently co-occur, share similar pathophysiology, and incur considerable airway disease burden, including OCS exposure. In this study we evaluated the effectiveness of mepolizumab in a real-world population of patients with comorbid asthma and NP.

Methods:

MarketScan Commercial and Medicare Databases were used to study 189 patients with comorbid asthma and NP who initiated mepolizumab between November 2015 and September 2020, ≥ 18 years of age at mepolizumab initiation (index date), and 12 months continuous enrollment before and after the index date. NP and asthma outcomes, adherence and persistence following mepolizumab initiation, were compared in the 1-year baseline and variable follow-up period with a post-hoc analysis comparing outcomes in the first year of follow-up to the 1-year baseline.

Results:

On mepolizumab, patients experienced fewer asthma-related exacerbations compared to baseline (first year of follow-up: 54.7% relative reduction, $p < .001$; variable follow-up: 61.6% relative reduction, $p < .001$). Sinus surgeries per patient per year (PPPY) decreased by 14.7% in the first year of follow-up and by 51.6% during the variable follow-up ($p < .001$) from baseline. The OCS mean daily-dose decreased by 76.9% in the first year of follow-up and by 81.1% during the variable follow-up ($p < .001$). OCS bursts PPPY decreased by 58.8% in the first year of follow-up and by 61.7% during the variable follow-up ($p < .001$). Nearly $\frac{3}{4}$ of patients were persistent (74.1%) and 67.2% were adherent to mepolizumab in the first year following initiation.

Conclusion:

Mepolizumab treatment in comorbid patients correlated with clinically impactful outcomes for upper and lower airway disease.

POSTERS

Poster #081

Reconstruction of sellar defects with laterally-pedicled native sphenoid sinus mucosa

Samuel Floren, MD
Merica Xiong
Timothy McCulloch
Azam Ahmed
Ian Koszewski, MD, FARS
University of Wisconsin

Background:

While purely endoscopic endonasal approaches to the sella turcica have emerged as a favorable option for resection of most pituitary tumors, optimal reconstruction after transsphenoidal pituitary surgery remains poorly established. Goals of reconstruction include avoiding complications such as postoperative CSF leak, minimizing short- and long-term morbidity, and optimizing sinonasal functional outcomes. Here we describe a single-institution experience of a novel reconstructive technique using laterally-pedicled native sphenoid mucosal flaps.

Methods:

A retrospective single armed chart review was performed of all patients who underwent primary transsphenoidal pituitary resection with reconstruction using the described pedicled septal mucosal flaps between the dates of 01/01/2018 and 02/02/2023.

Results:

44 patients underwent the above-described reconstruction with an average age of 53 (range: 25-77) and an average tumor size of 2.0 cm (range: 0.4-4.5cm). No patients developed postoperative CSF leak. There was one complication of postoperative pneumocephalus after aggressive nasal blowing. 9 patients (20%) used topical corticosteroids in the postoperative setting, compared to 6 patients (14%) pre-operatively. For patients who completed a postoperative Sino-Nasal Outcome Test-22, the average score 2 months postoperatively was 18.

Conclusions:

In appropriately selected patients, the use of laterally-pedicled native sphenoid mucosal flaps is a safe, effective, and intuitive reconstructive adjunct for small to medium sized sellar lesions.

Poster #082

Referral patterns: Number of providers and duration of loss before definitive intervention for olfactory disorders

Bruna Castro, MD
David Grimm, BS
Lei Shi
Farideh Hosseinzadeh, MD
Zara Patel, MD, FARS
Stanford University School of Medicine

Background:

Patients with olfactory disorders (OD) often first present to primary or urgent care settings. However, knowledge about recommended treatment options in this setting may vary. This study sought to evaluate the referral pattern and management of patients with OD before being seen by a smell expert.

Methods:

Retrospective cohort study in a tertiary care center. Adult patients seen between 2016-2022 with anosmia, hyposmia, parosmia or phantosmia with a documented psychophysical smell test were identified by diagnosis codes. Demographic and other patient factors, well as etiology, treatment options tried at each provider, and University of Pennsylvania Smell Identification (UPSIT) scores were collected.

Results:

A total of 100 patients were included, with 53 female, 47 male and 1 unknown gender. The mean age was 57 years old (range: 24-90). UPSIT mean score was 19.58 (range: 4-39). Post viral infection was the principal cause of smell loss corresponding to 43%, idiopathic 34%, head trauma 8%, post-surgery 6%, CRS 5%, chemical exposure 2%, and neurodegenerative disease 1%. The mean total number of providers seen prior to seeing a smell expert was two. The average time of smell loss until the first provider visit was 31 months (range 1 - 480 months). The average time from first provider visit to visit with a smell expert was an additional 9.8 months (range 1-120 months). As most patients were not started on a definitive treatment option for smell loss until seeing a smell expert, this equalled an average of 3.4 years before definitive intervention.

Conclusion:

Knowledge of treatment options for smell loss is lacking amongst primary and urgent care providers and the timeline to see a smell expert remains too long.

POSTERS

Poster #083
WITHDRAWN

Poster #084

Report of a novel reconstruction method using sternocleidomastoid flap and nasoseptal flap for nasopharyngeal tumors after nasopharyngectomy

Bitá Naimi, BA
 Alexander Duffy, MD
 Jay Trivedi
 Emily Garvey, BA
 Chase Kahn, MD
 Marc Rosen, MD, FARS
 Elina Toskala, MD, MBA, PhD, FARS
 Mindy Rabinowitz, MD, FARS
 James Evans, MD
 Gurston Nyquist, MD, FARS
 Adam Luginbuhl, MD
 Thomas Jefferson University Hospital

Introduction:

The sternocleidomastoid (SCM) flap has been widely utilized in head and neck reconstruction. We describe two cases utilizing a novel reconstruction method after expanded endonasal and transcervical resections of nasopharyngeal (NP) tumors using a combined pedicled SCM flap with a nasoseptal flap (NSF) onlay.

Technique:

Combined endoscopic, endonasal and transcervical approach to NP tumors allows for expanded resection and proximal control of the internal carotid artery. Adjuvant therapy including cesium seeds may be placed. SCM flap is superiorly pedicled and rotated into the defect to provide bulk and coverage of neurovascular structures. NSF is raised and laid endonasally along the lateral pharyngeal defect.

Cases:

1: A 39-year-old male with a history of EBV+ nasopharyngeal carcinoma presented two years after chemoradiation with rT1N0 EBV+ disease. He underwent a combined endonasal and transcervical approach to a right nasopharyngectomy with cesium seed brachytherapy placement and closure with a right SCM flap and left NSF. There were no complications or fistula at 5-months follow-up.

2: A 77-year-old female with T2N1 nasopharyngeal adenoid cystic carcinoma underwent a combined approach to left nasopharyngectomy, left neck dissection, right NSF, and left pedicled SCM flap. The flap remained patent with no evidence of fistula at follow-up and through adjuvant radiation.

Conclusion:

We describe the novel use of the SCM-NSF combination for reconstruction of lateral pharyngeal defects after nasopharyngectomy. A pedicled SCM flap with NSF onlay can limit scarring, prevent infection and fistula formation, and protect critical neurovascular structures through adjuvant treatment for primary and recurrent NP tumors.

POSTERS

Poster #085
WITHDRAWN

Poster #086

Restarting antithrombotic drugs following functional endoscopic sinus surgery: A scoping review

Trinithas Boyi, MA
Rhys Richmond, BS
R. Peter Manes, MD, FARS
Ryan Rimmer, MD, FARS
Yale School of Medicine

Background:

Anticoagulant and antiplatelet agents are routinely discontinued preoperatively to reduce the risk of hemorrhage. There are no clear guidelines on when to resume these agents in otolaryngologic patients following functional endoscopic sinus surgery (FESS). Our goal was to identify and systematically review existing literature related to this topic.

Methods:

We systematically queried PubMed, Embase, Ovid, Web of Science, Cochrane, and CINAHL databases, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, to identify publications reporting antithrombotic use in endoscopic sinus surgery. The primary outcomes were recommendations on the timing of resuming antithrombotic use.

Results:

We identified 104 unique articles, which underwent independent title and abstract review by two reviewers, with 20 undergoing full-text review and 7 meeting eligibility for analysis. Only 3 publications were case-control studies, 1 was a cohort study, and 3 were literature reviews. All publications discussed when to stop antithrombotic agents; however, only 3 articles discussed when to restart agents, with mixed recommendations.

Conclusions:

A paucity of literature exists related to resuming anticoagulant or antiplatelet agents following functional endoscopic sinus surgery. Additional research is needed to establish consensus guidelines.

POSTERS

Poster #087

Role of allergic rhinitis in recurrent acute rhinosinusitis

John Behnke, MD
 Zayd Al-Asadi, BS
 Dominic Lombardo, BS
 Hassan Ramadan, MD, FARS
 Chadi Makary, MD, FARS
 West Virginia University

Background:

While recurrent acute rhinosinusitis (RARS) is a relatively common diagnosis with significant healthcare burden, few reports have evaluated its association with other comorbidities.
 Goal: To evaluate the association between allergic rhinitis (AR) and RARS.

Methods:

A retrospective case-control study was conducted using patients presenting to the West Virginia University rhinology clinic from August 2020 to October 2022. Cases included patients diagnosed with RARS, and controls were patients diagnosed with headache and/or facial pain syndrome. Patients' characteristics and comorbidities were reviewed. RARS was diagnosed based on the International Consensus Statement on Allergy and Rhinology criteria of four or more independent episodes of acute rhinosinusitis per year with at least one episode documented by objective findings, and complete resolution of the infection between episodes. Patients with concomitant chronic rhinosinusitis (CRS) or recurrent exacerbations of CRS were excluded.

Results:

The study cohort contained 143 patients, 82 patients with RARS and 61 control patients. Patients with RARS were older (49 vs 43.5, $p=0.05$). There was no difference in gender, smoking history, obstructive sleep apnea (OSA), or nasal septal deviation between the RARS patients and controls. AR and asthma were significantly associated with RARS (OR=11.1, $p<0.0001$; OR=2.75, $p=0.013$ respectively). RARS patients had similar proportions of seasonal and perennial allergies (21.9%), with 14.1% affected by both.

Conclusion:

Allergic rhinitis is strongly associated with RARS; therefore, evaluation for AR should be considered when treating these patients. Future studies with larger sample sizes are needed to confirm these results.

Poster #088

Safety of proton beam therapy in patients with sinonasal carcinoma: A systematic review

Srivatsa Surya Vasudevan, MD, MS
 Estephania Candelo, Research Fellow
 Alireza Sharifi, Research Fellow
 Angela Donaldson, MD, FARS
 Mayo Clinic

Introduction:

In sinonasal carcinomas (SNC), treatment with proton therapy (PT) is noted to provide excellent local control, especially after gross total resection. However, depending on dose and duration, PT can be associated with both acute toxicity (AT) and late toxicity (LT). We reviewed published studies on PT toxicity after treatment for SNC.

Methods:

PubMed, Embase, EBSCO, Scopus, Science Direct, Web of Science, and Cochrane library were searched for articles discussing PT toxicity in the SNC population. Full-text screening was performed to extract data on AT (within 3 months) and LT (more than 3 months). The data comparing toxicity groups as well as controls were analyzed using STATA.

Results:

We identified 13 studies that met inclusion criteria. Pooled data from these studies included 684 patients who underwent PT for SNC. 272/684 (39.7%) patients with a mean age of 58.6 (SD \pm 8.85) developed PT-mediated toxicity. 107/684 (15.6%) of the patients developed AT and 165/684 (24.1%) developed LT. Among all toxicity patients: dermatitis, oral mucositis, and facial pain were the most common toxicities noted in 48.5%, 29.7% and 20.2% of the patients, respectively. 41.9% of AT and 70.2% of LT were grade 2 toxicities based on the Common Terminology Criteria for Adverse Events. There was no statistically significant difference in the incidence of AT compared to LT ($P=0.345$). There appears to be a correlation between higher grades of AT and presence of LT ($P < 0.121$).

Conclusion:

More studies are needed to confirm the correlation between AT and LT as well as risk of developing AT versus LT. The outcomes of this study can help physicians infer toxicity in different stages of PT and educate the patients regarding such occurrences.

POSTERS

Poster #089

Severe epistaxis after posterior nasal nerve ablation requiring surgical intervention: A single center case series

Yuki Yoshiyasu, MD
 Brian Wang, Physician/Surgeon
 Daniel Gorelik, Research Fellow
 Masayoshi Takashima, MD, FARS
 Omar Ahmed, MD, FARS
 University of Texas Medical Branch

Background:

Posterior nasal nerve (PNN) ablation is an emerging treatment option for refractory chronic rhinitis. These cryoablation (Clarifix) and radiofrequency heat ablation (Rhinaer, Neuromark) procedures are well-tolerated and can generally be safely performed in an office setting under local anesthesia. Given the novelty of PNN ablation, there is limited literature on procedure related complications. This objective of this case series is to report rare but severe epistaxis requiring surgical intervention following PNN ablation.

Methods:

Medical records were reviewed for patients who underwent PNN ablation between August 2018 and January 2023 at a tertiary care medical center.

Results:

192 patients were included in our case series, of which 5 patients (2.6%) had significant epistaxis requiring further intervention. All 5 patients had in-clinic PNN ablation. Devices used for ablation were the following: 2 Clarifix, 2 Rhinaer, 1 Neuromark. The complications occurred at mean 22 days (range 18 -24 days) post-operatively. 4 patients were treated with endoscopic sphenopalatine artery ligation (3 unilateral, 1 bilateral); 1 patient required unilateral endoscopic cauterization. No further epistaxis events were reported after interventions. 4 patients had history of hypertension on antihypertensives. Only 1 patient was on blood thinners (ASA 325mg).

Conclusion:

Our experience indicates that PNN ablation can be associated with major complications such as significant posterior epistaxis. While overall reported complication rates are low and most adverse events are minor complications (headache, dry eye, minor bleeding not requiring intervention etc.), PNN ablation should be performed with appropriate caution.

Poster #090

Severe unilateral refractory epistaxis arising from the septal branch of the anterior ethmoid artery

Theodore Nguyen, BS
 Benjamin Bitner, MD
 Jonathan Pang, BA
 Li Tang Meller, BS
 Katelyn Dilley, BS
 Sina Torabi, MD
 Arash Abiri, MS
 Milind Vasudev, BS
 Edward Kuan, MD, FARS
 University of California, Irvine

Introduction:

The septal branch of the anterior ethmoidal artery (sbAEA) may manifest as an arterial vascular pedicle in the superior mid-nasal septum, has become increasingly linked to severe refractory epistaxis. Here we describe the presentation, predisposing factors, treatment, and outcomes of severe refractory epistaxis originating from the sbAEA.

Methods:

Patients presenting with severe refractory epistaxis from July 2020 through July 2022 were retrospectively identified. Those with intraoperative confirmation of sbAEA-associated epistaxis were included. Patient demographics, presentation, imaging and laboratory studies, treatments, and treatment outcomes were recorded.

Results:

Seven patients (5 males) with unilateral (n=6) and bilateral (n=1) sbAEA epistaxis were identified. The mean age was 63.7±4.5 years and mean BMI was 29.4±0.9. The most common comorbidity was hypertension (n=5), with none having a history of bleeding disorders. Five patients had undergone previous treatment attempts without epistaxis resolution. One patient had previously undergone SPA ligation and one with contralateral packing placement prior to hospitalization. Preoperatively, imaging was unremarkable in all patients and hemoglobin was 8.86±0.89 g/dL, with 2 patients requiring one and three units of blood transfusion, respectively. All patients underwent directed cauterization with complete resolution of symptoms, no complications, and uneventful follow-up visits (8.0±3.5 months).

Conclusions:

sbAEA-associated severe refractory epistaxis may be challenging to recognize, but is associated with high treatment success through directed cautery. Increased awareness of this source of severe bleeding may increase epistaxis treatment success

POSTERS

Poster #091

Severity of chronic sinonasal symptoms after a major acute inhalational event: A world trade center retrospective cohort study

Jerlon Chiu, MD
 Hannah Sfreddo
 David Lehmann
 Sonya Marcus, MD
 Stony Brook Medicine

Background:

Chronic air pollution exposure is a known risk factor for the development of upper airway disease. Less is known about the effect of acute occupational exposure. The purpose of this study was to determine the relationship between intensity of acute air pollutant exposure and chronic sinonasal symptoms in World Trade Center (WTC) Health Program patients.

Methods:

WTC patients who were referred to the otolaryngology clinic at a tertiary-care medical center for sinonasal symptoms (2010-2020) and had sinus imaging available were included in this retrospective cohort study. Pollutant exposure was categorized as "low," "intermediate," "high," and "very high," based on location and duration of exposure to WTC pollutants, which is consistent with previous literature. Lund-Mackay (LMK) and Sinonasal Outcome Test (SNOT-22) scores were used to evaluate severity of disease. Statistical analysis was performed to determine the relationship, if any, between pollutant exposure and LMK/SNOT-22 scores.

Results:

141 patients were included in this study. Average age at presentation was 44.7 years (SD 8.6) and was normally distributed. 13.5% were female. Most patients had "high" exposure (47.5%). Median LMK score was 2 (IQR: 0 – 5). Mean SNOT-22 score was 42.8 (n=30). "Very high" exposure was associated with a higher LMK score than "low" exposure (U = 177, p = 0.016). Number of days worked at WTC-sites was associated with a higher SNOT-22 score (r = 0.43, p = 0.019, 95% CI [0.07, 0.69]). All other results were not significant.

Conclusions:

This study found that there is a significant positive association between the number of days worked at WTC-sites and a higher SNOT-22 score.

Poster #092

Sex-based differences in severity of chronic rhinosinusitis as reported by SNOT-22 scores

Snehitha Talugula
 Richard Chiu, Medical Student
 Sharmilee Nyenhuis
 Kamal Eldeirawi
 Victoria Lee, MD, FARS
 University of Illinois College of Medicine

Background:

Chronic rhinosinusitis (CRS) is a widely prevalent condition, however its degree of severity according to sex requires further study. The literature shows that sex-based differences exist in the severity of asthma and allergic airway disease in the population. These findings point to a potential hormonal cause for this difference, but there is no study suggesting the role of sex in CRS. The purpose of this study was to determine the association of sex and CRS severity in the United States.

Methods:

This study was conducted on data gathered from 181 participants documented in the NAVIGATE 1 and NAVIGATE II randomized control trials within the OPTINOSE database. US participants were analyzed based on sex controlling for airway related comorbidities, including history of asthma, race, and ethnicity. SNOT-22 scores were assessed as a measure of CRS severity. The association between sex and SNOT-22 scores were determined using multiple linear regression.

Results:

There were 81 female and 100 male patients. SNOT-22 scores were significantly higher in females. Average reported SNOT-22 scores in females were 53.8 ± 16.5 and 46.8 ± 18.8 in males. On adjusted regression, the association of sex and SNOT-22 scores approached but did not reach significance (β : -4.97; 95% CI: -10.68 - 0.73; p = 0.09).

Conclusions:

On average, females had more severe manifestations of CRS in comparison to men, with the adjusted association approaching significance. Further studies, potentially looking at hormones as a cause of pathogenesis, are needed to better elucidate the role of sex in CRS.

POSTERS

Poster #093

Shared decision making for patients with nasal polyposis: Needs assessment utilizing social media and clinical cohorts

Isaac Schmale, MD

Minjoo Jo, Medical Student

Li-Xing Man, MD, FARS

University of Rochester Medical Center

Background:

The management of chronic rhinosinusitis with nasal polyps (CRSwNP) has become increasingly complex with no single best treatment option. As such, CRSwNP treatment involves shared decision making (SDM). However, little is known regarding patient treatment and counseling preferences. This study investigates patient and provider needs relating to CRSwNP treatment and SDM.

Methods:

We conducted REDCap surveys among CRSwNP patients from CRSwNP Facebook groups. Surveys assessed patient understanding, concerns, and preferences regarding treatment. Additionally, providers who work with CRSwNP patients at our institution were surveyed. Responses were categorized and analyzed for emergent themes.

Results:

44 patients and 6 providers completed surveys. Physician counseling (21) and the internet (17) were considered to have the biggest influence on patient treatment decisions while lack of information was the top factor that made treatment decisions difficult (24). The top two patient goals for therapy were nasal/breathing improvement (49) and improved quality of life (26). From provider surveys, all six providers stated that improved delivery of credible treatment information would help patients and improve SDM.

Conclusion:

Both patients and providers believed that reliable information and SDM were important for improving CRSwNP care. Although most patients felt that their providers supported their decisions, many patients considered lack of information from physicians as the number one reason their treatment decision was difficult. A patient decision aid incorporating accurate treatment options, costs, and risks/benefits could help CRSwNP patients and allow for future well-designed trials looking at SDM outcomes.

Poster #094

Sinonasal renal cell-like adenocarcinoma: Learnings from a case In pregnancy

Andrew Lee, BS

Ryan Little, MD

Linton Evans, MD

Maggie Mouzourakis, MD

Geisel School of Medicine at Dartmouth

Sinonasal Renal Cell-Like Adenocarcinoma (SNRCLA) is an extremely rare sinonasal tract malignancy with a characteristic clear cell histology reminiscent of clear cell renal cell carcinoma. There have been at least 16 confirmed cases of SNRCLA. We report the case of a 42-year-old Ukrainian refugee female presenting to our clinic at 32 weeks gestation with a recurrent right nasal cavity mass measuring 8.1 x 4.1 x 4.4 cm. Associated symptoms included bilateral nasal obstruction, anosmia, epistaxis, diplopia and right proptosis. To our knowledge, this is the first case of SNRCLA in a pregnant patient. Cesarean section was performed 15 days prior to primary resection. A combined endoscopic endonasal resection and bifrontal craniotomy was required to achieve gross total resection of this vascular tumor with negative surgical margins. The tumor involved a large portion of the bilateral nasal septum as well as the cribriform plate. Anterior cranial fossa reconstruction was performed using a pericranial flap. Interventional radiology (IR) performed diagnostic angiography with embolization of the bilateral sphenopalatine arteries. There was significant vascular supply from the bilateral anterior and posterior ethmoid arteries as well as a large contribution from the right vidian artery. This unique case underscores the challenges from the accentuated hypervascularity of SNRCLA malignancies in setting of unknown contributions from pregnancy as well as the unclear role of IR embolization.

POSTERS

Poster #095

Stop scrolling: A social media quality review of sinusitis videos on TikTok

Rose Dimitroyannis, BA
David Fenton, Medical Student
Stella Cho, Medical Student
Christopher Roxbury, MD, FARS

Social media has emerged as a way to inform healthcare decisions. TikTok is a social media platform that allows users to post short-form videos. The study aimed to assess the quality of sinusitis-related videos on TikTok.

A TikTok search was done on 1/29/2023 using sinusitis-related hashtags: #sinusitis, #sinus, #sinusinfection. Number of views/shares per day, poster type (influencer [>10000 followers], lay individual [<10000 followers], and medical professional), content categories (medical advice, marketing, comedy, and lifestyle/acceptability), and content type (educational vs. factual) were collected. The Patient Education Materials Assessment Tool for AudioVisual Material (PEMAT-AV) and Journal of the American Medical Association (JAMA) Benchmark Criteria were used to measure understandability, actionability, and reliability. Descriptive statistics were performed using Welch's t-test ($\alpha=0.05$).

Of the 140 videos analyzed, 54.2% (76) of posters were influencers and 17.1% (24) were medical providers. Influencer videos were shared significantly more than medical providers' ($p<0.05$). Medical advice was the most common influencer (48.6%, 37/76) and medical professional (87.5%, 21/24) content. Influencer understandability and actionability scores were significantly lower than medical providers' ($p<0.05$), but there was no significant difference in reliability. While 63% (48/76) of influencer videos claimed to be educational, only 37.5% (18/48) of educational influencer videos were considered factual.

Most influencer-posted TikTok videos on sinusitis, categorized as medical advice claiming to be educational, are non-factual. Medical providers must find ways to address misinformation and disseminate factual, educational content.

Poster #096

Surgical management of obstructive nasal polyposis in Cornelia de Lange syndrome

Trisha Ortiz, Medical Student
Michelle Yu
Aaron Pearlman, MD, FARS
Weill Cornell Medicine

Cornelia de Lange syndrome (CdLS) is a rare genetic developmental disorder identified by distinct multi-system malformations, including facial dysmorphism, growth restriction, hirsutism, limb abnormalities, and intellectual disability. About a third of patients with CdLS experience recurrent and or chronic sinus infections, often with nasal polyposis.

This report describes a case of nasal polyposis in an 8-year-old boy with Cornelia de Lange Syndrome. The patient presented to his pediatric otolaryngologist with nasal obstruction and snoring. Exam was notable for bilateral obstructive nasal lesions, concerning for nasal polyps. His sinonasal disease was refractory to multiple systemic and topical therapies. He was referred to a rhinologist for surgical management. His CT scan was consistent with the exam findings and showed bilateral nasal polyposis with pansinus mucosal disease.

He underwent endoscopic sinus surgery and postoperatively had improved nasal breathing on follow up. The patient continues to improve postoperatively on topical steroid therapy.

Given the rarity of the disorder, there is limited literature discussing the features or management of sinus disease associated with CdLS. Endoscopic sinus surgery may be considered in pediatric patients with CdLS with nasal polyposis refractory to systemic and topical therapies in order to relieve and manage nasal obstruction.

POSTERS

Poster #097

Synergistic cytotoxicity of permethrin and N,N-Diethyl-Meta-Toluamide on sinonasal epithelia with or without chronic rhinosinusitis

Hong-Ho Yang, BS
 Saroj Basak, PhD
 Tom Maxim, MD
 Daniel Shin, MD, PhD
 Christine Wells, PhD
 Eri Srivatsan
 Jivianne Lee, MD, FARS

Objective:

Permethrin and N,N-Diethyl-Meta-Toluamide (DEET) have been shown to be cytotoxic to healthy sinonasal epithelial cells (SNEC). In this study, we investigate whether their concurrent exposure elicits synergistic cytotoxicity, and whether this synergy differs between SNEC with and SNEC without Chronic Rhinosinusitis (CRS).

Methods:

Ethmoid sinus mucosal specimens were obtained from 1 non-CRS patient (Tissue A) and 3 CRS patients (Tissue B, C, D). Specimens were expanded on culture plates and exposed to 0-5 μ m Permethrin and DEET for 7 days. Each experiment was replicated in triplet and cell viability was recorded every 2 hours using IncuCyte. Zero interaction potency score (ZIP) was computed every 12 hours between 24h and 144h using SynergyFinder.

Results:

When given alone, dose-response cytotoxicity of Permethrin and DEET was seen up to 2.5 μ m, and resistance was seen at 5 μ m for all tissues. For tissue A, significant synergy was seen up to 2.5, 1.25 μ m (CP, CD) throughout the entire exposure period, with peak synergy seen at 84h at 1.25, 0.625 μ m (ZIP 20.2, 95% C.I. 17.1-23.7). For all 3 CRS tissues, no significant synergy was seen during the first 4 days. For tissue B, synergy was first seen at 144h at 2.5, 1.25 μ m (ZIP 4.2, 95% C.I. 1.8-7.3). For tissue C, synergy was first seen at 108h at 0.625, 0.625 μ m (ZIP 12.7, 95% C.I. 2.8-23.8). For tissue D, no significant synergy was seen at all timepoints.

Conclusion:

This is the first study to investigate the combined effect of pesticides on SNEC. Results substantiated the synergistic cytotoxicity of permethrin and DEET on SNEC. Moreover, CRS tissues appear to be more resistant to this synergy, as more prolonged exposure was needed to elicit synergistic cytotoxicity.

Poster #098

The direct impact of the COVID-19 pandemic on rhinology practice

Sarah Sutton, BS
 April Taniguchi
 Shaun A. Nguyen, Dr.
 Zachary Soler, MD, MSc, FARS
 Rodney Schlosser, MD, FARS
 Medical University of South Carolina

The coronavirus of 2019 (COVID) pandemic triggered numerous concerns regarding the risks of in person clinic visits and endoscopy procedures. While this has been assessed through survey data, the direct effect of COVID on a rhinology practice has not been studied quantitatively. To assess the impact of COVID and subsequent recovery, a retrospective chart review (MUSC IRB Pro00125626), of all patients seen at a tertiary rhinology clinic during the spring (March through June) of 2019, 2020, and 2022 was performed. Visit type (new vs established), location (in person vs virtual), diagnosis, imaging, treatment plans, and follow-up visit type were collected. Total COVID (2020) encounters were 30% of pre-COVID (2019) volumes. In 2020, 27% of encounters were virtual, and established patient visits decreased from 60% to 46% (all $p < 0.008$). The proportion of sinusitis patients seen in clinic who underwent endoscopy decreased from 98% in 2019 to 87% in 2020 ($p = 0.02$), while computed tomography scans (CTs) increased from 10% (2019) to 23% (2020) and 30% (2022) ($p = 0.03$). In contrast, there was little change in management of patients diagnosed with tumor, orbital pathology, or cerebrospinal fluid leak. In 2022, total encounters were 132% of 2019 encounters with the greatest increases in new patients with inflammatory and non-surgical diagnoses. The proportion of endoscopies was similar to 2019 levels, but CTs remained elevated. The COVID-19 pandemic significantly affected the total number of patients seen, virtual visit encounters, nasal endoscopies, and imaging utilization. Further research is needed to determine if patient outcomes were impacted and if these changes in practice will persist as we transition away from COVID regulations.

POSTERS

Poster #099

The effect of acupuncture therapy on COVID-19 related olfactory loss

Michael Armstrong, MD
 Thomas O. Byrne
 Jason Calva
 Carlos Pinheiro-Neto, MD
 Garret Choby, MD, FARS
 Erin O'Brien, MD, FARS
 Brent Bauer
 Janalee Stokken, MD, FARS
 Mayo Clinic

Olfactory loss is a common symptom in patients with COVID-19 infection. While budesonide irrigation and olfactory training are effective, many patients fail to recover olfaction. The objective of this study was to examine the effect of acupuncture therapy on COVID-19 related olfactory loss.

Thirty patients were randomized into two groups. The standard group was treated with twice daily budesonide irrigation and olfactory training. The acupuncture group was treated with ten sessions of acupuncture therapy in addition to the standard group treatment. University of Pennsylvania Smell Identification Test (UPSIT), 10-point visual analog scale (VAS), and Sino-Nasal Outcome Test (SNOT-22) scores were obtained at baseline and after three months of treatment. Differences between study arms were compared using Fisher's exact and Wilcoxon rank sum tests.

A total of 18 patients completed the study. Twenty-seven percent of patients in the standard (3/11) and 43% of patients in the acupuncture group (3/7) had an increase in UPSIT score by at least 5 points ($p=0.63$). Mean UPSIT score improvement was 3.2 in the standard and 2.6 in the acupuncture group ($p=0.78$). Mean VAS score improvement was 1.7 in the standard and 1.9 in the acupuncture group ($p=1.00$). Mean SNOT-22 score improvement was 3.5 in the standard and 7.1 in the acupuncture group ($p=0.89$). There were no significant differences in score improvement on subgroup analysis of patients with olfactory loss > 12 months.

The effect of acupuncture on COVID-19 related olfactory loss is uncertain. Further research into the treatment of olfactory loss is warranted.

Poster #100

The impact of bundled codes on Medicare volume and reimbursements for endoscopic sinus surgery

Derek Liu, MD
 Sina Torabi, MD
 Benjamin Bitner, MD
 Edward Kuan, MD, FARS
 University of California, Irvine

Introduction:

In 2018, Medicare introduced changes to the Endoscopic Sinus Surgery (FESS) family of Current Procedural Terminology (CPT) codes. Three new codes were introduced which bundled ethmoidectomy with either frontal sinusotomy or sphenoidotomy, with or without removal of tissue. This study evaluates the volume and reimbursements for FESS before and after the introduction of bundled codes in 2018.

Methods:

Trends were analyzed using the Part B National Summary Data File from years 2010 to 2021. Volume was examined as the total number of sinuses treated per year, with bundled codes equated to two sinuses treated. An interrupted time series analysis was conducted on volume and reimbursements before and after the introduction of bundled codes in 2018.

Results:

Prior to 2018, volume and reimbursements for FESS grew at a mean rate of $2.5\% \pm 2.2\%$ per year and $6.9\% \pm 6.6\%$ per year, respectively. In 2020, likely due to the COVID-19 pandemic, volume and reimbursement decreased by 23.8% and 13.8%, respectively. Excluding 2020 and 2021 from interrupted time series analysis, the year 2018 was associated with significantly decreased total reimbursement (-13.9% , $p=0.014$) but stable procedural volume ($+0.72\%$, $p=0.602$). From 2018 to 2019, the rates of change of volume ($+3.1\%$, $p=0.750$) and reimbursements (4.9% , $p=0.878$) remained similar to annual trends prior to 2018.

Conclusion:

Medicare-based FESS volume and reimbursements steadily increased from 2010 to 2017. In 2018, payments decreased significantly despite no change in volume, which may be correlated to the introduction of bundled CPT codes. Another significant decrease in both volume and payments occurred in 2020, likely due to the COVID-19 pandemic.

POSTERS

Poster #101

The impact of Dupilumab treatment on CRSwNP outcomes in patients with severe CRSwNP from the SINUS-24 and SINUS-52 studies

Martin Desrosiers, MD

Scott Nash, Dr.

Andrew P. Lane, MD, FARS

Stella Lee, MD

Eugenio De Corso, Dr.

Changming Xia, Dr.

Asif Khan, Dr.

Juby Jacob-Nara, Dr.

Harry Sacks, MD, FAAP

Paul Rowe, Dr.

Yamo Deniz, Dr.

University of Montreal

Background:

Impaired nasal airflow is recognized as a high burden of disease for patients with chronic rhinosinusitis with nasal polyps (CRSwNP). This post hoc analysis evaluated the effect of dupilumab on key clinical outcomes for patients with CRSwNP and baseline peak nasal inspiratory flow (PNIF) that is abnormal (< 120 L/min) or normal (≥ 120 L/min) in the SINUS-24 and SINUS-52 trials (NCT02912468/ NCT02898454).

Methods:

PNIF was recorded in patients treated with dupilumab 300 mg every 2 weeks or placebo in the pooled SINUS-24/SINUS-52 population. Changes in CRSwNP outcome measures were analyzed to Week 24 in patients with normal and abnormal baseline PNIF.

Results:

Of 724 patients in the pooled intention-to-treat population, 76% had PNIF < 120 L/min at baseline. At Week 24, dupilumab significantly improved CRSwNP outcomes for patients with a normal or abnormal baseline PNIF. These included (least squares mean difference [95% CI] vs placebo for baseline PNIF < 120 or ≥ 120 L/min, respectively): PNIF (41.2 [33.8, 48.5] and 29.5 [15.9, 43.1]), nasal polyp score (-1.86 [$-2.12, -1.59$] and -2.01 [$-2.47, -1.54$]), loss of smell score (-1.03 [$-1.18, -0.89$] and -1.02 [$-1.30, -0.75$]), nasal congestion/obstruction (-0.81 [$-0.96, -0.67$] and 1.10 [$-1.32, -0.89$]), SNOT-22 (-18.86 [$-21.97, -15.75$] and -18.03 [$-23.18, -12.88$]), UPSIT (10.03 [8.71, 11.35] and 11.41 [8.91, 13.91]), and LMK-CT (-5.99 [$-6.63, -5.36$] and -6.33 [$-7.43, -5.23$]) vs placebo. All analyses $P < 0.0001$ vs placebo.

Conclusion:

Most patients had impaired nasal airflow at baseline. However, dupilumab improved clinical outcome measures in patients with severe CRSwNP irrespective of baseline PNIF.

Poster #102

The impact of the lateral crural reversing on the primary concavity

Mohsen Naraghi, MD, FARS

Orphans World Wide

Introduction:

Extreme concavities of the lower lateral crura can cause severe aesthetic and functional problems. Lateral crural reversing can contour the shape, reconstruct lateral crus completely, and correct concavity and valve collapse by a simple but delicate technique. It could be done with or without reinforcing grafts.

Methods:

This retrospective study was directed at thirty-four primary rhinoplasty patients with the follow-up from one to eight years. After transcolumellar and marginal incisions, the skin flap was elevated in a supraperichondrial plane, exposing the lower lateral cartilages and cartilaginous dorsum. Then the mucosa was detached from the posterior surface of the lower lateral crura. The cartilages were released, excised, reversed, and fixed in place. Different lateral crural grafts were used in some of the patients.

Results:

All patients were improved in form and function with different degrees of improvement according to the Nasal Obstruction Symptom Evaluation (NOSE) Scale. There was no significant difference between the patient with or without the use of grafts. Postoperative swelling was longer in patients with grafts. However, there was no long-term complication and all patients were satisfied with the long-term aesthetic and functional results.

Conclusion:

With the lower lateral crural reverse plasty, severe concavities of the lower lateral crura can be corrected. This technique is a useful and reproducible procedure, performed without additional tissue to achieve functionally and aesthetically satisfying and enduring results.

POSTERS

Poster #103

The influence of facility volume and type on sinonasal undifferentiated carcinoma treatment and outcomes

Amy Du, BS
Sina Torabi, MD
Arash Abiri, MS
Khodayar Goshtasbi, MD
Edward Kuan, MD, FARS

Background:

Sinonasal undifferentiated carcinoma (SNUC) is a rare and highly aggressive primary malignancy of the sinonasal tract, with multimodal strategies being the cornerstone of treatment. This study evaluates the influence of facility volume and type on SNUC treatment and overall survival (OS).

Methods:

The 2004-2016 National Cancer Database was queried for SNUC patients receiving definitive treatment. Facilities were categorized by volume by calculating the mean number of patients treated per facility during the study time span and using cutoff volumes that were 0.5 standard deviations above and below the mean. Low-volume facilities (LVFs) were defined as treating 1 patient, high-volume facilities (HVF) as treating ≥ 4 patients, and mid-volume facilities (facilities treating 2-3 patients) were excluded. Differences in treatment course, outcomes, and OS by facility volume and type were assessed using multivariable regression.

Results:

731 patients (34.3% female, 83.3% white) were included. Facilities were categorized into 165 LVFs and 58 HVFs. Compared to LVFs, HVFs treated more patients >65 years of age (79.3% vs 60.6%, $p=0.010$), more patients with private insurance (65.5% vs 49.1%, $p=0.008$), and patients were more likely to receive chemotherapy (77.6% vs 59.4%, $p=0.038$). On Cox proportional-hazard multivariate regression, no significant association was found between OS and facility volume or type ($p=0.458$ and $p=0.677$, respectively).

Conclusion:

Higher facility volume and academic facility type do not appear to be a significant predictor of improved survival outcomes in the treatment of SNUC, which may be attributed to its highly aggressive course.

Poster #104

The influence of inhibitors of apoptosis proteins (IAPs) on chronic rhinosinusitis with nasal polyps

Wilma Anselmo-Lima, MD, PhD
Fabiana Valera, PhD
Ivna Passos, MD, PhD
Marina Fantucci, MD
Adriana Murashima, MD
Lilian Silva, MD
Denny Garcia, PhD
Francesca Faria, MD
Ronaldo Martins, MD, PhD
Eurico Arruda Neto, MD, PhD
Edwin Tamashiro, PhD
Ribeirão Preto Medical School of University of São Paulo

Introduction:

Inhibitors of apoptosis proteins (IAPs) could have a role in the CRSwNP or interfere with the susceptibility of NP with topical nasal corticosteroids.

Objectives:

To compare the expression of IAPs between patients with CRSwNP and controls, to associate the expression of IAPs with the response to nasal corticosteroids, and to correlate the expression of IAPs to inflammatory markers.

Methods:

We obtained nasal biopsies from patients with CRSwNP ($n=27$) and controls ($n=16$). The gene expression of IAPs (XIAP, BIRC2/IAP1 and BIRC3/IAP2) and caspases (CASP3, CASP7, CASP9 and BCL2) were measured by qRT-PCR. The dosages of IFN- α , IL-5, IL-33, IL-10, IL-17, and TGF- β were measured by the Luminex. Principal Component Analysis (PCA) was used to correlate the expression of the markers with the response to nasal corticosteroids in the patients.

Results:

We found lower expression of the three IAP genes and significantly higher expression of the cytokines IFN- α , IL-5, and TGF- β in patients compared to controls. BIRC2/IAP1 expression was significantly associated with poor response to topical corticosteroids. PCA analysis identified that BIRC2/IAP1, XIAP, BCL2, CASP9, IL-17 and IL-33 were increased in patients with better clinical response, while CASP7 and TGF- β were related to worse response to treatment.

Conclusions:

Our data suggest that the decrease in IAPs expression is significant in the CRSwNP pathophysiology and may predict worse outcome to clinical treatment.

POSTERS

Poster #105

The role of normal nasal anatomical variability on intranasal drug particle transport

Claire Washabaugh, BS
 Ryan M. Sicard, BS
 Sarah M. Russel, MD, MPH
 Dennis O. Frank-Ito, PhD

Background:

This study investigates the role of two normal nasal anatomical variations – nasal vestibule notched indentation size (permanent variation) and nasal cycle (temporal variation) – on intranasal spray drug particle transport in the cavity of three healthy adult subjects (S1, S2, and S3) with normal nasal anatomy.

Methods:

The Nasal Obstruction Symptom Evaluation (NOSE) scores and cone beam computed tomography (CBCT) images were obtained from all subjects. Unilateral notched indentation size and nasal cycling state at time of CBCT were assessed. CBCT images were used to create subject-specific nasal cavity models for performing computational fluid dynamics airflow and intranasal spray particle transport simulations.

Results:

NOSE scores were: S1=15, S2=25, and S3=0. Unilateral notched assessment showed the right side had larger indentation (narrower nasal vestibule) in all three subjects. Nasal cycling states: S1 left side was less patent, S2 left side was less patent, and S3 right side was less patent. Drug particle depositions showed 91-94% anterior deposition on the side with greater notched indentation versus 58-87% anterior deposition on the smaller notched indentation side. Posterior depositions on lateral and septal mucosa were: less patent nasal cycle side had 0-8% and 0-23% lateral and septal depositions, respectively; more patent nasal cycle side had 0.03-7% and 0-0.17% lateral and septal depositions, respectively.

Conclusion:

Findings from pilot data suggest that larger nasal vestibule notched indentation may lead to increased anterior deposition. More patent nasal cycling side had greater posterior lateral mucosa deposition, and less patent nasal cycling side had greater posterior septal mucosa deposition.

Poster #106

The validation of the readability enhanced sinonasal outcome test (reSNOT-22) disease-specific quality of life survey

Abdullah Zeatoun, MD, Presented by Adam Kimple, MD, FARS
 University of North Carolina-Chapel Hill

Introduction:

The readability of the Sinonasal Outcome Test (SNOT-22) QOL survey is above the recommended 6th-grade level for patient-centered documents. Previous studies have demonstrated that patients with limited health literacy have worse sinonasal disease-specific Quality of Life (QOL) than patients with adequate health literacy. This study aimed to validate the proposed improved alternative Readability Enhanced Sinonasal Outcome Test (reSNOT-22).

Methods:

Three validated readability metrics were used to analyze the readability of the SNOT-22 questions. For questions that were outside of the 6th-grade level, alternative texts were devised by a panel of Rhinologists (n=5). Second, the alternative text was presented to patients, and they were asked to choose the text that made the most sense to them, while the Brief health literacy screening tool (BRIEF) was collected at the same visit. Finally, the reSNOT-22 was validated in a clinical population and compared to the original SNOT-22 in Chronic Rhinosinusitis (CRS) patients.

Results:

The three readability measure scores were 5th, 7th, and 11th grade for the SNOT-22. 7 of the 22 questions were above the recommended 6th-grade reading level.

The proposed alternative text reSNOT-22 improved the SNOT-22 grade-level readability. To date, 49 patients have been enrolled. The mean age was 52, and 22 females.

Conclusion:

The SNOT-22 readability is above the recommended level. However, with simple alterations, the new reSNOT-22 is easier, simpler, and preferred by patients.

POSTERS

Poster #107

Three cases of sinonasal organized hematoma

Sei Kobayashi, MD
 Yasuyuki Hinohira, Professor
 Masakazu Murayama
 Yoichiro Narikawa
 Takatoshi Tokudome
 Naruo Shoji
 Tomotaka Shimura
 Taketoshi Nogaki

Introduction:

Organized hematoma of the sinonasal tract is a rare clinical disease, which requires differential diagnosis from malignant tumor. We report three cases of organized hematoma.

Case:

66 year-old female visited us with oral bleeding. The easily bleeding tumor-like lesion was found in the left gingivabuccal sulcus. Computed tomography (CT) showed well-defined expansive soft tissue shadows with bone erosion. The lesion showed high intensity in T1 and low intensity in T2-weighted magnetic resonance imaging (MRI). Caldwell-Luc operation for total removal of the tumor was performed.

28 year-old female visited us with the right nasal bleeding from polyps in the middle nasal meatus. CT and MRI showed the mass lesion existing from the right nasal cavity to the maxillary sinus with bone erosion. Caldwell-Luc operation for total removal of the tumor was performed.

70 year-old male visited us with the frequent epistaxis. Rhinoscopy revealed easily bleeding mass lesion in the middle nasal meatus. CT showed the mass lesion located in frontal sinus and ethmoid sinus with bone erosion. The lesion showed low intensity in T1 and high intensity in T2-weighted MRI. Extranasal approach combined with endonasal endoscopic surgery was performed.

No recurrent lesion has been seen in the three cases.

Discussion:

Organized hematoma of the sinonasal tract is very rare. The progressive expansion of the tumor causes the demineralization of adjacent structures. In many patients with organized hematoma, the findings of CT and MRI are similar to neoplastic diseases. Therefore, surgical intervention is required in order to distinguish from malignant tumors.

Poster #108

Triple-combination Cystic Fibrosis transmembrane conductance regulator (CFTR) modulator therapy and functional endoscopic sinus surgery in Cystic Fibrosis with chronic rhinosinusitis

Brian Kinealy, MD
 Tony Mangino, PhD
 Amina Anwar, Medical Student
 Michael Anstead, MD, FCCP
 Brett Comer, MD, FARS

Cystic fibrosis (CF) causes dysfunction of the CF transmembrane conductance regulator (CFTR), leading to manifestations that include bronchiectasis, pancreatic insufficiency, and chronic rhinosinusitis (CRS). Computed tomography demonstrates CRS in 90-100% of patients with CF. The rate of functional endoscopic sinus surgery (FESS) in CF is greater than 20%. Prior to the advent of targeted therapies, the rate of revision FESS was shown to be significantly higher in adult CF patients with CRS compared to adults without CF, on the order of 18.7% compared to 13.4%. These patients also underwent revision FESS sooner than the general population, with a mean of 3.52 years as opposed to 4.23 years. Elexacaftor/tezacaftor/ivacaftor (ELX/TEZ/IVA) treatment has been associated with decreased Lund-Mackay scores and decreased sinus opacification, but little is known regarding the effect of CFTR modulators on FESS or revision FESS. With the advent of ELX/TEZ/IVA treatment in 2019, CF patients would be expected to return for revision FESS by late 2022, unless there were a substantial effect of ELX/TEZ/IVA on sinonasal symptomatology and need for revision surgery. This study is a retrospective review of adult patients with CF and CRS who underwent FESS at the University of Kentucky between the years of 2006 and 2022. We hypothesized that treatment with CFTR modulator therapy decreases the likelihood of revision FESS and increases the duration between index operation and subsequent FESS. Preliminary data suggests that both revision FESS rate is decreased with the use of ELX/TEZ/IVA and that duration between FESS surgeries is positively impacted by the use of ELX/TEZ/IVA.

POSTERS

Poster #109

Utilizing 3D navigation to enhance endoscopic sinus educational dissection for Otolaryngology trainees

Tadeas Lunga, MD
 Aviv Spillinger
 Sandra Lin, MD, FARS

Background:

Functional endoscopic sinus surgery (FESS) carries intraoperative risks, requiring CT scans for proper patient anatomical mapping. Use of a 3D Navigation System (TruDi) may reduce these risks and enhance training through image-guided navigation. This study evaluated how TruDi may enhance anatomical understanding, thoroughness, and outcomes for sinus surgeries among otolaryngology trainees.

Methods:

Eleven otolaryngology residents participated in cadaveric endoscopic sinus dissection with increasing difficulty on a cadaver head based on their PGY year. TruDi technology was visible on the right side and hidden on the left side dissection. Fast Anatomical Mapping was used to evaluate the completeness of dissection with and without the technology. A one-way repeated ANOVA was conducted on five residents to examine the completeness of dissection. After dissection, Likert scale questionnaires were completed by trainees assessing their overall experience with the TruDi system.

Results:

Eight residents found the technology helpful, six felt safer using it, seven felt it aided the completeness of surgery, nine felt it improved understanding of anatomy, and ten said they would use it again. Of the five residents evaluated for completeness of dissection, there was no statistically significant difference between dissections performed with and without TruDi.

Conclusion:

3D navigation system shows promise in improving the learning experience for trainees. It may aid in the completeness of surgery and understanding of anatomy while providing additional safety. Although the completeness of surgery was not significantly different with or without the TruDi system, further evaluation is needed to draw definitive conclusions.

Poster #110

Voice quality changes follow sinonasal surgery

Meha Fox, MD
 Tran Locke, MD
 Sylvia Adu-Gyamfi, Training Associate
 Sarah Blumhardt, Speech Pathologist
 Lauren Brewster, Medical Student
 Julina Ongkasuwan, Professor
 Baylor College of Medicine

Introduction:

Voice affects social function. Prior studies demonstrate variable impact of sinonasal surgery on voice quality measures, and none assess formant changes. The purpose of this study was to delineate any objective and clinician-perceived subjective changes in voice quality following sinonasal surgery.

Methods:

From November 2021 to August 2022, six adults were recruited. Pre- and post-operative voice recordings were analyzed using KayPentax computerized speech lab software. Consensus Auditory-Perceptual Evaluation of Voice (CAPE-V) assessment was completed by two independent reviewers. Wilcoxon signed-rank test was used to analyze the pre- and post-operative formant and CAPE-V scores.

Results:

Four males underwent endoscopic sinus surgery, and two females underwent septoplasty with inferior turbinate reduction. There was a statistically significant difference between pre- and post-operative formants 2 (F2) and 3 (F3) for the nasal consonant /n/. There was no statistically significant difference in pre- and post-operative formants 1-4 (F1-F4) for the nasal sounds /m/, /a/, and /i/, or in F1 and F4 for the sound /n/. However, the change in mean for F2-4 /m/, F4 /a/, F1-4 /n/, and F2-4 /i/ was greater than 50 Hz, which is clinically significant. There was no statistically significant difference in pre- and post-operative CAPE-V scores.

Conclusion:

Prior studies demonstrate variable changes in voice following sinonasal surgery. Our study revealed a clinically significant difference in formants. Lack of statistical significance is likely due to small study population. Larger scale studies assessing objective and subjective measures of voice are needed to better define voice changes following sinonasal surgery.

POSTERS

Poster #111

Which intranasal corticosteroids can be used in patients on PrEP or HAART?

Meghan Nicole Norris, PA-C

Erin Lopez

Daniel Alicea Delgado, MD

Brian D. Thorp, MD, FARS

Cristine N. Klatt-Cromwell, MD

Charles S. Ebert, Jr., MD, MPH, FARS

Brent Senior, MD, FARS

Adam Kimple, MD, FARS

UNC

Background:

Approximately 1.3 million Americans live with HIV. Pre-exposure prophylactic (PrEP) has increased by 8 fold in the last 5 years. Intranasal corticosteroids (INCS) are typically avoided in patients on antiretroviral therapy regimens that include protease inhibitors as they decrease the metabolism of iatrogenic steroids. This can result in Cushing's syndrome and adrenal suppression even from use of topical nasal steroids. We are interested to know which INCS are contraindicated in patients on PrEP and highly active antiretroviral therapy (HAART) regimens.

Methods:

University of Liverpool HIV Medication Interaction Checker was used to assess antiretroviral therapy and PrEP medication interactions with fluticasone, mometasone, budesonide, beclomethasone, triamcinolone, and flunisolide nasal sprays.

Results:

The PrEP medications are emtricitabine / tenofovir (Truvada), emtricitabine / tenofovir (Descovy) and cabotegravir (Apretude). There were no reported interactions with INCS and any of the PrEP medications. INCS should be avoided in patients on HAART regimens that include ritonavir, cobicistat, darunavir, atazanavir, efavirenz, etravirine, lenacapavir, or nevirapine. The exception to this rule is that beclomethasone can generally be used safely; however, clinicians should monitor for symptoms of Cushing's syndrome, such as fatigue, muscle weakness and weight gain in any patient on HAART and INCS.

Conclusion:

INCS may be safely utilized in patients on PrEP. Patients on HAART regimens that do not include ritonavir, cobicistat, darunavir, atazanavir, efavirenz, etravirine, lenacapavir, or nevirapine can be treated with INCS with reasonable oversight and monitoring for symptoms of Cushing's syndrome.

Poster #112

Wide resection of extradural skull base lesions requiring sacrifice of internal carotid artery: Preliminary surgical outcome at a single medical center

Sung-Woo Cho, MD

Tae-Bin Won, MD, PhD

Kihwan Hwang, MD

Seoul National University Bundang Hospital

Introduction:

Skull base lesions invading internal carotid artery (ICA) are challenging as these pathologies can progress and eventually lead to death. In this study, we tried to evaluate our preliminary surgical outcome of extradural skull base lesions requiring sacrifice of ICA.

Methods:

Retrospective review of patients was performed for those who underwent endoscopic radical resection of extradural skull base lesion invading the ICA. In all cases, invaded ICAs were occluded either spontaneously or intentionally. Pathologies, management of ICA, and surgical outcomes were evaluated.

Results:

Eleven cases (mean age 61.7 years) were collected. Pathologies were osteoradionecrosis (ORN) (N=7), ORN combined with malignancy (N=3), and malignancy without ORN(N=1). ICAs were managed as follows; spontaneous ICA occlusion (N=5), occluded intentionally (pre-operative embolization or intra-op planned ligation) (N=5), and extracranial to intracranial bypass surgery (N=3). Mean duration of follow up was 20 months (range 3-56 months). After radical resection, severe headache decreased from 72.7% to 17.2%. However, cranial nerve palsy was increased from 72.7% to 81.8%. There were 3 cases of disease progression and eventual death. Among them 2 had uncontrolled cancer regrowth and the other developed brain stem necrosis after adjuvant radiotherapy. The 2-year progression free survival was 71.6%. All the patients without disease progression (N=8) were alive and showed acceptable functional outcome with ECOG performance below 1.

Conclusion:

Radical resection of the skull base lesion invading ICA can be performed with no peri-operative mortality. Depending on the disease pathology, good post operative performance can be expected.

Fellows of the American Rhinologic Society

- Waleed Abuzeid, MD, FARS
 Nithin Adappa, MD, FARS
 Omar Ahmed, MD, FARS
 Abdullah Al Bader, MBBS, FARS
 Ford Albritton IV, MD, FARS
 Gustavo Almodovar-Mercado, MD, FARS
 Ghassan Alokby, MD, FARS
 Jeremiah Alt, MD, PhD, FARS
 Kenneth Altman, MD, FARS
 Jastin Antisdell, MD, FARS
 Sanford Archer, MD, FARS
 Henry Barham, MD, FARS
 Fuad Baroodi, MD, FARS
 Emily Barrow, MD, FARS
 Pete Batra, MD, FARS
 Richard Beck, MD, FARS
 Adam M. Becker, MD, FARS
 Karen Bednarski, MD, FARS
 Jeffrey Bedrosian, MD, FARS
 Thomas Benda, MD, FARS
 Michael Benninger, MD, FARS
 Regan Bergmark, MD, FARS
 Daniel Beswick, MD, FARS
 Naveen Bhandarkar, MD, FARS
 Benjamin S. Bleier, MD, FARS
 Robert Bridge, MD, FARS
 Seth Brown, MD, FARS
 Nicolas Busaba, MD, FARS
 Jose Busquets Ferriol, MD, FARS
 Adam Campbell, MD, FARS
 Raewyn Campbell, MD, FARS
 David Caradonna, MD, FARS
 Roy Casiano, MD, FARS
 Peter Joseph Catalano MD, FARS
 Mohamad Chaaban, MD, FARS
 Yvonne Chan, MD, FARS
 Rakesh Chandra, MD, FARS
 Dennis F. Chang, MD, FARS
 Eugene Chang, MD, FARS
 Philip Chen, MD, FARS
 Nipun Chhabra, MD, FARS
 Alexander Chiu, MD, FARS
 Garret Choby, MD, FARS
 Andy Chua, MD, FARS
 Christopher Church, MD, FARS
 Martin J. Citardi, MD, FARS
 David Clark, MD, FARS
 Perrin Clark, MD, FARS
 Alen Cohen, MD, FARS
 Noam Cohen, MD, FARS
 Brett Comer, MD, FARS
 David Conley, MD, FARS
 John Craig, MD, FARS
 Dana Crosby, MD, FARS
 Michael Cruz, MD, FARS
 Opeyemi Daramola, MD, FARS
 Subinoy Das, MD, FARS
 Greg Davis, MD, FARS
 Nathan Deckard, MD, FARS
 Robert DeDio, MD, FARS
 John Del Gaudio, MD, FARS
 Kara Detwiler, MD, FARS
 H. Peter Doble, MD, FARS
 Brennan Dodson, MD, FARS
 Angela Donaldson, MD, FARS
 Marc Dubin, MD, FARS
 Jay Dutton, MD, FARS
 Charles Ebert, Jr., MD, FARS
 David Edelstein, MD, FARS
 Jean Anderson Eloy, MD, FARS
 Alexander Farag, MD, FARS
 Elisabeth Ference, MD, FARS
 Adam Folbe, MD, FARS
 Karen Fong, MD, FARS
 Christine Franzese, MD, FARS
 Marvin P. Fried, MD, FARS
 Richard Gall, MD, FARS
 Rohit Garg, MD, FARS
 Mathew Geltzeiler, MD, FARS
 Ross Germani, MD, FARS
 Andrew Goldberg, MD, FARS
 James D. Gould, MD, FARS
 Satish Govindaraj, MD, FARS
 Parul Goyal, MD, FARS
 Scott Graham, MD, FARS
 Stacey Gray, MD, FARS
 David Greene, MD, FARS
 David Gudis, MD, FARS
 James Hadley, MD, FARS
 Ashleigh Halderman, MD, FARS
 Joseph Han, MD, FARS
 Wade Han, MD, FARS
 Gady Har-El, MD, FARS
 Richard Harvey, MD, FARS
 Samuel Helman, MD, FARS
 Thomas Higgins, MD, FARS
 Eric Holbrook, MD, FARS
 Christian Hull, MD, FARS
 Ian Humphreys, DO, FARS
 Peter Hwang, MD, FARS
 Elisa Illing, MD, FARS
 Christopher Ito, MD, FARS
 David Jang, MD, FARS
 Amin Javier, MD, FARS
 Stephanie Joe, MD, FARS
 Deya Jourdy, MD, FARS
 Jeb Justice, MD, FARS
 Seth Kanowitz, MD, FARS
 Boris Karanflov, MD, FARS
 David Kennedy, MD, FARS
 Robert Kern, MD, FARS
 David Keschner, MD, FARS
 Esther Kim, MD, FARS
 Jean Kim, MD, FARS
 Adam Kimple, MD, FARS
 Todd Kingdom, MD, FARS
 Anna Knisely, MD, FARS
 Ian Koszewski, MD, FARS
 Stilianos Kountakis, MD, FARS
 Jeffrey S. Krivitt, MD, FARS
 John Krouse, MD, FARS
 Edward Kuan, MD, FARS
 Devyani Lal, MD, FARS
 Kent Lam, MD, FARS
 Andrew Lane, MD, FARS
 Donald Lanza, MD, FARS
 Christopher Le, MD, FARS
 Richard A. Lebowitz, MD, FARS
 Annie Lee, MD, FARS
 Jivianne Lee, MD, FARS
 Victoria Lee, MD, FARS
 William Leight, MD, FARS
 Randy Leung, MD, FARS
 Corinna Levine, MD, FARS
 Howard Levine, MD, FARS
 Joshua Levy, MD, FARS
 Jonathan Liang, MD, FARS
 Sandra Y. Lin, MD, FARS
 Brian Lobo, MD, FARS
 Todd Loehrl, MD, FARS
 Neal Lofchy, MD, FARS
 Patricia Loftus, MD, FARS
 Nyall London, MD, FARS
 Mark C. Loury, MD, FARS
 Lauren Luk, MD, FARS
 Amber Luong, MD, PhD, FARS
 Luis Fernando Macias-Valle, MD, FARS
 Chadi Makary, MD, FARS
 Li-Xing Man, MD, FARS
 Lee Mandel, MD, FARS
 R. Peter Manes, MD, FARS
 Michael Marino, MD, FARS
 Steven Marks, MD, FARS
 Alice Maxfield, MD, FARS
 Stanley McClurg, MD, FARS
 Edward McCoul, MD, FARS
 K. Chris McMains, MD, FARS
 Bradford Mechor, MD, FARS
 Josh Meier, MD, FARS
 Christopher Melroy, MD, FARS
 Ralph B. Metson, MD, FARS
 Suzette Mikula, MD, FARS

Fellows of the American Rhinologic Society

Joseph Mirante, MD, FARS
 Jeffrey Myhill, MD, FARS
 Mohsen Naraghi, MD, FARS
 Ryan Neilan, MD, FARS
 Gurston G. Nyquist, MD, FARS
 Gretchen M. Oakley, MD, FARS
 Daniel O'Brien, MD, FARS
 Erin O'Brien, MD, FARS
 Richard Orlandi, MD, FARS
 Randall Ow, MD, FARS
 James Palmer, MD, FARS
 Ankit Patel, MD, FARS
 Chirag Patel, MD, FARS
 Zara Patel, MD, FARS
 Spencer Payne, MD, FARS
 Aaron Pearlman, MD, FARS
 Robert Pincus, MD, FARS
 David M. Poetker, MD, FARS
 Alan Pokorny, MD, FARS
 Juan Portela, MD, FARS
 Jordan Pritikin, MD, FARS
 Melissa A. Pynnonen, MD, FARS
 Mindy Rabinowitz, MD, FARS
 Roheen Raithatha, MD, FARS
 Hassan Ramadan, MD, FARS
 Jeevan Ramakrishnan, MD, FARS
 Vijay Ramakrishnan, MD, FARS
 Murugappan Ramanathan, Jr, MD, FARS
 Sanjeev Rangarajan, MD, FARS
 Douglas D. Reh, MD, FARS
 Camilo Reyes, MD, FARS
 Ryan Rimmer, MD, FARS
 Rachel Roditi, MD, FARS
 John Romanow, MD, FARS
 Austin Rose, MD, FARS

Marc Rosen, MD, FARS
 Allan Rosenbaum, MD, FARS
 Arthur Rosner, MD, FARS
 Brian Rotenberg, MD, FARS
 Christopher Roxbury, MD, FARS
 Paul Russell, III, MD, FARS
 Matthew Ryan, MD, FARS
 Alok Saini, MD, FARS
 Zoukaa Sargi, MD, FARS
 Rodney J. Schlosser, MD, FARS
 Jerry Schreibstein, MD, FARS
 Theodore Schuman, MD, FARS
 Kirby Scott, DO, FARS
 Brent A. Senior, MD, FARS
 Gavin Setzen, MD, FARS
 Michael Setzen, MD, FARS
 Adam M. Shapiro, MD, FARS
 David A. Sherris, MD, FARS
 Alan Shikani, MD, FARS
 Timothy Siglock, MD, FARS
 Michael J. Sillers, MD, FARS
 Stacey Silvers, MD, FARS
 Raj Sindwani, MD, FARS
 Ameet Singh, MD, FARS
 Douglas Skurada, MD, FARS
 Timothy Smith, MD, FARS
 Zachary Soler, BA, FARS
 Alla Y. Solyar, MD, FARS
 James A. Stankiewicz, MD, FARS
 Michael Stewart, MD, FARS
 Janalee K. Stokken, MD, FARS
 J. Pablo Stolovitzky, MD, FARS
 Scott Stringer, MD, FARS
 Jeffrey Suh, MD, FARS
 Krishnamurthi Sundaram, MBBS, FARS

Ronnie Swain, Jr., MD, FARS
 Abtin Tabaei, MD, FARS
 Mas Takashima, MD, FARS
 Bobby Tajudeen, MD, FARS
 Thomas Tami, MD, FARS
 Dennis Tang, MD, FARS
 Luisam Tarrats, MD, FARS
 Jordan Teitelbaum, MD, FARS
 Erica Thaler, MD, FARS
 Brian Thorp, MD, FARS
 Jonathan Ting, MD, FARS
 Charles Tong, MD, FARS
 Eliina Toskala, MD, FARS
 Justin Turner, MD, FARS
 Winston Vaughan, MD, FARS
 Darshni Vira, MD, FARS
 Frank Virgin, MD, FARS
 Jarrett Walsh, MD, FARS
 Eric Wang, MD, FARS
 Marilene Wang, MD, FARS
 Danielle Warner, MD, FARS
 Robert Weiss, MD, FARS
 Kevin Welch, MD, FARS
 Sarah Wise, MD, FARS
 Ian James Witterick, MD, FARS
 Troy D. Woodard, MD, FARS
 Bradford A. Woodworth, MD, FARS
 Erin Wright, MD, FARS
 Bozena Wrobel, MD, FARS
 Arthur W. Wu, MD, FARS
 Rhoda Wynn, MD, FARS
 William Yao, MD, FARS
 Michael Yim, MD, FARS
 Mark A. Zacharek, MD, FARS

ARS Fellow Membership: A physician who has met the criteria for Regular membership and has the following additional qualifications: must be out of residency for at least 3 years, 50 surgical rhinologic cases in two years, Publications or other evidence of scholarly activity in rhinology, attendance at two American Rhinologic Society meetings or ARS-sponsored courses over a three-year period may apply to become a Fellow of the Society. Fellows shall have the same rights and privileges of Regular members and shall be eligible to vote, serve on one or more committees, and in addition may hold office. A complimentary on-line and hard copy subscription to the International Forum of Allergy & Rhinology will be provided with your paid annual membership.

Become a Fellow of the American Rhinologic Society:
<https://www.american-rhinologic.org/fellow-of-the-ars>

Your invitation to experience
the International Forum of Allergy & Rhinology app



International Forum of Allergy & Rhinology. To Go.
Introducing International Forum of Allergy & Rhinology for the iPad®, iPhone®, and iPod®.

Keep up to date with current research regarding the management of otolaryngic allergy, rhinologic, and skull base diseases. IFAR is indexed in PubMed and ISI, and achieved a first year impact factor of 1.00. With its app you will experience:

- Readable, print-like experience enhanced with dynamic figures, tables, and references
- Rapid access to breaking research — Early View articles updated as they publish
- Adjustable text and table sizing with “pinch and zoom”
- Ability to browse content before downloading an issue, and to download issues to read offline
- Email and social media sharing tools
- Links to supplemental material online
- Convenient alerts when new issues are available

Submit your next paper to:
<http://www.american-rhinologic.org/journal>

If your institution subscribes to IFAR, follow the steps below to get access:

- 1 Register to create an account on Wiley Online Library or, if you already have one, log in
- 2 Access Wiley Online Library from your institution’s network and log in. If you are off-site and need help getting access to licensed content, contact your librarian
- 3 Visit the roaming access section of “My Profile” and click “Activate Roaming Access”
- 4 Download the International Forum of Allergy & Rhinology app from iTunes
- 5 Launch app from the Newsstand, and follow the steps in the access wizard

Enter your Wiley Online Library account information.
For more detailed instructions, visit Journal iPad® App Frequently Asked Questions

Can't Access International Forum of Allergy & Rhinology? Recommend this title to your institutional library.

ARS and AAOA Members! Your subscription includes the new app!

Log in with your regular Wiley Online Library log-in to access journal content with the app

Apple, iPad, iPhone, and iPod are trademarks of Apple Inc., registered in the U.S. and other. App Store is a service mark of Apple Inc.

WILEY

**International Forum of Allergy and Rhinology
Top 20 Reviewers**

- | | |
|-----------------------------|----------------------------|
| Ryan Rimmer, MD, FARS | Jeffrey Suh, MD, FARS |
| Mathew Geltzeiler, MD, FARS | Lauren Roland, MD |
| Daniel Beswick, MD, FARS | Victoria Lee, MD, FARS |
| Nyall London, MD, FARS | Justin Turner, MD, FARS |
| Do-Yeon Cho, MD | Devyani Lal, MD, FARS |
| Nicholas Rowan, MD | Benjamin Bleier, MD, FARS |
| Christopher Brook, MD | Kara Detwiller, MD, FARS |
| Chadi Makary, MD, FARS | Garret Choby, MD, FARS |
| Edward Kuan, MD, FARS | Rodney Schlosser, MD, FARS |
| Naweed Chowdhury, MD | David Gudis, MD, FARS |



SAVE THE DATE 2024



COSM 2024

May 15-16, 2024

**Hyatt Regency Chicago
Chicago, IL**



ARS 13th Annual Summer Sinus Symposium

*Best Sinus Course in the World:
Improving Rhinology from Office to OR*

July 12-14, 2024

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



ARS 70th

Annual Meeting

September 26-28, 2024

Miami, FL

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)