



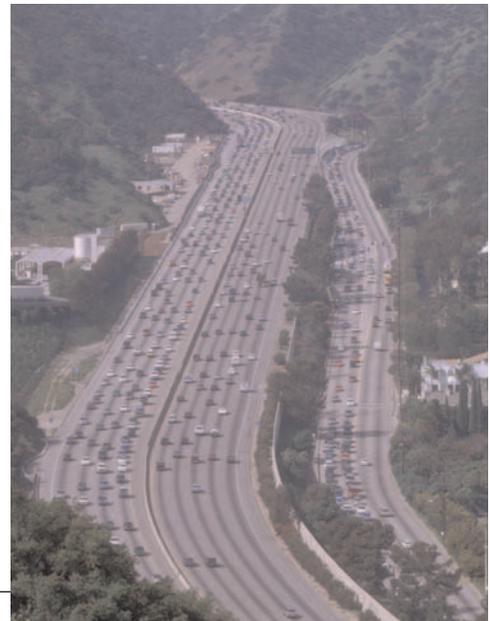
**American Rhinologic Society**

# **51<sup>st</sup> Annual Meeting**

**Westin Bonaventure Hotel & Suites**

**Los Angeles, California**

**September 24, 2005**





**American Rhinologic Society**

**51<sup>st</sup> Annual Meeting**

**REGISTRATION**

September 24, 2005

Catalina Foyer (3rd Level)

Open 6:30 a.m.

## Educational Objectives

### Mission Statement

The American Rhinologic Society's mission is to serve, represent and advance the science and the 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 enhance clinical skills and promote research.

### Educational Objectives

The program will consist of presentations from abstracts selected by the program committee through a blinded review process. The specific objectives are as follows:

- The participants should become more familiar with the diagnostic and treatment modalities in patients with chronic rhinosinusitis.
- The participants should gain better understanding of the basic science and pathophysiology of chronic rhinosinusitis.
- The participants should understand more completely the impact of various surgical procedures for chronic rhinosinusitis.
- The participants should have more insight into advanced rhinologic techniques and procedures for treatment of neoplastic disease and pathology of the anterior of skull base.

**Target Audience:** Practicing otolaryngologists and otolaryngology residents in training

**Statement of Need:** The clinical and basic science related to rhinology is rapidly expanding. The program is designed to meet the need to further educate those who evaluate, treat, and perform research in the area of rhinologic disorders.

**Activity Goal:** The goal of the program is provide current information as well as future areas of interest in the field of rhinology

**Accreditation Statement:** The American Rhinologic Society is accredited by the Accreditation Council for Continuing Medical Education to provide medical education for physicians. The American Rhinologic Society designates this educational activity for a maximum of 9 category 1 credits toward the AMA Physician's Recognition Award. Each physician should claim only those hours that he/she actually spent on the educational activity.

**Faculty Disclosures:** The "Faculty Disclosure Policy" of the American Rhinologic Society requires that presenters participating in a CME activity disclose to the audience any significant financial interest or other relationship an author or presenter has with the manufacturer(s) of any product(s) discussed in an educational presentation. Presenters are required to disclose any relationship with a pharmaceutical or equipment company which might pose a potential, apparent or real conflict of interest with regard to their unlabeled or investigational use of any commercial product or device not yet approved for use in the United States.

The following faculty/presenters have indicated these disclosures:

- *William Bolger, MD* - The authors serve as members of the Scientific Advisory Board for and have an equity holding in Acclarent Inc., the company that developed the devices studied and reported in the presentation.
- *Bradford Woodworth, MD* - Rodney Schlosser, MD (co-author) is a consultant for BrainLab and Aventis.
- *Thomas Tami, MD* - Consultant, Medtronic Xomed
- *Subinoy Das, MD* - Brent Senior, MD (co-author) is a consultant for BrainLab.
- *Jern-Lin Leong, MD* - Martin Citardi, MD (co-author) is a member of the scientific advisory board for GE Healthcare Navigation (2003-present), and he was a member of the scientific advisory board for CBYON (1999-2003)
- *Seth Brown, MD* - Equipment used in this study was provided in part by GE Medical Navigation and Visualization. Marvin Fried, MD is on the GE Surgical Advisory Board.
- *Alexis H. Jackman, MD* - RL Doty is a major shareholder in Sensonics, Inc., the manufacturer and distributor of smell and taste tests.
- *Vijay Anand, MD* - GE Medical Systems
- *Teresa King, MD* - Michael Sillers, MD (co-author) is a consultant for Gyrus ENT, Sinus Pharmacy, Metronic Xomed and GE Navigation.
- *Valerie J. Lund, MD* - Consultant for GlaxoSmith Kline, Schering Plough, Astra Zeneca, Bayer and Servier.
- *Howard L. Levine, MD* - Medical Director for Sinucare. Speaker for Aventis and GlaxoSmith Kline. Consultant for Medtronic Xomed, Scott Cordray. Owner of Master Solutions.

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## Disclosures

The following faculty/presenters have no disclosures to report:

Ramez J. Awwad, MD  
Marc Bassim, MD  
Samuel Becker, MD  
Christopher L. Brown, MD  
Alexander G. Chiu, MD  
Noam Cohen, MD  
Jacquelynn Corey, MD  
Martin Desrosiers, MD  
Marc Dubin, MD  
Jay Dutton, MD  
Ellen Friedman, MD  
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Stuart Hardy, MD  
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Alexis H. Jackman, MD  
Amin R. Javer, MD  
Anita Jeyakumar, MD  
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Robert Kern, MD  
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Debra Weinberger, MD  
W. Stites Whatley, MD  
Rhoda Wynn, MD  
Kashif Yousuf, H.BA.  
Kai Zhap, PhD

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## Welcome Note . . .

In 1954, Maurice Cottle organized the American Rhinologic Society for the accumulation and dissemination of scientific knowledge in the field of rhinology, and to engender original investigation and to stimulate interest in all phases of this branch of medicine. The American Rhinologic Society is now entering its 51st year following a successful 50th Anniversary meeting, September 18-20, 2004. I want to take this opportunity to thank the entire ARS membership, Executive Committee, Board members, Consultants and Committee Chairs.

Our goal for the immediate future of the ARS is to increase both our national and international membership. The present membership includes many young, active, enthusiastic, superbly trained Rhinologists that are invigorating the society through basic science and clinical research. Simultaneously, these same individuals are all actively involved in the structural and support aspects of the ARS. In addition, the society has secured a solid foundation of senior members that have brought the ARS to its present level of leadership within the Otolaryngologic as well as the entire medical community.

The COSM 2005 meeting in Boca Raton Florida was extremely successful. I want to congratulate the President-Elect, Dr. Michael Sillers as well as the program committee.

The Fall Annual Meeting has been designed to provide you with an in-depth exciting scientific program, including a CME Breakfast Symposium, lunch symposium, evening CME symposium, poster presentations and an all-day Exhibit Hall presenting their latest products.

Joseph B. Jacobs, MD  
President, ARS

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## Committee Chairs

*Audit Committee*  
**Stilianos Kountakis, MD**

*Awards Committee*  
**Allen Seiden, MD**

*By-Laws Committee*  
**William Bolger, MD**

*CME Committee*  
**James Palmer, MD**

*Corporate Liaison Committee*  
**Paul Toffel, MD**

*Credentials*  
**Peter Hwang, MD**

*Education Committee*  
**Todd Kingdom, MD**

*Information Technology Committee*  
**Martin Citardi, MD**

*Membership Committee*  
**Karen Fong, MD**

*Patient Advocacy Committee*  
**Michael Setzen, MD**

*Pediatric Rhinology Committee*  
**Rodney Lusk, MD**

*Program Committee*  
**Michael Sillers, MD**

*Research Grant Committee*  
**Thomas Tami, MD**

## Past Presidents

1954 – 1955	Maurice H. Cottle, M.D.*
1955 – 1956	Ralph H. Riggs, M.D.*
1956 – 1957	Walter E. E. Loch, M.D.*
1958 – 1959	Kenneth H. Hinderer, MD*
1959 – 1960	Roland M. Loring, M.D*
1960 – 1961	Ivan W. Philpott, M.D*
1962 – 1963	Raymond I. Hilsinger, M.D*
1963 – 1964	H. Ashton Thomas, M.D*
1964 – 1965	Carl B. Spath, M.D.
1966 – 1967	Walter J. Aagesen, M.D.
1967 – 1968	Richard Hadley, M.D.*
1968 – 1969	Henry L. Williams, M.D.*
1970 – 1971	Charles A. Tucker, M.D.*
1971 – 1972	Pat A. Barelli, M.D.
1972 – 1973	Gerald F. Joseph, M.D.
1973 – 1974	Manuel R. Wexler, M.D*
1974 – 1975	George H. Drumheiler, MD*
1975 – 1976	Joseph W. West, M.D.*
1976 – 1977	Albert Steiner, M.D*
1977 – 1978	Anthony Failla, M.D*
1978 – 1979	Clifford F. Lake, M.D*
1979 – 1980	W. K. Locklin, M.D.
1981 – 1982	Eugene B. Kern, M.D.
1982 – 1983	Carlos G. Benavides, M.D.
1983 – 1984	Leon Neiman, M.D.
1984 – 1985	George C. Facer, M.D.
1985 – 1986	Larry E. Duberstein, M.D.
1986 – 1987	Glenn W. Drumheiler, DO
1987 – 1988	Alvin Katz, M.D.
1988 – 1989	Donald Leopold, M.D.
1990 – 1991	Pierre Arbour, M.D.
1991 – 1992	Fred Stucker, M.D.
1992 – 1993	David W. Kennedy, M.D.
1993 – 1994	Sandord R. Hoffman, M.D.
1994 – 1995	Richard J. Trevino, M.D.
1995 – 1996	Vijay K. Anand, M.D.
1996 – 1997	Dale H. Rice, M.D.
1997 – 1998	Michael S. Benninger, M.D.
1998 – 1999	William Panje, M.D.
1999 – 2000	Charles W. Gross, M.D.
2000 – 2001	Frederick A. Kuhn, M.D.
2001 – 2002	Paul Toffel, M.D.
2002 – 2003	Donald C. Lanza, M.D.
2003 – 2004	James A. Hadley, MD
2004 – 2005	Joseph B. Jacobs, MD

*\*Deceased*



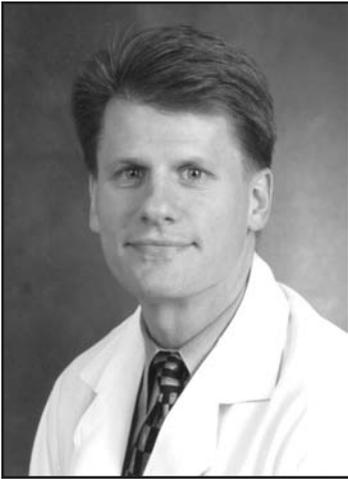
## *Joseph B. Jacobs, MD*

### **President**

Joseph B Jacobs, M. D. graduated from Columbia University in New York City with a B. A. in Liberal Arts in 1970 and went on to obtain his M. D. at Albert Einstein College of Medicine. He completed his general surgical internship at Montefiore Hospital and Medical Center which was followed by Otolaryngology training at New York University-Bellevue Hospital from 1974-1978. This was followed by a Facial Plastic and Reconstructive Surgery Fellowship at UCLA from 1978-1979. Dr Jacobs returned to New York University within the Otolaryngology Department as Director of Facial Plastic Surgery. Following his promotion to Assistant Professor in 1990 his interest in Rhinology increased and he was appointed Director in 1992. He is now Clinical Professor , Director of Rhinology and Vice-Chair of the Department of Otolaryngology. Dr Jacobs is a Fellow of the American Rhinologic Society, the American College of Surgeons and the American Academy of Otolaryngology Head and Neck Surgery.

Dr Joe Jacobs has over 80 publications and has given over 100 invited lectures. He is an Associate Editor of the American Journal of Rhinology, reviewer for Laryngoscope, Archives of Otolaryngology and Operative Techniques in Otolaryngology. Dr Jacobs is President-Elect of The American Rhinologic Society and Chair of the Program Committee for the ARS 50<sup>th</sup> Anniversary Meeting. He received an Honorable Mention for his Thesis to the Triologic Society, "100 Years of Frontal Sinus Surgery" in 1994. He also received numerous awards at Columbia University, Albert Einstein College of Medicine and at New York University-Bellevue Medical Center. Dr Jacobs is listed in Best Doctors in New York City and Best Doctors in America (Castle Connolly Medical LTD), as well in "New York's Top 100 Minimally Invasive Surgeons," and "New York's Best Doctors" (New York Magazine).

His Research interests include Endoscopic Frontal Sinus Surgery and the Utilization of Frameless Image Guidance as well as numerous clinical trials concerning the effectiveness of various antibiotics for Acute Bacterial Sinusitis.



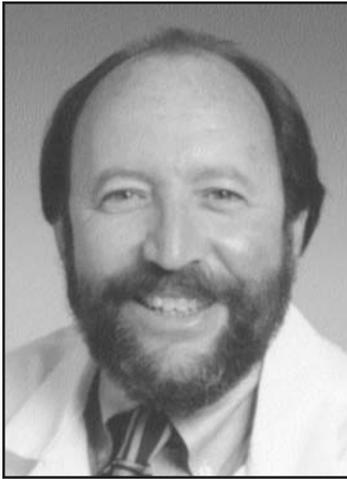
*Michael J. Sillers, MD*

**President Elect/Program Chairman**

Michael J. Sillers, M.D. graduated from the University of Alabama in 1984 and received his M.D. from the University of Alabama in 1988. He completed an internship in general surgery and a residency in otolaryngology-head and neck surgery at the University of Alabama-Birmingham in 1993. He completed his training as a fellow in rhinology and sinus surgery at the Medical College of Georgia and joined the faculty at UAB in 1994. He has since been promoted to professor of surgery, holds the James J. Hicks Chair in otolaryngology-head and neck surgery and currently serves as the medical director at the Kirklin Clinic.

Dr. Sillers has served on the American Rhinologic Society Board of Directors since 1999 and is currently the First Vice-President. He has also served on the Rhinology and Paranasal Sinus Committee and received an Honor Award from the American Academy of Otolaryngology-Head and Neck Surgery in 2001. He has been listed as one of America's top doctors (Castle and Connolly Medical LTD), is a member of Alpha Omega Alpha, and has been named faculty member of the year in otolaryngology-head and neck surgery on several occasions at UAB.

Dr. Sillers has published numerous peer review articles in the field of rhinology and lectures at educational courses around the country. He serves as a peer reviewer for the American Journal of Rhinology, Laryngoscope, and the Archives of Otolaryngology. His clinical research interests include surgical navigation and extended applications of transnasal endoscopic surgery. His basic science interests involve microarray analysis of inflammatory mediators in chronic rhinosinusitis.



*Marvin P. Fried, MD*

**Secretary/Second Vice President**

**Professor and University Chairman  
Department of Otolaryngology  
Albert Einstein College of Medicine/Montefiore Medical Center**

Marvin P. Fried, M.D. is a New York native. He received the New York City Jonas Salk Award and Scholarship from New York City College. He graduated Tufts University School of Medicine in 1969, followed by training in Otolaryngology at Washington University School of Medicine, where he also served as a Fellow of the National Institute of Neurologic Disease and Stroke. He has been on the faculty of Boston University School of Medicine, Tufts University School of Medicine, and Harvard Medical School, being promoted ultimately to Professor of Otolaryngology. He served as Chief of the Divisions of Otolaryngology at the Brigham and Women's Hospital, Beth Israel Deaconess Medical Center, and Co-Director of the Head and Neck Oncology Program at Dana-Farber Cancer Institute. In 1999, he became Professor of Otolaryngology and University Chairman, Albert Einstein College of Medicine and Montefiore Medical Center.

His awards include first place award for Basic Research in Otolaryngology as a Resident from the American Academy of Ophthalmology and Otolaryngology (1975), the Edmund Prince Fowler Award for Basic Science Research from the American Laryngological, Rhinological, and Otological Society (Triologic Society) 1984, the Honor Award of the American Academy of Otolaryngology-Head and Neck Surgery 1988, and the Mark Award for Contributions to the Advancement of Laser Medicine and Surgery in 1994 from the American Society for Laser Medicine and Surgery. He received the Medal of the City of Paris in 1987. He has been listed in the Best Doctors in America; Best Doctors in New York (Castle Connolly Medical LTD), as well as in "New York's Top 100 Minimally Invasive Surgeons," and "New York's Best Doctors" (*New York Magazine*).

He has been President of the Society of University Otolaryngologists-Head and Neck Surgeons, and the American Society for Laser Medicine and Surgery. He is Secretary of the American Rhinologic Society, and the American Laryngological Association. He has also served on numerous committees for other organizations, such as, the American Society for Head and Neck Surgery, the American Broncho-Esophagological Association, and the American Academy of Otolaryngology-Head and Neck Surgery.

Dr. Fried is on the Editorial Board of the *Archives of Otolaryngology-Head and Neck Surgery*, the *Laryngoscope*, *Ear Nose and Throat Journal*, the *Journal of Clinical Laser Medicine and Surgery*, *Lasers in Surgery and Medicine*, and the *Annales d'Oto-Laryngologie et de Chirurgie Cervico Faciale*.

His research interests are in the realm of technical applications for the improvement of surgery as it relates to disorders of the head and neck. This has included laser applications and safety, computer-assisted and image-guided surgery, and surgical simulation. He has been the principal investigator on grants issues by the Department of Defense, as well as current investigator from the Agency for Healthcare Research and Quality.

He is currently investigating the use of sophisticated surgical simulation for training of residents and physicians for endoscopic sinus surgery and its relationship to the improvement of patient safety. He has authored over 150 original reports, reviews, and chapters, as well as books and monographs. He has been the Senior Editor of two editions of a definitive textbook on laryngeal disorders.



## *Brent Senior, MD*

### **Secretary-Elect**

Brent A. Senior, MD, FACS graduated from the Wheaton College in Wheaton, Illinois in 1986 and received his medical degree from the University of Michigan in 1990. His internship in General Surgery was completed at Boston University in 1991, followed by a residency in otolaryngology/head and neck surgery at the combined otolaryngology residency training program at Tufts University and Boston University. In 1996, he completed a fellowship in rhinology and sinus surgery at the University of Pennsylvania. He joined the Department of Otolaryngology/Head and Neck Surgery at Henry Ford Hospital as a Senior Staff Surgeon in 1996, leaving to join the faculty of the University of North Carolina in 1999. He currently serves as Associate Professor of Otolaryngology/Head and Neck Surgery and Chief of Rhinology, Allergy, and Sinus Surgery at the University of North Carolina at Chapel Hill.

Dr. Senior serves on the editorial boards of the American Journal of Rhinology and Laryngoscope and he is also Associate Editor of Otolaryngology/Head and Neck Surgery. He currently serves on the Rhinology Section of the Home Study Program for the AAO/HNS Foundation, as well as the Paranasal Sinus Committee. He has served as guest examiner with the American Board of Otolaryngology and currently serves as Secretary/Treasurer for the Christian Society of Otolaryngology/Head and Neck Surgeons.

Having a passion for education, Dr. Senior has received numerous awards and honors including teacher of the year, Best Doctors in North Carolina, Best Doctors in the USA. He has received the Honor award from the American Academy of Otolaryngology/Head and Neck Surgery and has served as Director and/or instructor in sinus surgery and rhinology in over 40 national and international courses. He has published over 50 articles and book chapters.

Dr. Senior is a Fellow of the American Rhinologic Society and has served the society in several ways including Consultant to the Board, and Editor of "Nose News," the newsletter of the American Rhinologic Society. He is currently Secretary for the Society and serves on the Education Committee.



## *David W. Kennedy, MD*

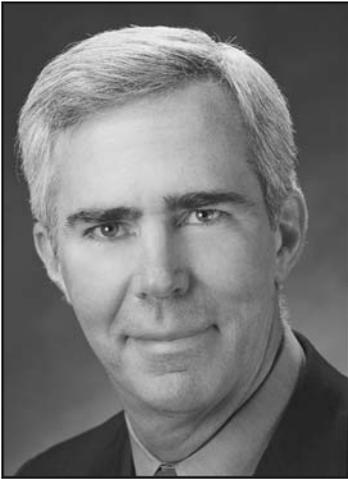
**Treasurer**

David W. Kennedy, M.D., F.R.C.S.I., F.A.C.S., is currently Vice Dean for Professional Services at the University of Pennsylvania, Senior Vice President of the University of Pennsylvania Health System, and Rhinology Professor and Chief of the Division of Rhinology in the Department of Otorhinolaryngology: Head and Neck Surgery at the University of Pennsylvania. Prior to his current appointment, Dr. Kennedy spent 12 years as Chair of the Department of Otorhinolaryngology: Head and Neck surgery at Penn.

Dr. Kennedy performed his residency training in otolaryngology at Hopkins and then spent 12 years on the faculty as Assistant Professor, Associate Professor and Director of the Otolaryngology Residency Training Program. Originally from the British Isles, he spent his school years in England and Ireland. He graduated from the Royal College of Surgeons with many awards and transmigrated directly to Hopkins following his internship. While in Baltimore, he served as a member of the Board of Directors of the Hearing and Speech Agency of Metropolitan Baltimore, and as Otolaryngology Consultant to the Maryland State Department of Health.

In 1985, Dr. Kennedy introduced the concept of managing sinus disease under endoscopic control to the United States, a technique that he termed 'Functional Endoscopic Sinus Surgery'. Dr. Kennedy is interested in the pathogenesis of sinusitis, sinusitis outcomes and mucociliary clearance. He has participated in approximately 200 courses nationally and internationally teaching the current concepts of rhinosinusitis management to otolaryngologists and other health care professionals. The Department of Otorhinolaryngology: Head and Neck Surgery is considered a premier department internationally for its work in the field of sinus disease, olfaction and nasal disorders.

Dr. Kennedy is Board Certified in Otolaryngology and a Fellow of the Royal College of Surgeons in Ireland and of the American College of Surgeons. At Penn, he has served as Chief of the Medical Staff, as a member of the Board of Trustees of the Medical Center and on the Medical Center Steering Committee. He is Past-President of the American Rhinologic Society, Past-President of the International Symposium of Infection and Allergy of the Nose and currently serves as Editor-in-Chief of the American Journal of Rhinology. He also serves on the editorial boards of nine other journals and is a member of the Board of Directors of the American Academy of Otolaryngology. He has published well over 150 journal articles and chapters in his field, has received a number of international awards. In 1999, he was elected to the Institute of Medicine of the National Academy of Sciences. He received the 2002 Practitioner Excellence Award from the Board of Governors of the American Academy of Otolaryngology-Head and Neck Surgery and is the recipient of a Presidential Citation from the same organization.



## *James A. Hadley, MD*

### **Immediate Past President**

James A. Hadley, MD, FACS, is an Associate Professor of Clinical Otolaryngology at the University of Rochester Medical Center and in an academic clinical practice of Otolaryngology, Head and Neck Surgery associated with the University Residency Program. He received his medical degree from the University of Bordeaux II, Faculty of Medicine, in France and completed a surgical internship at the Hospital of St. Raphael in New Haven and a medical internship at The Greenwich Hospital, both in Connecticut. His additional postgraduate training includes a residency in Otolaryngology, Head and Neck Surgery at the University of Rochester Medical Center.

Dr. Hadley is the current President of the American Rhinologic Society and is an elected Director of the American Board of Otolaryngology. He has completed his service as Director-at-large to the Board of Directors of the American Academy of Otolaryngology-Head & Neck Surgery 2000-2003. He also served as President of the American Academy of Otolaryngic Allergy from 1995-1996. He is a past Chairman of the AAO-HNS Allergy and Immunology and Medical Devices and Drugs Committees and is a member of the Slide lecture and Self Instructional Committees. He is a Fellow of the American College of Surgeons, American Academy of Otolaryngic Allergy, American Rhinologic Society and the American Academy of Otolaryngology Head & Neck Surgery who recently presented him with their Distinguished Service Award for Meritorious Service.

In addition to his academic teaching in surgery and otolaryngology, Dr. Hadley's clinical practice specializes in rhinology and sinonasal disorders, otolaryngic allergy and pediatric otolaryngology. He has been an Invited Speaker and Instructor on guidelines for the management and treatment of these disorders at numerous meetings of the American Academy of Otolaryngic Allergy, American Academy of Otolaryngology Head & Neck Surgery Foundation and the American Rhinologic Society. His work has also appeared in such scientific journals as *Otolaryngology Head and Neck Surgery*, *Current Opinion in Otolaryngology*, *ENT Journal*, *Otolaryngology Clinics of North America*, *Medical Clinics of North America*, *Journal of Managed Care* and the *American Journal of Rhinology* and the textbooks: *Community Acquired Respiratory Tract Infections*, *Allergy and Immunology, an Otolaryngic Approach* and *Primary Care for Women*.



## *Donald C. Lanza, MD*

### **Past President**

Donald C. Lanza graduated from Fordham University (New York, NY) in 1979 with a B.S. in Biology. Subsequently, he completed his M.S. in Physiology from Georgetown University (Washington, DC) and in 1985 he obtained his M.D. at the State University of New York, Health Science Center in Brooklyn, NY (Downstate). In 1990, Dr. Lanza completed his general surgery and otolaryngology training at Albany Medical Center in upstate New York and became board certified by the American Board of Otolaryngology. He began 1 year of fellowship training in Rhinology with David W. Kennedy, MD at Johns Hopkins Medical Institutes that was completed at the University of Pennsylvania. After a period as an assistant professor at PENN, Dr. Don Lanza was promoted to associate professor of otolaryngology and was made their director of the Division of Rhinology. In 1992, he became a Fellow of the American Rhinologic Society and in 1994, he became a Fellow of the American College of Surgeons. In 1999 he took a position as the Section Head of Nasal & Sinus Disorders in the Department of Otolaryngology & Communicative disorders at The Cleveland Clinic Foundation in Ohio.

Dr. Don Lanza has over 100 publications, with 70 publications in peer-reviewed journals. He has given more than 300 invited lectures in the U.S.A. and abroad. Don Lanza, MD is internationally recognized as an innovator of surgical procedures for the nasal passages and the paranasal sinuses. He is an active fellow in The American Academy of Otolaryngology – Head Neck Surgery (AAO-HNS) and an active member of the American Academy of Otolaryngic Allergy. Dr. Lanza, recently completed a three year term as the AAO-HNS representative to the Sinus & Allergy Health Partnership and was President of the American Rhinologic Society in 2002-3.

Dr. Don Lanza has been the course director for 27 Continuing Medical Education programs and the host for 2 international meetings on nasal and sinus disorders. Donald C. Lanza, MD is a winner of the prestigious “Golden Head Mirror Award,” from the American Rhinologic Society for meritorious teaching. Additionally, he was awarded as the “Otolaryngology Teacher of the Year,” by the residents in 1998 at the University of Pennsylvania and again in 2004 at The Cleveland Clinic Foundation. Donald C. Lanza, MD is listed in Best Doctors in America since 1994 and in Castle & Connolly’s Top Docs in America since it was first introduced in 2001.

Donald C. Lanza, MD was instrumental in developing rhinology centers of excellence that are internationally recognized at both the University of Pennsylvania & The Cleveland Clinic Foundation. In an effort to be closer to his family in Florida, Dr. Lanza resigned his position as Section Head at The Cleveland Clinic Foundation in August 2004 and has established the Sinus & Nasal Institute of Florida, P.A. in St. Petersburg on the Tampa Bay.



## *Howard L. Levine, MD*

### **First Vice President**

Howard L. Levine, MD, is Director of the Cleveland Nasal-Sinus & Sleep Center at Marymount Hospital (part of the Cleveland Clinic Health System) in Cleveland, Ohio. He is also the director of Marymount Hospital Nasal and Sinus program.

A graduate of the University of Pennsylvania and Northwestern University School of Medicine, Dr. Levine trained in general surgery at University Hospitals of Cleveland Ohio and in otolaryngology at Northwestern University Medical Center.

Dr. Levine is a fellow in the American Rhinologic Society (serving physicians specializing in nose and sinus diseases) and serves on its board of directors and is its vice-president. He is also a fellow in the American Academy of Otolaryngology-Head and Neck Surgery, the American Academy of Facial Plastic and Reconstructive Surgery and the American College of Surgeons.

Dr. Levine is one of the pioneers in the development of advanced nasal endoscopic diagnostic techniques, functional sinus surgery, and advanced applications for managing nasal and sinus disease. He has helped to develop conservative methods to correct nasal and sinus problems using nasal endoscopy, radiofrequency, and lasers.

Dr. Levine has published nearly 100 scientific papers, has given more than 350 scientific lectures around the world, and serves as a consultant to several companies that specialize in pharmaceuticals and instrumentation for nasal and sinus disease.

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## Board Members



*Martin J. Citardi, MD*

Cleveland, Ohio



*Scott M. Graham, MD*

Iowa City, IA



*Peter H. Hwang, MD*

Stanford, CA

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## Board Members



*Steven C. Marks, MD*

Havre de Grace, MD



*Thomas A. Tami, MD*

Cincinnati, OH



*Winston C. Vaughan, MD*

E. Palo Alto, CA

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**Consultants**



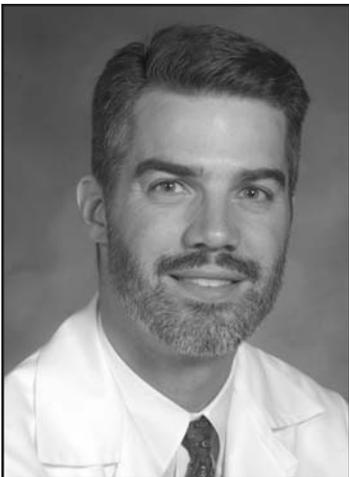
*Kelvin C. Lee, MD*

New York, NY



*Todd A. Loehrl, MD*

Wauwatosa, WI



*Richard Orlandi, MD*

Salt Lake City, UT

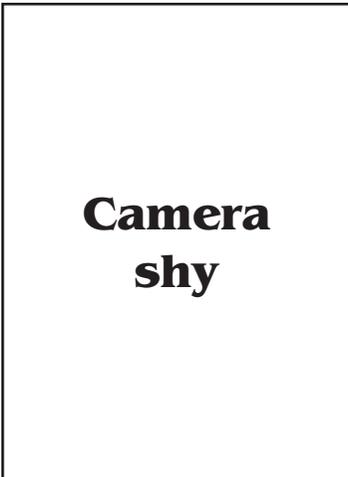
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**Consultants**



*Kathleen Yaremchuk, MD*

Dearborn, MI



**Camera  
shy**

*Wendi Perez*

Administrator  
Warwick, NY

## **COSM 2006**

May 19 – May 22, 2006

Hyatt Regency Hotel

Chicago, IL

Call for Papers: 11/15/2005

Submit your abstract on-line at  
[www.american-rhinologic.org](http://www.american-rhinologic.org)

## **Fall 2006**

September 16, 2006

Toronto, Canada

Call for Papers: 6/05/2006

Submit your abstract on-line at  
[www.american-rhinologic.org](http://www.american-rhinologic.org)

**Catalina Ballroom – Avalon**

6:30 a.m.

Registration – Catalina Foyer (3rd Level)

7:00 a.m.

CME Breakfast Symposium  
(Supported by Merck & Co., Inc.)

8:00 a.m. - 8:10 am

Welcome and Introduction  
Joseph Jacobs, MD - President  
Michael Sillers, MD - President-Elect

**Moderators:** Peter Hwang, MD  
Richard Orlandi, MD

8:10 a.m. – 8:17 a.m.

*In Vitro Inhibition Of Fungal Growth With Amphotericin B Irrigation Solution*  
Marc Dubin, MD

8:17 a.m. – 8:24 a.m.

*The Anatomy Of The Sphenopalatine Artery For The Endoscopic Sinus Surgeon*  
Ullas Raghavan, MD

8:24 a.m. – 8:31 a.m.

*Surgical Navigation Using CT-MRI Fusion for Transsphenoidal Hypophysectomy*  
James McIlwaine, MD

8:31 a.m. – 8:38 a.m.

Discussion

8:38 a.m. – 8:45 a.m.

*Endoscopic Anatomy of the Parasellar Region*  
Marc Bassim, MD

8:45 a.m. – 8:52 a.m.

*The Surgeons View Of The Anterior Ethmoid Artery*  
Ullas Raghavan, MD

8:52 a.m. – 8:59 a.m.

*Catheter Based Dilation of the Sinus Ostia: Initial Safety and Feasibility Analysis*  
William Bolger, MD

8:59 a.m. – 9:06 a.m.

Discussion

**Moderators:** James Palmer, MD  
Peter Doble, MD

9:06 a.m. – 9:13 a.m.

*Efficacy of Hyaluronic Acid Carboxymethyl Cellulose as an Absorbable Spacer after ESS*  
Corey Mineck, MD

9:13 a.m. – 9:20 a.m.

*Anatomic and Endoscopic Localization of the Anterior and Posterior Ethmoid Arteries*  
Samuel Becker, MD

9:20 a.m. – 9:27 a.m.

*The Safety Of Steroid Injection Of Nasal Polyps Versus Surgical Removal: Review Of A Decade Of Experience*  
Samuel Becker, MD

9:27 a.m. – 9:34 a.m.

Discussion

9:34 a.m. – 9:41 a.m.

*Altered Sinonasal Ciliary Dynamics in Chronic Rhinosinusitis*  
Noam Cohen, MD

9:41 a.m. – 9:48 a.m.

*In Vitro Biofilm Formation by Organisms Isolated from Routine Sinus Cultures*  
Giridhar Venkatraman, MD

9:48 a.m. – 9:55 a.m.

*Image Guidance: A Survey of Attitudes and Use*  
Richard Orlandi, MD

9:55 a.m. – 10:02 a.m.

Discussion

10:05 a.m. – 10:25 a.m.

Break with Exhibitors

10:25 a.m. – 10:55 a.m.  
*2nd Annual David W. Kennedy  
Lectureship Endoscopic Surgery  
of the Anterior Skull Base*

Professor Aldo Stamm

**Moderator:** Joseph Han

10:55 a.m. – 11:02 a.m.

*The Measurement Of Water Loss In Human Nasal Mucosa*  
Masato Miwa, MD

11:02 a.m. – 11:09 a.m.

*The Effect Of Prostanoids On Ion Transport Of Airway*  
Mayumi Matsunaga, MD

## Saturday, September 24, 2005

- 11:09 a.m. – 11:16 a.m.  
*Serum Inflammatory Protein Profiles In Patients With Chronic Rhinosinusitis Undergoing Sinus Surgery: A Pilot Study*  
Stilianos Kountakis, MD
- 11:16 a.m. – 11:23 a.m.  
*As Assessment of Sinus Quality of Life and Pulmonary Function in Children with Cystic Fibrosis...*  
Ellen Friedman, MD
- 11:23 a.m. – 11:30 a.m.  
Discussion
- 11:30 a.m. – 12:00 p.m.  
*Patient Advocacy Panel*  
**"Award Winning Sinus Coding Tips"**  
Michael Setzen, MD, *Chair PAC Committee*  
Mary LeGrand, Karen Zupko and Associates
- 12:00 p.m. – 1:00 p.m.  
Lunch with Exhibitors / Poster Review  
Catalina Ballroom Foyer (3rd Level)  
Supported by Xoran Technologies
- 1:00 p.m. – 1:10 p.m.  
Awards Presentation  
Allen Seidan, MD - Chairman, Awards Committee
- Moderators:** Stilianos Koutakis, MD  
Chris McMains, MD
- 1:10 p.m. – 1:17 p.m.  
*Total IgE Levels and Peripheral Eosinophilia: Correlation with Mucosal Disease Based on Paranasal Sinus CT*  
Sheri Poznanovic, MD
- 1:17 p.m. – 1:24 p.m.  
*Immunolocalization Of Surfactant Protein A And D In Sinonasal Mucosa*  
Bradford Woodworth, MD
- 1:24 p.m. – 1:31 p.m.  
*Surgical Management of Lesions of the Sphenoid Lateral Recess*  
Thomas Tami, MD
- 1:31 p.m. – 1:38 p.m.  
*Physiologic Change In Nasal Patency In Response To Changes In Posture, Temperature, And Humidity Measured By Acoustic Rhinometry*  
Jacquelynne Corey, MD
- 1:38 p.m. – 1:45 p.m.  
Discussion
- 1:45 p.m. – 1:52 p.m.  
*High Resolution Computed Tomography Analysis Of The Greater Palatine Canal: Implications For*  
Subinoy Das, MD
- 1:52 p.m. – 1:59 p.m.  
*An In-Vitro Assay For Determination Of Biofilm Forming Capacity Of Bacteria In Chronic Rhinosinusitis*  
Desrosiers Martin, MD
- 1:59 p.m. – 2:06 p.m.  
*Reconstruction Of Skull Base Defects After Minimally Invasive Endoscopic Resection Of The Anterior Skull Base Neoplasms*  
Jern-Lin Leong, MD
- 2:06 p.m. – 2:13 p.m.  
*Increased Expression of Acid Mammalian Chitinase in Chronic Rhinosinusitis with Nasal Polyps*  
Andrew Lane, MD
- 2:13 p.m. – 2:20 p.m.  
Discussion
- Moderator:** Todd Loehrl, MD
- 2:20 p.m. – 2:27 p.m.  
*Do Nasal Polyps And Inverted Papilloma Have Similar Disorders In Cell Cycle Regulation?*  
Simon Robinson, MD
- 2:27 p.m. – 2:34 p.m.  
*Acoustic Rhinometry Predicts Tolerance Of Nasal Continuous Positive Airway Pressure (Ncpap): A Pilot Study*  
Luc Morris, MD
- 2:34 p.m. – 2:41 p.m.  
*Single Photon Emission Computed Tomography Assesment of Anosmia*  
Mohsen Naraghi, MD
- 2:41 p.m. – 2:48 p.m.  
*Comparison Of Objective And Subjective Measures Of The Nasal Airway*  
Derek Lam, MD
- 2:48 p.m. – 2:55 p.m.  
Discussion
- 2:55 p.m. – 3:20 p.m.  
Break with Exhibitors  
Emerald Bay (3rd Level)

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## Saturday, September 24, 2005

3:20 p.m. – 3:50 p.m.

*Patient Advocacy Panel*

Micheal Setzen, MD  
Mary LeGrand, Karen Zupko and Associates

3:20 p.m. – 4:00 p.m.

*International Faculty Panel Discussion*

**Moderators:** Ronald Swain, Jr.  
Todd Kingdom, MD

4:00 p.m. – 4:07 p.m.

*Utilizing Gene Array Technology in the Evaluation of Cytokines involved in Chronic Rhinosinusitis and Nasal Polyposis*

John Pezold, MD

4:07 p.m. – 4:14 p.m.

*Expression Of NF Kappa B In Eosinophilic Granulocytes Of Patients With Nasal Polyps Before And After Exposure To Alternaria With Respect To The Respective Toll Like Receptor Status*

Jan Gosepath, MD

4:14 p.m. – 4:21 p.m.

*"Digital Subtraction" in Image Guided Surgery of the Sinuses and Skull Base*

Stuart Hardy, MD

4:21 p.m. – 4:28 p.m.

*Atopy And Its Role In The Development Of Inflammatory Sinonasal Disease*

Simon Robinson, MD

4:28 p.m. – 4:35 p.m.

*A Prospective Randomized Blinded Cross Over Trial Using Nasal Drops In Patients With Nasal Polyposis: An Evaluation Of Effectiveness And Comfort Level Of Two Head Positions*

Ullas Raghavan, MD

4:35 p.m. – 4:45 p.m.

Discussion

4:45 p.m. – 5:00 p.m.

Discussion and Closing Remarks

5:00 p.m. – 5:30 p.m.

**ARS Business Meeting** (Members Only)

## Saturday, September 24, 2005 – Poster Presentations

*A Comparison of Automatic and Surface Registration Strategies in Electromagnetic Navigation*

Thomas Knipe, MD

*A New Paradigm In The Management Of Posterior Epistaxis: A Pilot Study*

Anita Jeyakumar, MD

*Advanced Endoscopic Surgery for Resection of Skull Base Neoplasms*

Vijay Anand, MD

*Allergic Fungal Sinusitis Without "Characteristic CT Changes"*

Marc Dubin, MD

*An Unusual Foreign Body in the Pterygomaxillary Fossa*

Ramez J. Awwad, MD

*Anatomic Measurements and Cadaver Dissection for Endoscopic Modified Lothrop Procedure*

Stilianos Kountakis, MD

*Angiocentric Fibrosis of The Sinonasal Tract: A Case Report and Literature Review*

Alexis H. Jackman, MD

*Arachnoid Cyst Presenting as Ethmoidal Mucocele*

Mohsen Naraghi, MD

*Audit of The Effectiveness of Septoplasty*

Kolitha S. Goonetilleke, MD

*Autologous Platelet Gel For Repair Of Cerebrospinal Fluid Leaks: Introduction Of A New Technique*

Amin R. Javer, MD

*Catheter Based Dilatation of Paranasal Sinus Ostia: An Initial Clinical Trial*

Christopher L. Brown, FRACS

*Cholesterol Granuloma of the Nasolacrimal Canal*

W. Stites Whatley, MD

*Complications Following Obliteration of the Sphenoid Sinus*

Teresa King, MD

*Computational Modeling Of Nasal Anatomical Abnormalities*

Kai Zhao, Ph.D.

*Concha Bullosa of the Inferior Turbinate*

Jeremy P. Watkins, MD

*Concurrent Endoscopic Sinus Surgery and Rhinoplasty*

Jay M. Dutton, MD

*CT Imaging for Sinus Disease: Direct Coronal vs. Reformatted Images*

Steven D. Fletcher, MD

*Current Management Of Epistaxis Presenting In The Emergency Department*

Monica Nguyen-Okun, MD

*Depressed Anterior Table Fracture-A Minimally Invasive Method Of Reduction*

Derek K. Hewitt, MD

*Effect of Anti IgE Antibody In Patients With Chronic Rhinosinusitis*

Alexander G. Chiu, MD

*Diagnosing Allergic Rhinitis: The Effectiveness Of Physical Examination In Comparison To Conventional Skin-Testing*

Kashif Yousuf, H.BA.

*Epidermoids of the Paranasal Sinus and Beyond: Endoscopic Management*

Emma M. Kruger, MD

*Feasibility Of Real-Time Image-Guided Sinus Surgery Using Intraoperative Fluoroscopy*

Seth Brown, MD

*FESS Combined Radiofrequency Surgery*

Mahmoud Moravej, MD

*Fungal Nasal Septal Abscess in the Immunocompromised Patient*

Ronald J. Walker, MD

*Inflammatory Mucous Membrane Disease In Chronic Sinusitis*

Marc G. Dubin, MD

*Intracranial Complications of Sinusitis*

Shatul L. Parikh, MD

*Medication Use For Acute And Chronic Sinusitis In Canada: Are Guidelines Being Followed?*

Martin Desrosiers, MD

*Nasal Endoscopy Findings With Normal Anterior Rhinoscopy*

Stilianos Kountakis, MD

*Nasal Manifestations of Non-HIV Kaposi's Sarcoma*

Rhoda Wynn, MD

**WITHDRAWN**

## Poster Presentations

*Novel Sinonasal Complications of Maxillary Orthognathic Surgery (LeFort I Osteotomy)*  
Christopher T. Melroy, MD

*Olfactory function in firefighters*  
Alexis H. Jackman, MD

*Phosphaturic Mesenchymal Tumor Of The Nasal Cavity: Case Report And Review Of The Literature*  
Jonathan M. Owens, MD

*Recent Advances in Mucosal Immunology and Genetics: Implications for the Pathophysiology of Chronic Rhinosinusitis*  
Robert C. Kern, MD

*Response To a Standardized Management Strategy For Refractory Chronic Rhinosinusitis: Implications For Studies Of Genetics*  
Martin Desrosiers, MD

*Rhinoplasty By Using 4.0 MHz Radiowave Technology*  
Mahmoud Moravej, MD

*Role of CT/MRI And Endoscope For Preservation Of Eye In Sinonasal Cancer Encroaching On The Orbit*  
Hwan-Jung Roh, MD

*Sinonasal Teratocarcinoma*  
Hsin-Chin Lin, MD

*Surgical Intervention for Intractable Epistaxis Unresponsive to Embolization*  
Heather C. Nardone, MD

*Systemic Corticosteroids In The Treatment of Sinonasal Disorders: Current Use And Reported Complications*  
Ryan M. Greene, MD, Ph.D.

*The Frequency of Nasal Packing after Endoscopic Sinus Surgery: A Systematic Analysis*  
Pete Batra, MD

*The Middle East Nose: 14 years Experience in Augmentation Rhinoplasty*  
Mohsen Naraghi, MD

*The Role of Mitomycin C in Surgery on the Frontonasal Recess: A Prospective Open Pilot Study*  
Valerie J. Lund, MD

*Traumatic vs. Spontaneous Encephaloceles of Ethmoid Roof: A Comparison Study*  
Alexis H. Jackman, MD

*Update on Pediatric Intracranial Complications of Sinusitis*  
Debra Weinberger, MD

*Use of Dead Sea Salt Solution for Chronic Rhinitis and Rhinosinusitis*  
Howard L. Levine, MD

*Use of Olfactory Mucosal Biopsy For Diagnosis of Alzheimer's Disease - A Pilot Study*  
Ashutosh Kacker, MD

**2<sup>nd</sup> Annual  
David W. Kennedy Lectureship**



**ALDO STAMM** obtained his medical degree from the Federal University of Santa Maria, in Brazil. He completed his training as an ENT resident in 3 years, after which obtained a Master and PhD titles in 1994 at the Federal University of São Paulo, working in the fields of the Otolaryngology and Neurosurgery. Since then, Dr. Stamm has given many international lectures and courses around the world. He has also published 4 books on Paranasal Sinus and Skull Base Surgery. He is the former president of the Brazilian Rhinologic Society, the Brazilian Skull Base Society, the Iberian–Latin–American Society of Otolaryngology and is the current president of ISIAN. He is the Director of the São Paulo ENT Center at Hospital Professor Edmundo Vasconcelos and is on the teaching faculty at the Otolaryngology Department of the Federal University of São Paulo.

## Detailed Program

6:30 a.m.

Registration – Catalina Foyer (3rd Level)

7:00 a.m.

CME Breakfast Symposium

(Supported by Merck & Co., Inc.)

8:00 a.m. – 8:10 a.m.

Welcome and Introduction

Joseph Jacobs, MD - President

Michael Sillers, MD - President-Elect

**Moderators:** Peter Hwang, MD  
Richard Oralndi, MD

8:10 a.m. – 8:17 a.m.

### **In Vitro Inhibition Of Fungal Growth With Amphotericin B Irrigation Solution**

*Marc Dubin, MD*

Introduction: Amphotericin B irrigation is touted by investigators as a treatment for chronic sinusitis. The prescribed solution is compounded by pharmacies and is prepared in sterile water. However, amphotericin in solution is unstable, particularly so in water, and has a very short shelf life in this formulation. This study examines in vitro the activity of amphotericin B solution on fungal growth inhibition. Methods: Amphotericin B suspended in sterile water (100 micrograms/ml) was purchased from a compounding pharmacy. Plates were streaked with *Bipolaris* sp. from a patient with allergic fungal sinusitis. The plates were then treated with either one drop of amphotericin solution, 1 spray of amphotericin solution, 1 drop of water, 1 spray of water or nothing. Inoculation and treatment was performed on days 0, 3, 6, 14, 21, and 28 after receipt of solution. It was kept in an opaque bag and was refrigerated per pharmacy instructions. The diameter of the zone of inhibited growth was measured 3 and 6 days after inoculation. Results: Amphotericin B inhibited fungal growth throughout the entire treatment period. There was a statistically significant difference in growth inhibition compared to water ( $p < 0.001$ ). There was no difference in growth inhibition from amphotericin at Day 0 compared to Day 28. Conclusion: Preliminary data suggests that amphotericin B mixed in water inhibits fungal growth despite contradictory pharmacology literature. Further research on the fungicidal effects of this solution in vitro and in vivo need to be performed followed by clinical trials in patients known with certainty to have fungal sinusitis.

Disclosure: No Disclosure Reported.

8:17 a.m. – 8:24 a.m.

### **The Anatomy Of The Sphenopalatine Artery For The Endoscopic Sinus Surgeon**

*Ullas Raghavan, MD*

Objective: This study was performed to determine the variations in the branching pattern of the sphenopalatine artery medial to the crista ethmoidalis. Study Design: Seventy seven cadaver head sides that had been sectioned sagittally in the midline with their septum removed were used after injecting pink latex to highlight the arterial vessels. Method: The mucosa from the middle meatus from the level of the basal lamella was removed until the artery and its branches were seen and then examined under the microscope to identify the position of the arterial branches.

Result: The sphenopalatine artery and its branches were identified in 75 specimens. Of these 75 (97%) had 2 or more branches medial to the crista ethmoidalis, 49 (67%) had 3 or more branches, 26 (35%) had 4 or more branches and 1 specimen had 10 branches. In 2 specimens the artery presented as a single trunk.

Conclusion: The sphenopalatine artery normally branches lateral to the crista ethmoidalis and these branches vary widely. It is important that the surgeon who undertakes ligation or cautery of the artery is aware of these variations otherwise they may overlook some of the branches. With an endoscopic approach removal of the crista ethmoidalis helps visualise these branches.

Disclosure: No Disclosures Reported.

## Detailed Program

8:24 a.m. – 8:31 a.m.

### **Surgical Navigation Using CT-MRI Fusion for Transsphenoidal Hypophysectomy**

*James McIlwaine, MD*

**Objectives:** Trans-nasal hypophysectomy is an operation which demands excellent anatomical localization of the tumor and adjacent soft tissues as well as the bony confines of the paranasal sinuses. Recent advances in image-guidance technology allow surgeons to navigate using CT and MRI images which are digitally fused together. The purpose of this study was to present a novel technique that permits surgical navigation using CT-MRI fusion for trans-nasal pituitary surgery.

**Study Design:** Retrospective case-control. **Methods:** Twenty-two patients underwent transsphenoidal hypophysectomy using either standard stereotactic volume reduction technique employing CT image-guided surgery (N=12) or CT-MRI fusion image-guided surgery (N=10) from 2002-2004. Patient records were reviewed and perioperative data including operative time, estimated blood loss, length of hospital stay, and complications were examined. Collected data were compared between the two cohorts.

**Results:** All patients had preoperative evaluations including CT and MRI of the head. The fused images provided excellent anatomical detail and accuracy. The utilization of CT-MRI fusion technology did not result in any significant increase in operative time, hospital stay, estimated blood loss, or complications ( $p>0.05$ ). One location related complication, an optic nerve injury, occurred in the control group.

**Conclusion:** Surgical navigation based upon the fusion of preoperative CT and MRI image data represents the next generation of image-guidance technology. CT-MRI fusion technology is safe, easy to use, and accurate. Navigation using CT-MRI fusion should be considered for complex skull base procedures, as it appears to afford superior localization. Fusion technology is not indicated for routine sinus surgery.

**Key Words:** CT-MRI fusion, fusion navigation, image-guided surgery, surgical navigation, computer-assisted surgery, transsphenoidal hypophysectomy.

**Disclosure:** No Disclosure Reported.

8:31 a.m. – 8:38 a.m. Discussion

8:38 a.m. – 8:45 a.m.

### **Endoscopic Anatomy of the Parasellar Region**

*Marc Bassim, MD*

**Objective:** To describe the endoscopic anatomy of the cavernous sinus and adjoining parasellar regions and their relationships to the sphenoid sinus

**METHODS:** An endoscopic transnasal transsphenoidal approach to the pituitary gland and posterior skull base was performed on 5 fresh frozen cadaver heads (10 sides). Neural and vascular anatomic landmarks of the cavernous sinus and parasellar regions were identified and correlated with sphenoid surface anatomy.

**RESULTS:** The posterior wall of the sphenoid sinus presents several surface landmarks allowing the identification of the sella, carotid artery and optic nerve. Identification of the optic-carotid recess allows reflection of the internal carotid artery medially and a safe access to the cavernous sinus. Further lateral dissection allows for easy identification of the oculomotor, trochlear, trigeminal, and abducens nerves. The ophthalmic artery can then be followed from its origin on the internal carotid artery coursing anteriorly into the orbit. The optic chiasm can also be easily identified superiorly. Posteriorly, careful dissection allows access to the basilar artery along the clivus.

**Conclusion:** As endoscopic surgeons continue to expand their procedures to involve areas of the skull base outside the paranasal sinuses, knowledge of the endoscopic anatomy of the sella, parasellar and adjacent areas is paramount. Critical landmarks are readily evident in the sphenoid sinus providing good access to neural and vascular structures of this region of the skull base

**Disclosure:** No disclosure reported.

## Detailed Program

8:45 a.m. – 8:52 a.m.

### **The Surgeons View Of The Anterior Ethmoid Artery**

*Ullas Raghavan, MD*

**Objectives:** (1) To examine the relationship between the anterior ethmoid artery and the frontal recess. (2) To test the hypothesis that the degree of pneumatization of the suprabullar recess/supraorbital cell correlates with the distance of the anterior ethmoid artery from the skull base and makes it vulnerable to damage during surgery.

**Method:** 34 cadaver head sides perfused with pink latex were used. All specimens had CT scans using bone windows in the axial, coronal and sagittal planes. The nasal septum was removed and ethmoid carefully dissected to expose the anterior ethmoid artery and to measure the distance of the artery from the frontal recess and skull base. **Outcome:** The mean distance of the anterior ethmoid artery from the posterior wall of frontal recess was 11 mm. The commonest location of the artery was in the suprabullar recess (85.3%). Supraorbital cells were seen in 16 specimens, 10 of which were large and in these the artery was lying 3.7mm (range 1-8mm) away from skull base. The remaining 6 specimens had small supraorbital cells and the artery was found lying in or close to the skull base.

**Conclusions:** The position of the anterior ethmoidal artery is very variable. When ethmoids are more pneumatized and in particular with a supraorbital cell the artery lies below the skull base. The anterior ethmoid artery can be identified preoperatively by looking for the degree of pneumatization of the ethmoids from CT scans as the artery can usually be located in the suprabullar, supraorbital or retrobullar recess spaces.

**Disclosures:** No disclosures reported.

8:52 a.m. – 8:59 a.m.

### **Catheter Based Dilation of the Sinus Ostia: Initial Safety and Feasibility Analysis**

*William Bolger, MD*

**Introduction:** Over the past twenty years, many patients have benefited from endoscopic sinus surgery and its ability to relieve sinus obstruction. Yet, problems do still occur with surgery, thereby leaving room for innovation. Recently, catheter-based technology has provided new options for treating cardiac, vascular and urologic diseases. We speculated that catheter technology might also offer new treatment options for sinusitis patients. The purpose of this investigation was to explore the use and safety of catheter based technology to relieve sinus ostial obstruction.

**Methods:** Anatomic models and human cadaver specimens were used initially to design and iterate catheters to open sinus ostial drainage pathways. Thereafter, the safety of balloon-catheter dilation was evaluated in six human cadaver heads. Computerized tomography obtained before and after catheter ostial dilation was analyzed for evidence of catheter-induced trauma. Dilated ostia also were examined by endoscopy and gross anatomic dissection for unwanted catheter-induced trauma.

**Results:** Catheters successfully dilated 31/31 ostia, including 9 maxillary, 11 sphenoid and 11 frontal ostia/recesses. CT scan, endoscopy and gross anatomic dissection revealed dilation did not cause trauma to surrounding structures such as the orbit or skull base. Mucosal trauma imparted by catheter dilation appeared to be much less than that seen with standard endoscopic instruments. **Conclusion:** This study indicates that catheter technology can be used to dilate sinus ostia safely. Reduced mucosal trauma and ease of use make catheters an attractive minimally invasive treatment strategy. Further testing in patients is indicated to gain additional safety information and to explore the utility of catheter based technology.

**Disclosure:** The authors serve as members of the Scientific Advisory Board for and have an equity holding in Acclarent Inc, the company that developed the devices studied and reported on in this presentation.

8:59 a.m. – 9:06 a.m. Discussion

## Detailed Program

**Moderators:** James Palmer, MD  
Peter Doble, MD

9:06 a.m. – 9:13 a.m.

### **Efficacy of Hyaluronic Acid Carboxymethyl Cellulose as an Absorbable Spacer after ESS**

*Corey Mineck, MD*

**Background:** The effect of absorbable packing on surgical outcomes following ESS is an area of active investigation. Hyaluronic acid carboxymethyl cellulose (HACC) has been found to promote optimal wound healing in other systems.

**Methods:** Twenty-two patients undergoing bilateral ESS were enrolled. At completion of surgery, one middle meatus was randomly assigned to receive HACC. The opposite side served as an unpacked control. Outcomes were measured at 1, 2, 4, and 8 weeks. A visual analog scale was used to assess patient symptoms.

**Objective data** was collected regarding mucosal edema and regeneration, the need for debridement, and the amount of material remaining.

**Results:** HACC packing exhibited no significant difference from control at any time point when examining rate of mucosal regeneration, need for debridement, perceived amount of crusting, or use of irrigation. There was a trend towards decreased sensation of congestion in the HACC side at the 2 week post-operative time point ( $p=0.077$ ). Additionally, there was an objective decrease in the amount of mucosal edema at 2 weeks post-operatively ( $p=0.024$ , chi square) on the HACC side. The packing material had dissolved in all patients by the week 2 follow-up. All objective and subjective outcomes were similar by the week 8 visit.

**Conclusions:** HACC nasal packing demonstrates a more rapid resolution of mucosal edema compared to no packing, though the final outcome was equivalent. Patients undergoing ESS may perceive less congestion with the use of absorbable hyaluronic acid packing in the early post-operative period. Multi-center data is necessary.

**Disclosure:** No disclosures reported.

9:13 a.m. – 9:20 a.m.

### **Anatomic and Endoscopic Localization of the Anterior and Posterior Ethmoid Arteries**

*Samuel Becker, MD*

**Objective:** Anatomic locations of the anterior and posterior ethmoid arteries have gained importance with the expanding role of functional endoscopic sinus surgery (FESS). The ability to precisely locate these arteries not only helps the surgeon avoid them during FESS, but may also have a role in the treatment of epistaxis. The objective of this study is to define endoscopic anatomic locations of the anterior and posterior ethmoid arteries.

**METHODS:** Twenty-five cadaveric heads were used to identify the anterior and posterior ethmoid arteries at their foramina via a Lynch incision. Image guidance system was used to record the 3-D locations of these arteries and then referenced to the axilla of the middle turbinate and anterior wall of the sphenoid sinus. Distances of the arteries to these two locations were then calculated. Endoscopic locations of the arteries were also identified.

**RESULTS:** Fifty nasal cavities were dissected to identify the anterior and posterior ethmoid arteries. Mean distance from the axilla of the middle turbinate to the anterior ethmoid artery was  $17.3 \pm 4.7$ mm. Anterior ethmoid artery was located immediately anterior (33.3%), at (30.8%), and immediately posterior (35.9%) to the superior attachment of the basal lamella. Mean distance of the posterior ethmoid artery to the anterior ethmoid artery was  $14.9 \pm 4.2$ mm. Mean distance of the posterior ethmoid artery from the anterior wall of the sphenoid sinus was  $7.6 \pm 3.9$  mm.

**CONCLUSIONS:** Specific anatomic relationships and measurements have been presented for the anterior and posterior ethmoid arteries.

**Disclosures:** No disclosures reported.

## Detailed Program

9:20 a.m. – 9:27 a.m.

### **The Safety Of Steroid Injection Of Nasal Polyps Versus Surgical Removal: Review Of A Decade Of Experience**

*Samuel Becker, MD*

**Background:** Sinonasal polyps are treated with topical steroids, systemic oral steroids, surgical excision, and intra-polyp steroid injection. Use of steroid injection is not widespread due to reported complications. The objective of this study was to evaluate the complications of intra-polyp steroid injections and compare it to the complications of surgical removal of polyps.

**Methods:** All patients seen between 1990 and 2003 with a diagnosis of nasal polyps were reviewed retrospectively. Demographics, complications, follow-up, and comorbidities were collected. Initial CT scans were evaluated using the Lund-Mackay scale. Frequency of each treatment modality used and complications of each treatment were compared.

**Results:** 358 patients were in the study with a mean follow up of 43 months. Respiratory comorbidities were asthma alone (35.5%), aspirin triad (16.5%), and cystic fibrosis (15.1%). Other comorbidities were smokers (21.2%). Treatment modalities were medical treatment alone (14.2%), medical treatment and steroid injections (19.0%), medical treatment and surgery (33.0%), and medical treatment, injections, and surgery (33.8%). Patients who underwent injection had fewer surgeries ( $p < 0.001$ ). There was a single complication (transient diplopia) associated with the 1495 injections and 27 complications associated with the 239 surgeries with a significant difference ( $p < 0.001$ ). There was no significant difference in demographics, follow-up, comorbidities, or CT score between patients who received injections and those who underwent surgery.

**Conclusions:** Intra-polyp steroid injection is associated with a significantly lower rate of complication than is surgical excision of sinonasal polyps. Steroid injection may also decrease the need for further surgical intervention of polyps.

**Disclosures:** No disclosures reported.

9:27 a.m. – 9:34 a.m. Discussion

9:34 a.m. – 9:41 a.m.

### **Altered Sinonasal Ciliary Dynamics in Chronic Rhinosinusitis**

*Noam Cohen, MD*

**Introduction:** Although multiple etiologies contribute to the development of rhinosinusitis, the ultimate pathophysiology is largely due to ineffective sinonasal mucociliary clearance, leading to stasis of sinonasal secretions, subsequent infection, and persistent inflammation. The respiratory cilia beat continually at a basal rate, while during times of stress, such as exercise or infection, ciliary beat frequency (CBF) increases, accelerating mucus clearance. Previous investigations have led to conflicting results with some authors reporting decreased CBF while others have found normal values of CBF in patients with CRS. Additionally, these studies have only analyzed basal CBF. The goal of this study is to compare the basal as well as the stimulated sinonasal CBF in patients with CRS versus controls.

**Method:** A dual temperature controlled perfusion chamber, differential interference contrast (DIC) microscopy, and high speed digital video, were used to analyze both basal and ATP (100uM) stimulated CBF in human sinonasal mucosal explants.

**Results:** Although no difference in basal CBF was detected between control and CRS patients, a marked difference in stimulated CBF was noted. Exogenously applied ATP resulted in a 50%-70% increase of CBF in control tissue with no observed CBF increase in explants from CRS patients.

**Conclusion:** Dynamic regulation of respiratory ciliary activity is critical for the respiratory epithelium to adapt to varying environmental situations. Diminished or absent adaptation thus, could predispose the sinonasal cavity to accumulation of inhaled infectious and noxious particulate matter resulting in infection / inflammation. Our findings suggest that CRS patients have decreased sinonasal ciliary adaptation to environmental stimuli.

**Disclosure:** No disclosures reported.

## Detailed Program

9:41 a.m. – 9:48 a.m.

### **In Vitro Biofilm Formation by Organisms Isolated from Routine Sinus Cultures**

*Giridhar Venkatraman, MD*

Introduction: Bacterial biofilm formation has been documented in infections of indwelling venous and urinary catheters, orthopedic implants, and recently, surgical cultures from the paranasal sinuses. Biofilm formation is implicated as one mechanism that allows bacterial survival in inhospitable environments and confers increased antibiotic resistance.

Methods: Organisms from routine clinical sinus cultures in a tertiary care rhinology practice were isolated and typed. Isolates were grown in vitro in a liquid media assay, fixed with methanol, and stained with crystal violet. Absorbance (590 nm) of adsorbed crystal violet was compared to a laboratory standard *Pseudomonas aeruginosa* strain known to form biofilms, as confirmed by scanning electron microscopy. Bacterial colony counts following biofilm formation were correlated to absorbance values by Pearson correlation analysis.

Results: Nineteen bacterial organisms were isolated from routine office-based sinus cultures, of which fifteen isolates reliably grew in the liquid media assay. Forty percent of these clinical isolates consistently formed biofilms in repeated trials of the crystal violet protocol. Forty percent of the organisms formed biofilms on an intermittent basis or were borderline biofilm-formers by the absorbance limits of our assay, and 20% of bacterial isolates did not form biofilms. Absorbance values and biofilm bacterial colony counts correlated at  $r = .807$  ( $p < .001$ ). The most consistent biofilm-forming organisms were coagulase negative Staphylococci.

Conclusion: Bacterial isolates from routine sinus cultures of rhinosinusitis patients at their clinical baseline form biofilms in vitro. Paranasal sinus biofilm formation likely contributes to disease persistence and antibiotic resistance in this patient population.

Disclosure: No disclosure reported.

9:48 a.m. – 9:55 a.m.

### **Image Guidance: A Survey of Attitudes and Use**

*Richard Orlandi, MD*

OBJECTIVE: To determine access to, usage of, and attitudes toward image guidance in endoscopic sinus and anterior skull base surgery.

METHOD: Survey of ARS members. RESULTS: Of 1050 surveys mailed, 345 (33%) were returned and scored. Image guidance was available to 86% of respondents. 18% of respondents did not use image guidance in any cases, while 25% used it in 10% of cases. 8% of respondents used image guidance in  $\neq 90\%$  of cases. Respondents felt the primary indication for this technology is in revision or advanced cases. 70% of respondents felt image guidance was not typically indicated for a primary total ethmoidectomy while  $\neq 90\%$  of respondents felt it was either a relative or absolute indication for revision frontal sinus exploration, modified Lothrop procedure, or closure of cerebrospinal fluid leak. Attitudes of the respondents did not vary by year of residency completion or by the access to image guidance during residency. Current access to image guidance was associated with a higher likelihood of feeling it was indicated.

CONCLUSIONS: The majority of respondents had access to image guidance. Many feel it is a relative or absolute indication for revision and advanced endoscopic sinus and skull base procedures. A very small minority used this technology in all cases.

NOTE: The results of this survey reflect the opinion of the respondents. They do not necessarily reflect the views of the ARS or of practicing otolaryngologists in general. Supported by a research grant from MedtronicXomed.

Disclosure: This work was supported by a research grant from MedtronicXomed. Dr. Orlandi has an equity holding in SentrxSurgical, Inc.

9:55 a.m. – 10:02 a.m. Discussion

10:05 a.m. – 10:25 a.m. Break with Exhibitors

10:25 a.m. – 10:55 a.m.

### **2<sup>nd</sup> Annual David W. Kennedy Lectureship**

Endoscopic Surgery of the Anterior Skull Base  
*Professor Aldo Stamm*

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## Detailed Program

**Moderator:** Joseph Han

10:55 a.m. – 11:02 a.m.

**The Measurement Of Water Loss In Human Nasal Mucosa**

*Masato Miwa, MD*

The regulation of barrier function of nasal epithelium seems to be involved in the pathogenesis of allergic rhinitis. The measurement of transepidermal water loss has been proved to be an important non-invasive method for assessing the efficiency of the skin as a protective barrier. Although the nasal mucosal epithelium has such protective function as well as skin, the precise mechanism is still obscure. We examined the human nasal water loss by Tewameter TM210 (Courage+Khasaka electric, Germany) using our original adapter. We could evaluate the human nasal mucosal water loss in the basal state. We also demonstrated the effect of test solutions. After non-traumatic application of physiological saline, hypertonic saline (10% NaCl), nasal barrier cream (Towa Yakuhin, Japan) and 10% glycerol on the mucosal surface of the inferior turbinate, the alteration of nasal mucosal water loss was studied. In this study, nasal mucosal water loss was increased by hypertonic saline and decreased by nasal cream and glycerol. We demonstrated the human nasal mucosal water loss both in the basal state and following topical application of various substances for the first time.

Disclosure: No disclosures reported.

11:02 a.m. – 11:09 a.m.

**The Effect Of Prostanoids On Ion Transport Of Airway**

*Mayumi Matsunaga, MD*

Airway surface liquid is thought to be regulated by the ion transport processes across the airway epithelium in a vectorial manner. Various lipid mediators such as prostaglandin (PG) D<sub>2</sub>, thromboxane (TX) A<sub>2</sub> and leukotrienes (LT) seem to act not only on the nasal vasculature but also nasal epithelium. To evaluate the possible role of lipid mediators on the epithelial permeability of airway mucosal epithelium, we examined the effect of prostanoids (100microM PGD<sub>2</sub>, 100microM U46619 and 100microM LT C/D/E) individually on the electrical permeability of nose and trachea of guinea pig by using DVC1000 (WPI, USA) in vivo and in vitro. Nasal potential differences of guinea pig were decreased after non-traumatic application of those prostanoids. The short circuit current of trachea excised from guinea pig were increased after apical application of prostanoids. These effects were inhibited partly by chloride channel blockers. The enhancement of ion transport on nasal epithelium by prostanoids and the alteration by chloride channel blockers as shown in this study would contribute to understand the pathogenesis of the hypersecretion state of patients suffering from allergic rhinitis.

Disclosure: No disclosures reported.

## Detailed Program

11:09 a.m. – 11:16 a.m.

### **Serum Inflammatory Protein Profiles In Patients With Chronic Rhinosinusitis Undergoing Sinus Surgery: A Pilot Study**

*Stilianos Kountakis, MD*

**Objectives:** Proteomic analysis in patients with tumors of the ovary, breast, lung, pancreas and prostate using Surface Enhanced Laser Desorption/Ionization Time-of-Flight Mass Spectrometry (SELDI-TOF-MS) has been demonstrated as a feasible technique for early detection and diagnosis. We propose that this technology can be utilized to identify patients with Chronic Rhinosinusitis (CRS) from healthy controls. We analyzed SELDI-TOF-MS protein profiles of patients with CRS undergoing functional endoscopic sinus surgery (FESS) and healthy controls to determine the sensitivity and specificity of SELDI assay for detection of patients with known CRS.

**Methods:** Serum samples were collected prospectively from 40 CRS patients who underwent FESS and 10 control volunteers negatively screened according to the Sinus and Allergy Health Partnership guidelines on CRS. SELDI-TOF-MS was performed on serum samples to identify protein peaks in the range of 0-100 kDa. Data analysis was performed using Ciphergen Biomarker Wizards and Biomarker Pattern Software to process the spectral data and classify the disease status of the patients.

**Results:** The SELDI assay generated serum protein profiles in the range of 0 to 100 KD. Classification tree analysis based on peak expression correctly classified patients with CRS with 89.17% sensitivity and 76.67% specificity.

**Conclusions:** Proteomic analysis of serum protein profiles distinguishes patients with CRS from healthy negatively screened controls with a high degree of sensitivity and specificity. Further investigation is merited into the clinical utility of these findings and the use of this technology in the diagnosis and management of patients with CRS.

**Disclosure:** No disclosures reported.

11:16 a.m. – 11:23 a.m.

### **Assessment of Sinus Quality of Life and Pulmonary Function in Children with Cystic Fibrosis...**

*Ellen Friedman, MD*

**Introduction:** Although almost 100% of patients with cystic fibrosis (CF) have sinusitis, the treatment is primarily directed at the lungs. There is a growing feeling that the status of the sinuses may have a profound influence on the health of the lungs in these patients.

**Background:** Several of investigators have demonstrated a relationship between coexisting rhinitis, sinusitis and other upper airway conditions and lung disease. Several studies have shown that treatment and resolution of sinusitis results in an improvement in a number of pulmonary conditions. **Hypothesis:** Pulmonary function will be decreased in the CF patients with more severe sinusitis.

**Methods:** Fifty (50) consecutive CF patients were asked to complete a sinus specific quality of life using the instrument (SNOT-16). These scores were compared to FEV1 scores.

**Results:** Univariate analysis revealed no significant correlation between SNOT-16 and FEV1 for all subjects combined. However, when age was factored in, in children less than 12, increased severity of sinus disease did correlate with worse FEV1. This was statistically significant and there was a similar trend toward significance in the older children. Evaluation of the raw data shows that children with the highest FEV1 had the lowest SNOT-16.

**Conclusion:** This study indicates that the severity of sinus disease correlates with the severity of pulmonary disease in CF patients under the age of 12. We plan to use the SNOT-16 to assess sinus interventions on pulmonary status.

**Disclosure:** No disclosures reported.

11:23 a.m. – 11:30 a.m.      Discussion

## Detailed Program

11:30 a.m. – 12:00 p.m.

*Patient Advocacy Panel*

### **"Award Winning Sinus Coding Tips"**

Michael Setzen, MD, *Chair PAC Committee*  
Mary LeGrand, Karen Zupko and Associates

12:00 p.m. – 1:00 p.m.

### **Lunch with Exhibitors / Poster Review (Catalina Foyer-3rd Level)**

**Supported by Xoran Technologies**

1:00 p.m. – 1:10 p.m.

### **Awards Presentation**

Allen Seidan, MD - Chairman  
Awards Committee

**Moderators:** Stilianos Koutakis, MD  
Chris McMains, MD

1:10 p.m. – 1:17 p.m.

### **Total IgE Levels and Peripheral Eosinophilia: Correlation with Mucosal Disease Based on Paranasal Sinus CT**

*Sheri Poznanovic, MD*

**Background:** Tissue and peripheral eosinophilia and IgE-mediated atopy have been implicated in the pathogenesis of both chronic rhinosinusitis and asthma. **Objectives:** To evaluate the relationship between peripheral eosinophilia, total IgE, and disease severity based on sinus computed tomography (CT).

**Study design:** Retrospective review of a large medical information database from a tertiary referral medical center.

**Methods:** The medical record database was reviewed in a retrospective fashion for patients having total IgE, peripheral eosinophil levels, and sinus CT imaging. A total of 303 patients were found to have peripheral eosinophil levels and CT imaging for review. Total IgE levels and CT imaging were found in 288 patients. CT scans were graded using the Lund MacKay scoring system and a linear regression analysis used to assess statistical significance.

**Results:** There was a significant positive correlation between sinus CT stage and peripheral eosinophil levels ( $r=0.60$ ). Eighty-nine percent (89%) of the abnormal eosinophil counts ( $>550$  cells/microliters) were associated with CT scores greater than 12. Total IgE did not correlate with CT stage of disease ( $r=0.05$ ).

**Conclusions:** The presence of peripheral eosinophilia indicates a high likelihood of mucosal sinus disease based on CT imaging. This data supports the link between eosinophilia and the pathogenesis of chronic rhinosinusitis.

**Disclosure:** No disclosures reported.

1:17 p.m. – 1:24 p.m.

### **Immunolocalization Of Surfactant Protein A And D In Sinonasal Mucosa**

*Bradford Woodworth, MD*

**Introduction:** Surfactant-associated proteins (SP) A and D are in the family of collectin proteins that play an integral part in the innate defense system. SP-A and SP-D expression and function are altered in a variety of inflammatory and infectious diseases of the lungs, such as asthma, allergies, and cystic fibrosis. Our prior studies are the first to identify the presence of these proteins in the human sinonasal cavity. The objective of this study is to immunolocalize SP-A and SP-D in human sinonasal tissue.

**Materials/Methods:** Sinonasal mucosal biopsies were performed in patients ( $n=10$ ) with various forms of chronic hyperplastic rhinosinusitis with nasal polyposis and non diseased mucosa from patients undergoing trans-sphenoidal hypophysectomy. Immunolocalization of SP proteins was performed with antibodies to SP-A and SP-D using immunoperoxidase staining. Isotype negative controls were performed on all specimens.

**Results:** Analyses of mucosal biopsies from human sinonasal tissue reveals staining within respiratory and transitional type epithelium. In addition, staining was intense in the submucosal seromucinous glands and their conducting epithelium. These properties appear to be consistent regardless of disease state and location within the sinuses.

**Conclusion:** This is the first study to immunolocalize SP-A and SP-D in sinonasal human mucosa. These are secreted proteins that are intricately involved in innate immunity in the lungs. Their secretion in the upper airway demonstrates that future studies may allow manipulation of these proteins and development of novel treatments for sinonasal pathology.

**Disclosure:** Rodney J. Schlosser, MD: BrainLab and Aventis Consultant

## Poster Descriptions

1:24 p.m. – 1:31 p.m.

### **Surgical Management of Lesions of the Sphenoid Lateral Recess**

*Thomas Tami, MD*

Introduction: Pneumatization of the sphenoid sinus occasionally includes an extensive lateral recess creating an area beneath the temporal lobe which is relatively inaccessible to surgical intervention. Pathology in this anatomical location presents special surgical and therapeutic challenges. Recently, several authors have described the endoscopic/trans-pterygopalatine fossa approach to this anatomic region. This approach is associated with minimal morbidity while providing direct endoscopic surgical access for managing a variety of disease processes in this region.

Methods/Results: This paper presents experience with 8 cases requiring this approach or a modification of this approach. Six patients presented with temporal lobe meningoencephaloceles with CSF rhinorrhea (all women). Each case was successfully managed through this surgical approach. One patient experienced transient postoperative palatal anesthesia due to injury to the greater palatine nerve, however there were no other complications in this series. Two other patients had neoplasms (inverting papilloma, chondrosarcoma) which were also successfully addressed through this technique. There were no postoperative complications in these patients.

Conclusions: We have previously described the relationships of neural and vascular structures in this anatomical region. This paper will review these relationships as they pertain to this surgical approach and will discuss the indications, techniques and surgical outcomes in this series of patients. This approach is a valuable addition to the endoscopic armamentarium for the experienced endoscopic surgeon.

Disclosure: Medtronic/Xomed - Consultant

1:31 p.m. – 1:38 p.m.

### **Physiologic Change In Nasal Patency In Response To Changes In Posture, Temperature, And Humidity Measured By Acoustic Rhinometry**

*Jacquelynne Corey, MD*

Introduction: Acoustic rhinometry assesses nasal patency and calculates nasal cavity volume. The unique advantage of acoustic rhinometry is its ability to carry out measurements without causing any disturbances in nasal anatomy and physiology. The purpose of this study was to assess changes in nasal patency after alterations in posture, temperature, and humidity.

Methods: 8 healthy adult volunteer subjects underwent acoustic rhinometry during the following conditions: 1) up-right, sitting position (control); 2) supine; 3) left lateral recumbent; 4) one nostril mechanically blocked; 5) icepack on neck; 6) drinking cold water; 7) drinking hot water; 8) nasal nebulizer; 9) oxymetazoline decongestant

Results: Two distinct patterns emerged based on initial nasal cavity volume in the control position: subjects with initial volumes near the mean (7.14cm<sup>3</sup>) had an expected increase in volume to the decongestant (9-50%), and increase in volume to cold stimuli (5-35%), and a variable response to changes in posture, warm stimuli, and nasal nebulizer. Subjects with initial nasal volumes 1 SD above the mean (9.23cm<sup>3</sup>) had a paradoxical response to the decongestant (20-35% decrease in volume), and had a decrease in volume after nearly all of the experimental conditions.

Conclusions: Changes in nasal cavity volume are detected on acoustic rhinometry after alterations in posture, temperature, and humidity. These changes were greater after exposure to cold stimuli in subjects with initial nasal cavity volumes within one SD.

Disclosure: No disclosures reported.

1:38 p.m. – 1:45 p.m. Discussion

## Detailed Program

1:45 p.m. – 1:52 p.m.

### **High Resolution Computed Tomography Analysis Of The Greater Palatine Canal**

*Subinoy Das, MD*

Introduction: The greater palatine foramen injection is effective for controlling epistaxis and minimizing bleeding during endoscopic sinus surgery. The use of this injection has not gained widespread acceptance due to the potential risk of orbital and intracranial complications. The correct injection depth is important to minimize the risk of orbital penetration. The purpose of this study was to analyze the length of the greater palatine canal using high resolution computed tomography and image guided surgery software to assist in determining the optimal injection depth. Methods: High resolution computed tomography sinus scans from 100 adults without a history of fractures or malignancy were analyzed using the Iplan software from Brainlab AG. 1200 measurements were performed by 4 blinded observers.

Results: The mean distance of the greater palatine foramen to the orbital floor was 37 +/- 3 mm in males and 35 +/- 3 mm in females (range: 30 to 45 mm). The mean distance of the greater palatine foramen to the sphenopalatine foramen was 28 +/- 2 mm in males and 27 +/- 2 mm in females (range: 23 to 34 mm). There were no significant differences between the right and left side in patients.

Conclusion: The greater palatine foramen injection is a safe and effective method to minimize bleeding during endoscopic sinus surgery. We recommend an injection depth of 25 mm in adults, which appears to be a safe distance to minimize the risk of intraorbital complications.

Disclosure: Dr. Brent Senior is a consultant for Brainlab.

1:52 p.m. – 1:59 p.m.

### **An In-Vitro Assay For Determination Of Biofilm Forming Capacity Of Bacteria In Chronic Rhinosinusitis**

*Desrosiers Martin, MD*

Introduction: Bacterial biofilms are increasingly implicated in the pathogenesis of chronic disease and have been demonstrated in several chronic ENT conditions.

Objectives: We wished to assess the capacity of an in-vitro test to assess biofilm production in chronic rhinosinusitis. Setting: Academic tertiary rhinology practice.

Method: Positive and negative controls for *Pseudomonas Aeruginosa*, *Staphylococcus Aureus* and coagulase-negative staphylococcus were obtained. Samples were cultured 24 hours at 37 C on 96-well plates in TSB 0.5% glucose medium. After staining with crystal violet, optical density at 570 nm was measured to quantify biofilm production. Biofilm-forming capacity of controls was compared with thirty-one bacterial cultures recovered from 19 patients with chronic rhinosinusitis.

Results: Positive controls all grew biofilms, with a tendency to lesser biofilm formation at higher dilutions. Twenty-four of 31 clinical samples produced a biofilm greater or equal to the positive control. Biofilm was recovered consistently for all 3 species studied.

Conclusion: This in-vitro assessment method is capable of detecting biofilm-forming capacity in bacteria known to be biofilm producing. Demonstration of biofilm forming capacity in bacteria from individuals with chronic rhinosinusitis suggests that it may be useful in clinical research.

Disclosure: No disclosures reported.

## Detailed Program

1:59 p.m. – 2:06 p.m.

### **Reconstruction Of Skull Base Defects After Minimally Invasive Endoscopic Resection Of The Anterior Skull Base Neoplasms**

*Jern-Lin Leong, MD*

**Introduction:** Minimally invasive endoscopic resection (MIER) has been recently employed for management of anterior skull base (ASB) tumors. The endoscopic resection of the cribriform plate and ethmoid roof result in large ASB defects. The goal of this study is to evaluate the efficacy of the endoscopic skull base reconstruction in this clinical setting.

**Methods:** Retrospective analysis was performed on all patients undergoing MIER between April 2000 and September 2004 at a tertiary care medical center.

**Results:** Eleven patients underwent endoscopic resection of the ethmoid roof and cribriform plate for ASB tumor excision. The mean age was 58.7 years (range 26 – 84). The sex distribution was 5 men and 6 women. The specific indications for resection included 9 malignant and 2 benign neoplasms. One patient had received radiation therapy (XRT) preoperatively, and another had received preoperative chemotherapy and XRT. In 8 instances, intraoperative cerebrospinal fluid leaks (CSF) were encountered. The skull base was reconstructed with multiple layers, including acellular dermal allograft (Alloderm, Life Cell Corporation, Branchburg, NJ) as well as autologous cartilage, fascia, fat, and mucosal free grafts. Surgical navigation was used in all cases. Postoperative lumbar drainage was used in 7 cases for an average of 5 days. Postoperative XRT was administered to 7 patients. No postoperative CSF leaks were noted. Mean follow-up was 36.9 months (range 4 – 61).

**Conclusions:** This study confirms that the standard endoscopic techniques for CSF leak repair may be successfully used for the relatively large skull base defects that result from endoscopic sinonasal tumor excision.

**Key Words:** skull base neoplasms; craniofacial resection; endoscopic sinus surgery; computer aided surgery; surgical navigation; cerebrospinal fluid leak.

**Disclosure:** Dr. Citardi is a member of the scientific advisory board for GE Healthcare Navigation (2003-present), and he was a member of the scientific advisory board for CBYON (1999-2003).

2:06 p.m. – 2:13 p.m.

### **Increased Expression of Acid Mammalian Chitinase in Chronic Rhinosinusitis with Nasal Polyps**

*Andrew Lane, MD*

**Introduction:** Chitin is an abundant polysaccharide found in fungi, insects, and parasitic nematodes. Innate immune host defense against chitin-containing pathogens include production of chitinases. In human lower airways, acid mammalian chitinase (AMCase) is produced in epithelial cells via a Th2-specific, IL-13-dependent pathway, and may act as an inflammatory mediator in asthma. The role of AMCase in chronic rhinosinusitis (CRS) has not previously been studied. **Methods:** Ten controls and twenty-eight subjects with medically recalcitrant CRS were prospectively enrolled prior to undergoing endoscopic sinus surgery. RNA was extracted from surgically obtained ethmoid mucosa, and real-time PCR was employed to determine expression of AMCase, eotaxin, and IL-13. Subjects were followed for at least 6 months post-operatively to assess for polyp recurrence.

**Results:** AMCase mRNA was detected in the sinus mucosa of 50% of control subjects and patients with CRS without polyps, but in 90% of patients with eosinophilic CRS with nasal polyps (CRSwNP). The expression of AMCase was significantly greater in recalcitrant CRSwNP than it was in treatment-responsive CRSwNP. There was no significant difference in IL-13 expression between these two groups. A trend towards increased eotaxin expression in recalcitrant CRSwNP did not achieve statistical significance.

**Conclusions:** AMCase may be an important mediator in the pathogenesis of Th2 inflammatory diseases of the respiratory tract. Failure of medical and surgical therapy in CRSwNP is associated with significantly increased expression of AMCase, but not the Th2 cytokines IL-13 and eotaxin. Further studies are needed to determine the potential of AMCase as a therapeutic target in CRSwNP.

**Disclosure:** No disclosures reported.

2:13 p.m. – 2:20 p.m. Discussion

## Detailed Program

**Moderator:** Todd Loehrl, MD

2:20 p.m. – 2:27 p.m.

### **Do Nasal Polyps And Inverted Papilloma Have Similar Disorders In Cell Cycle Regulation?**

*Simon Robinson, MD*

**Introduction:** The aim of this study was to determine the expression of cell cycle regulation genes in patients with nasal polyposis(NP) and compare this expression to patients with inverting papilloma(IP).

**Methods:** Tissue from 18 patients with IP and 5 with NP were stained using immunohistochemistry techniques for p53, p27 and MGMT. Measurement of the gene expression was performed by three assessors, who we blinded with respect to the specimens.

**Results:** The median score for p53 expression (3.33 STD = .63) was significantly higher ( $p = 0.003$ ) in the IP group than the NP group (1.0 STD = .20).

Additionally we demonstrated in a number of individuals variation in the p53 expression within the same specimen. The areas of increased expression were those sections within the IP where there was increased squamous metaplasia and increased inversion into underlying stroma. There was no difference in the median scores for p27, with a score of 2.0 STD .35 (IP group) and 1.67STD .28 (NP) group  $p = 0.147$ . There was no difference in MGMT expression between the IP and NP groups.

**Conclusion:** Our study demonstrated a significantly increased expression of p53 in IP when compared to NP. Increased staining of p53 within a single specimen from a region of polyposis without inversion to regions with significant inversion may indicate a continuum from nasal polyposis to IP.

**Disclosure:** No disclosures reported.

2:27 p.m. – 2:34 p.m.

### **Acoustic Rhinometry Predicts Tolerance Of Nasal Continuous Positive Airway Pressure (Ncpap): A Pilot Study**

*Luc Morris, MD*

**Introduction:** Emerging evidence suggests that nasal obstruction contributes to sleep disordered breathing (SDB); in some patients, it is a major factor. Nasal CPAP is usually the first line intervention for SDB, but 25-50% of patients are unable to tolerate this therapy due to discomfort – usually nasal complaints. Turbinoplasty has been shown to improve nCPAP compliance. This prospective study examined the relationship between nasal cross-sectional area and nCPAP tolerance.

**METHODS:** We enrolled 44 patients referred to a sleep center for polysomnography. Acoustic rhinometry was performed before the initial sleep study. The patients successfully titrated to nCPAP were interviewed 18 months after starting therapy, to determine CPAP tolerance, defined as using CPAP every night without complaints of discomfort.

**RESULTS:** Nasal CPAP tolerance was successfully evaluated for 25 patients. Between tolerant and intolerant patients, there were no significant differences in age, gender, CPAP level, respiratory distress index, or subjective nasal obstruction. Cross-sectional area (baseline and decongested) at the inferior turbinate differed significantly between the two groups ( $p = .03, .05$ ). This remained significant after multivariate analysis for possibly confounding variables. A cross-sectional area cutoff of 0.6 cm<sup>2</sup> at the head of the inferior turbinate carried a sensitivity of 75% and specificity of 77% for CPAP intolerance in this patient group.

**Conclusions:** these patients with SDB, only nasal airway size at the inferior turbinate correlated with CPAP tolerance, supporting an important role for the nasal airway in CPAP, and providing a physiologic basis for findings that turbinoplasty improves CPAP compliance. Objective nasal airway evaluation, but not the patient's subjective feeling of nasal obstruction, appears critical in the management of the SDB patient.

**Disclosure:** No disclosures reported.

## Detailed Program

2:34 p.m. – 2:41 p.m.

### **Single Photon Emission Computed Tomography Assessment of Anosmia**

*Mohsen Naraghi, MD*

**Introduction:** We attempted to study quantitative brain perfusion Single Photon Emission Computed Tomography (SPECT) in patients with anosmia. We compared our findings with the qualitative brain perfusion SPECT and other imaging techniques.

**Materials and Methods:** 18 patients suspicious for posttraumatic anosmia were included in the study and the tests of olfactory quantitative and qualitative brain perfusion SPECT as well radiological imaging were compared. Control group included 12 cases. Quantitative brain perfusion SPECT was performed by measuring uptake ratio of orbital frontal cortex to occipital pole in the sagittal projection (uptake index).

**Results:** Quantitative assessment of brain perfusion SPECT depicted pronounced orbital frontal hypoperfusion compared with controls with 87.5% of anosmic patients were revealing orbital frontal hypoperfusion more than two standard deviations below that of the lowest levels in control subjects. In addition, quantitative brain perfusion SPECT detected more orbital frontal abnormality than qualitative method or radiological imaging.

**Conclusion:** Findings suggest that posttraumatic anosmia strongly corresponds to the hypoperfusion in orbital frontal cortex. Because of its availability, rather low cost, easy performance and objective quantitative information, brain perfusion SPECT can be helpful to other diagnostic techniques in evaluation of anosmia and olfactory function.

**Disclosure:** No disclosures reported.

2:41 p.m. – 2:48 p.m.

### **Comparison Of Objective And Subjective Measures Of The Nasal Airway**

*Derek Lam, MD*

**Introduction:** We sought to compare objective and subjective assessments of the nasal airway. Objective assessments include nasal peak inspiratory flow (nPIF) and acoustic rhinometry (AR) measures of minimum cross-sectional area (MCA) and nasal volume. Subjective measures include the validated Nasal Obstruction Symptom Evaluation (NOSE) Scale and a visual analog scale (VAS).

**Methods:** This was a prospective cross-sectional study of 328 consecutive patients evaluated for obstructive sleep apnea. AR, nPIF, NOSE, and VAS were completed simultaneously. Spearman correlations were computed. Multivariate linear regression determined associations between objective and subjective measures, adjusting for age, sex, race, and body mass index.

**Results:** Objective parameters (AR and nPIF) correlated weakly, at best, with subjective measures (mean  $-0.10 \pm 0.04$ , range  $[-0.02, -0.17]$ ), 4 of 16 correlations with  $p < 0.05$ , power  $> 99\%$ ). AR and nPIF parameters also correlated poorly (mean  $0.10 \pm 0.04$ , range  $[0.04, 0.16]$ ), 2 of 16 correlations with  $p < 0.05$ , power  $> 99\%$ ). NOSE correlated with VAS (0.81,  $p < 0.001$ ). Adjusted associations between objective and subjective measures were all insignificant (all  $p > 0.10$ ).

**Conclusions:** In our sample, objective measures correlated weakly, at best, with subjective experience of nasal obstruction with no discernible pattern to observed significant correlations. Explanations include: 1) anatomic and subjective instruments measure different aspects of nasal obstruction, 2) AR and nPIF measure the nasal airway at a single point in time whereas the NOSE Scale assesses subjective experience over the previous month, or 3) chronic obstruction may result in subjective desensitization to nasal obstruction. Future studies should be directed at developing and testing a composite measure including both subjective and objective parameters.

**Disclosure:** No disclosures reported.

2:48 p.m. – 2:55 p.m.

Discussion

2:55 p.m. – 3:20 p.m.

### **Break with Exhibitors**

Emerald Bay (3rd Level)

3:20 p.m. – 4:00 p.m.

*International Faculty Panel Discussion*

## Detailed Program

**Moderators:** Ronald Swain, Jr.  
Todd Kingdom, MD

4:00 p.m. – 4:07 p.m.

### **Utilizing Gene Array Technology in the Evaluation of Cytokines Involved in Chronic Rhinosinusitis and Nasal Polyposis**

*John Pezold, MD*

**Background:** Limitations in treatment of chronic rhinosinusitis (CRS) and nasal polyposis are based on our lack of knowledge of the molecular mechanisms that occur during the disease process. Understanding cytokine expression in mucosal pathology relative to unaffected mucosa may allow targeted molecular therapy to specific cytokines or their receptors. Gene array technology gives us the ability to analyze the expression patterns of thousands of genes simultaneously.

**Methods:** Tissue, health data, endoscopic assessment, and radiographic scores were collected on 19 patients undergoing endoscopic sinus surgery for chronic rhinosinusitis (6 patients), nasal polyposis (8 patients), or nasal airway obstruction (normal controls, 5 patients). RNA was extracted from snap frozen tissue and analyzed using cytokine and inflammatory cascade oligonucleotide cDNA microarray. The expression data was normalized to house keeping genes, and then gene expression compared between patient groups.

**Results:** The expression of IL-3 was higher in the polyp group than the control group, and IL-3 expression in the control group was higher than the CRS, both results statistically significant ( $p < .02$ ), and ( $p < .02$ ) respectively. A higher expression of IL-5 was found in the nasal polyp group than the control group ( $p < .02$ ). Also, a statistically significant higher expression of IL-6 and IL-13 RNA was found in the nasal polyp group than the CRS group ( $p < .01$ ) and ( $p < .04$ ) respectively. Patients with high Kennedy-Lund endoscopic scores and high Lund-Mackay radiographic scores were found to have higher inflammatory gene expression.

**Conclusions:** Gene array technology allows the efficient analysis of many genes simultaneously. Utilizing gene array technology we found significant differences in the cytokines IL-3, and IL-5 between the control group and the nasal polyp group, and significant differences in the cytokines IL-3, IL-6, and IL-13 between the CRS group and the nasal polyp group. All of these cytokines are involved Th2 pathway of allergic inflammation. Hopefully, in the future we can utilize gene array technology to fully elucidate the cascade of inflammation present in CRS and nasal polyposis.

**Disclosure:** No disclosures reported.

4:07 p.m. – 4:14 p.m.

### **Expression Of NF Kappa B In Eosinophilic Granulocytes Of Patients With Nasal Polyps Before And After Exposure To Alternaria With Respect To The Respective Toll Like Receptor Status**

*Jan Gosepath, MD*

**Objective:** To describe the expression profile of Toll Like Receptors 2, 4 and 6 in blood derived eosinophilic granulocytes of patients with chronic rhinosinusitis and nasal polyps versus healthy controls and the effects of in vitro stimulation of these granulocytes with alternaria antigens on expression and regulation of NF kappa B.

**Methods:** Peripheral blood was drawn of 20 patients diagnosed with polypous chronic rhinosinusitis and 10 healthy controls with no history of inflammatory disease of the nose and / or paranasal sinuses. Eosinophilic granulocytes were separated, quantified and cultured in each sample. Expression of Toll Like Receptors 2, 4 and 6 was determined by immunohistochemistry in both groups. Before and after exposure to alternaria expression of NF kappa B was quantified in both groups using ELISA.

**Results:** Statistical analysis of the obtained data revealed a significant decrease of NF kappa B expression in nuclei of eosinophils from patients when compared to controls after alternaria stimulation, along with a strong expression of Toll Like Receptor 2 and 4.

**Conclusion:** These data suggest a systemic immunologic sensitization of eosinophilic granulocytes against alternaria antigenes in individuals suffering from nasal polyposis, potentially mediated by Toll Like Receptors. This potential way of direct interaction between eosinophils and fungal material could be an important link between the presence of fungal DNA within the nasal respiratory mucosa, which has been shown in earlier studies and an immunologic reaction potentially related to the etiology of chronic rhinosinusitis and nasal polyposis.

**Disclosure:** No disclosures reported.

## Detailed Program

4:14 p.m. – 4:21 p.m.

### **“Digital Subtraction” in Image Guided Surgery of the Sinuses and Skull Base**

*Stuart Hardy, MD*

Introduction: Image Guided Surgery (IGS) has proved helpful in sinus and skull base surgery by providing an intraoperative roadmap for the surgeon, but it has been hampered by the limitation that information derives from preoperative imaging alone. This “fatal flaw” has been solved by manufacturers in a variety of ways, but all requiring intraoperative imaging, including CT, Fluoroscopy, or MRI in order to update the IGS images. These technologies are large, cumbersome, and expensive. This paper looks at a novel, inexpensive approach to solving this problem: digital subtraction. With digital subtraction, IGS images are manipulated in a virtual fashion similar to the eraser tool on photo manipulation software. An eraser probe is “painted” over the surgical surface and the computer software erases anatomy from the triplanar images resulting in a virtual updated CT image.

Methods: Unblinded prospective clinical trial in 10 patients undergoing sinus and skull base surgery, both open and endoscopic. Assessments included determination of accuracy and efficacy.

Results: Digital subtraction was found highly accurate, with less than 2 mm error throughout the surgical field. Efficacy was noted for assessment of: 1) persistent ledges in the presence of revision endoscopic surgery 2) the opening of the frontal sinus in extended frontal sinusotomy. 3) bony tumor removal in a setting of distorted anatomic landmarks. 4) completeness of surgery in the setting of extensive polypoid disease.

Conclusions: Digital subtraction is efficacious in surgery of the sinuses and skull base.

Disclosures: No disclosures reported.

4:21 p.m. – 4:28 p.m.

### **Atopy And Its Role In The Development Of Inflammatory Sinonasal Disease**

*Simon Robinson, MD*

Introduction: The aim of this study is to determine the an association between a patient’s atopic status and their sinonasal disease.

Methods: Patients with recurrent acute sinusitis and chronic rhinosinusitis and nasal polyposis awaiting endoscopic sinus surgery, were separated into atopic and non-atopic groups. Analysis was then performed to determine if their was a difference in the two groups according to a) Lund-Mackay CT scores b) Symptom scores using the Lund and Glikitch scoring systems c) Quality of life measures using the SNOT-20 and d) revision surgical rates.

Results: There were 212 patients, and the prevalence of atopy was found to be 27%. A Chi-square analysis showed no correlation between the prevalence of atopy and disease subgroup. The mean CT score was 14.2 +/- 1.6 in the atopic patients and 12.2 +/- 1.3 in the non-atopic patients ( $p = 0.05$ ). The SNOT 20 score demonstrated no difference in scores except patients who were troubled by sneezing, reduced productivity and reduced concentration were more likely to be atopic. No association was found between atopic status and symptom scores. The rate of revision surgery was not significantly different between atopic and non-atopic patients though.

Conclusion: This series is one of the largest to compare the symptomatology, radiological severity and outcome of chronic sinusitis patients with and without atopy. It has been found that the patients’ atopic status has little influence on disease severity or outcome. This relationship holds true for each of the three clinical subgroups into which our study patients were classified.

Disclosures: No disclosures reported.

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## Detailed Program

4:28 p.m. – 4:35 p.m.

**A Prospective Randomized Blinded Cross Over Trial Using Nasal Drops In Patients With Nasal Polyposis: An Evaluation Of Effectiveness And Comfort Level Of Two Head Positions**

*Ullas Raghavan, MD*

Objective: To compare the clinical efficacy, the ease of use and the degree of discomfort caused by the Mygind's (supine and head extended) position and the lying on the side head down (LSHD) position used for instilling nasal drops.

Study design: A prospective randomised blinded cross over trial.

Method: 23 patients with nasal polyps were recruited to this study. They were given Betnesol nasal drops for 6 weeks after grading the polyps. The assessor was blinded to the position used by the patient which was selected randomly. The patients were reviewed after 6 weeks when the polyp grade were reassessed. In addition they were given visual analogue chart to record the ease by which drops could be instilled and any discomfort caused by the position. After a 2 weeks washout period the patients were treated for another 6 weeks with the same drops using the other head position and were reassessed afterwards.

Results: 21 patients completed the study. The LSHD and Mygind's positions were equally effective in controlling the nasal polypi. Patients found Mygind's position was easier to instil drops in the nose although LSHD position caused less discomfort for the patient. The nasal peak inspiratory flow increased linearly as the polyp size decreased. In 86% of the patients the symptoms were well controlled.

Conclusion: The drops were efficacious in both head positions. LSHD position caused least discomfort although patients found Mygind's position easier to instil drops. Steroid nasal drops are an effective way to manage patients with nasal polyposis.

Disclosures: No disclosures reported.

4:35 p.m. – 4:45 p.m. Discussion

4:45 p.m. – 5:00 p.m. Discussion and Closing Remarks

5:00 p.m. – 5:30 p.m. **ARS Business Meeting (Members Only)**

## **Golden Head Mirror Honor Award For Meritorious Teaching in Rhinology**

*The Golden Head Mirror Honor Award was first given by Dr. Maurice Cottle to colleagues who were chosen because of "Meritorious Teaching in Rhinology". The first pair of Golden Head Mirror Cuff Links was given by Dr. Cottle to Dr. George Fisher in 1948.*

### **A**

Vijay Anand, US  
Pierre Arbour, US  
Harold Arlen, US  
Walter J. Aagesen, US  
Tomas L. Aguara, Mexico

### **B**

Pat A. Barelli, US  
Fred W. Beck, US\*  
Carlos G. Benavidez, US  
Michael Benninger, US  
Bernard Blomfield, US\*  
Max Bornstein, US\*

### **C**

Jamie Carillo, Mexico\*  
James Chesson, US\*  
Maurice H. Cottle, US\*

### **D**

Efrain Davalos, Mexico  
H.A.E. van Dishoeck, The Netherlands\*  
George H. Drumheller, US\*  
Glen W. Drumheller, US  
Larry E. Duberstein, US

### **F**

George W. Facer, US  
Anthony Faills, US\*  
George G. Fisher, US\*  
Douglas W. Frericha, US  
Amos D. Friend, US\*

### **G**

Irwin E. Ganor, US  
Norman E. Ginsberg, US\*  
Vernon D. Gray, US\*  
Charles Gross, US  
Harvey C. Gunderson, US

### **H**

Richard B. Hadley, US\*  
Robert M. Hansen, US\*  
Edward W. Harris, US\*  
Raymond L. Hilsinger, US\*  
Kenneth H. Hinderer, US\*  
Leland R. House, US  
Sandy Hoffman, US  
Egbert Huizing, The Netherlands

### **J**

Gerald F. Joseph, US

### **K**

Alvin Katz, US  
David Kennedy, US  
Eugene Kern, US  
John Kirchner, US  
Daniel D. Klaff, US\*  
Zvonimir Krajina, Croatia  
Frederick A. Kuhn, US

### **L**

Clifford F. Lake, US\*  
Donald Lanza, US  
Donald Leopold, US  
Walter E.E. Loch, US\*  
W. Kaye Lochlin, US  
Fausto Lopez-Infante, Mexico  
Roland M. Loring, US\*  
Frank Lucente, US

### **M**

Henry Merriman, US\*  
Lewis E. Morrison, US

### **N**

William J. Neidlinger, US\*  
Roberto Nevews-Pinto, Brazil  
Leon Neiman, US

### **O**

Joseph H. Ogura, US\*  
Harold Owens, US

### **P**

Charles J. Patrillo, US\*  
Ivan W. Philpott, US\*  
Loring W. Pratt, US

### **R**

Frederico Reyes, Mexico  
Ralph H. Riggs, US  
Zvi Henry Rosen, Israel

### **S**

Piefer H. Schmidt, The Netherlands  
Thomas C. Smersh, US  
Maynard P. Smith, US  
Pinckney W. Snelling, US\*  
Carl B. Sputh, US  
Heinz Stammberger, Austria  
Albert Steiner, US\*  
Sydney L. Stevens, US\*  
Fred Stucker, US  
Giorgio Sulsenti, Italy  
Edward A. Swartz, US

### **T**

William H. Tenny, US  
H. Ashton Thomas, US\*  
Paul H. Toffel, US  
Richard Trevino, US  
Charles A. Tucker, US

### **W**

Richard C. Webster, US\*  
Alvin P. Wenger, US  
Joseph W. West, US\*  
Manual R. Wexter, US\*  
Henry L. Williams, US\*  
Russell I. Williams, US

\* Deceased

## **Dr. Maurice H. Cottle Honor Award**

### ***For Outstanding Clinical and Laboratory Investigation in Rhinology First Place Gold Medal Winners***

- 1978**  
**The Nasal Cycle in the Laboratory Animal**  
*Winston M. Campbell, MD, Mayo Clinic, Rochester, MN*  
*Eugene B. Kern, MD, Mayo Clinic, Rochester, MN*
- 1979**  
**The Physiologic Regulation of Nasal Airway Resistance During Hypoxia and Hypercapnia**  
*T.V. McCaffrey, MD, Mayo Clinic, Rochester, MN*  
*Eugene B. Kern, M.D., Mayo Clinic, Rochester, MN*
- 1980 (Two Awards Given)**  
**Growth Patters of the Rabbit Nasal Bone Region – A Combined Serial Gross Radiographic Study with Metallic Implants**  
*Bernard C. Sarnat, MD, Los Angeles, CA*  
*Abbee Selman, DDS, Los Angeles, CA*
- Sleep Disturbances Secondary to Nasal Obstruction**  
*Kerry D. Olsen, MD, Mayo Clinic, Rochester, MN*  
*Eugene B. Kern, MD, Mayo Clinic, Rochester, MN*  
*Phillip R. Westbrook, MD, Mayo Clinic, Rochester, MN*
- 1984**  
**Nasal Problems in Wood Furniture Workers-A Study of Symptoms and Physiological Variables**  
*Borje Drettner, MD, Sweden*  
*Bo Wihlelnisson, MD, Sweden*
- 1987**  
**Eustachian Tube and Nasal Function During Pregnancy – A Prosepective Study**  
*Craig S. Derkay, MD, Pittsburgh, PA*
- 1988**  
**The Effects of Kiebsiella Ozenae on Ciliary Activity in Vitro: Implications for Atrophic Rhinitis**  
*Jonathan Ferguson, MD, Mayo Clinic, Rochester, MN*
- 1990**  
**The in Vivo and in Vitro Effect in Phnylephirine (Neo Synephrine) on Nasal Ciliary Beat Frequency and Mucoolliary Transport**  
*P. Perry Phillips, MD, Mayo Clinic, Rochester, MN*
- 1991**  
**Ultrastructural Changes in the Olfactory Epithelium in Alzheimer’s Disease**  
*Bruce Jafek, MD, University of Colorado, Denver, CO*
- 1992**  
**A Scanning Electron Microscopic Study of Msoking and Age Related Changes in Human Nasal Epithelium**  
*Steven Kushnick, MD, New York, NY*
- 1993**  
**Mucociliary Functionin Endothelins 1, 2 & 3**  
*Finn Ambie, MD, Mayo Clinic, Rochester, MN*
- 1996**  
**Capsacin’s Effect on Rat Nasal Mucosa Substance P Release**  
*Frederick A. Kuhn, MD, Savannah, GA*
- 1999**  
**Subacute Effects of Ozone-Exposure on Cultivated Human Respiratory Mucosa**  
*Joseph Gosepath, MD, D. Schaefer, MD, C. Broomer, MD, L. Klimek, MD, R.G. Amedee, MD, W.J. Mann, MD, Mainz, Germany*
- 2000**  
**Capsacin’s Effect on Trigenonal Nuciens Substance P Release**  
*Frederick A. Kuhn, MD, Savannah, GA*
- 2002**  
**Bioengineering of Cartilage Using Human Nasal Chondrocytes Propagated in Microcarrier Spinner Culture**  
*Alan H. Shikani, MD, David J. Fink, Ph.D., Afshin Sohrabi, M.H.S., Phong Phan, BS, Anna Polotsky, MD, David S. Hungerford, MD, Carmelita G. Frondoza, Ph.D., San Diego, CA*
- 2004**  
**Composition Of Hyaluronan Affects Wound Healing In The Rabbit Maxillary Sinus**  
*Matthew Proctor, M.D., Kery Proctor, M.D., Xian Zheng Shu, PhD., L.D. McGill, DVM,PhD., Glenn D. Prestwich, PhD., Richard R. Orlandi, M.D.*

## **International Research Award Winners**

**2004**

**Development Of A Rhinovirus Study Model Using Organ Culture Of  
Turbinate Mucosa**

*Yong Ju Jang, MD, Si Hyeong Lee, MD,  
Hyon-Ja Kwon, MSc, Yoo-Sam Chung, MD, Bong-Jae Lee, MD*

**2003**

**Nitric Oxide and Collagen Expression in Allergic Upper Airway  
Disease**

*Marc A. Tewfik, MD, Julio F. Bernardes, MD, Jichuan Shan, MD,  
Michelle Robinson, MD, Saul Frenkiel, MD, David H. Edelman, MD*

**2002**

**Recording of the Electro-Olfactogram (EOG) Using Externally  
Placed Electrodes**

*Churunal K. Hari, FRCS, Liwei Wang, PhD,  
Tim J.C. Jacob, PhD, San Diego, CA*

## **ARS Investigator Award**

**2005**

**Surfactant Proteins A and D In Chronic Sinusitis**

*Rodney J. Schlosser, MD*

**2004**

**Assessment of Bacterial Biofilms in Sinusitis**

*James N. Palmer, MD*

**2002**

**Characterization of Eosinophil Peroxidase-Induced Tissue  
Damage in Sinonasal Polyposis and Chronic Rhinosinusitis**

*Martin J. Citardi, MD*

**Influence of Estrogen on Maturation of Olfactory Neurons**

*Karen J. Fong, MD*

**2001**

**Apoptosis in the Aging Olfactory Mucosa**

*David B. Conley, MD*

## **ARS Poster Awards**

### **COSM 2005**

**1<sup>st</sup> Place: "Imaging Of The Internal Carotid Artery And Adjacent Skull Base With Three-Dimensional CT Angiography For Preoperative Planning And Intraoperative Surgical Navigation"**

*Jern-Lin Leong, MD*

**2<sup>nd</sup> Place: "Total Serum Ige Level Change After Six Weeks Of Terbinafine Therapy For Chronic Sinusitis"**

*Christopher Melroy, MD*

**3<sup>rd</sup> Place: "Retrospective Review of Endonasal Dacrocystorhinostomy with Mucosal flap procedure (Wormald Procedure)"**

*Raymond Sacks, MD*

### **Fall Annual Meeting – 2004**

**1<sup>st</sup> Place: "Modeling Pre & Post-Operative Airflow and Odorant Delivery Pattern in the Nasal Cavity: A Quantitative Evaluation of Surgical Intervention"**

*Kai Zhao, MD*

**2<sup>nd</sup> Place: "Presence of Sufactant Lamellar Bodies in Normal and Diseased Sinus Mucosa"**

*Bradford Woodworth, MD*

**3<sup>rd</sup> Place: "The Effect of Histamine on Rhinovirus-16 Infection in Airway Epithelial Cells"**

*Yoo-Sam Chung, MD*

### **COSM 2004**

**1<sup>st</sup> Place: Longterm effects of Floseal nasal packing after ESS**

*Rakesh K Chandra, MD, David B. Conley, MD, Robert Kern, MD*

**2<sup>nd</sup> Place: Evidence based use of topical nasal anesthesia for flexible transnasal endoscopy.**

*Rhoda Wynn, MD, Boris L. Bentsianov, MD*

**3<sup>rd</sup> Place: Pnemocele of the maxillary sinus: case report and literature review**

*B. Todd Schaeffer, MD*

## Poster Descriptions

### **A Comparison of Automatic and Surface Registration Strategies in Electromagnetic Navigation**

*Thomas Knipe, MD*

**Introduction:** Electromagnetic navigation in endoscopic sinus surgery (ESS) allows for registration by several different strategies. The objective of this analysis is to compare accuracy of surface registration (SR) using the AccuMatch technique to that of automatic registration (AR) using the headset. **Methods:** The study group included 13 consecutive patients undergoing ESS using image guidance with the GE Medical Systems InstaTrak 3500 Plus. All patients underwent preoperative 1 mm computed axial tomography under an identical protocol. Root mean square (RMS) error at 4 standardized fiducial markers was calculated based on screen measurements in each of the 3 axes following both AR and SR. **Results:** Statistical analysis by both paired T-test and by ANOVA with multiple pair-wise comparisons revealed that RMS error was significantly less ( $p < 0.05$ ) for AR at 2 of the 4 fiducial markers. The mean RMS error measured across all 4 FMs was significantly less for the AR (2.54 vs. 1.59,  $p = 0.006$ , paired T-test). Deviation in the anterior-posterior axis was the most common source of error. Mean set up time for AR was 41 seconds compared to 4 minutes 53 seconds for SR ( $p < 0.0001$ , paired T-test). **Conclusions:** Although SR obviates the need for a headset and provides accuracy within reasonable limits, AR has a faster set up time and its accuracy may be greater, at least at the periphery of the surgical volume.

**Disclosure:** No disclosures reported.

### **Role of CT/MRI And Endoscope For Preservation Of Eye In Sinonasal Cancer Encroaching On The Orbit**

*Hwan-Jung Roh, MD*

**INTRODUCTION:** The periorbital has been regarded as the crucial structure in decision making for preservation of the eye. CT and MRI have limitation to distinguish the exact relationship of tumor to the periorbital. There has been no report regarding oncological safety of endoscopic removal of tumor from the periorbital. The aims of this study are to estimate the usefulness of CT/MRI when tumor encroaches on the orbit and to evaluate the oncological safety of endoscopic removal of infiltrated tumor onto the periorbital. **METHODS:** Five patients of advanced maxillary cancer, showing bony orbital wall destruction and infiltration onto the periorbital but not transgress into orbital fat, underwent partial or total maxillectomy. Infiltrated tumor onto the periorbital was removed using bipolar coagulation and tumor forcep under endoscopy. Preoperative CT and MRI were performed in all cases and compared with intraoperative findings. **RESULTS:** Follow-up ranged from 8 to 99 months (mean 31.6 months). It was impossible to differentiate the periorbital from the mass on CT. The periorbital showed thickened hypointensity on T2-weighted images compared with the mass. All cases showed no local recurrence on the periorbital after endoscopic removal. The fascial layer, encircling orbital fat, deep to the periorbital could be confirmed during endoscopic dissection but was undetectable on CT and MRI. **CONCLUSIONS:** MRI was more conspicuous than CT for detecting orbital invasion. The mass beyond the thickened periorbital on T2-weighted coronal images is considered as a positive finding of true orbital invasion. Endoscopic removal of infiltrated tumor onto the periorbital can be oncologically safe technique.

**Disclosure:** No disclosures reported.

### **Computational Modeling Of Nasal Anatomical Abnormalities**

*Kai Zhao, Ph.D.*

Nasal anatomical abnormalities (e.g. septal deviation, septum perforation, turbinate hypertrophy, nasal collapse) can significantly disturb the nasal airflow pattern and impair its normal physiological functions. The most health impacting symptoms involve olfaction and subjective nasal patency. Unfortunately, quantifying the functional impact of anatomical abnormalities and the subsequent surgical treatment outcomes using rhinomanometry, acoustic

rhinometry or computed tomography (CT) is inadequate. Studies have shown poor correlations between these objective measurements and patients' subjective symptoms. In this study, we digitize individual patient CT scans in order to construct anatomically accurate 3-D numerical nasal models that can be used to simulate nasal airflow and identify fluid mechanical properties that are pertinent to the nasal functions, including: global and localized air flow rate, odorant concentration and mucosal uptake flux, wall shear stress, mucosal heat exchange rate, etc. The model can also be rapidly modified to reflect surgical interventions such as turbinate reduction, closure of nasal septal perforation, nasal valve repair or septoplasty. Our goal is to correlate variations in patient symptoms with changes of one or multiple localized or global candidate properties following treatment and to reveal underlying mechanisms that cannot be determined in standard clinical tests. In the future, such modeling techniques may provide a quantitative evaluation of surgical procedures and an important pre-operative guide to the optimization of airflow and odorant delivery in the human nose.

**Disclosure:** No disclosures reported.

### **Diagnosing Allergic Rhinitis: The Effectiveness Of Physical Examination In Comparison To Conventional Skin-Testing**

*Kashif Yousuf, H.BA.*

**Introduction:** Allergic rhinitis (AR) affects anywhere from 15%-32% of Americans. The primary objective of this study is to evaluate the effectiveness of physical examination (PE) in diagnosing AR as compared to skin-testing (ST). **Method:** Fifteen patients were randomized to see three different physicians— an allergist, rhinologist, and otolaryngology fellow. Each physician conducted a PE making their impression, followed by a history to make a clinical diagnosis (CD). The physicians were blinded to the ST results during their patient evaluation. The inclusion criterion was all patients with rhino-sinusitis at the Jewish General Hospital nasal clinic. Patients using systemic steroids or antihistamines were excluded. **Results:** Regression analysis showed the following multiple correlations: PE variables and CD equal to 0.750; history variables and CD equal to 0.926. The average sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) of the impression compared to the ST was 66.7%, 63.3%, 50.3%, and 80.3% respectively, and of the CD compared to the ST was 86.6%, 86.6%, 77.0%, and 93.3% respectively. The inter-rater reliability of PE and history variables was 0.281 and 0.494 respectively. **Conclusion:** Regression analysis comparing PE and history variables to CD shows that the history was more significant in determining the CD. Changes in sensitivity, specificity, PPV, and NPV between the impression versus ST and the CD versus ST show that the history and PE findings made the diagnosis of AR more accurate with respect to the ST than PE alone, indicating that diagnosis of AR cannot be reached accurately with PE alone.

**Disclosure:** No disclosures reported.

### **Intracranial Complications of Sinusitis**

*Shatul L. Parikh, MD*

**Objectives:** Sinusitis is a common medical problem in the adult and pediatric populations. Intracranial complications of sinusitis (ICS) are clearly the most life threatening potential sequelae of sinusitis. We reviewed our experience with patients with ICS to determine outcomes and identify factors that may affect patient morbidity and mortality. **Methods:** We retrospectively reviewed patients treated for ICS between January 2000 and January 2005 at three tertiary care referral hospitals within the Emory Healthcare system. **Results:** Twenty-two patients were identified accounting for a total of 30 cases of ICS. The male to female ratio was 5:1. Of the 22 patients identified, 17 were children under the age of 18 and 5 were adults. All patients presented with altered mental status at time of diagnosis. CT scan was used for initial diagnosis in all patients. Five patients had negative CT scans for ICS and diagnosis was made by MRI. Complications included 12 cases of epidural abscess, 9 subdural abscess, 4 intracerebral abscesses, and 5

## Poster Descriptions

meningitis. Meningitis was always present with either epidural or subdural abscess. Frontal sinus opacification was seen on the same side as the intracranial complication in all patients. All surviving patients (21) had neurosurgical procedures to treat ICS. Sixteen patients also had endoscopic sinus procedures during their hospital stay. Long term neurologic sequelae included sensorineural hearing loss (1/22), cognitive neurologic (2/22), and seizure disorder (1/22). One patient died of ICS. All patients were treated with long term antibiotics. Conclusions: ICS is a rare complication of sinusitis, but requires early diagnosis and intervention. There should be a high index of suspicion for ICS in patients who present with altered mental status and frontal opacification on CT scan. MRI may sometimes be necessary to definitively diagnose ICS. Surgical evacuation of intracranial infection is almost uniformly required.

Disclosure: No disclosures reported.

### **Update on Pediatric Intracranial Complications of Sinusitis**

*Debra Weinberger, MD*

**Introduction:** The identification and treatment of intracranial complications of sinusitis (ICS), which include meningitis, epidural, subdural and intracranial abscesses, and venous sinus thrombosis can be challenging, especially in the era of antibiotic resistance. We perceived an increase in the number and severity of these infections and hypothesized that the widespread use of antibiotics has resulted in a higher incidence of ICS and an increased incidence of resistant bacteria. **Methods:** A retrospective chart review was performed at a large pediatric hospital. The ICD-9 codes for intracranial abscess, extradural or subdural abscess, and meningitis were used to identify patients admitted between 2000 and 2004. Records were also evaluated for ICD-9 codes for acute and chronic sinusitis and nasopharyngitis. The charts and radiographs of patients with a sinogenic source were reviewed. **Results:** Of the 308 children identified, 12 had infections secondary to sinusitis and underwent a total of 21 surgical procedures. Five of these 12 children had both orbital and intracranial complications. Thirty culture specimens were obtained; 13 of these were negative. The positive cultures grew the following bacteria in order of frequency: Streptococcus species, Staphylococcus species, Peptostreptococcus species, Bacteroides species, Diphtheroids, Prevotella Loescheii and amoeba. None of the bacteria demonstrated multidrug resistance. **Conclusions:** Compared to previous studies, pediatric ICS are not occurring more frequently and are not requiring an increased number of surgical drainage procedures. ICS continue to cause high levels of morbidity due to virulent organisms not because of microbial antibiotic resistance.

Disclosure: No disclosures reported.

### **Allergic Fungal Sinusitis Without Characteristic CT Changes**

*Marc Dubin, MD*

**Introduction:** Allergic fungal sinusitis (AFS) is characterized by specific CT findings, nasal polyposis, evidence of type I hypersensitivity, eosinophilic mucus and fungal hyphae on smear. The characteristic CT finding is multiple densities in an opaque sinus. However, it is common that this is not found despite all other evidence of AFS. **Methods:** A retrospective review was conducted on 30 patients with AFS based on the Bent-Kuhn criteria. 15 patients were identified with all 5 criteria and 15 patients were identified who met 4 of the 5 criteria; each lacking characteristic changes on CT. **Data included:** length of follow-up, number and length of steroid treatments, number and length of antibiotic treatments, use of nebulized steroids and number of surgical procedures. **Results:** Average follow-up was 26 months. Patients who met four of five criteria for AFS (without CT changes) required fewer weeks of antibiotics per month of follow-up (0.57 v. 0.90,  $p=0.047$ ). They also required fewer weeks of steroids per month of follow-up (0.85 v. 1.64,  $p=0.04$ ). There was no difference in the number of months of nebulized steroids, number of surgical

procedures, courses of antibiotics or courses of steroids. **Conclusion:** Patients who meet all five Bent-Kuhn criteria for AFS are more likely to require longer courses of antibiotics and steroids than patients who do not. Despite this difference, patients who do not have characteristic CT changes require frequent courses of steroids, antibiotics and nebulized steroids to maintain their disease as do patients who meet all five criteria.

Disclosure: No disclosures reported.

### **Epidermoids of the Paranasal Sinus and Beyond: Endoscopic Management**

*Emma M. Kruger, MD*

Epidermoids of the Paranasal Sinus and Beyond: Endoscopic Management EM Kruger, RK Chandra, JN Palmer

**Background:** Epidermoid tumors of the craniofacial skeleton are uncommon, with the exception of acquired cholesteatoma of the temporal bone. These lesions may be primary embryologic in origin, or less frequently, may be iatrogenic or post-traumatic. **Methods:** report 3 cases of unusually encountered epidermoids, all of which were managed by endoscopic marsupialization via paranasal sinus approaches. We also review the pathophysiology and clinical presentation of these rare entities. **Results:** The first patient is a 50-year-old male with a congenital epidermoid of the petrous apex removed via an endoscopic trans-sphenoid approach assisted by image guided surgical navigation with CT/MRI merge. The second case is a 46 year-old female with a history of trauma found to have a mass in the pterygopalatine space. An endoscopic transmaxillary approach was used to ligate the internal maxillary artery and marsupialize the cyst into the maxillary sinus. The third patient is a 22-year-old female with a supraorbital ethmoid epidermoid tumor discovered intraoperatively during surgery for a presumed mucocele. This patient also had a known history of trauma. The cyst was marsupialized into the adjacent frontal sinus. Image guided surgical navigation using CT was utilized in the latter two cases. All patients are free of recurrence with follow up ranging from 12 to 24 months. **Conclusions:** With advancements in endoscopic techniques, including the utilization of image guidance, many of these relatively uncommon lesions can be managed by minimally invasive approaches via the paranasal sinuses.

Disclosure: No disclosures reported.

### **Feasibility Of Real-Time Image-Guided Sinus Surgery Using Intraoperative Fluoroscopy**

*Seth Brown, MD*

**Introduction:** Image-guided surgery (IGS) is used in many operating rooms around the world for specific sinus cases. One of the main limitations of IGS is that navigation relies on the use of a CT scan obtained prior to surgery and is unable to be updated during the procedure. A software addition has been developed to enable reconstruction of CT-like images from a series of fluoroscopic scans and integrate these into an image-guided system. This has been tested previously in a cadaveric model. We report our initial experience with a series of patients undergoing intraoperative fluoroscopic navigation in sinus surgery. **Methods:** After IRB clearance we prospectively studied 10 patients to-date undergoing image-guided sinus surgery with the use of intraoperative fluoroscopy. **Results:** All patients had preoperative and postoperative fluoroscopic images reconstructed into CT-like images (GE Medical Navigation and Visualization). Initial images were deemed inadequate for delineation of anatomic structures and pathology. We continued to modify the equipment, mechanism, and procedures to vastly improve the image quality so that navigation could be achieved. These details are reported. **Conclusions:** Real-time image-guided sinus surgery using fluoroscopy is feasible. Compared to intraoperative MRI the financial obligation is significantly less and personnel in the operating room generally have experience with the use of fluoroscopy and the C-arm. Radiation exposure for the patient is approximately 8% of a standard sinus CT. Future studies will need

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to focus on defining the procedures that could benefit, such as tumor resection, to enhance patient safety during these operations.

Disclosure: Equipment used in this study was provided in part by GE Medicine Navigation and Visualization. Dr. Marvin P. Fried is on the GE Surgical Advisory Board.

### **The Middle East Nose: 14 years Experience in Augmentation Rhinoplasty**

*Mohsen Naraghi, MD*

**Introduction:** The Middle East rhinoplasty patients usually have long noses with the long skin covering, making them difficult cases to achieve ideal aesthetic parameters. The problem with these noses is maintaining the stability of the results in long term, because the long skin covering and the functions of the muscles that pull the nose downward makes a propensity for the nose to hang down. I will present my personal technique which I have been used successfully during the last 14 years. **Methods:** Since 1992 more than two thousand Middle East patients had undergone rhinoplasty by the author. We categorized the patients to the four groups according to the most prominent problem. Most of problems were addressed to the hump, long skin with poor support, a wide ill-defined tip and deviated nose. Augmentation was the mainstay of our correction. Multiple grafts have been used to compensate the weak support of the nose which will be discussed in detail. **Results:** In this retrospective study we reviewed our results based on the aesthetic parameters before and after surgery. Most of augmentation was applied to the tip-columella-Lip complex, the site of underlying pathology in most cases of the Middle East nose. Long term results were more stable with more pronounced augmentations. **Conclusion:** According to our experience, augmentation rhinoplasty is the mainstay of correcting the Middle East nose. The most common augmentations were applied to the tip-columella-Lip complex which was the weakest area in the Middle East nose.

Disclosure: No disclosures reported.

### **Olfactory function in firefighters**

*Alexis H. Jackman, MD*

**Introduction:** Firefighters are exposed to smoke and other hazardous airborne agents, which are associated with olfactory loss. To determine the relationship between the environmental toxins, perceived olfactory loss and olfactory function in firefighters a comparison of firefighters and age-matched non-firefighters control subjects was performed. **Methods:** Retrospective study of the olfactory function of firefighters and age matched controls. Subjects completed a questionnaire, which included medical/surgical history, perceived olfactory function, and work exposure and use of masks/safety equipment. The University of Pennsylvania Smell Identification Test (UPSIT) was used to determine olfactory function. The relationship between amount of exposure to fire and olfactory function was determined using a Spearman correlation coefficient (rs).

**Results:** Twenty-five male firefighters (mean age = 39, SD = 9) and age-matched controls were included in this study. Duration of exposure to fires ranged from 320-5716 hrs. Seven firefighters (28%) had some degree of microsmia. Eighteen (72%) of the firefighters were normosmic, although 80% percent of these firefighters scored below the 50th percentile rank when compared to age-matched non-firefighter controls. The spearman correlation coefficient for duration of exposure and olfactory function was -0.41. **Conclusion:** This study suggests that olfactory function in most firefighters is slightly diminished compared to age matched controls. Cumulative time of exposure to active fires did not correlate highly a trend of increasing duration and decreasing olfactory function was noted.

Disclosure: RL Doty is a major shareholder in Sensonics, Inc., the manufacturer and distributor of smell and taste tests.

### **Advanced Endoscopic Surgery for Resection of Skull Base Neoplasms**

*Vijay Anand, MD*

**Objective** To report and demonstrate the technique, results, and complications of endoscopic surgical treatment of skull base tumors. **Methods** Retrospective chart review of endoscopic, endonasal resections of 20 skull base tumors. The patient demographics and pre and postoperative endocrine and ophthalmologic symptoms and complications were assessed. **Results** The skull base lesions included 15 pituitary macroadenomas, 2 craniopharyngiomas, 1 Rathke's cyst, 1 meningioma, and 1 chordoma. Residual tumor was found with IMRI and resected endoscopically in three cases. In two other cases, suspected residual tumor on IMRI was examined endoscopically and found to be normal post-operative change. In two cases, no tumor was seen on the IMRI. One patient required lumbar drain for a suspected high pressure hydrocephalus and one patient required a blood patch. There were no other complications. Five patients who had preoperative progressive visual loss preoperatively, which improved post resection and two macroadenoma patients who had increased insulin growth factor-I (IGF-1) preoperatively normalized postoperatively. There were no other major otolaryngologic or neurosurgical complications. **Conclusion** Combining intraoperative endoscopy and IMRI is an effective, minimally invasive surgical modality for skull base tumor resection that uses the sphenoid sinus as a gateway to the skullbase. Each technology provides complimentary information, which can assist the surgeon in safely maximizing the extent of resection and good post-operative result.

Disclosure: GE Medical Systems

### **Traumatic vs. Spontaneous Encephaloceles of Ethmoid Roof: A Comparison Study**

*Alexis H. Jackman, MD*

**Objectives/Hypothesis:** To describe presentation, management, and outcomes of spontaneous and traumatic skull base defects of the ethmoid sinus roof. **Materials & Methods:** A retrospective study of all patients with defects of ethmoid sinus roof treated via an endoscopic approach at the University of Pennsylvania from 2001 to 2005. Medical records and radiographic images were reviewed. Differences in presentation, defect size and location as well as operative and medical management of spontaneous and traumatic ethmoid sinus encephaloceles were compared. **Results:** Eighteen patients with encephaloceles of the ethmoid roof were endoscopically repaired. Etiology was surgical trauma in 8 patients and spontaneous in 10 patients. Presentation of traumatic encephaloceles included meningitis (5), pneumocephalus (1), and CSF rhinorrhea (1). Presentation of spontaneous encephaloceles was CSF rhinorrhea (9) and incidental finding during FESS (1). Spontaneous encephaloceles were associated with increased intracranial pressure (6) and multiple encephaloceles (6) and smaller skull base defect. Management of increased ICP included the use of acetazolamide (4) and ventriculoperitoneal shunt (1). Surgeon preference tended towards bone grafting in epidural space for all defects larger than 2 mm in diameter and all cases associated with a spontaneous leak. Success rate of both traumatic and spontaneous encephaloceles was 100% at latest follow-up (mean = 12 months). **Conclusion:** Both traumatic and spontaneous encephaloceles can be managed safely using endoscopic approaches. The use of adjuvant therapy should be considered in all patients with increased ICP.

Disclosure: No disclosures reported.

### **Complications Following Obliteration of the Sphenoid Sinus**

*Teresa King, MD*

**Introduction:** The transsphenoidal approach to the sella turcica has become routine for the excision of pituitary tumors. Autologous fat is often used to obliterate the sphenoid sinus after transsphenoidal hypophysectomy. Morbidities associated with this procedure include donor site complications and delayed mucocele

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formation. Objectives: At our institution, postoperative MRI scans are routinely performed on all patients at various intervals after pituitary surgery. The objective of this study was to determine if any early evidence of mucocele formation was present on postoperative MRI scans. The charts were also examined for any evidence of septal perforations, CSF leaks, or donor site morbidities. Methods/Study Design: This study was a retrospective review. Postoperative MRI reports a minimum of one year after transsphenoidal pituitary surgery (with fat obliteration of the sphenoid sinus) were reviewed on 40 patients. Attention was paid to the description of the sphenoid sinus and any changes noted in that area. The charts of these patients were also examined for any other complications related to the procedure. Comments on the MRI reports and in the charts were recorded. Results: In the 40 MRI reports reviewed, there was no evidence of mucocele formation. Several comments were made regarding the variety of appearances that fat assumes on MRI scans. Inflammatory changes were noted in the sphenoid sinus on 3 patients. One septal perforation and one donor site hematoma were reported. Conclusion: Mucocele formation is a known complication after transsphenoidal pituitary surgery with subsequent fat obliteration of the sphenoid sinus. Although no evidence of mucocele formation was evident on the postoperative MRI scans of the patients in this study, any of these patients is still at risk for a mucocele. We will hopefully be able to re-examine this patient population in several years for further radiologic changes in the sphenoid sinus.

Disclosure: Michael Sillers, MD: Consultant for Gyrus ENT, Sinus Pharmacy, Medtronic-Xomed, GE Navigation

### **Concurrent Endoscopic Sinus Surgery and Rhinoplasty** *Jay M. Dutton, MD*

Introduction: Concerns over increased surgical risk and associated complications have been reported regarding concurrent endoscopic sinus surgery (ESS) and rhinoplasty procedures. The aim of this study was to evaluate the overall safety of these concurrent procedures in our experience. Methods: A chart review was performed on 48 consecutive patients operated for concurrent endoscopic sinus surgery and rhinoplasty between January 1998 and January 2005 with a mean follow-up of 12 months. The extent of surgical procedures, revisions required and postoperative complications were documented. Results: Thirty-one (65%) women and 17 (35%) men ranging in age from 16 to 56 years with a mean age of 37 years were included in this study. Forty-five patients (93.7%) underwent a primary rhinoplasty procedure, whereas the other three (6.3%) underwent a revision rhinoplasty. Five patients required minor rhinoplasty revision procedures for a rhinoplasty revision rate of 5/48 or 10.4%. Complications noted in three separate cases included partial nasal obstruction, pain near osteotomy site, and infection for a complication rate of 3/48 or 6.3%. Conclusion: None of the rhinoplasty revisions were felt to be definitively caused by the fact that ESS was performed at the same time as rhinoplasty. The only complication possibly attributed to a combined approach was a postoperative infection that developed in an insulin independent diabetic patient. In our experience, complications noted during concurrent ESS and rhinoplasty were minor indicating the overall safe nature of this combined procedure when performed in appropriate patients.

Disclosure: No disclosures reported.

### **Depressed Anterior Table Fracture-A Minimally Invasive Method Of Reduction** *Derek K. Hewitt, MD*

Introduction: The majority of frontal sinus fractures (~70%) are isolated anterior table fractures. Treatment approaches include: coronal incision, bilateral brow incision, access through overlying laceration and endoscopic brow lift approach assisted with a direct incision, or delayed endoscopic repair with camouflaging implant. We describe a minimally invasive reduction technique requiring a single two centimeter incision. Method: A twelve year old male

sustained an isolated closed frontal sinus anterior table fracture in a head-to-head collision playing basketball. An obvious indentation over the left medial forehead was present and computed tomography showed a depressed anterior table fracture not involving the outflow pathway. A Lynch incision allowed a 6mm trephination in the floor of the involved frontal sinus. The posterior table, ostium and fractured anterior table were evaluated endoscopically, confirming an isolated anterior table fracture. Using a urethral sound inserted through the trephine, the fractured segment was reduced into anatomic position. Palpation and endoscopic inspection confirmed satisfactory fracture reduction. RESULT: Reduction was stable without fixation. On follow-up the patient had an excellent cosmetic outcome.

Conclusion: Reduction of a depressed anterior table fracture can be achieved with a minimally invasive technique. This avoids soft tissue dissection, obvious scarring, and other inherent risks (temporal hollowing, facial nerve injury) of alternate approaches. An excellent cosmetic result can be achieved with a single well placed Lynch-type incision for appropriate isolated closed anterior table frontal sinus fractures.

Disclosure: No disclosures reported.

### **Effect of Anti IgE Antibody In Patients With Chronic Rhinosinusitis** *Alexander G. Chiu, MD*

Introduction: Current research shows that chronic rhinosinusitis has a multi-factorial etiology with inflammation serving as a common final pathway. Immunomodulation is an emerging treatment strategy. Omalizumab, an anti IgE monoclonal antibody, is the first FDA approved agent for respiratory disease. Currently approved only for asthma, this study is the first to examine its effects in asthmatics with concurrent chronic rhinosinusitis. Methods: A retrospective case series of four patients with chronic rhinosinusitis and asthma treated with Omalizumab. Results: Omalizumab was effective in decreasing serum free IgE levels in each patient. All patients continued to have relapsing symptoms of chronic rhinosinusitis based on subjective quality of life scores and objective nasal endoscopy. Discussion: Despite effectively decreasing serum IgE levels, patients with chronic rhinosinusitis continued to exhibit relapsing sinonasal symptoms. This suggests that many causes of chronic rhinosinusitis are non IgE mediated and immunomodulation may be more effective if directed at another level of inflammation. More patients are needed to identify the subset of patients with chronic rhinosinusitis who will benefit from anti IgE antibody use.

Disclosure: No disclosures reported.

### **Medication Use For Acute And Chronic Sinusitis In Canada: Are Guidelines Being Followed?** *Martin Desrosiers, MD*

Introduction: National guidelines for management of acute and chronic sinusitis have been prepared and published by expert advisory bodies in several countries. In Canada, these have recommended use of amoxicillin initially for acute sinusitis, with second-line antibiotic agents reserved for penicillin allergy, frontal and sphenoid sinusitis, immunocompromised patients, or presumed resistance suggested by failure of therapy after 72h or repeated episodes of sinusitis. For chronic sinusitis, second-line therapy is recommended for all cases while amoxicillin is not recommended. However, it is unknown whether physicians in practice have integrated these recommendations into their clinical practice. Objectives: To compare medication use by Canadian physicians for the management of acute and chronic sinusitis with those recommended in published guidelines. Method: IMS Health Canadian Disease and Therapeutic Index data on physician drug recommendations for the 1st and 2nd quarter of 2004 were reviewed for diagnoses of acute sinusitis and chronic sinusitis. Results: For acute sinusitis, second line agents constituted the mainstay of therapy, with amoxicillin prescribed only 10.6% of the

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time. For chronic sinusitis, second line agents predominated, while amoxicillin was still prescribed 10.4% of the time. Conclusion: In Canada, physician prescription patterns do not follow published recommendations for management of either acute or chronic rhinosinusitis. Future guidelines should better reflect physician needs and include educational objectives and means for monitoring them as integral parts of the guideline process.

Disclosure: No disclosures reported.

### **Surgical Intervention for Intractable Epistaxis Unresponsive to Embolization**

*Heather C. Nardone, MD*

**Introduction:** Recent studies have demonstrated the efficacy of sphenopalatine artery ligation for intractable epistaxis. Despite a failure rate of over 10%, arterial embolization of the internal maxillary and facial artery is the procedure of choice for intractable epistaxis in many institutions. The goal of this study is to evaluate the effectiveness of surgical ligation in the treatment of epistaxis refractory to arterial embolization and to develop a treatment algorithm for the management of intractable epistaxis. **Methods:** A retrospective chart review was performed to evaluate the success rate of sphenopalatine artery ligation with or without anterior ethmoid artery ligation in patients with epistaxis who failed arterial embolization. **Results:** Six patients were identified who were embolized unsuccessfully for epistaxis and subsequently underwent surgical ligation. Hemostasis was achieved with surgical ligation in five (83%) of these cases. The lone failure was secondary to a hyperviscosity syndrome diagnosed and later successfully treated during the hospitalization. **Conclusions:** Surgical management of the sphenopalatine and anterior ethmoid arteries is an effective modality for treating epistaxis refractory to arterial embolization. An algorithm for the management of epistaxis is presented to help determine suitable candidates for surgery or embolization.

Disclosure: No disclosures reported.

### **Cholesterol Granuloma of the Nasolacrimal Canal**

*|W. Stites Whatley, MD*

**Cholesterol Granuloma of the Nasolacrimal Canal Introduction:** Cholesterol granulomas are expansile lesions which usually arise in the air cells of the temporal bone, and while reports exist of these lesions occurring in the paranasal sinuses, none have described cholesterol granuloma of the nasolacrimal canal. **CASE DESCRIPTION:** A fifty-five year old male was referred for evaluation of a nasal mass found incidentally on physical examination. The patient denied any history of previous trauma, nasal surgery, nasal airway obstruction, or epistaxis. Nasal endoscopy revealed a submucosal mass arising from the left lateral nasal wall, and computed tomography demonstrated an expansile cystic lesion intimately related to the nasolacrimal duct. The lesion was endoscopically excised with removal of the medial wall of the nasolacrimal canal. The nasolacrimal duct was preserved, and the patient's postoperative course was uneventful, with no evidence of epiphora. Pathology demonstrated inflammatory tissue with cholesterol clefts and multinucleated giant cells, consistent with a cholesterol granuloma. **DISCUSSION:** The etiology of cholesterol granulomas is hypothesized to be due to inflammatory reaction to cholesterol crystals formed from the degradation of erythrocytes in obstructed air cells. Those that arise in the temporal bone are often associated with chronic otitis media or cholesteatoma. Lesions occurring in the paranasal sinuses are rare, and hypothetically occur after trauma with hemorrhage into an unventilated bony cavity. **CONCLUSION:** Cholesterol granuloma may develop within the nasolacrimal canal and should be considered in the differential diagnosis of expansile sinonasal masses. This lesion is amenable to endoscopic management with preservation of nasolacrimal duct function.

Disclosure: No disclosures reported.

### **Systemic Corticosteroids In The Treatment of Sinonasal Disorders: Current Use And Reported Complications**

*Ryan M. Greene, MD, Ph.D.*

**OBJECTIVE:** A survey was undertaken to determine the present use of systemic corticosteroids in the treatment of sinonasal disorders, and to identify side effects encountered during treatment. **STUDY DESIGN AND SETTING:** A survey was sent to 915 practicing otolaryngologists to determine the use of systemic corticosteroids in various sinonasal disorders. The questionnaire content included the use of steroids in various disorders, the type of steroid preferred, dosing and duration of therapy, and the complications encountered during treatment. Emphasis was also placed on the avoidance of complications by using either a pre-treatment screening questionnaire or gastrointestinal (GI) ulcer prophylaxis. **RESULTS:** Of the 178 respondents, approximately 97% of otolaryngologists prescribe systemic steroids to treat a variety of sinonasal disorders. Prednisone and methylprednisone were the most commonly used. A significant percentage of respondents have encountered complications during treatment, which often require discontinuing treatment. However, a minority of respondents use risk assessment screening prior to prescribing steroids. On the other hand, GI prophylaxis is often employed during treatment, with a large number reporting encountering GI ulcer exacerbation. **CONCLUSIONS:** Systemic corticosteroids are commonly prescribed to treat sinonasal disorders, despite the fact that complications are often encountered. Although some reported using a screening questionnaire prior to prescribing steroids, this was not associated with a decreased reporting of complications. Finally, the use of GI prophylaxis was not associated with a decreased observance of GI ulcer exacerbation.

Disclosure: No disclosures reported.

### **The Role of Mitomycin C in Surgery on the Frontonasal Recess: A Prospective Open Pilot Study**

*Valerie J. Lund, MD*

**Introduction:** Maintaining patency of the frontal sinus ostium remains one of the most difficult challenges in sinus surgery. Mitomycin C is a chemotherapeutic agent which inhibits fibroblast proliferation and has been shown to reduce stenosis when applied topically in ophthalmic and laryngeal surgery. The objective was to determine the efficacy of mitomycin C in reducing frontal ostium stenosis following endoscopic sinus surgery. **Method:** This prospective open pilot study was conducted in 28 patients. All patients had undergone one or more previous surgical interventions for frontal sinusitis, either endoscopic or external and had complete unilateral obstruction of frontal sinus drainage. To assess efficacy, mitomycin C solution (1.2mg/2ml) was applied on ribbon gauze for 5 minutes to the frontal ostial region via an endoscopic or combined endoscopic and external approach at the end of surgery. Patency of the frontal ostium was evaluated endoscopically during regular follow up for a minimum of 6 months. If restenosis was observed, further endoscopic application of MMC was undertaken. **Results:** There were 17 men and 11 women, mean age 51.7years (range 26-86). Mean number of applications was 1.5 (range 1-4). The initial application was performed endoscopically in 8 patients (29%), in the rest by a combined approach and endoscopically for any subsequent applications. Mean follow up was 19 months (range 6-32). Overall patency rate was 86%. **Conclusions:** Mitomycin appears to have an important role in reducing post-operative scarring which may obviate the need for repeated and more extensive surgery. A randomised placebo controlled trial is underway.

Disclosure: Consultancy work for GlaxoSmith Kline, Shering Plough, AstraZeneca, Bayer, Servier.

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### **Use of Olfactory Mucosal Biopsy For Diagnosis of Alzheimer's Disease: A Pilot Study**

Ashutosh Kacker, MD

**Specific Aims:** To demonstrate the feasibility of endoscopic olfactory biopsy and its use in the diagnosis and follow-up of Alzheimer's disease. **Background and Significance:** Alzheimer's disease (AD) is the most common cause of dementia in older people. An estimated 4 million people in the United States suffer from AD. Olfactory dysfunction is a common feature of AD and the olfactory receptor neurons (ORNs) of the olfactory epithelium show the histological changes of AD. Immunohistochemical studies of nasal tissue taken at autopsy reveal extensive degeneration in the sensory epithelium as well as abnormal neurites that share immunoreactive epitopes with dystrophic neurites and neurofibrillary tangles of the AD brain disease not seen in PD. Researchers have shown the safety of olfactory epithelial biopsy in normal subjects and that biopsy of human olfactory neuroepithelium has no discernible adverse effect on the ability to smell. **Material and Methods:** In our study endoscopically guided olfactory epithelium biopsy were performed on patients undergoing unrestricted autopsies using a sinus endoscope and microcup forcep. The tissue was then stained using Tuj-1 a marker for neural tissue. An IRB approval no #0102-082 for the project was obtained. **Results:** 15 patients undergoing autopsies underwent endoscopically guided olfactory epithelium biopsy. Seven patients had adequate olfactory epithelium stain for neural markers (Tuj-1) and eight patients had severe autolysis, which prevented neural staining. **Conclusion:** Endoscopic olfactory biopsy is an effective modality to perform neural tissue harvest. The neural tissue is identified by using immunostaining and can be used to stain for dementia diagnosis.

Disclosure: No disclosures reported.

### **Audit of The Effectiveness of Septoplasty**

Kolitha S. Goonetilleke, MD

**Background:** Septoplasty is designed to improve the nasal airway in septal deviation and therefore directly improve the symptom of nasal obstruction, and improves facial pain and catarrh with improved night time sleep. The Sino-nasal Outcome Test (SNOT-22) is an outcome measure that incorporates both nasal specific health questions and general health questions. **Method:** This was a prospective study of 22 patients who underwent septoplasty at the Royal Shrewsbury Hospital, United Kingdom between November 2003 to July 2004. Patients were given a pre-operative SNOT-22 questionnaire. The second questionnaire was posted to the patient six weeks after their procedure. **Results:** 11 patients (50%) returned both pre-operative and post-operative questionnaires. Two patients had not completed the questionnaires correctly and were therefore excluded. **Change Scores for Nasal Obstruction.** 55.6% showed an improvement in nasal obstruction. This was lower than the suggested standard of 75%. **Change Scores for Facial Pain.** 22.2% showed an improvement in facial pain. This was lower than the suggested standard of 33%. **Total SNOT-22 Score.** The mean item scores for all 22 items were showed there was a general improvement in symptoms 77.8%. This is much higher than the suggested target of 45%. **Conclusions:** The Total SNOT-22 scores indicated a general improvement in symptoms and quality of life in 77.8% of patients, which was substantially greater than the target of 45%. However when looking at the proportion of patients who experienced overall improvements in quality of life as a result of septoplasty, it appears that for most patients it is an effective procedure.

Disclosure: No disclosures reported.

### **CT Imaging for Sinus Disease: Direct Coronal vs. Reformatted Images**

Steven D. Pletcher, MD

**Objective:** To evaluate the image quality of direct coronal vs. reformatted coronal images in patients undergoing endoscopic sinus surgery. **Study Design and Setting:** A retrospective review was performed of 20 patients who've undergone both direct and reformatted coronal CT scans at a tertiary care medical center. Reformatted images were obtained during image guidance protocol CT scans. The 40 scans were randomized and reviewed by two experienced endoscopic sinus surgeons and one neuroradiologist who were asked to rate the overall image quality as well as the imaging of key anatomic landmarks such as the osteomeatal complex, the medial orbital wall, the skull base, and the frontal recess. **Results:** Direct coronal images were noted to have higher overall image quality and better delineated the anatomy of key landmarks. These findings were statistically significant. **Conclusion:** Direct coronal imaging provides imaging clarity that is superior to the reformatted coronal images from image guidance protocol CT scans.

Disclosure: No disclosure reported.

### **Anatomic Measurements and Cadaver Dissection for Endoscopic Modified Lothrop Procedure**

Stilianos Kountakis, MD

**Objective:** To validate previously proposed preoperative radiographic frontal recess and frontal sinus measurements for use in selection of patients for the modified Lothrop procedure. **Methods:** Data was collected from sagittally reformatted CT scans of 6 cadaver heads. Anatomic measurements recorded were: A) Thickness of the nasal beak (mid-sagittal measurement of the anterior buttress). B) Mid-sagittal distance from nasal beak to skull base. C) Para-sagittal accessible dimension at the frontal recess. Accessible dimension is defined as the distance between two parallel lines drawn perpendicular to the line of the insertion of endoscopic instrumentation. The first line is tangent to the plane of the anterior skull base and the second one tangent to the posterior margin of the nasal beak (desirable > 5 mm). D) Maximum Anterior-Posterior dimension of each frontal sinus. Additionally, modified endoscopic Lothrop procedure was performed on each cadaver head. Feasibility and ease of access was recorded and correlated with radiographic measurements. **Results:** For each measurement, the mean and the range for each were: A) Nasal beak thickness: 9.7 mm (8.6-12.1mm); B) Nasal beak-skull base: 9.8 mm (6.7-13.3 mm); C) Accessible dimension (Left): 10.3 mm (5.0-18.6mm); Accessible dimension (Right): 7.4 mm (3.9-9.5 mm); D) AP diameter of the frontal sinus (left): 13.7 mm (9.8-16.6 mm); AP diameter of the frontal sinus (right): 11.1 mm (6.5-14.0 mm). In each of the specimens, the modified Lothrop procedure was successfully performed. **Conclusion:** Preoperative radiographic frontal recess and sinus anatomic measurements correlate with the ability to perform the endoscopic modified Lothrop procedure.

Disclosure: No disclosures reported.

### **Angiocentric Fibrosis of The Sinonasal Tract: A Case Report and Literature Review**

Alexis H. Jackman, MD

**Introduction:** Eosinophilic angiocentric fibrosis (EAF) is an extremely rare fibrosing lesion of unknown etiology. Although EAF is a benign lesion, it has been shown to cause extensive local destruction of the sinonasal tract. To date, only a few cases have been reported in the literature. **Educational Objective:** To discuss evaluation and management of EAF. **Methods:** A case report of a 34 year old male progressive nasal obstruction with midline nasal mass with normal nasal mucosa. Initial workup included a CT scan and nasal biopsy. Clinical photographs, radiographic studies, and pathologic slides will be presented. Operative technique and clinical course will be discussed. **Results:** Radiographic imaging

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demonstrated a large tissue mass the anterior nasal septum and lateral nasal wall. Histopathologic specimen showed a whirling fibrosis surrounding a largely eosinophilic inflammatory in a characteristic onionskin pattern, which typifies EAF. The patient was taken to the operating room for partial septectomy and resection of the lesion via a combined endoscopic approach and left lateral rhinotomy. At 7 months postoperative follow-up, he is asymptomatic and without evidence of recurrence. Conclusions: EAF is a destructive but benign lesion of the sinonasal tract. Surgical resection was accomplished via a combined endoscopic and open approach with resolution of patient symptoms.

Disclosure: No disclosure reported.

### **Nasal Manifestations of Non-HIV Kaposi's Sarcoma**

*Rhoda Wynn, MD*

Objective: Kaposi's sarcoma is a rare disease that came to be primarily associated with AIDS during the past two decades. The objective of this presentation is to familiarize physicians with two other non-HIV-associated forms of Kaposi's sarcoma, the African/endemic variant and the classic form, with particular attention to nasal manifestations. Design: Case reports and review of the literature. Methods: The first patient is a 43 year old male who emigrated from Africa who had developed progressively worsening left nasal obstruction and intermittent epistaxis for one year; on examination, there was a pinkish-brown mass extruding from the left nasal cavity. The second patient is a 78 year old male of Jewish ethnicity who had been undergoing therapy for cutaneous and oropharyngeal/hypopharyngeal Kaposi's sarcoma lesions who then developed nasal obstruction and was found to have a reddish-brown mass on the posterior nasal septum. Results: Histopathology from biopsies done in both cases demonstrated capillary lobular proliferation with epithelioid features and spindle-cell proliferation, consistent with a diagnosis of Kaposi's sarcoma. Conclusions: Non-HIV-related Kaposi's sarcoma is rare disorder that may present as nasal obstruction. Accurate diagnosis depends on tissue biopsy. Symptomatic obstruction in selected cases may be aided by limited surgical resection in addition to chemotherapy.

Disclosure: No disclosures reported.

### **Recent Advances in Mucosal Immunology and Genetics: Implications for the Pathophysiology of Chronic Rhinosinusitis**

*Robert C. Kern, MD*

Chronic rhinosinusitis (CRS) is a clinical syndrome characterized by persistent symptomatic nasal inflammation; it may present both with (CRS<sub>NP</sub>) and without nasal polyps (CRS<sub>NP</sub>). The role of infectious agents in the etiology of CRS remains unclear, but interest has centered on two organisms: *Staphylococcus aureus* and *Alternaria*, both of which are frequently cultured from the nasal cavity. Histologic analysis of pathologic specimens reveals varying degrees of tissue eosinophilia in the majority of cases but the molecular mechanisms whereby eosinophils are recruited and activated by these microbes remains obscure. The superantigen hypothesis proposes that exotoxins secreted by colonizing *Staphylococci*, trigger eosinophilia through: (1) direct B-cell stimulation by toxin leading to a local polyclonal IgE response and (2) T-cell stimulation with Th2 cytokine release. The fungal hypothesis proposes that a T-cell mediated hypersensitivity to *Alternaria* results in IL-5 production causing eosinophil recruitment and activation. The fungi are specifically targeted by a mechanism that is not believed to involve immunoglobulins. Recent advances in both the immunology of the nasal mucosa and the genetics of other chronic mucosal disorders permit a re-assessment of these hypotheses. Specifically, studies on the genetics of asthma and atopic dermatitis have indicated a complex interplay between multiple genes that regulate the integrity of the epithelial barrier

and the ability of barrier cells to manifest innate and acquired immune responses of appropriate strength and duration. The etiology and pathogenesis of CRS will be re-interpreted in light of these advances with emphasis on a re-assessment of the validity of current hypotheses.

Disclosure: No disclosures reported.

### **Use of Dead Sea Salt Solution for Chronic Rhinitis and Rhinosinusitis**

*Howard L. Levine, MD*

Introduction: Many otolaryngologists use nasal saline irrigations and sprays for patients with chronic rhinitis and rhinosinusitis as a mainstay to manage and irrigate purulent secretions from the nasal cavity. The Dead Sea is the world's most saline lake. Its 30% salt composition has proportionately more calcium, magnesium, bromine, and potassium and less sodium sulfate and carbonate than any other ocean. The dominant cation, magnesium has been found to be effective in the management of inflammatory cutaneous lesions, inhibit histamine effects, and stabilize eosinophils. This paper looks at the value of a nasal irrigating solution and spray from the Dead Sea. Methods: Thirty one patients were selected because of refractive purulent rhinosinusitis that persisted after treatment medically or surgically. A relatively new irrigating solution and nasal wash containing as its major component Dead Sea Salt, (Oasis, Master Solutions, Tulsa Oklahoma) was used as an irrigation in the morning and spray midday and evening. Quality of life was measured through Medical Outcomes Short Form 36 (SF-36) and the Chronic Sinusitis Survey (CSS). Twenty-six of the 31 patients returned the survey instruments. Data was analyzed using STATISTICA. Results: The means before treatment were 20.08 for chronic sinusitis and 75.88 for quality of life and after treatment significantly reduced to 13.37 and 45.65 respectively. Conclusions: Dead Sea Salt is an effective irrigation and spray in the management of purulent rhinosinusitis improving quality of life and rhinosinusitis symptoms. It may have its effectiveness because of the different cation composition from normal or hypertonic saline.

Disclosure: Howard Levine: Medical Director, Sinucare; Speaker, Aventis, GlaxoSmithKline; Consultant, Medtronic Xomed / Scott Cordray: Owner, Master Solutions

### **Autologous Platelet Gel For Repair Of Cerebrospinal Fluid Leaks: Introduction Of A New Technique**

*Amin R. Javer, MD*

Objective: To assess the efficacy of using platelet gel as a sealant during intranasal, endoscopic repair of dural-osseous defects of the skull base. Methods: Six cases of CSF rhinorrhea were reviewed retrospectively. Using an intranasal endoscopic approach, all dural-osseous defects were repaired in a similar fashion using a multi-layered closure. Platelet gel was used as the sealant for all cases. The mean time for follow-up was 7.4 months. Results: All 6 cases of CSF rhinorrhea were successfully repaired utilizing platelet gel as the sealant. All 6 patients remained entirely asymptomatic, with no evidence of recurrent CSF rhinorrhea. No post operative complications were identified. Conclusion: Platelet gel is an effective biological sealant when used during intranasal, endoscopic, multi-layered closure of skull base defects. It is an autologous sealant which can be created within minutes of taking blood. The use of platelet gel alleviates concerns regarding the use of foreign blood products in surgical patients.

Disclosure: No disclosures reported.

## Poster Descriptions

### **Catheter Based Dilatation of Paranasal Sinus Ostia: An Initial Clinical Trial**

*Christopher L. Brown, FRACS*

**Introduction:** Endoscopic sinus surgery (ESS) has effectively managed patients who fail medical therapy for sinusitis. However, ESS is not always successful and serious complications can occur. New techniques and instrumentation that improve outcomes and reduce complications would be seriously welcomed. Innovative catheter based technology has improved treatment of several conditions such as coronary artery disease, peripheral vascular disease and stroke. Recently, catheter devices have been developed for the paranasal sinuses. Cadaver studies confirm the potential of these devices in rhinosinusitis. The objective of this investigation was to ascertain the feasibility and safety of these newly developed devices in performing catheter based dilation of sinus ostia and recesses. **Materials / Methods:** A non-randomized prospective cohort of 10 ESS candidates was offered a new technique of balloon catheter dilatation of targeted sinus ostia. The frontal, maxillary and sphenoid sinuses were considered appropriate for this innovative catheter based technology. The primary study endpoints were intraoperative procedural success and absence of adverse events. **Results:** A total of 18 ostia/recesses were successfully catheterized and dilated including 10 maxillary, 5 sphenoid and 3 frontal. No adverse events occurred. Mucosal trauma and bleeding appeared to be less with catheter dilation than typically observed with ESS techniques. **Conclusions:** Dilatation of sinus ostial regions via balloon catheter based technology appears to be safe and feasible. Larger multicentric clinical trials are now warranted to further establish safety and to determine the role of this exciting new technique..

**Disclosure:** No disclosures reported.

### **Nasal Endoscopy Findings In Patients With Normal And Abnormal Sinus Computed Tomography**

*Stilianos Kountakis, MD*

**Objectives/Hypothesis:** To correlate nasal endoscopy scores with CT scan findings in patients seen in a tertiary rhinology practice. **Methods:** Retrospective analysis of prospectively collected data in two cohorts. The first cohort consisted of 201 consecutive patients undergoing functional endoscopic sinus surgery (FESS) at a tertiary care medical center for chronic rhinosinusitis (CRS) (previously published). The second cohort consisted of 100 patients with primary headache and normal paranasal computed tomography (CT) scans (previously published). CRS was diagnosed according to the Rhinosinusitis Task Force (RSTF) criteria. CT scans were graded according to the Lund-Mackay criteria. Data analysis was performed using Student's T-test. **Results:** Two hundred and one patients were identified with CRS (104 male and 97 female). Mean CT score was 12.8 and mean endoscopy score was 5.8. Among the 100 patients with headache but without CRS, mean CT score was 3.7 and mean endoscopy score was 0.2 ( $p < 0.0001$ ). When stratified by diagnosis, those patients with CRS with nasal polyposis showed a mean CT score of 18.0, where as patients with CRS without polyposis had a mean CT score of 9.5 ( $p < 0.0001$ ). Patients with polyposis had a mean endoscopy score of 9.7 versus 3.3 in patients without polyposis ( $p < 0.0001$ ). **Conclusions:** Patients with evidence of CRS on CT had significantly higher endoscopy scores than patients presenting with primary complaint of headache. Furthermore, patients with nasal polyposis had higher CT and endoscopy scores than patients with CRS without polyposis.

**Disclosure:** No disclosures reported.

### **Arachnoid Cyst Presenting as Ethmoidal Mucocele**

*Mohsen Naraghi, MD*

complication of severe head injury that only occurs in 0.05-1% of cases, of which 90% are in children less than 3 years old. Growing fractures are the result of a traumatic disruption of both inner and outer table, with a dural tear, through which the arachnoid membrane is pushed out, by the pulsation of the cerebrospinal fluid (CSF). The orbit contains soft and rather non-resistant tissues, which can be a suitable place for extension of these cysts. Arachnoid cyst, which is in close proximity to the posterior the lateral bony wall of the orbit, can introduce the remodeling process of the bony wall, resulted in exophthalmos of some degree. The degree of the exophthalmos was not related with the size of the arachnoid cyst and that the posterior third of the posterior bony wall of the orbit was the peak of the bowing from the remodeling process. Surgery performed as early as possible is the optimum treatment for posttraumatic leptomenigeal cyst. In particular, the dural defect must be fully repaired. The most common mass lesion of the orbit originating in the paranasal sinuses is the mucocele which usually present with unilateral proptosis. This presentation could be mistaken with that of the arachnoid cyst. We report an adult case of posttraumatic arachnoid cyst that mimicked a mucocele with proptosis, diplopia and frontal headache. **Methods:** A 28 year old man presented with a post traumatic arachnoid cyst manifested by proptosis of 3 year duration and a 1 year history of frontal headache and diplopia. He had suffered an injury to his head when he was 6 years old. Brain CT scan showed a cystic lesion with no enhancement after contrast injection. He was treated surgically with a diagnosis of frontoethmoidal mucocele, but **Results:** On surgery, only CSF leakage and gray cystic membranous tissue was found. The dural and bone defects were repaired. **Conclusion:** Unilateral proptosis in adults can be caused by an arachnoid cyst originating from a skull fracture. Differentiating of these lesions from ethmoidal mucoceles could prevent unwanted CSF leakage risks during surgery.

**Disclosure:** No disclosures reported.

### **Response To a Standardized Management Strategy For Refractory Chronic Rhinosinusitis: Implications For Studies Of Genetics**

*Martin Desrosiers, MD*

**Introduction:** Studies of the genetics of chronic rhinosinusitis (CRS) offer potential insight into the pathophysiology of this poorly understood condition. We wished to identify patient factors correlated with poor response to medical and surgical therapy in order to identify starting points for future studies of genetics of CRS. **Methods:** Retrospective chart review of cases of CRS refractory to medical and at least one surgical attempt referred for care in a tertiary sinus center. All patients were managed by a single physician by using a standardised treatment protocol consisting of BID nasal irrigations with saline/corticosteroid (budesonide; BUD) mixture. Response to treatment was defined as absence of symptoms, oedema, or secretions at last visit. **Results:** 71 cases were identified. Age at first surgery was 38.2 years. 59.8% were male, 5% smokers. Atopy was present in 33.3%, asthma in 69.0% and ASA sensitivity in 33.3%. 43/71 (60.5%) patients were managed successfully with budesonide irrigations alone. Rates of asthma and ASA-intolerance higher in failures of irrigations ( $p < 0.05$ ); however, multiple regression analysis showed failure to respond to irrigations correlated only with recovery of gram-negative rods other than *Pseudomonas Aeruginosa* (GNR). **Conclusions** Asthma and ASA-intolerance are frequent in refractory sinusitis. Irrigation with budesonide solution appears effective in management. Lesser response to irrigation in patients with GNR suggests the existence of a sub-class of sinusitis with different pathogenesis, possibly via polymorphisms in receptors of innate immunity. Studies of the genetics of CRS will include genes known to be involved with both asthma and innate immunity.

**Disclosure:** No disclosures reported.

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### **Sinonasal Teratocarcinoma**

*Hsin-Chin Lin, MD*

**Background:** Sinonasal teratocarcinoma (SNTCS) is a malignant neoplasm, consisting of one malignant epithelium and two or more malignant mesenchymal components. The characteristics of SNTCS are rapid growth and aggressive local destruction, and it generally has an unfavorable prognosis. Herein, we reported a case of SNTCS with an emphasis on the clinical course, focusing especially on cancer behavior, which has rarely been mentioned in previous literature. **Method:** Case report. **Results:** A 51-year-old man complained of recurrent epistaxis for 2 months. Nasoendoscopy revealed a reddish and polypoid mass in the region of the middle meatus and extended to the roof of the nasal cavity. A computed tomography showed a sinonasal soft tissue mass that filled up the left sinonasal cavity nearly making contact with the base of the skull. A lateral rhinotomy was performed. A pathological examination of the mass was consistent with teratocarcinoma. The patient was then treated with adjuvant radiotherapy and regularly followed up every month. However, the left cheek, parotid and neck metastasis began to recurrently develop after 16 months postoperatively. The recurring metastatic masses appeared suddenly and quickly enlarged within 3 weeks. After receiving left neck dissection, parotidectomy, and free flap reconstruction for the left facial defect, the regional metastatic conditions were under control. Unfortunately, this patient died from lung metastasis 3 years postoperatively, even without locoregional recurrence. **Conclusion:** SNTCS is a highly aggressive malignancy with invasive tumor behavior. We suggest that an aggressive radical neck dissection should be performed in the early stage when treating SNTCS.

**Disclosure:** No disclosures reported.

### **Allergic Fungal Sinusitis Without Characteristic CT Changes**

*Marc Dubin, MD*

**Introduction:** Allergic fungal sinusitis (AFS) is characterized by specific CT findings, nasal polyposis, evidence of type I hypersensitivity, eosinophilic mucus and fungal hyphae on smear. The characteristic CT finding is multiple densities in an opaque sinus. However, it is common that this is not found despite all other evidence of AFS. **Methods:** A retrospective review was conducted on 30 patients with AFS based on the Bent-Kuhn criteria. 15 patients were identified with all 5 criteria and 15 patients were identified who met 4 of the 5 criteria; each lacking characteristic changes on CT. **Data included:** length of follow-up, number and length of steroid treatments, number and length of antibiotic treatments, use of nebulized steroids and number of surgical procedures. **Results:** Average follow-up was 26 months. Patients who met four of five criteria for AFS (without CT changes) required fewer weeks of antibiotics per month of follow-up (0.57 v. 0.90,  $p=0.047$ ). They also required fewer weeks of steroids per month of follow-up (0.85 v. 1.64,  $p=0.04$ ). There was no difference in the number of months of nebulized steroids, number of surgical procedures, courses of antibiotics or courses of steroids. **Conclusion:** Patients who meet all five Bent-Kuhn criteria for AFS are more likely to require longer courses of antibiotics and steroids than patients who do not. Despite this difference, patients who do not have characteristic CT changes require frequent courses of steroids, antibiotics and nebulized steroids to maintain their disease as do patients who meet all five criteria.

**Disclosure:** No disclosures reported.

### **Concha Bullosa of the Inferior Turbinate**

*Jeremy P. Watkins, MD*

**Introduction:** Concha bullosa of the inferior turbinate is an uncommon anatomic variation, with only 11 cases reported in the English literature. **Methods:** A series of 3 cases of inferior turbinate concha bullosa is presented. The clinical and radiographic presentation is discussed, and the literature is reviewed. **Results:**

The three patients included two females and one male, all of which were middle-aged adults. Both females presented with nasal airway obstruction, and one of these patients also complained of anterior nasal pressure. The inferior turbinate concha bullosa was bilateral in both of these cases. One was successfully treated with topical intranasal steroids, while the other required surgery to resect the medial lamella of the concha on each side after failed intranasal steroid therapy. The male patient had an asymptomatic inferior turbinate concha bullosa visualized on CT scan performed after orbital trauma. This patient received no specific intervention. In all three cases, the entity was diagnosed with 2 mm coronal CT scan. **Conclusions:** Inferior turbinate concha bullosa may be more common than previously reported, as many cases may be asymptomatic. Symptomatic patients may derive relief from intranasal steroids. In patients failing medical therapy, resection of the medial lamella of the concha can be effective in controlling symptoms.

**Disclosure:** No disclosures reported.

### **An Unusual Foreign Body in the Pterygomaxillary Fossa**

*Ramez J. Awwad, MD*

**Introduction:** Foreign bodies within the aerodigestive tract are common clinical entities, especially in children. Although foreign bodies can be located anywhere along the aerodigestive tract, there are no case reports describing a foreign body within the pterygomaxillary fossa. This area contains numerous vascular and neural structures, and can be quite difficult to access. **Study Design:** A single case report of a subject with a foreign body embedded within the pterygomaxillary fossa. **Methods:** A review of the clinical treatment of pterygomaxillary foreign bodies, potential complications, and surgical approaches to this area for retrieval of the foreign bodies. **Results:** An 18 year old African American sustained a gunshot wound to the left cheek. The patient complained of left nasal congestion and cheek pain, but denied any visual changes, headaches, epistaxis, malocclusion, or neurologic changes. A computed tomography scan revealed the bullet to be wedged in the left pterygomaxillary fossa. He underwent an endoscopic removal of the bullet via the left nasal cavity. Despite its location in the pterygomaxillary fossa, the patient had no significant bleeding or neurological deficits. **Conclusion:** This is the first case report describing a foreign body in the pterygomaxillary fossa. The otolaryngologist has a variety of options in regards to surgical approach to this area. With the advancement of endoscopic surgery, an open procedure rarely needs to be carried out. Endoscopic techniques provide superior visualization, are minimally invasive, and save the patient a potentially unsightly scar.

**Disclosure:** No disclosures reported.

### **Fungal Nasal Septal Abscess in the Immunocompromised Patient**

*Ronald J. Walker, MD*

**Introduction & Purpose:** Nasal septal abscesses (NSA) are uncommon entities usually resulting from trauma with septal hematoma formation and subsequent bacterial infection. In the immunocompromised patient, however, NSA may arise without antecedent injury, and may be the result of a fungal infection. Failure to recognize this condition may result in the dangerous spread of infection and the development of severe functional and cosmetic sequelae. **Methods:** We report an unusual case of nontraumatic fungal NSA in an immunocompromised patient. The clinical presentation, medical and surgical options for management and potential complications are reviewed. **Results:** A 64 year-old male with a history of Crohn's disease and pulmonary fibrosis presented with a 2-week history of nasal obstruction. Clinical examination was suspicious for NSA. Incision and drainage were performed under local anesthesia. The patient was treated with oral antibiotics but did not improve. When seen 48 hours later, the NSA was noted to have reaccumulated. Cultures revealed *Aspergillus flavus*. The patient was admitted to hospital for formal

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surgical drainage and was started on intravenous voriconazole. Following surgery the patient underwent 6 weeks of outpatient intravenous antifungal therapy. He was doing well at 18 months follow-up. Conclusions: The diagnosis of fungal NSA should be considered in the immunocompromised patient even in the absence of trauma. Proper management requires prompt diagnosis and adequate surgical drainage, followed by culture-guided antimicrobial therapy. Analysis of drainage fluid must include a search for fungal organisms. Sinonasal fungal infections may become more prevalent as the population of immunocompromised individuals continues to rise.

Disclosure: No disclosures reported.

### **Novel Sinonasal Complications of Maxillary Orthognathic Surgery (LeFort I Osteotomy)**

*Christopher T. Melroy, MD*

Introduction: Maxillary orthognathic surgery is widely used to correct dentofacial anomalies for cosmesis and function. Some complications of this procedure are well described in the literature including their potential to predispose to rhinosinusitis. The purpose of this investigation is to study a series of patients with anatomic and functional sinonasal disease secondary to maxillary orthognathic surgery and to detail complications that have not been well described in the literature. Methods: A retrospective chart review was performed in a tertiary rhinology practice over a 1 year period. Patients with sinonasal pathology due to a structural problem from maxillary orthognathic surgery were reviewed. Results: Four patients ages 16-44 (average age 31) presented 1-20 (average 13) years after maxillary orthognathic surgery with sinonasal disease that extended beyond chronic rhinosinusitis. Two patients had maxillary sinus mucocoeles, and 2 had linear and inferior nasal septal perforations. One patient had accessory maxillary sinuses created by the procedure with corresponding oroantral fistulae. One patient had an obstructed maxillary ostium that led to pus in the sinus and extension of the pus into facial soft tissues resulting in abscess. Conclusions: Maxillary orthognathic surgery can lead to structural and functional changes in the sinonasal cavity that may manifest as any of these novel complications. Shared knowledge between orthognathic surgeons and rhinologists is essential for the proper care and surveillance of these patients.

Disclosure: No disclosures reported.

### **Current Management Of Epistaxis Presenting In The Emergency Department**

*Monica Nguyen-Okun, MD*

Introduction: Epistaxis management has evolved significantly, with few studies documenting initial management. The increase number of uninsured patients and the changes in the health care delivery system have steered many patients to seek care in the emergency department (ED). EDs vary widely in epistaxis management, equipment and use of otolaryngology consultation. Methods: This study entailed a two-page survey questionnaire of NYU ED attending physicians. Survey questions include their experience and epistaxis management. A MEDLINE literature search was performed. A search of the NYU billing database was made using ICD-9 code (784-7). Results: 25 questionnaires. NYU ED physicians see approximately 4 epistaxis cases per month and admit less than 1%. IV hydration is not a routine part of management. Laboratory is not routinely sent. If sent, complete blood count (73%) and coagulation panel (73%) are the most common. 92% of ED physicians will place anterior packing. 70% prefer merocel and 20% prefer gelfoam. ED physicians will call otolaryngology consultation after their initial packing fails. 96% of ED physicians will refer to otolaryngology for follow up regardless if otolaryngology consultation was obtained. Conclusion: Epistaxis is a common problem which usually requires no medical attention. When a patient seeks care in the ED, physicians will attempt to stop the bleed with anterior packing and consult otolaryngology for cases of profuse bleeding. In an otolaryngology practice, the goal is to stop

the bleeding and leave no packing in place. Consequently, communication between the initial care provider and the physician following the patient is essential.

Disclosure: No disclosures reported.

### **A New Paradigm In The Management Of Posterior Epistaxis: A Pilot Study**

*Anita Jeyakumar, MD*

INTRODUCTION: Most measures used to control posterior epistaxis cause significant patient morbidity, and a prolonged hospital stay. OBJECTIVES: The efficacy of a new treatment protocol for posterior epistaxis was implemented as a prospective pilot study. The goal of the protocol is resolution of the bleeding, a short stay in the hospital, without the morbidity of embolization and/or surgery. METHOD: All patients under study suffered from acute unilateral posterior epistaxis. A choanal balloon, along with a hemostatic agent, was used on the affected side only. The packing was removed within 24 hours of placement. RESULTS: All patients involved in the study had complete resolution of their bleeding, without the need for further intervention. They have been without any evidence of recurrence from 1-4 months of follow-up to date. CONCLUSION: As a consequence of this study, we recommend and practice a new step-wise treatment protocol of patients with posterior epistaxis. In the case of success, as we have had with our small pilot, the patients can be discharged much earlier, with significantly less morbidity.

Disclosure: No disclosures reported.

### **Inflammatory Mucous Membrane Disease In Chronic Sinusitis**

*Marc G. Dubin, MD*

Introduction: Chronic sinusitis is a disease that can be divided into several sub-groups.

Patients can be separated into those that have inflammatory disease of the mucous membrane (i.e. allergic fungal sinusitis (AFS), aspirin sensitive asthma with nasal polyposis) and those that do not. Methods: A retrospective review was conducted on 30 patients with chronic sinusitis. 10 patients were identified with AFS, 10 patients were identified with aspirin sensitive asthma with nasal polyposis and 10 patients were identified without either diagnosis (or other mucosal disease, i.e. Wegeners, Sarcoidosis). Data included: length of follow-up, number and length of steroid treatments, number and length of antibiotic treatments and use of nebulized steroids. Results: Average follow-up was 27.4 months. Patients without mucous membrane disease required fewer courses of steroids per month of follow-up (0.02) than those with aspirin triad (0.14) and AFS (0.10) ( $p < 0.01$ ). They also required fewer weeks of steroids per month of follow-up (0.07) versus those with aspirin sensitive asthma (1.29) and AFS (1.47) ( $p < 0.01$ ). Nebulized steroids were less frequently used in patients without mucous membrane disease ( $p < 0.05$ ). There was a trend for a greater number and longer courses of antibiotics per month of follow-up in patients with mucous membrane disease ( $p > 0.05$ ). Conclusion: Patients with inflammatory disease of the mucous membrane (i.e. AFS, aspirin sensitive asthma) require more and longer courses of steroids to maintain their disease than patients that do not. They also may need longer and more frequent courses of antibiotics.

Disclosure: No disclosures reported.

### **Rhinoplasty By Using 4.0 Mhz Radiowave Technology**

*Mahmoud Moravej, MD*

Objective: Radiosurgery in Rhinoplasty is new surgical technique employing the low temperature 4.MHz radio wave .By using special RF electrodes affords surgical precession ,causes no burning of tissue or thermal injury . Methodes: The procedures were performed under Local or General Anesthesia .Radio wave surgical application for Cutting skin and Mucosa tissue during Open Rhinoplasly causes fewer bleeders.

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Result: 4.0 MHz Radiofrequency surgery allows for Cutting & Coagulation with controlled penetration depth and the cosmetic result is superior compared to the classic procedures. Conclusion : Our studies show that 4.0MHz Radiofrequency surgery is the best technique for Cosmetic Surgery application,producing a Micro-incision in Target tissue ,causing less bleeding and resulting in faster healing process with a superior cosmetic result.

Disclosure:

### **FESS Combined Radiofrequency Surgery**

*Mahmoud Moravej, MD*

Obective: FESS combined Radiofrequency Surgery is a new Surgical technique using 4.0 MHz Radio wave technology .As compared to classic FESS, it is better alternative.

Method: The procedure will be performed by de-bulking Nasal Mass, then removal mass by specific RF electrodes under Endoscop vision.

Result: The efficacy of technology, there is minimal tissue damage but no burning, so the removal tissue is achieved by controlled tissue depth.

Conclusion: The best technique for Nasal and Paranasal Endoscopic Surgery is FESS combined RF. There are not post operative complications like Atrophic Rhinitis.

Disclosure: No disclosures reported.

### **Phophaturic Mesenchymal Tumor Of The Nasal Cavity: Case Report And Review Of The Lliterature**

*Jonathan M. Owens, MD*

OBJECTIVE: Phosphaturic mesenchymal tumor (mixed connective tissue variant) (PMT-MCT) is an unusual tumor which is rarely encountered in the nasal cavity and paranasal sinuses. This tumor is associated with oncogenic osteomalacia (OO) secondary to renal phosphate wasting. METHODS: Case report and literature review RESULTS: We present a case of a 49 year old otherwise healthy woman who presented with a several month history of progressive left sided nasal obstruction. Rhinoscopy and nasal endoscopy revealed a large mass occupying the entire nasal cavity. The mass was completely excised endoscopically and was found to be originating from the middle turbinate. Histologic evaluation revealed a low grade tumor with relatively sparse spindle cells in a myxoid stroma and abundant microvasculature. Immunohistochemical analysis was positive for S-100 and actin, consistent with PMT-MCT. The patient has no evidence of OO and has been followed for six months with no recurrence.

CONCLUSIONS: PMT-MCT is a very rare tumor of the nasal cavity and paranasal sinuses, with this case representing the sixth reported case. A review of the literature suggests PMT-MCT is clinically important because it is associated with phosphate wasting and osteomalacia. PMT-MCT occasionally presents as a malignant variant with metastases. Furthermore, PMT-MCT is often misdiagnosed as other mesenchymal tumors, such as hemangiopericytoma, giant cell tumor, and osteosarcoma. This entity must be considered when atypical tumors are encountered in the nasal cavity and paranasal sinuses. Misdiagnosis is a definite possibility given its challenging histology and appropriate management dependent on the accurate recognition of this rare tumor.

Disclosure: No disclosures reported.

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**SIPP, James, MD**  
Atlanta, GA

**SMITH, Dana, MD**  
Portland, OR

**SMITH, Ronald, MD**  
Danville, PA

**SNYDER, Mary C., MD**  
Omaha, NE

**SOLARES, Clementino, MD**  
Cleveland Heights, OH

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Arlington, MA

**STEIGER, Jacob D., MD**  
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**STEIN, Jeannine, MD**  
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**STUPAK, Howard, MD**  
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**SUBINOY, Das, MD**  
Durham, NC

**SWANSON, Greg, MD**  
Detroit, MI

**TADROS, Monica, MD**  
Washington, DC

**TEOH, Su, MD**  
Indianapolis, IN

**TO, Wyatt, MD**  
Weston, FL

**TOMA, Vincent, MD**  
W Bloomfield, MI

**VARGAS, Hannah, MD**  
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**VARNER, Cheryl, MD**  
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**VASYUKEVICH, Konstantin, MD**  
Bronx, NY

**VENKATESAN, T, MD**  
Chicago, IL

**VENTRAPRAGADA, Shridhar, MD**  
Chicago, IL

**VILA, Raul, MD**  
PUERTO RICO

**VILLAGRA, Eric J, MD**  
Mexico City, MEXICO

**VINER, Daniel, MD**  
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**VUKAS, Daniel D, MD**  
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**WALSH, Curtis, MD**  
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**WILCOX, Bryan, MD**  
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**WILLIAMS, Mark, MD**  
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**WISE, Sarah K, MD**  
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**WOODWORTH, Bradford, MD**  
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**YEN, Thomas, MD**  
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**YUN, David, MD**  
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**ZAGER, Warren, MD**  
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**ZEIDERS, Jacob, MD**  
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# AMERICAN RHINOLOGIC SOCIETY

## APPLICATION FOR MEMBERSHIP

### Membership Category

- Resident: **No Charge**. Letter of recommendation from chairman required.
- Regular Member: **\$290** (\$240 annual dues +\$50 application fee). Must be out of residency training two or more years and board certified by the American Board of Otolaryngology or its equivalent.
- Fellow: **\$290** (\$240 annual dues +\$50 application fee). Must be out of residency at least 3 years and board certified by the ABO or its equivalent. Must have attended at least 2 ARS meetings over the past 3 years.

PLEASE PRINT OR TYPE

Name	Primary Address	Secondary Address
Last <input type="text"/>	Street <input type="text"/>	Street <input type="text"/>
First <input type="text"/>	<input type="text"/>	<input type="text"/>
MI <input type="text"/>	City <input type="text"/>	City <input type="text"/>
Suffix <input type="text"/>	State <input type="text"/> Zip <input type="text"/>	State <input type="text"/> Zip <input type="text"/>
Birthdate <input type="text"/>	Phone <input type="text"/>	Phone <input type="text"/>
	Fax <input type="text"/>	Fax <input type="text"/>
	Email <input type="text"/>	Email <input type="text"/>

Preferred contact for dues notice  Email  Fax  Mail

Medical School  Year of Graduation

Residency  Year Completed

Year Certified by American Board of Otolaryngology or equivalent

Graduate Training in Rhinology (if any)

Membership in Societies & Professional Organizations/Scholarly work in rhinology (lectures, publications, teaching, etc.)

ARS Meeting Attendance (Fellow Applicants only): Have you attended at least two meetings within the past three years?

Yes  No

If so, please indicate: Date  Place:  COSM  Fall Meeting  
Date  Place:  COSM  Fall Meeting

**Journal requested: For Regular members and Fellows, subscription is complimentary with membership.**

**Journal is available to residents for an annual fee of \$100.**

None  American Journal of Rhinology  Rhinology (International)

**Sponsors: Regular and Fellow applicants must be sponsored by 2 ARS members.**

Name  Office Phone #:  email:

Name  Office Phone #:  email:

**Fellow applicants only: Submit two letters of recommendation from present ARS members, CV, and a list of 50 surgical cases over the past two years in table format (date, procedure, patient's initials, facility). Application Deadlines:** March 15th for Spring Meeting/ August 15th for Fall Meeting. Applicants will be notified 4-6 weeks after the spring or fall ARS meeting regarding their membership status.

Check payable to American Rhinologic Society must accompany application.

### MAIL APPLICATION, LETTER OF RECOMMENDATION, AND FEE TO:

Peter H. Hwang, MD  
Chairman, Credentials Committee  
Department of Otolaryngology/ Head and Neck Surgery  
801 Welch Road  
Stanford, CA 94305  
Tel: 650-725-6500 Fax: 650-725-8502  
Email: phwang@ohns.stanford.edu  
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