PHOENIX COSM

Combined Otolaryngological Spring Meetings

JW Marriott Desert Ridge

American Rhinologic Society

Program Abstracts 2004

Target Audience

This activity has been designed for American Rhinologic Society members and other medical professionals involved in the care of patients with nasal and sinus symptoms/disorders.

Statement of Need:

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 Sinusology. The American Rhinologic Society is dedicated to providing communication and fellowship to the members of the Rhinologic Community through ongoing medical education, patient advocacy, and social programs. The most common chronic disease in the United States is chronic sinusitis, which is included in the purview of Rhinology. Other areas of the discipline include acute sinusitis, all inflammatory and neoplastic diseases of the sinonasal tract, and functional issues, such as sleep apnea and nasal obstruction. Chronic sinusitis specifically is notoriously difficult to treat as evidence by the multiple treatment and modalities and inability to affect a cure. Further study both on the basic science level and in clinical matters is necessary and required to create greater understanding of the pathogenesis of this crippling disease and improve treatment outcomes as well as potential cures. Group study and presentation of new findings in research and education of these diseases will improve patient outcomes and quality of life.

Learning Objectives:

On completion of CME activities the participant should:

1) Be more familiar with treatment modalities of chronic sinusitis especially disease of the frontal sinus.

2) Understand concepts of the basic pathophysiology of chronic sinusitis and basic science treatment frontiers in Rhinology.
3) Gain a better understanding of the anatomy of the paranasal sinuses and how it impacts chronic disease.
4) Become aware of new treatment modalities and clinical trials in chronic sinusitis.

Activity Goal

The purpose of this activity is to review the current studies in treating chronic sinusitis and other rhinologic disorders as well as provide clinicians with evidence for best treatment modalities and new treatment options. These findings will allow clinicians to identify new options and treatment strategies for these difficult to treat diseases.

Accreditation Statement

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

The American Rhinologic Society designates this educational activity for a maximum of 7.5 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 contribution to the activity, and any discussions of 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:

Martin J. Citardi, MD	Recipient of an ARS New Investigator Research Grant, which partially funded this project.
Todd Loehrl, MD	Janssen Pharmaceuticals funded the study
Vijay K Anand, MD	GE Medical, Scientific Consultant; SinuCare, Scientific Consultant
Alexander G Chiu, MD	Medpointe Pharmaceuticals, Consultant
David Kennedy, MD	Aventis, Consultant; Novartis, Consultant/ Research Funding; Medtronic-Xomed, Consultant; Medtronic-Xomed, Royalty
James Palmer, MD	GE Navigational Systems, Consultant
Rodney J Schlosser, MD	BrainLab

The following faculty have indicated that they have no disclosures:

Nithin D Adappa, MD
Hany Mohamed Amin, MD
Young H An, MD
Pete S. Batra, MD
Mohamed A Bitar, MD
Giovanna Cantarella, MD
Anthony Albert Carboni, D.Ed.
Peter J. Catalano, MD
Rakesh K Chandra, MD
Siew Shuen Chao, MD
Christopher Church, MD
Joel David B. Conley, MD
John DelGaudio, MD
John M. DelGaudio, MD
Marc G. Dubin, MD
Samer Fakhri, MD
Firas T Farhat, MD
Salvador Flores, MD
Jason Clark Friedrichs, M.S.
Richard Daniel Gentile, MD
Tamer Ghanem, MD
Amit Srikant Gir, MD
Jan Gosepath, MD
Joshua Adam Gottschall, MD
Rafael E. de la Hoz, MD
Joseph B Jacobs, MD
Bruce Jafek, MD
Ashutosh Kacker, MD
Seth J. Kanowitz, MD
Jan L Kasperbauer, MD
Stilianos E Kountakis, MD
Ali Saeed Al-Qahtani, Ksuf, MD
Andreas Lackner, Dr.
Andrew P. Lane, MD
Antti A Mäkitie, MD
Scott Clark Manning, MD
Kevin Christopher McMains, MD
Vishvesh Mehta, MD

Piero Nicolai, MD
William Numa, MD
Richard Orlandi, MD
Spencer Payne, MD
Robert Perloff, MD
Shepherd Green Pryor, MD
Hassan H Ramadan, MD
B. Todd Schaeffer, MD
C. Arturo Solares, MD
Robert E Sonnenburg, MD
Jacob D Steiger, MD
Erica Robb Thaler, MD
Vincent Sabah Toma, MD
Matteo Trimarchi, MD
Yuri Petrovich Uliyanov, MD, PhD
Ramakrishnan Vidyasagar, MBBS
Harishnath Viswanathan
Rhoda Wynn, MD
Mark A. Zacharek, MD

AMERICAN RHINOLOGIC SOCIETY

Officers and Board of Directors
2003-2004

President
James A. Hadley, MD

President-Elect
Joseph B. Jacobs, MD

Secretary
Marvin P. Fried, MD

Treasurer
David Kennedy, MD

Immediate Past President
Donald C. Lanza, MD

Past President
Paul H. Toffel, MD

First Vice President
Michael J. Sillers, MD

Second Vice President
Howard Levine, MD

Board of Directors
William E. Bogler, MD
Martin J. Citardi, MD
Scott M. Graham, MD
Stilianos E. Kountakis, MD, PhD
Steven Marks, MD
Winston Vaughan, MD

Consultants to the Board
Peter H. Hwang, MD
Richard Orlandi, MD
Eugenia M. Vining, MD
Kathleen Yaremchuk, MD

AMERICAN RHINOLOGIC SOCIETY

2004 Committee Chairmen

Information Technology Committee
Martin Citardi, MD

Newsletter Committee
Brent Senior, MD

Program Committee
Joseph B. Jacobs, MD

Corporate Affiliate Committee
Paul Toffel, MD

ACCME Committee
James Stankiewicz, MD

Patient Advocate Committee
Michael Setzen, MD

Research Grant Committee
Tom Tami, MD

Education Committe
Winston Vaughan, MD

Membership Committee
Daniel Becker, MD

Credentials Committee
Peter Hwang, MD

Awards Committee
Allen Seiden, MD

Upcoming Dates

September 18-20, 2004
ARS Golden Anniversary Fall Meeting
Hilton New York, New York, NY

November 1, 2004
Abstracts Due, Spring Meeting, 2004

December 15, 2004
Membership Dues Due, 2005

January 13-15, 2005
Southern Section Meeting
Miami, FL

January 21-23, 2005
Eastern Section Meeting
Washington, DC

February 3-5, 2005
Western Section Meeting
Las Vegas, NV

May 12-17, 2005
COSM 2005, Boca Raton, FL

The American Rhinologic Society wishes to thank the following Corporate Supporters for their unrestricted grants which in their entirety are used to award research grants. These supporters do not contribute to the continuing medical education of these meetings. These grants are not used in support of the ARS Spring Meeting, however, they are valuable contributions to the society and the furtherance of important research.

The American Rhinologic Society wishes to thank Merck & Co., Inc for their unrestricted grant supporting the CME Dinner Symposium.

Platinum ($10,000)
Aventis
Gyrus ENT

Gold ($5,000)
Karl Storz Endoscopy America
SinusPharmacy

Silver ($2,500)
Bayer
Medtronic-Xomed
Ortho McNeil
Richard Wolf Medical Instruments

Bronze ($1,000)
GE Medical Systems
Abbott Laboratories

Friend ($500)
Brainlab

ARS Scientific Session COSM Program

April 30, 2004 - May 1, 2004

Friday, April 30, 2004

1:00 pm

Opening Remarks

James Hadley MD President
Joseph B Jacobs MD President-Elect

Frontal Sinus Surgery

Moderators:

Andrew Lane, MD, John DelGaudio, MD

1:10 pm

The Indications and Role of Osteoplastic Flap for Obliteration of the Frontal Sinus in the Era of Image-Guided Surgery

Ashutosh Kacker, MD
Carlo P Honrado, MD
David Hiltzik, MD
Vijay K Anand, MD
New York, NY

Background: This study evaluates the Senior Author's experience in osteoplastic flap surgery (OPFS) in the current era of image guided endoscopic sinus surgery (IGESS) in the management of frontal sinus disease.

Study Design: A retrospective chart review of patients who underwent OPFS in the past 10 years at a tertiary care teaching hospital.

Material and Methods: Chart review of both clinic and inpatient patients who underwent OPFS by the senior author was performed. Indications for surgery, prior sinus surgeries,

time to OPFS, post OPFS sinus surgeries, and associated co-morbid factors were reviewed.

Results: In the period under review, the senior author (VKA) performed 1310 endoscopic sinus surgeries, out of which 710 were IGESS. In the same period 30 patients underwent IGESS for isolated fronto-ethmoid disease in patients who were candidates for OPFS. 18 patients who had an osteoplastic flap procedure in the past ten years were identified, of which 14 charts were available for review. The indications for the procedure included mucocele in 10 cases, tumors in 2 cases and trauma in 2 cases. Four patients underwent revision OPFS. The patients who failed IGESS had prior trauma, tumor resection, radiation or large septate frontal sinus with lateral extension in whom the mucocele could not be drained endoscopically. The average time to OPFS was 6.2 years (0-27 yrs). Nine patients had prior sinus surgery (1-7 prior surgeries) and 5 patients had subsequent endoscopic surgical procedures.

Conclusion: All patients with frontal mucocele should be attempted endoscopically using IGESS due to the low morbidity of the procedure. Patients with risk factors for failure should be considered for OPFS if IGESS proves to be unsuccessful.

Dr. Vijay Anand – Consultant – GE Medical

1:15 pm

Surgical Decisions in the Management of Frontal Sinus Osteomas

Alexander G Chiu, MD
Noam A Cohen, MD
David W Kennedy, MD
James N Palmer, MD
Philadelphia, PA

Introduction: A mucocele, chronic mucosal thickening and persistent headaches are common indications for the removal of a frontal sinus osteoma. The best surgical approach to insure complete removal of the lesion is less clear cut. The advent of specialized frontal sinus instruments, angled endoscopes and surgical navigational systems has made removal of frontal sinus osteomas possible through an endoscopic approach. The aim of this study is to review our recent experience with the surgical management of frontal sinus osteomas, and the anatomical features that make these lesions more or less amenable to endoscopic resection.

Methods: A retrospective review of all frontal sinus osteomas surgically resected from the years 1999-2004. This period was selected to reflect the invention and popularization of surgical

navigation systems and specialty instruments designed specifically for the frontal sinus. CT scans, operative reports and post-operative course were reviewed.

Results: Eight patients were identified. Three osteomas were removed through an endoscopic approach. Four were removed by a combined osteoplastic flap and endoscopic dissection of the frontal recess. One was removed through an osteoplastic flap with subsequent obliteration of the sinus. The most important features identified for endoscopic removal were the size of the frontal recess in relation to the diameter of the osteoma, the room to remove the intersinus septum, and the site of attachment to the frontal sinus.

Conclusion: The ability to remove frontal sinus osteomas endoscopically is dependent on the size of the frontal recess and the site of attachment to the frontal sinus. Those unamenable to a purely endoscopic approach may be performed in combination with an external incision, taking care to preserve frontal sinus mucosa and establish an adequate drainage pathway into the nasal cavity.

Chiu - Medpointe Pharmaceuticals, Consultant Palmer - GE Navigational Systems, Consultant Kennedy- Aventis Consultant Novartis Consultant/Research Funding Medtronic-Xomed Consultant, Medtronic-Xomed Royalty

1:20 pm

Causes of Frontal Sinus Failure in Endoscopic Sinus Surgery

John DelGaudio, MD
Kristen Johnson Otto, MD
Atlanta, GA

Background: Endoscopic sinus surgery is the gold standard for the treatment of chronic sinusitis refractory to medical therapy. There is, however, a population of patients for whom recurrent or persistent disease is a problem. The most common area for failure is the nasofrontal recess and frontal sinus. We evaluated the causes for frontal sinus failure after endoscopic sinus surgery.

Methods: A retrospective review was performed between May 1997 and October 2004. Inclusion criteria were frontal sinus or nasofrontal recess disease in patients undergoing revision surgery by the senior author. Operative records were reviewed to identify the cause of nasofrontal recess obstruction. Office records and CT scans were reviewed when necessary.

Results: 270 frontal sinuses were included from 149 patients. Five common causes for frontal sinus failure were identified:

(1) Mucosal disease or polyps (71%), (2) Retained nasofrontal recess cells (64%), (3) A lateralized middle turbinate obstructing the nasofrontal recess (33%), (4) Scar in the nasofrontal recess (13%), and (5) Neoosteogenesis (7%). Most frontal sinuses had more than one reason for failure (mean 2.0, range 1-4).

Conclusions: Multiple causes of frontal sinus failure can be identified. Some of these causes can be attributed to inherent mucosal disease, while others represent the technical shortcomings of the previous surgical procedures. A comprehensive approach to address all contributing factors, including full understanding of the anatomy of the nasofrontal recess, is necessary to prevent surgical failure among patients presenting for endoscopic frontal sinus surgery.

1:25 pm

Chronic Frontal Sinusitis: Is Endoscopic Sinus Surgery a Risk Factor?

Tamer Ghanem, MD
Charles Gross, MD
Bora Lee, MD
Joseph Han, MD
Charlottesville, VA

Introduction: With the introduction of functional endoscopic sinus surgery the frequency of sinus surgery has increased as well as an apparent increase in the instance of frontal sinusitis requiring surgical therapy. Does endoscopic sinus surgery, particularly in the region of the frontal recess, become a risk factor and possibly cause frontal sinusitis? Therefore we examined the source for frontal sinusitis in patients who underwent endoscopic frontal sinusotomy.

Methods: Retrospective chart review was performed over a 5-year period of patients who underwent endoscopic frontal sinusotomy at the University of Virginia Sinus Center. Patients with sinonasal tumor, cystic fibrosis, or trauma were excluded from the study. Demographic data, clinical presentation, intraoperative endoscopic findings of the frontal recess, and procedures were recorded and analyzed.

Results: 82 patients with a mean age of 47 years met the study criteria and a total of 143 frontal sinusotomies were performed. The causes were polyp (61%), frontal recess synechia (19%), agger nasi cell (8%), frontal cell (4%), narrow osteomeatal complex (4%), osteitic bone (3%), and mucous retention cyst (1%). 57% of the patients had previous endoscopic sinus surgery and of these patients 87% were referred patients while the remaining patients had previous surgery at our institution. The mean follow up is thirteen months.

Conclusion: In this series, the most common reason for chronic frontal sinusitis is polypoid disease followed by frontal recess synechia as the second most common cause. Further investigation is warranted to better delineate these causes and attempt to decrease the iatrogenic causes.

1:30 pm

Discussion

Radiologic Evaluation

Moderators:

Richard Orlandi, MD, Robert C Kern, MD

1:45 pm

Isolated Inflammatory Sphenoid Sinus Disease: A Revisitation of CT Indications Based Upon Presenting Findings

Young H An, MD
Giridhar Venkatraman, MD
John M Delgaudio, MD
Atlanta, GA

Introduction: Isolated inflammatory sphenoid sinus disease (IISSD) can be difficult to diagnose. History and physical exam are frequently inadequate in establishing a diagnosis. Computed tomography (CT) is an excellent screening tool; however, it is often obtained late in the disease process, owing to vague symptoms at presentation. Identifying the most common symptoms at initial presentation of IISSD may facilitate more rapid detection by determining earlier indications for CT. Presently, headache is not an indication for a sinus CT.

Methods: A retrospective chart review of IISSD presentation was performed at our institution. A literature review was also performed to quantitatively document trends in presentation of IISSD, including characterization of headache symptoms by location. Cumulative findings were then compared to current CT indications to determine if presentation patterns warrant a change in indications for CT.

Results: A total of 361 cases were evaluated by our inclusion criteria. Headache was the most common finding (81.7%), particularly peri/retro-orbital, vertex, and frontal headache. Although ocular changes (17.5%) and cranial nerve involvement (16.1%) were also common, headache was frequently a solitary finding (42.6%). Twenty-six IISSD cases were reviewed at our institution over seven years, with similar results. Under current guidelines, the only IISSD findings which indicate CT scan are the ophthalmologic and neurologic complications.

Conclusion: Not every headache necessitates a CT scan. However, the deep-seated peri/retro-orbital, vertex, or frontal headaches, particularly when aggravated by head movement and refractory to analgesics, as is often seen in IISSD, should indicate early CT evaluation before potentially disastrous complications ensue.

1:50 pm

Anatomic Measurements for the Endoscopic Modified Lothrop Procedure

Firas T Farhat, MD
Stilianos E. Kountakis, MD
Augusta, GA

Objective: To introduce preoperative radiographic frontal recess and sinus anatomic measurements to assist in the selection of patients considered for the modified Lothrop procedure.

Methods: Data was collected from sagittally reconstructed CT scans of 7 cadaver heads. Four anatomic parameters for measurement were defined as follows: A) Thickness of the nasal beak (desirable < 10 mm. B) Midsagittal distance from nasal beak to skull base. Adding A and B provides the anterior-posterior space at the cephalad margin of the frontal recess (desirable >=15 mm). C) Accessible dimension (in a parasagittal plane through the frontal ostium): the distance between two lines drawn parallel to the plane of the anterior skull base and perpendicular to the line of the insertion of the nasal endoscope during surgery. The posterior line is drawn at the skull base and the anterior line is drawn at the posterior margin of the nasal beak. The distance between the lines indicates the space available for instrumentation (desirable > 6 mm. D) Anterior-posterior dimension of each frontal sinus.

Results: The average and the range of each parameter measured were as follows: A) Nasal beak thickness = 8.0 mm (5.0-10.4); B) Nasal beak–skull base = 7.9 mm (2.5-14.1); C) Accessible dimension: 6.1 mm (0.9-9.6); D) AP diameter of the frontal sinus: 9.7 mm (5.2-14.1). Three specimens were considered candidates for modified Lothrop, 3 did not and 1 was marginal.

Conclusion: Preoperative radiographic frontal recess and sinus anatomic measurements may assist in the selection of patients considered for the endoscopic modified Lothrop procedure.

1:55 pm

Orbital Volumetric Analysis of Allergic Fungal Sinusitis Patients with Proptosis Before and After Endoscopic Sinus Surgery

Rodney J Schlosser, MD
Angela Chu Stonebraker, MD
Charleston, SC

Objective: To examine the changes of orbital volumes in allergic fungal sinusitis (AFS) patients with proptosis who undergo endoscopic sinus surgery.

Study Design: Retrospective study of operative patients with proptosis due to AFS. Normative data was obtained using patients with chronic sinusitis without orbital involvement.

Methods: Orbital volume measurements were obtained using digitized images and computer software to calculate volumes (cm3) of outlined regions on 1.3mm axial CT images. Orbital volumes were measured as total volumes and volume within the bony orbit. Bony orbits were defined using 2 techniques: (1) the region posterior to a line from ipsilateral zygoma to contralateral zygoma and (2) the region posterior to a line from zygoma to ipsilateral lacrimal bone. Four affected orbits in 3 AFS patients with proptosis were evaluated. Twenty-eight unaffected orbits in 14 patients were used as normal comparisons.

Results: Orbital involvement by AFS resulting in proptosis decreased orbital volumes within the bony orbit to a mean of 70% of normal. After successful endoscopic sinus surgery, bony orbital volumes normalize or approach normal ranges to a mean 89% of normal with resolution of clinically apparent proptosis. Total volumes remained stable before and after surgery.

Conclusions: Massive AFS may affect the orbit resulting in proptosis. Spontaneous orbital remodeling with clinical resolution of proptosis and normalization of bony orbital volumes can be seen in AFS patient several months after sinus surgery and aggressive medical treatment. Surgical orbital reconstruction is typically not needed once the sinus disease is adequately addressed.

Dr. Schlosser- BrainLab

2:00 pm

Utility of Sagittal Reformatted Computerized Tomographic Images in the Evaluation of the Frontal Sinus Outflow Tract

Seth J. Kanowitz, MD
Deborah R. Shatzkes, MD
Joseph B. Jacobs, MD
Richard A. Lebowitz, MD
New York, NY

Introduction: Anatomic and mucosal obstruction of the frontal sinus outflow tract (FSOT) can result in frontal headache and frontal sinusitis. Evaluation of patients with these symptoms routinely involves axial and coronal computerized tomographic (CT) scans of the paranasal sinuses (PNS). With the advent of multichannel multidetector CT scanning, the availability of high quality sagittal images has become increasingly widespread. However, the utility of these images in the assessment of FSOT patency has not yet been established.

Methods: A retrospective review of coronal and sagittal images from 30 PNS CT scans (60 sides) were randomized, blinded, and independently evaluated by two attending neuroradiologists. FSOT obstruction by ager nasi cells, the ethmoid bulla, and mucosal disease was assessed. A degree of confidence was rendered for each of these findings in both image planes. The results were then compared against a consensus diagnosis, which was rendered based upon simultaneous reading of the coronal and sagittal images. Generalized estimating equations were used to assess the difference between sagittal and coronal images in terms of reader confidence and agreement of diagnoses with the consensus.

Results: Review of sagittal images had a higher degree of concordance with the consensus than did coronal images, and was highest for mucosal disease. Both readers were more confident in rendering a diagnosis based upon the sagittal images.

Conclusions: Sagittal reformatted CT images of the PNS are helpful in the radiologic evaluation of the FSOT. Experienced neuroradiologists had a higher degree of confidence in the diagnosis of anatomic and mucosal obstruction of the FSOT using sagittal reformatted images.

2:05 pm

Sagittal and Coronal Dimensions of the Ethmoid Roof: A Radiologic Study

Mark A. Zacharek, MD
Joseph K. Han, MD
Robert Allen, BS
Peter H. Hwang, MD
Portland, OR

Introduction: Understanding the anatomy of the ethmoid roof is critical to safe surgical outcomes. Normative data regarding the height and slope of this region have been somewhat limited, derived primarily from cadaveric studies and coronal CTs. With triplanar imaging programs, precise multidimensional measurements of the ethmoid roof are now possible. We present a radiologic study to characterize normative anatomic dimensions of the ethmoid roof.

Methods: Bilateral measurements were taken in 100 consecutive sinus CT scans using ThinClient 3D software. In the sagittal plane, the height of the ethmoid roof was measured at five equidistant points between the frontal beak and sphenoid face, referencing the nasal floor. In the coronal plane, the ethmoid roof was measured at three points at the level of the anterior ethmoid artery.

Results: The average sagittal skull base slope, from anteriormost to posteriormost quadrant, was as follows: 58.4%, 34.1%, 17.1%, 4.4%. The right side showed significantly lower skull base heights in the anterior ethmoid compared to left (59.0mm vs. 59.8mm, P=0.017; 53.7mm vs. 54.5mm, P=0.0004). Coronal measurements showed similar significant differences. The anterior ethmoid had greater variability in skull base height and slope compared to posterior, which was fairly constant.

Conclusions: This study provides numerical correlates to accepted concepts regarding the shape and slope of the ethmoid roof. The posterior ethmoid roof appears to be relatively constant and should serve as a reliable surgical landmark. Differences in height and slope of the skull base between right and left sides may be an important surgical consideration.

2:10 pm

Discussion

2:25 pm

Panel: Guidelines for the Management of Chronic Rhinosinusitis

Moderator:

Howard L. Levine, MD

Participants:

Michael S. Benninger, MD, Bradley F. Marple, MD, Berrilyn J. Ferguson, MD

New Guidelines Defining Chronic Sinusitis:

Michael Benninger, MD

The Role of Bacteria and the Superantigen in Chronic Sinusitis:

Bradley F. Marple, MD

Fungus: Its Role and the Treatment in Chronic Rhinosinusitis:

Berrilyn J. Ferguson, MD

The Role of Bone Infection in Chronic Rhinosinusitis:

Howard Levine, MD

Case Presentations:

Howard Levine, MD

3:10 pm

Break

Antibiotics and Bacteriology

Moderators:

BJ Ferguson, MD, Pete Batra, MD

3:30 pm

Endoscopically Guided Aerobic Cultures in Post-Surgical Patients with Chronic Rhinosinusitis

Robert E Sonnenburg, MD
Charles S Coffey, BS
Marc G Dubin, MD
Brent A Senior, MD
Chapel Hill, NC

Introduction: Endoscopically guided cultures are increasingly being used to identify responsible micro-organisms and guide antimicrobial therapy in patients with chronic rhinosinusitis. While they potentially offer advantage in this regard it has not been studied to date whether these cultures significantly alter empiric antibiotic choices in post-surgical patients. This study is designed to detect how often these cultures changed management decisions in the senior author's clinical practice.

Methods: A retrospective chart review was performed of 47 consecutive endoscopically guided aerobic cultures from post-surgical patients with chronic rhinosinusitis. Culture site, empiric antibiotic therapy, culture results, sensitivities, and antibiotic treatment change were recorded. Patient characteristics including drug allergy, last antibiotic treatment, time since last antibiotic treatment, previous surgery, presence of allergic rhinitis, and presence of nasal polyposis were also noted. Culture results were compared and contrasted to other previously reported results in the literature. The number of times that culture results changed antimicrobial therapy was noted for patients with a variety of clinical characteristics.

Results: The most commonly cultured organisms were coagulase negative staphylococci, staphylococcus aureus, and pseudomonas aeruginosa. Culture results were noted to change empiric antimicrobial treatment 28% of the time. Allergic rhinitis, nasal polyposis, presence of drug allergy, and previous antibiotic therapy within 2 months did not correlate with need to change empiric treatment.

Conclusion: Endoscopically guided aerobic cultures in post-surgical patients with chronic rhinosinusitis does lead to changes in empiric antimicrobial therapy in a significant number of cases.

3:35 pm

Adverse Effects of Quinolone Antibiotics in Treatment of Sinusitis

Christopher Church, MD
Tsungju O-Lee, MD
Charles Stewart, IV, MD
Loren Seery, BA
Loma Linda, CA

Quinolone antibiotics are widely used in the treatment of acute sinusitis and acute exacerbations of chronic sinusitis. These drugs are generally well tolerated, and adverse effects are usually mild. Although not previously described in the literature, our patients have frequently complained of arthralgias and/or myalgias with oral quinolone therapy. A retrospective review of quinolone prescriptions in our tertiary rhinology clinic was therefore completed. Patients treated with oral levofloxacin for sinusitis over a 12 month period were contacted by mail and asked to complete an anonymous survey regarding adverse effects. Of 81 patients identified, 36 responses were received. Among respondents, the incidence of arthralgias and/or myalgias was 25 percent, which was more than twice the incidence of any other adverse effect reported. Occurrence of arthralgias and/or myalgias did not appear to be influenced by respondent age, course length, concurrent use of oral steroids, or a history of arthritis. Concurrent use of medications for arthritis was reported in 11 percent of patients with arthralgias and/or myalgias, but in 37 percent of those without symptoms. Among those reporting this adverse effect, symptoms began after an average of 3 days of therapy, and resolved an average of 7.5 days after cessation of treatment. Fourteen percent of respondents were unable to complete their course of therapy due to arthralgias and/or myalgias. Although effective and generally well tolerated in the treatment of sinusitis, quinolone antibiotics have frequent adverse effects of arthralgia and/or myalgia. Concurrent use of medications for arthritis may prevent these symptoms.

3:40 pm

Treatment of Chronic Rhinosinusitis Exacerbations Due to Methicillin-Resistant Staphylococcus Aureus with Mupirocin Irrigations

C. Arturo Solares, MD
Pete S. Batra, MD
Gerri S. Hall, PhD
Martin J. Citardi, MD
Cleveland, OH

Introduction. Chronic rhinosinusitis (CRS) exacerbations due to methicillin-resistant staphylococcus aureus (MRSA) are routinely encountered. Treatment often involves intravenous antibiotics that provide only transient benefits. Mupirocin has well-recognized anti-staphylococcal activity, and its nasal formulation is approved by the FDA for the eradication of nasal colonization with MRSA.

Objective. Describe the use of mupirocin nasal irrigations for the treatment of CRS exacerbations due to MRSA. Materials and

Methods. The charts of patients who received mupirocin nasal irrigations (22 g 2% ointment in 1 liter of normal saline; irrigate each side with 50 cc bid for 4-6 weeks) for MRSA exacerbations of CRS between January 2000 and October 2004 were reviewed.

Results. A total of 42 MRSA positive cultures were obtained from 24 patients (mean age: 61 years; range: 38-82 years; 15 women and 9 men). Twenty-eight episodes were treated with mupirocin nasal irrigations and doxycycline (100 mg po bid, 4 weeks); 4 episodes were treated with mupirocin nasal irrigations and trimethoprim-sulfamethoxazole DS (one tablet po bid, 4 weeks); and 7 episodes were treated with mupirocin nasal irrigations alone. Patients were re-evaluated approximately 4-6 weeks after commencing treatment. Repeat cultures were not obtained in 12 patients (due to clinical and endoscopic resolution), 26 repeat cultures grew organisms other than MRSA and inadequate follow-up was available for 3 patients. Of the 14 patients with persistent symptoms after treatment, only one endoscopic culture grew MRSA.

Conclusions. Although the risk of recurrent MRSA exacerbation remains, mupirocin nasal irrigations may avoid the need for intravenous antibiotics, which often provide temporary benefits and entail greater costs and more morbidity. Thus, mupirocin nasal irrigations may provide a relatively simple means for the management of MRSA exacerbations of CRS.

3:45 pm

Use of an Electronic Nose to Diagnose Bacterial Sinusitis

Erica Robb Thaler, MD
C. William Hanson, MD
Philadelphia, PA

INTRODUCTION: We have previously demonstrated that an electronic nose (enose) can distinguish among in vitro bacterial samples, between CSF and serum, and can identify patients with ventilator-associated pneumonia by sampling exhaled gas. We hypothesize that bacterial sinusitis can be diagnosed by sampling exhaled gas with an enose.

METHODS: Using a nasal CPAP mask, we sampled gas exhaled through the nose of 11 patients with sinusitis diagnosed by culture and compared them to 11 uninfected controls. The data was evaluated by support vector machine (SVM) analysis, a learning machine that can perform pattern recognition.

RESULTS: SVM analysis showed good discrimination using two approaches. First, all samples were used to create a training set and that set was used to predict whether individual samples from each set was a member of the control or the infected sets. The enose was correct 98.4% of the time. Second, half of the samples from each of the control and infected groups were used to construct a training set. That set was used to predict infection in the remaining samples. The enose was correct 82% of the time.

CONCLUSIONS: By using the enose to sample nasal exhalation of patients with suspected sinusitis, we were able to predict correctly the diagnosis of sinusitis in 82% of the samples. The next step will be to do forward prediction using this model, in which additional control and patient samples will be collected, treated as “unknowns” and classified by the enose.

3:50 pm

Discussion

Radiologic and Clinical Correlation

Moderators:

Andrew Murr, MD, Richard Lebowitz, MD

4:10 pm

Correlation of Degree of Frontal Sinus Disease to the Presence of Frontal Headache

John M. DelGaudio, MD
Sarah K. Wise, MD
Atlanta, GA

Background: Sinusitis is a common cause of frontal pain and pressure. In this study we evaluated the relationship between headache and the degree of frontal sinus disease in chronic rhinosinusitis (CRS) patients.

Methods: Inclusion criteria were frontal sinusitis or nasofrontal recess disease on CT scan. Office notes and operative reports were reviewed to determine the presence and location of frontal pain and to categorize the sinus disease. The senior author reviewed all CT scans to determine the extent of frontal sinus disease.

Results: 207 patients were identified with nasofrontal recess obstruction and/or frontal sinus disease. 34 of 39 (87%) patients with frontal mucoceles had frontal pain. 25 of 78 (32%) polyp patients had headache, with only 11/42 (26%) patients with complete frontal opacification having headache. In patients with CRS without polyps, 61 of 98 (62%) had frontal pain, with 18 of 29 (62%) with complete opacification having pain. The difference between these groups was significant with $p < .05$ for the total groups and the complete opacification subgroups. With the exception of patients with mucoceles, the most likely patients to have frontal pain were those with mild to moderate soft tissue thickening of the frontal sinuses (13/24 (54%) polyp patients, and 32/42 (76%) CRS patients without polyps, p=NS between groups).

Conclusions: Frontal sinus pain is much more common in CRS without polyps than in patients with polyps. Excluding patients with frontal mucoceles, patients with mild to moderate thickening in the frontal sinuses have the greatest incidence of frontal pain, regardless of underlying pathology.

4:15 pm

Correlations Between Bone SPECT and CT Imaging of the Sinuses in Chronic Sinusitis

Peter J. Catalano, MD
Ellen E. Choi, BS
Burlington, MA

Introduction: Computerized tomography (CT) has been the imaging study of choice for evaluating chronic sinusitis (CRS). Bone SPECT scintigraphy, while also used to diagnose sinusitis, has recently been shown to be a sensitive test for identifying osteitis within the ethmoid bone. However, there are no documented studies to evaluate any relationship between these two imaging modalities in CRS.

Methods: 30 patients diagnosed with CRS underwent CT imaging and a SPECT bone scan of the sinuses. The mean time between studies was 16 days. An abnormal bone scan was defined as increased tracer uptake in any sinus; an abnormal CT was defined as mucosal thickening in one or more sinuses.

Results: The bone scan was abnormal in 25/30 patients, the CT was abnormal in 27/30, and both studies were abnormal in 23/30 patients. In 9/23 patients, there was exact correlation between CT and SPECT images; in 14/23 patients, abnormal CT and SPECT images did not overlap. Correlation between these two studies was highest for the ethmoid sinus (60%), followed equally by the maxillary and frontal sinuses (27%), and least in the sphenoid sinus (20%). An abnormal SPECT image occurred most frequently in the ethmoid sinus (80%) and least frequently in the maxillary sinus (26%); an abnormal CT was most common in the maxillary sinus (73.3%) and least common in the sphenoid sinus (47%).

Conclusions: Although a majority of patients had both abnormal bone SPECT and CT scans, anatomic specific correlation was poor. An in-depth data analysis and explanation of these findings will be presented

4:20 pm

Challenges in the Management of Sphenoid Inverted Papilloma

Samer Fakhri, MD
Martin J Citardi, MD
Stephen Wolfe, MD
Donald C Lanza, MD
Cleveland, OH

BACKGROUND: Inverted papilloma (IP) arising in the sphenoid sinus is extremely rare. The current mainstay therapy for all IP is endoscopic surgical excision. Management of sphenoid sinus IP is especially challenging due to the paucity of sinonasal symptoms upon presentation and the inherent surgical risks associated with the anatomic location of the sphenoid sinus.

PURPOSE: Present a significant series of patients with IP originating in the sphenoid sinus, with particular emphasis on surgical challenges encountered during endoscopic resection. Specific management recommendations and surgical strategies to deal with large and erosive tumors are formulated.

METHODS: Retrospective review of medical records of all patients with primary IP of the sphenoid sinus.

RESULTS: A total of 5 patients were identified. All patients were managed with endoscopic resection. The most common presenting symptom was headache (3 patients). Two patients had erosive skull base lesions adjacent to the internal carotid artery (ICA) and were managed with a staged endoscopic resection. An additional patient had a recurrence in the pterygoid recess after 25 months and underwent revision endoscopic resection.

CONCLUSION: Due to its vital location, sphenoid sinus IP poses a particular surgical challenge, especially when bone and surrounding structures are eroded. Endoscopic management of sphenoid IP allows maximal resection with minimal morbidity and facilitates endoscopic postoperative surveillance. Complete preoperative radiological assessment of tumor extent and its relationship to the ICA, optic nerve and skull base is essential. Preoperative antibiotics and/ or steroids can help normalize inflamed mucosa and minimize intraoperative bleeding. For large erosive IP, surgical risks may be minimized by considering a staged resection and using computer-aided surgery.

4:25 pm

Increased role of the Otolaryngologist in Endoscopic Pituitary Surgery: Endoscopic Hydro-examination of the Sella

Marc G. Dubin, MD
Robert E. Sonnenburg, MD
Matthew Ewend, MD
Brent A. Senior, MD
Chapel Hill, NC

Objective: To discuss the use of nasal irrigation and suction systems in endoscopic pituitary surgery to examine the sella and facilitate tumor removal.

Study Design: Description of new technique

Methods: Following the endoscopic approach to the pituitary by the otolaryngology team, pituitary masses are resected. To facilitate complete removal of the mass by the neurosurgical team, ClearESS nasal irrigation and suction system (SLT, Montgomeryville, PA) is used to visualize the sella. The combination of ClearESS technology and angled endoscopes is used to scrutinize previously inaccessible areas of the tumor bed.

Results: Over forty patients have undergone minimally invasive pituitary surgery via the endoscopic approach to the pituitary with post-resection hydro-examination of the sella. The use of angled endocopes in combination with ClearESS technology greatly increased visualization of the sella. There have been no complications associated with the use of hydro-examination.

Conclusion: The use of angled endoscopes in conjuction with hydro-examination leads to superior visualization of the sella. The otolargyngologist plays a critical role in this examination with manipulation of the angled endoscopes. The role of the otolarygologist is therefore extended beyond the approach to the pituitary.

4:30 pm

Discussion

Olfaction

Moderator:

Karen Fong MD

4:45 pm

Development of Transgenic Mouse Models for the Study of Human Olfactory Dysfunction

Andrew P. Lane, MD
Zhao Haiqing, PhD
Randall R. Reed, PhD
Baltimore, MD

Introduction: Olfactory loss is a significant health problem that remains incompletely understood. The development of suitable animal models is essential to the progress of human olfactory loss research. Recent advancements in transgenic technology allow creation of model systems to address causes of olfactory neuron dysfunction. This presentation describes two transgenic mouse models with potential utility in the study of olfactory loss and highlights the molecular techniques that underlie development of such systems.

Methods: Genetic constructs were generated using standard molecular biological techniques. These were introduced into mouse germlines either by homologous recombination or by pronuclear injection. One construct (UbI7) placed the olfactory receptor I7 under control of the OMP promoter. The other two constructs (TI) act together to direct expression of cytokines in the olfactory epithelium.

Results: The ubiquitous expression of a single olfactory receptor in the UbI7 mouse strain gives robust and uniform responses to heptanal and octanal in all olfactory neurons. Olfactory tissue-specific and temporally-controlled production of cytokines can be achieved through the TI transgenic mouse model, creating a novel approach to the study of inflammatory olfactory loss.

Conclusions: Powerful scientific tools now exist to develop animal models useful to the study of human olfactory disease. Transgenic olfactory neurons from the UbI7 mouse strain respond to known odorants, facilitating experiments that examine in vitro modulation of olfactory neuron function. The ability to express specific genes in the olfactory mucosa of the TI mouse has great potential in elucidating the role of cytokines in the development of olfactory dysfunction in vivo.

4:50 pm

The Effects of Zinc on the Olfactory Neuroepithelium and Olfactory Bulbs of the Sprague-Dawley Rat Following Oral Administration of Zinc Gluconate Trihydrate

Anthony Albert Carboni, DEd
Kay J. Cullen, BS
William Gaynor Lavelle, MD
Worcester, MA

The most frequent causes of upper respiratory infections are human rhinoviruses (HRVs). The olfactory neuroepithelium (ONe), which includes the mucosa and the receptor cells, is a first line of defense against airborne viruses and allergens, some of which manage to penetrate the nasal mucosa and invade the tissues of the ONe. Biochemical evidence from several studies suggests that zinc is an effective cold treatment and that over-the-counter zinc gluconate compounds may provide the high pharmacological doses of zinc needed to act as the most effective means of treating and reducing the duration and severity of symptoms of the common cold. A series of male Sprague-Dawley rats were fed an oral preparation of zinc gluconate trihydrate to deliver a comparable dose of ionic zinc, or received the equivalent through drinking water, to investigate potential cytotoxic and/or neurotoxic insult from the use of such compounds to the olfactory receptor cells and other tissue in the ONe and afferent neuronal pathways. Coronal sections of the rat ONe and corresponding olfactory bulbs (OB) showed consistent cellular and tissue damage of increasing severity that correlated with the duration of treatment with the zinc compound when compared to the control group animals. The results of this analysis indicate that the repeated oral administration of such zinc-containing compounds have neurotoxic effects on the ONe and to the mitral cells in the OB of treated rats. These findings point toward increased investigation into the potential deleterious effects of zinc containing compounds to humans as well.

4:55 pm

Discussion

5:00 pm

ARS Business Meeting

Saturday, May 1, 2004

8:00 am

Opening Remarks

Pathophysiology and the Inflammatory Pathway

Moderators:

Stilianos Kountakis, MD, Peter Hwang, MD

8:05 am

TGF-b as a Marker for Eosinophil Mediated Inflammation in Chronic Rhinosinusitis and Nasal Polyposis

Stilianos E Kountakis, MD
Dewayne T Bradley, MD
Augusta, GA

Objectives: To determine the correlation between TGF-b, eosinophilia and eosinophil activation in patients undergoing sinus surgery for chronic rhinosinusitis (CRS) and chronic rhinosinusitis with nasal polyposis (CRS/NP).

Methods: Sinus tissue from patients undergoing endoscopic sinus surgery for CRS and CRS/NP were collected. Sinus tissue samples were cultured in-vitro and were treated with IL-4 for 24 hours. Real time PCR was used to quantify the transcription of TGF-b. Sinus tissue samples were also collected and stained for EG2, a marker for eosinophil granules. Mucosal eosinophilia was quantified from hematoxylin and eosin (H&E) stained sinus tissue samples. The level of TGF-b transcription was then compared to EG2+ samples and to the degree of mucosal eosinophilia.

Results: Twenty-one patients were evaluated, 14 with CRS/NP and 7 with CRS alone. The mean age was 43.3 years (range 20-74) with 15 females and 7 males. The transcription of TGF-b was quantified and was found to be 0.12 in the EG2- group, compared to 2.49 in the EG2+ group ($p<0.03$). All patients with eosinophil activation (EG2+) had greater than 5 eosinophils /hpf.

Conclusion: Patients with mucosal eosinophilia (>5 cells/hpf) showed evidence of inflammatory cascade activation demonstrated by elevations in TGF-b expression. Further, patients with mucosal eosinophilia showed evidence of eosinophil activation as measured by EG2 positive immunostaining.

8:10 am

Tissue Damage Induced by Eosinophil Peroxidase in Patients with Chronic Rhinosinusitis

Martin J. Citardi, MD
Wei Song, MS
Donald C. Lanza, MD
Stanley Hazen, MD
Cleveland, OH

Introduction. Recent data suggest that the eosinophils serve as a primary inflammatory cell in a variety of sinonasal disorders, including chronic rhinosinusitis (CRS). Activated eosinophils release eosinophil peroxidase (EPO), a heme enzyme that catalyzes oxidative reactions that are toxic to invading microorganisms. Bromotyrosine (BrTyr), an oxidative product of EPO activity, serves as a specific marker of EPO activity.

Objective. Assess EPO activity in CRS by measuring BrTry and alternative molecular markers of distinct oxidative pathways in CRS patients.

Methods. The tissue and plasma levels of BrTyr; chlorotyrosine (ClTyr), a specific marker for myeloperoxidase catalyzed oxidation; dityrosine (diTyr), a specific oxidative cross link; ortho-tyrosine (o-Tyr), a marker for metal catalyzed oxidation; and nitrotyrosine (NO2Tyr), a stable product of NO-derived oxidants, were measured in anterior ethmoid mucosa tissue from CRS patients as well as middle turbinate mucosa from normal, healthy volunteers through mass spectrometry.

Results. Tissue levels of BrTyr were significantly elevated in CRS patients (1396.9 umol/mol Tyr, n=10) compared with healthy volunteers (804 umol/mol Tyr, n=9) (p=0.003). No significant differences were noted for tissue levels of markers of distinct oxidative pathways (ClTyr, diTyr, oTyr, and NO2Tyr). No significant differences were noted in plasma levels of any markers monitored (BrTyr, ClTyr, diTyr, o-Tyr and NO2Tyr).

Conclusions. Oxidative tissue damage catalyzed by EPO was demonstrated in patients with chronic rhinosinusitis. BrTyr, a specific molecular footprint for eosinophil-mediated tissue damage, may serve as an objective and quantifiable index of CRS disease activity. These data further support the potential role of the eosinophil in inflammatory injury during chronic rhinosinusitis.

Dr. Citardi is the recipient of an ARS New Investigator Research Grant, which partially funded this project.

8:15 am

Cysteinyl Leukotriene 1 Receptor Expression in Nasal Polyps

Siew Shuen Chao, MD
Scott M Graham, MD
Christopher L Brown, MD
Iftikhar Hussain, MD
Iowa City, IA

Introduction: Nasal polyposis (NP) is a chronic inflammatory condition that is mostly characterized by an infiltration of eosinophils. Cysteinyl leukotrienes (CysLTs) have been implicated in the pathogenesis of eosinophilic inflammation. They are released from a variety of inflammatory cells and mediate multiple aspects of eosinophilic inflammation through interactions with the CysLT-1 receptors (CysLT1R). This study was undertaken to compare the expression of CysLT1R in NP with healthy sinus tissue.

Methods: The study group consisted of 20 patients with NP removed endoscopically. Ethmoid mucosa from 4 patients who underwent orbital decompression for Graves' opthalmopathy was used as controls. The human subjects committee approved this study. Sinus tissue specimens were stained using a rabbit anti-human anti-CysLT1R polyclonal antibody. Cells were counted in a unit area of the epithelium and the stroma using light microscopy (20X magnification). Data are expressed as the mean ± SEM and a P value of less than .05 was considered significant.

Results: As expected, there were significantly more cells expressing CysLT1R in the stroma of polyps as compared to controls (2.6±0.7% vs 0.3±0.3%, $p<0.01$). Interestingly, there was significantly higher expression of CysLT1R in the epithelium of polyps compared to controls (0.6±0.1% vs 0.0±0.0%, $p=0.03$). However, among the study group, there were no significant differences between polyps obtained from patients with or without Samter's triad, asthma and allergic fungal sinusitis.

Conclusions: This study supports the hypothesis that polyp epithelium may have an active role in the disease process and upregulation of CysLT1R is involved in the pathogenesis of NP irrespective of etiology.

8:20 am

Expression, Localization and Significance of Vascular Permeability / Vascular Endothelial Growth Factor (VPF / VEGF) in Nasal Polyps

Jan Gosepath, MD
Juergen Brieger, PhD
Hans Anton Lehr, MD
Wolf Juergen Mann, MD
Mainz, Germany

BACKGROUND: The exact etiologic mechanisms leading to the formation of nasal polyps have remained largely obscure. A key phenomenon of this specific type of chronic inflammatory disease in nasal respiratory mucosa is a remarkable edema. Vascular permeability / vascular endothelial growth factor (VPF/VEGF) plays an important role in inducing angiogenesis and / or modulating capillary permeability.

OBJECTIVE: To study the expression and localization of VPF/VEGF as a putative key factor in nasal polyp development.

METHODS: Specimens of nasal polyps (n=12) were harvested during endonasal sinus surgery in patients with polypous chronic rhinosinusitis (CRS). Specimens of healthy nasal respiratory mucosa (n=12) served as controls and were obtained from inferior turbinates of patients undergoing surgery for nasal obstruction without signs and symptoms of inflammatory disease. Frozen sections were immunohistochemically stained for VPF / VEGF and quanitatively analyzed, using computer-based image analysis.

RESULTS: The expression of VPF / VEGF in specimens of nasal polyps was significantly stronger than in specimens of healthy nasal mucosa of controls. VPF / VEGF in polypous tissue was mainly localized in vascular endothelial cells, in basal membranes and perivascular spaces as well as in epithelial cells.

CONCLUSION: The markedly increased expression in nasal polyps as opposed to healthy nasal mucosa suggests that VPF / VEGF may play a significant role in both the formation of nasal polyps and in the induction of heavy tissue edema. This finding is discussed with respect to the differential expression of cyclooxygenase (COX) isoenzymes –1 and –2 (COX-1 and COX-2) in nasal polyps.

8:25 am

Discussion

Moderators:

James Palmer, MD, Jay Dutton, MD

8:45 am

Fungi: A Normal Content of Human Nasal Mucus

Andreas Lackner, Dr.
Kurt Freudenschuss, Dr
Walter Buzina, Dr
Heinz Stammberger, Prof.
Graz, Austria

Introduction: In recent studies we showed that 91,3% of CRS patients but also healthy controls grew positive fungal cultures out of their nasal mucus and it appears to be a common finding within the adult population. However, it was still unknown, as of when fungi could be cultured from nasal mucus in humans. We attempted to identify this point of time, in the nasal mucus of neonates.

Methods: We examined nasal mucus from thirty neonates immediately after birth, on the first and fourth day post partum, and after two and four months of life. The samples obtained with sterile cotton swabs were cultured on agar plates. Fungal cultures were identified either conventionally by microscopy or with molecular techniques. To provide for possible contamination during birth, mucus of the maternal vagina was examined as well.

Results: We found in 20% of our neonates positive fungal cultures just after birth, in 3 of them Candida albicans probably due to contamination passing the maternal vagina. At first day post partum in 7% , respectively fourth day post partum in 15% of our neonates positive fungal cultures were obtained, all limited to one day only without clinical symptoms of colonisation. After the second month of life, examination of nasal mucus yielded positive fungal cultures in 72%, after four months even in 94% of our babies, with a wide array of different species.

Conclusions: Fungi can be cultured from nasal mucus as soon as contact with the environmental air exists but they are not persistent in the first days of life. However, after four months the situation is similar to the one in adults: fungal cultures can

be obtained from almost everyone's nose. Therefore fungi must be considered a normal content of nasal mucus.

8:50 am

Evidence of Bacterial Biofilms in a Rabbit Model of Sinusitis

Joel Robert Perloff, MD
James N Palmer, MD
Philadelphia, PA

Background: Bacterial biofilms have been documented on middle ear mucosa, tonsils, and cholesteatoma. We have also previously described bacterial biofilms on frontal recess stents placed during surgery for chronic sinusitis. We hypothesize that bacterial biofilms are present on the mucosa of animals with sinuses experimentally infected with Pseudomonas Aeruginosa.

Experiment: We instilled Pseudomonas Aeruginosa at log phase growth into the right maxillary sinus in 22 New Zealand White rabbits and harvested specimens one to twenty days later. We then examined the tissues with scanning electron microscopy (SEM) and light microscopy. Mucosa from the middle turbinate on the contralateral side was used as a control.

Results: We identified evidence of bacterial biofilms on the mucosa of all 22 animals under SEM. 21 of 22 had sinus cultures positive for Pseudomonas. Bacterial biofilms were identified by evidence of glycocalyx, water channels, and three-dimensional structure. These images were similar to other images of known biofilms.

Conclusions: This is evidence of the presence of bacterial biofilms in an animal model of sinusitis. This model may serve as a means to study the efficacy and safety of pharmacologic and surgical treatments on the disruption and elimination of bacterial biofilms. Further study into the role of bacterial biofilms in perpetuating chronic sinusitis is warranted.

8:55 am

Superantigens and Chronic Sinusitis II: Analysis of T-Cell Receptor Vâ Domains in Nasal Polyps

David B. Conley, MD
Anju Tripathi, MD
Kristin A. Seiberling, MD
Robert C. Kern, MD
Chicago, IL

INTRODUCTION: The superantigen hypothesis of chronic sinusitis suggests that the presence of toxins within the nose stimulates massive clonal expansion of T-cell populations mediating tissue inflammation. Superantigens are capable of activating a thousand fold more lymphocytes than typical antigens by directly binding specific Vâ domains of the T-cell receptor (TCR). Earlier work has shown that, in contrast to control patients, serum from sinusitis patients contains IgE to bacterial exotoxins known to act as superantigens. While these earlier results indicated systemic exposure to the toxins, the current study will assess chronic sinusitis tissue for evidence of a local superantigen response.

METHODS: Prospective analysis of serum and polyp tissue from 25 patients. Flow cytometry was used to analyze the distribution of specific TCR Vâ domains in polyp tissue in comparison to serum.

RESULTS: Multiple patients with nasal polyps demonstrated clonal expansion of lymphocytes expressing T cell receptors with specific Vâ domains.

CONCLUSIONS: The current results indicate that, at least in some patients, polyps are associated with a selective local expansion of lymphocytes expressing particular families of TCRs. Although the trigger(s) for this expansion are still unknown, these data are consistent with the super-antigen hypothesis of sinusitis. Further studies are necessary to evaluate sinus tissue for the concurrent presence of superantigens with their complimentary TCR Vâ domains.

9:00 am

MUC5B Secretion is Upregulated in Chronic Sinusitis Compared to Controls

Harishnath Viswanathan, Mr
Lain A Brownlee, Dr
Jeffrey P Pearson, Prof.
Sean Carrie, Mr
Newcastle upon Tyne

Introduction: The mucus that lines the airway epithelium provides barrier against pathogenic and noxious agents and participates in the mucosal response to inflammation and infection. Mucins are the major components of mucus and the macromolecules that impart rheologic properties to airway mucus. Airway mucus is overproduced in chronic sinusitis. Biochemical and biophysical characterisation of mucus in chronic sinusitis and in normal airways will elucidate important aspects of chronic sinusitis pathophysiology and allow the design of targeted medical treatments.

Objective: To estimate secretion of sinus mucins in healthy individuals and chronic sinusitis and correlate with their biophysical properties.

Methods: 27 sinus mucus samples from 21 patients (14 subjects with chronic sinusitis undergoing sinus surgery as part of their treatment and 7 control subjects undergoing hypophysectomy without sinonasal disease). Biophysical properties of the mucus were calculated by rheometry. Mucins were isolated by caesium chloride density gradient centrifugation. ELISA was done to estimate MUC5AC and MUC5B mucin content in comparison to standards i.e. porcine gastric mucin (MUC5AC) and human salivary mucin (MUC5B).

Results: MUC5B secretion±SEM was 0.44±0.12 (n=20) and 0.17±0.05 (n=7) while MUC5AC secretion±SEM was 1.32±0.25 (n=20) and 1.46±0.61 (n=7) in chronic sinusitis and control subjects respectively. Viscosity per unit mucin showed no significant difference between sinusitis and control group. There was no correlation between specific viscosity per unit mucin content and mucin gene product.

Conclusions: MUC5B secretion is significantly upregulated in chronic sinusitis compared to control subjects (p value=0.02). This is likely to have important implications for future therapies in chronic rhinosinusitis.

9:05 am

Discussion

9:25 am

Panel: Update on the Treatment of Pediatric Rhinosinusitis: Are there Differences Between Adults and Children?

Moderator:

Rodney Lusk MD

Panelist:

Michael Poole MD

Medical Therapy:

Michael Poole, MD

Surgical Therapy:

Rodney Lusk, MD

10:00 am

Break

Techniques and Evaluation

Moderators:

Winston Vaughan, MD, Kelvin Lee, MD

10:20 am

Is Helicobacter Pylori Really Present in the Adenoids of Children?

Mohamed A Bitar, MD
Asaad Sweid, MD
Ghazi Zaatari, MD
Nabil Fuleihan, MD
New York, NY

Background & Purpose: Adenoids hypertrophy (AH) is a common cause of nasal obstruction in the pediatric age group. It has been associated with several entities including gastroesophageal acid reflux (GER). The presence of Helicobacter pylori (HP) outside the stomach has been reported in the literature but its significance and mode of transmission are still vague. Recently, the adenoids were claimed to harbor HP relying solely on rapid urease testing (RUT). We conducted this pilot study to identify a potential role for HP in AH and to check for any association between its presence and middle ear disease or GER.

Method: Consecutive patients undergoing adenoidectomy were enrolled. Each adenoids specimen was subjected for RUT. Histological sections were stained with Giemsa and Warthin Starry stains to examine for the presence of HP. A questionnaire on GER symptoms was filled.

Results: Twenty-five patients were enrolled in the study. Twenty-one (84%) adenoids were positive on RUT. Seventeen (68%) had bacteria seen on histological sections, with four (16%) containing HP-like bacteria and the rest coccobacilli. There was no correlation between the presence of bacteria in the adenoids and middle ear disease. Patients with HP-like organisms in their adenoids were more likely to have GER.

Conclusion: The adenoids infrequently harbor HP in children. Relying solely on the RUT will lead to a high incidence of false positive results. The role of HP in the pathogenesis of AH is still unclear. It may have reached the adenoids via GER.

10:25 am

Pharyngeal pH Probe Findings in Patients with Postnasal Drainage

Todd Loehrl, MD
Timothy Smith, MDMPH
Ray Hoffman, PhD
Albert Merati, MD
Milwaukee, WI

Background: Patients commonly present with complaints of postnasal drainage (PND). This study reports the pharyngeal pH probe findings in patients without rhinitis/rhinosinusitis who present with complaints of PND.

Methods: This is a prospective study of patients presenting with complaints of PND but no historical or endoscopic evidence of rhinitis/rhinosinusitis. Twenty-four hour pharyngeal pH probe studies were done on 31 consecutive patients and compared to historical controls. None of the patients had a history of or had been treated for gastroesophageal reflux.

Results: There were a total of 31 patients with PND (mean age of 54 years) and 51 controls (mean age of 49 years). The proportion of patients with positive pH probes was higher in PND (28.1%) vs. controls (17.6%) but did not reach statistical significance ($p=0.27$). However, when comparing the mean number of pharyngeal acid exposure events, patients with PND had significantly more events (1.6) than controls (0.3) ($p<0.002$). In addition, the mean acid exposure time was significantly higher in PND (0.18%) vs. controls (0.01%)($p<0.004$).

Conclusion: The proportion of patients with PND demonstrating positive pharyngeal 24 hour pH probes is not significantly greater than controls. However, patients with PND do exhibit a statistically greater degreee of pharyngeal acid exposure as compared to controls. Further research is required to delineate the role of pharyngeal reflux in patients with PND.

Janssen Pharmaceuticals funded the study.

10:30 am

Real-Time Image Guided Endoscopic Sinus Surgery: A C-Arm Cadaveric Study

Vijay K Anand, MD
Casey R.A. Manarey, MD
Mark Shrime, MD
Ashutosh Kacker, MD
New York, NY

Introduction: Computer-aided surgery utilizes a triplanar image reconstructed from a preoperative CT scan loaded into a computer to localize the position of an instrument in the paranasal sinuses during endoscopic sinus surgery. The major limitation of this technology is the inability to visualize the remaining anatomical structures and the residual disease at the completion of surgery. GE Medical has developed new technology that merges images from the GE OEC® 9800 Plus C-arm with the InstaTrak™ 3500 plus to allow a reconstructed triplanar view that can be used for real-time computer-aided sinus surgery.

Methods: Preoperative accuracy of the CT scan images and the C-arm images were assessed in six cadaver specimens using predetermined anatomical landmarks. Each cadaver specimen underwent a complete endoscopic sinus surgery dissection. An intraoperative real-time C-arm scan was then performed and its accuracy compared with the preoperative CT scan for each specimen.

Results: Preliminary analysis indicates the C-arm technology to be more accurate. Postoperatively the accuracy of the CT scans decreased when compared to the C-arm scans.

Conclusions: The ability to reconstruct triplanar images on the GE InstaTrak™ 3500 plus from the GE OEC® 9800 Plus C-arm represents a significant advancement in technology. The images obtained from the C-arm were clear enough to carry out a complete image guided procedure. The value of the C-arm technology was significant in assessing advanced endoscopic sinus surgery techniques in real-time. Further the accuracy of the images from the C-arm was better than those reconstructed from CT scans.

Vijay Anand, GE Medical, Scientific Consultant; SinuCare, Scientific Consultant

10:35 am

Allergic Fungal Sinusitis Cases and the 32nd Parallel Latitude

Scott Clark Manning, MD
Bradley F Marple, MD
Seattle WA

Background: In the strictest sense, allergic fungal sinusitis (AFS) is defined by the histologic presence of allergic mucin (sheets of degenerated inflammatory cells with Charcot-Leyden crystals and scattered fragmented fungal forms) in an immunocompetent patient without signs of tissue invasion. As clinicians around the globe become more familiar with this definition of AFS, some sinus disease that was formerly considered invasive or "fungus ball" is now being recognized as AFS.

Methods: Pathology records from the University of Washington (Seattle) and the University of Texas Southwestern (Dallas) were reviewed for the overall incidence of AFS among tissue specimens submitted in surgical cases of chronic sinusitis over the past 10 years. In addition, a previously unpublished case series of AFS cases from Porto Alegre Brazil was reviewed. An English language literature search of all cases fitting the histologic and clinical diagnosis of AFS was performed.

Results: AFS by the above definition was highly prevalent in central Texas (greater than 10% of chronic sinusitis cases in Dallas) and extremely uncommon in Seattle (2 cases). In fact, the two Seattle patients had spent a significant amount of time in the southern U.S.. The literature review showed a significant clustering of AFS cases around the 32nd parallel of latitude in both the northern (Southern California, Arizona, Texas, Georgia, Florida, northern Africa, Gulf States in the Middle East, and northern India) and southern (southern Brazil, South Africa, southern Australia) hemispheres.

Conclusion: AFS cases show a strong geographic variation. Climatic factors including mean temperature, humidity, and wind speed probably play a role in influencing exposure to relevant fungal antigens.

10:40 am

Discussion

Moderators:

Tim Smith, MD, Todd Loehrl, MD

10:50 am

Revision FESS: Objective and Subjective Surgical Outcomes

Kevin Christopher McMains, MD
Stilianos E. Kountakis, MD
Augusta, GA

Objective: To report objective and subjective outcomes after revision sinus surgery for chronic rhinosinusitis.

Methods: Retrospective analysis of prospectively collected data in 125 patients requiring revision FESS after failing both maximum medical therapy and prior sinus surgery for chronic rhinosinusitis. Patients were seen and treated over a three-year period (1999-2001) in a tertiary Rhinology setting. CT scans were graded as per Lund-Mackay and patient symptom scores were recorded using the SNOT-20 outcomes instrument. Individual rhinosinusitis symptoms were evaluated on a visual analog scale (0-10) before and after surgery. All patients had a minimum 2-year follow-up.

Results: The mean number of prior sinus procedures was 1.9+/-0.1 (range 1-7) and the mean preoperative CT grade was 13.4+/-0.7. Preoperative mean SNOT-20 and endoscopy scores were 30.7+/-1.3 and 7.3+/-0.4 respectively. At the 2-year follow-up, mean SNOT-20 and endoscopy scores improved to 7.7+/-0.6 and 2.1+/-0.4 respectively (p=0.0000). Eight of 15 patients with Samter's triad failed revision FESS and required additional sinus surgery. Five of these 8 patients were treated with aspirin desensitization after their last surgery and remain free of recurrence. The remaining 10 Samter's patients continued to require oral and depository steroids.

Conclusion: Revision FESS benefits patients that fail maximum medical therapy and prior sinus surgery for chronic rhinosinusitis by objective and subjective measures. Patients with Samter's triad have high revision surgery failure rates and require additional aggressive intervention.

10:55 am

Endoscopic Orbital Decompression for Graves Ophthalmopathy

Jan L Kasperbauer, MD
Lucinda Hinkley, RN
Rochester, MN

Graves ophthalmopathy generates a volume excess for the orbital cavity which may produce proptosis, pain, exposure keratitis, diploplia, and optic neuropathy. Endoscopic orbital decompression expands the orbital cavity into the ethmoid cavity and medial maxillary sinus. This retrospective study documents the outcomes following endoscopic orbital decompression for patients with Graves ophthalmopathy. Data collected included demographic information, symptom resolution, complications related to the surgery, reduction in proptosis, subsequent need for eye muscle surgery, and hospital length of stay. Between July 1989 and April 2004, 62 patients were referred for endoscopic orbital decompression (often unilateral). 3 patients refused use of their medical records for research purposes. 70% were female with the average age of the study group noted to be 49 years. Preoperatively 63% had diploplia and optic neuropathy was noted in 27%. Two patients had a cerebrospinal fluid leak identified and managed during the decompression. No postoperative leaks occurred. 25% of patients did not require eye muscle surgery. 48% of patients underwent one procedure to manage diploplia. The average reduction in proptosis was 2.5 mm. 54% were managed as an outpatient and 27% underwent a 23-hour observation period. This data supports the safety, efficiency, and efficacy of endoscopic orbital decompression for unilateral and bilateral Graves ophthalmopathy. Eye muscle surgery will frequently be required to manage diploplia following decompression.

11:00 am

Inspiratory and Fixed Nasal Valve Collapse—Clinical and Rhinometric Assessment

Ramakrishnan Vidyasagar, MBBS
Michael Friedman, MD
Hani Ibrahim, MD
Ninos J Joseph, BS
Chicago, IL

Introduction. Acoustic rhinometry (AR) has been used in the assessment of nasal valve obstruction. Standard AR measurement of the cross-sectional area (CSA) of the nasal valve is done in the apneic phase, whereas often collapse occurs on inspiration. We hypothesized that using a ratio of the CSA obtained during deep inspiration and during apnea would provide a more meaningful method of diagnosing nasal valve collapse.

Methods. AR was performed in 40 patients without nasal valve obstruction and in 40 patients clinically diagnosed with nasal valve obstruction. Patients with septal deflection or anterior inferior turbinate hypertrophy were not studied. The internal and external nasal valve area was observed during apnea and on deep inspiration. AR measurement of the CSA of both nasal valves was performed during apneic phase and during active inspiration. The CSA(inspiratory)/CSA(apneic) ratio was calculated for each set of measurements.

Results. The CSA(inspiratory)/CSA(apneic) ratio was >= 1 in normal patients and in patients with fixed nasal valve collapse. The ratio was < 1 in patients with inspiratory collapse. Data from history, physical exam, and dual mode AR testing successfully differentiated patients into: 1) fixed external valve obstruction 2) inspiratory external valve collapse, 3) fixed internal valve obstruction, and 4) inspiratory internal valve collapse. A significant number of patients had both internal and external valve obstruction.

Conclusion. Dual mode testing of AR is an effective tool in more precisely identifying nasal valve obstruction and is the first objective test shown to be highly diagnostic of inspiratory nasal valve collapse.

11:05 am

Discussion

11:15 am

Poster Presentation and Award

Moderators:

Todd Kingdom, MD, Kathy Yaremchuk, MD, Michael Sillers, MD

11:30 am

Panel: Utilizing Correct CPT Coding and Documentation to Enhance Patient Care

Moderator:

Michael Setzen MD

Panelists:

Michael Sillers MD, Donald Lanza MD

Closing Remarks

Poster Presentations

Long Term Effects of FloSeal Nasal Packing after ESS

Rakesh K Chandra, MD
David B Conley, MD
Robert C Kern, MD
Memphis, TN

Background: A previous study demonstrated increased adhesions (p=.007) and granulation tissue (p=.006) in ethmoid cavities packed with FloSeal (FS) compared the opposite side which was packed with thrombin-soaked gelatin foam (TGS). That study included 20 patients evaluated 6-8 weeks post-ESS. The current report provides long-term follow-up of this cohort.

Methods: At least one year of follow-up was available in 18/20 patients. Nasal endoscopy was performed with examiners blinded to the nature of the post-surgical pack. The presence of adhesions and granulation tissue was evaluated for each cavity. The number of office procedures to lyse adhesions during the first year post-ESS was also tabulated.

Results: None of the 18 patients required revision ESS. Among the 18 FS sides, 10 (56%) exhibited asymptomatic adhesions, 5 (28%) had adhesions requiring lysis, and 3 (16%) were adhesion-free. The 5 FS cavities in which lysis of adhesions was performed required a total of 7 procedures during the follow-up period. Among the 18 TSG sides, 2 (11%) demonstrated silent adhesions, none had undergone adhesion lysis, and the remaining 16 (89%) were without adhesions. The prevalence of adhesions was significantly greater in the FS group (p<.001). Persistent granulation tissue was observed in 2 FS cavities compared to none in the TSG group.

Conclusions: Although no obvious difference in outcome was seen between the two groups, FS appears to stimulate scar formation and increase the amount of postoperative care required after ESS. The optimal choice for nasal packing after ESS remains unclear.

Oncocytoma of Nasolacrimal Duct

Hassan H Ramadan, MD
Jose Sanclement, MD
Morgantown, WV

Introduction: Oncocytoma of the nasolacrimal duct is a very rare benign tumor. After review of the literature only 2 cases have been reported. The most common presenting symptoms were epiphora and obstruction of the duct. We present a patient who had nasal obstruction with no evidence of mass on exam.

Methods: Case report.

Results: A years old male presented with a one year history of right sided nasal obstruction without any other associated symptoms. Examination of the nose was repeatedly negative and medical management was not helpful. He had no history of trauma or surgery to the nose and had no associated allergies or history of sinusitis. On nasal rhinoscopy a big right inferior turbinate was noted but no septal deviation or masses were seen. After topical decongestion the right inferior turbinate did not decongest and nasal endoscopy was difficult but revealed no other findings. A CT scan was obtained and showed a massive mass involving the nasolacrimal duct (Fig.1). Endoscopic biopsy was planned. During endoscopy a large right inferior turbinate was again visualised. The turbinate was infractured and a huge rounded fleshy mass was seen behind it (Fig.2). Biopsy was obtained and final diagnosis was oncocytoma (Fig.3). Medial maxillectomy was recommended to the patient who elected not to proceed with any surgery at this time. Review of the literaure showed 20 cases of oncocytoma involving the nasolacrimal sac and only 2 cases involving the duct.

Conclusion: This case reports on the 3rd case of nasolacrimal duct oncocytoma that presented as progressive nasal obstruction in an elderly gentleman without any positive findings on exam. CT scan showed a mass involving the nasolacrimal duct which was a rare benign tumor

Middle Turbinate Stabilization in Endoscopic Sinus Surgery

Richard Daniel Gentile, MD
Youngstown, Ohio

Middle Turbinate Stabilization in Endoscopic Sinus Surgery “Middle Tubinopexy” Obstruction of the middle meatus by scar tissue and middle turbinate lateralization has plagued Endoscopic Sinus Surgeons since the advent of the new

techniques for sinus surgeries were introduced. Methods to "control" the lateralization of the middle turbinate and the consequences of obstruction on the sinus outflow tract have been advocated since the post operative consequences of scar tissue and turbinate lateralization were recognized. These include prolonged packing, stents, sutures, clips, and more extensive resection of the middle turbinate as well as others. Advantages for middle turbinate stabilization include easier post operative debridement and confidence in the management of the final post operative outcome. The author describes his personal technique for middle turbinate stabilization termed "Middle Turbinopexy". This technique has been used for over 10 years in well over 750 patients. The surgical technique, complications and the effect on reducing the incidence of middle meatal and fronal stenosis is reviewed. A review of other techniques for middle turbinate stabilization will also be accomplished with attention the overall effect in these techniques to reduce the incidence of middle meatal and or frontal stenosis and the need for subsequent revision surgery. To determine the overall efficacy of the authors technique \Middle Tubinopexy\" a turbinate lateralization technique in reducing the complications of scarring

Pneumocele of the Maxillary Sinus: Case Report and Literature Review

B. Todd Schaeffer, MD

Lake Success, NY

Introduction: A pneumocele is an expanded hyperaerated sinus with bone thinning without mucosal disease. This should be differentiated from pneumosinus dilitans, another type of hyperaerated sinus, where no bone thinning occurs. A tenth reported case of maxillary sinus pneumocele is demonstrated. Barotrauma from repeated airplane flights contributes to the pathophysiologic etiology.

Methods: A twenty-year old male without prior history of sinusitis, trauma or sinus surgery presents with excruciating left sided facial pain only during airplane flights. Endoscopic pictures of an abnormal bulge in the middle meatus, CT confirmation of an expanded sinus and bone thinning without mucosal disease confirm the diagnosis of a pneumocele. Surgical endoscopic decompression is the treatment of choice.

Results: A maxillary sinus pnemocele is diagnosed and successfully treated with endoscopic sinus surgery with decompression of the middle meatus and ethmoidectomy. Pre- and post-operative CT scan images confirm the successful ventilation. A literature review explains the different types of hyperaerated sinuses and the rarity of this finding.

Conclusions: Pneumocele of the maxillary sinus is a type of sinus hyperaeration, which is an exceeding rare entity. Diagnosis is confirmed by history, endoscopic examination and CT scan findings of sinus expansion, bone thinning and no mucosal disease. A patient is presented whose history of multiple airplane flights contributes to the pathophysiology of pneumoceles. Endoscopic decompression of the middle meatus is the treatment of choice. This is successfully performed and confirmed with pre and post-operative imaging studies.

Drainage of Retro-Parapharyngeal Abscess: A New Indication for Endoscopic Sinus Surgery?

Piero Nicolai, MD
Davide Lombardi, MD
Davide Farina, MD
Marco Berlucchi, MD
Brescia, Italy

Introduction: Deep neck abscesses are life-threatening conditions that in early stages are preferably treated by intravenous antibiotic therapy; in advanced stages, surgical drainage is mandatory.

Material and Methods: We report two cases of retro-parapharyngeal abscesses, with prevalent retronasopharyngeal extension, present in 2 males aged 60 and 82 years. Both patients underwent transnasal endoscopic drainage of the abscess. The main surgical steps were: incision of the posterior nasopharyngeal mucosal wall by a diode laser; widening of the incision with a microdebrider and cutting instruments; drainage of purulent fluid; careful dissection and removal of the necrotic tissue; lavage with antibiotic solution of the cavity.

Results: The younger patient, having an abscess associated with chronic otitis media and hypoglossal nerve palsy, quickly recovered from pharyngodynia, otalgia, and trismus. Two years after surgery the patient is asymptomatic; hemitongue atrophy due to denervation is the only detectable residual sign. The older patient, affected by diabetes mellitus, underwent a second endoscopic procedure for the occurrence of another abscess in the contralateral retroparapharyngeal space after a first successful drainage. Four months after surgery, MRI shows just mild inflammatory changes along the skull base and the patient reports an improvement of symptoms, except for dysphonia due to persistent vagal nerve palsy.

Conclusion: In selected cases of abscess with limited parapharyngeal involvement and prevalent retronasopharyngeal extension, transnasal endoscopic drainage may be an effective and safe alternative to external approaches. Absence of cervical or palatal scars accompanied by a short hospitalization time may be considered as important advantages.

Endoscopic Power-Assisted Orbital Exenteration (EPOE)

Pete S. Batra, MD
Donald C. Lanza, MD
Cleveland, Ohio

Objective: Orbital exenteration has been long utilized for management of extensive sinonasal malignancies invading the periorbita and/or orbit. The objective of this report is to describe a new technique for orbital exenteration.

Study Design: Case-series from a tertiary care referral center.

Methods: Study population is comprised of 3 patients presenting with sinonasal malignancy (2 cases) and fulminant invasive fungal sinusitis (1 case). Extraocular muscle involvement was present in all 3 cases. Advanced endoscopic techniques in conjuction with powered instrumentation were utilized for management of the primary pathology within the paranasal sinuses and the orbit.

Results: The orbit was successfully exenterated via an eyelid-sparing endoscopic approach with minimal blood loss in all 3 cases. The exenteration portion of the procedure was completed within 30-60 minutes and the lateral periosteum within the orbit was preserved resulting in complete mucosalization of the cavities within 8 weeks. Two of the patients are alive without disease at 6 months follow-up. One patient with persistent cavernous sinus malignant peripheral nerve sheath tumor died 4 months after the procedure. The surgical technique will be demonstrated through digital video presentation.

Conclusion: In this preliminary report, EPOE offered an effective alternative method for orbital exenteration. The technique offered several advantages compared to the traditional approach: avoidance of facial incisions; preservation of the eyelids; direct magnified visualization of the pathology; preservation of the lateral periorbita with rapid mucosalization; minimal blood loss; and shortened operative time. This technique may serve as an important adjunct for management of the orbit with sinonasal malignancy or invasive fungal rhinosinusitis.

The Fate of an Amputated Nose After Replantation

Giovanna Cantarella, MD
Riccardo F. Mazzola, MD
Davide Pagina, MD
Milano, Italy

Amputation of the nose is a rare and challenging condition, and the effectiveness of replantation is still controversial. We describe the case of a dog-bite nasal amputation in a 69-year-old woman. The full-thickness lesion included the lobule, and one third of the columella and alae. The avulsed piece was cooled in iced saline and replantation was completed within two hours of the trauma. Hyperbaric oxygen therapy was administered eight hours after surgery and continued for 12 daily sessions in order to improve oxygenation and revascularization. Multiple punctures were performed to diminish venous congestion, but the skin gradually necrotized and the eschar was tangentially excised eight days after replantation. Open wound management included moistened saline dressings to prevent desiccation, daily applications of 1% silver sulfadiazine cream and judicious debridement. The mucosa and almost all of the cartilage layer survived. The wound healed in three weeks and the final defect was smaller than the original. At that stage, reconstruction was planned. At surgery, the contracture was released and a bilateral conchal graft improved tip projection. A midline forehead flap was utilized to replace skin cover, and thinned 15 days after surgery. Two weeks later, the pedicle was severed and contour irregularities improved. The outcome was functionally and aesthetically satisfactory. This case confirms that replantation of an amputated nose as a composite graft is worthwhile. Although the skin layer necrotized and required reconstruction, the lining and most of the cartilage support were preserved, reducing the extent of the defect and considerably simplifying the repair.

Diagnosis and Management of Sinonasal Oncocytic Papilloma

Antti A Mäkitie, MD
Marit Starck, MD
Leif Bäck, MD
Ilmo Leivo, MD

INTRODUCTION AND OBJECTIVES: Sinonasal oncocytic papilloma (also known as cylindrical cell papilloma) is a rare

lesion comprising only a few percent of all Schneiderian papillomas. Oncocytic papillomas are usually found in the lateral nasal wall, or in maxillary and ethmoid sinuses. The epithelial lining of these lesions has features of oncocytes and they are sometimes associated with a malignant neoplasm. We review the literature and present three cases. Relevant aspects of their clinical behavior and the management of this condition are discussed.

SETTING: Tertiary referral centre

STUDY DESIGN: A retrospective clinicopathological review

MATERIALS AND METHODS: The clinical and pathological data in three cases of sinonasal oncocytic papilloma are reviewed.

RESULTS: We describe the histopathological features, surgical treatment and clinical course of three cases in which there was no evidence of malignancy. The patients were 40-82 years of age, 2 males, 1 female. One case was an exophytic lesion in the maxillary antrum, while two cases were from the lateral wall of the nasal cavity, one of them purely endophytic, histologically.

CONCLUSIONS: Awareness of this rare diagnostic entity is important as these papillomas, with a distinct histopahological morphology, show frequent recurrences and a significant association with malignancy. The differential diagnosis includes low-grade papillary and intestinal-type adenocarcinomas of nasal and paranasal regions, low-grade mucoepidermoid carcinoma, and rarely, sporangia of rhinosporidiosis. Surgical resection with wide margins is necessary to control these lesions. The malignancies associated with these lesions are often epidemoid carcinomas with a high mortality.

Nasal T-cell Lymphoma: A Case Presentation and Review of Literature

Vincent Sabah Toma, MD
John H. Krouse, MD
Detroit, MI

A 30 year old healthy AAM was referred to us for evaluation of perforated nasal septum of three months duration. Clinical examination showed significant crusting which was removed revealing complete erosion of the cartilaginous septum. There also was exposed bone along the maxillary spine and posterior septum with polypoid and granulomatous changes of the mucosa. Diagnosis of high grade nasal T-cell lymphoma was made. The patient is being treated with combination chemotherapy and radiotherapy. Although these nasal T-cell lymphomas have been well described in the oncology and

pathology literature, very little has been written about them in the otolaryngologic literature. We present a case of nasal T-cell lymphoma and review diagnostic features and current literature regarding this disease.

Cocaine Induced Midline Destructive Lesions: Has Apoptosis a Role in its Pathogenesis?

Matteo Trimarchi, MD
Anna Rita Miluzio, PhD
Pier Carlo Marchisio, MD
Mario Bussi, MD
Milano, Italy

Objective: Cocaine-induced lesions may cause extensive destruction of the osteocartilaginous structures of the nose, sinuses and palate but its pathogenesis is still unknown.

Aim of the Study: The authors studied apoptosis in a group of patients affected by cocaine induced midline destructive lesions (CIMDL). A comparison with data obtained from a group of patients (P) who underwent septoplasty was also made.

Methods: From June 2002 to September 2004, 10 patients with CIMDL (8 males, 2 females; age range: 22-48 yr) and 10 P (7 males, 3 females; age range: 18-52 yr) were observed at the Department of Otorhinolaryngology, San Raffaele University Hospital, Milano, Italy. All specimens obtained with biopsies of the nasal mucosa were submitted to immunohistochemistry for Caspase 3(CASP 3), Caspase 9(CASP 9) and with In Situ Terminal Deoxynucleotidyl Transferase Biotin-dUTP Nick End Labeling (TUNEL) assay. We assayed Caspase 8(CASP 8) too.

Results: Immunohistochemistry analysis revealed significant differences between the two groups: CASP 3, 9 and TUNEL were positive exclusively in CIMDL patients. CASP 8 was negative in both groups.

Conclusions: The results indicate that cocaine has a direct cytotoxic effect on the nasal mucosa and that apoptosis is probably the major mechanism in the pathogenesis of CIMDL. The intrinsic apoptotic pathway seems to be activated.

Definition of the Type of Nasal Aerodynamics by Means of Anterior Rhinoscopy

Yuri Petrovich Uliyanov, MD, PhD
Moscow, Russia

New Stent for Prevention of Restenosis Following Choanal Atresi

Ali Saeed Al-Quahtani, KSUF
Farouk Mahmoud Messahel, DR
Wadi Al-Dawsir

The high incidence of restenosis following choanal atresia repair may reach 80%. No standard and ready-made stent available and stents in current use are usually fashioned from different materials. We describe a newly designed stent for the prevention of restenosis, which has several advantages over the different types of stents. It is composed of two parallel tubes made of reinforced silicone rubber, connected posteriorly by a strip of the same material without any metal reinorcement. The front part of each tube contains a hole on each side, so that the 4 holes are on the same line. A bridge consists of a hollow tube made of polyvinyl chloride (PVC), with piece of sponge attached to it (to protect columella from pressure necrosis), fixed by a strong thread which passes through the holes and the inside of the PVC tube. Two solid tipped PVC catheter (one for each tube) to be used to position stent in nostril through the mouth. Stent has several advantages: 1. Ready made so operative time shortens 2. Imbedded metal wire within its walls keeps lumen patent and suction easier 3. Metal wire expands at body temperature so stands pressure of restenosis 4. Spiral metal wire adds flexibility to stent easing its insertion 5. Produced from material previously tested and licensed for use in humans (Z79-IT) i.e, does not initiate inflammatory toxic tissue reaction which eventually result in scar tissue formation and possible restenosis.

Presentation and Management of Refractory Chronic Rhinosinusitis in Children

Nithin D Adappa, MD
James M Coticchia, MD
Cleveland, OH

Background: Pediatric chronic rhinosinusitis (CRS) continues to be a difficult problem for the medical community. Traditionally, oral antibiotic therapy has been the cornerstone of treatment, but a subpopulation of patients exist that are resistant to multiple trials of oral antibiotics. These patients require alternative therapeutic modalities. One such option, the use of intravenous (IV) antibiotics, has shown a high success rate in a small number of past studies.

Objective: To estimate the success of a therapy consisting of culture directed IV antibiotics, adenoidectomy, and sinus aspiration in ameliorating long-term (>6months) clinical symptoms of CRS in pediatric patients resistant to oral antibiotic therapy.

Methods: A retrospective review of a preliminary data set including medical records for 22 patients who received treatment, looking at patient age, initial CRS presenting symptoms, computed topography (CT) scan finding, length, duration, and type of prior oral antibiotic treatment, length and type of IV antibiotic treatment, and long-term follow up of clinical symptom resolution.

Results: Preliminary data indicates initial clinical improvement following cessation of IV therapy was achieved in 100% patients. 91% of the patients demonstrated long-term resolution of clinical symptoms of CRS.

Conclusions: The results suggest that IV antibiotics may prove beneficial for those pediatric patients who demonstrate CRS not responsive to traditional oral therapy. Although other treatment options are currently available for this subpopulation of patients, this IV antibiotic therapy provides both a maximally effective outcome while using a relatively minimally invasive intervention.

Excision of Juvenile Nasopharyngeal Angiofibroma: Endoscopic vs External Approach Techniques

Shepherd Green Pryor, MD
Eric J Moore, MD
Rochester, MN

OBJECTIVES: Juvenile nasopharyngeal angiofibroma (JNA) is an uncommon neoplasm presenting in the nasopharynx. In select patients, endoscopic approach to resection has allowed for decreased operative time, hospital stay, blood loss, and adverse sequelae compared to traditional transpalatal or lateral rhinotomy approaches without compromising complete removal and possibility of recurrence.

STUDY DESIGN: Retrospective chart review of those patients who underwent either endoscopic or traditional external approach for excision of juvenile nasopharyngeal angiofibroma at the Mayo Clinic from 1980 to 2004. Outcomes were compared.

METHODS: The charts of patients who underwent either endoscopic or external surgical approach to resection of JNA were retrospectively reviewed. The technique was evaluated.

The authors present a detailed description of the method for endoscopic approach to resection of JNA and discuss the advantages and limitations of this method.

RESULTS: Successful resection of JNA can be accomplished via an endoscopic approach. Complications were minimal and healing time was significantly decreased. All patients display acceptable functional results.

CONCLUSION: Endoscopic removal of JNA tumor is safe and effective. This technique appears to decrease operative time and operative blood loss and markedly reduces hospital stay and healing time. Recurrence was not significantly affected by approach. Criteria for candidacy will be discussed.

Persistent Upper Airway Illness in Rescue, Recovery and Restoration Workers of the World Trade Center

Rafael E. de la Hoz, MD
Michael Shohet, MD
Stephen Levin, MD
Robin Herbert, MD
New York, NY

The attack to the World Trade Center (WTC) on September 11, 2001, and the subsequent massive effort to rescue, recover, and restore services to the area, exposed a large number of workers (estimated at about 40,000) to a large number of occupational toxicants and stressors, which remain to be fully characterized. Two years after the attack, persistent illnesses continue to be observed. We will present clinical descriptive data on a group of over 400 workers, which includes a wide spectrum of occupations. Workers underwent detailed and systematic medical evaluation (with ongoing follow up) at a dedicated clinical unit. Depending largely on symptom severity, a subset was referred for a comprehensive physical examination of the upper aerodigestive tract including flexible fiberoptic laryngopharyngoscopy and, when appropriate, allergy testing. The disease profile continues to be fairly consistent, and the observed conditions can be generally grouped into five major categories: upper and lower airway diseases, gastroesophageal reflux disease, psychological diseases, and musculoskeletal injuries and illnesses. The upper airway group of conditions is the most prevalent, with three quarters of all workers presenting evidence of rhinitis, sinusitis, pharyngytis, and laryngitis. Evidence of gastroesophageal and/or laryngopharyngeal reflux has been found in more than 40% of the workers. Response to topical steroids has been partial. Atopic allergy appears to be a marginal contributor to the

severity of disease. The above listed conditions often coexist in different combinations, which (as expected) mutually enhances their clinical expression, complicates medical management, and slows recovery. Based on the above observations and the expected longer latency for other potential health effects from the exposures, we anticipate a need for continued longitudinal monitoring and clinical follow-up.

Sinonasal Papillomas of Mixed Histology: A Case Report

Jacob D. Steiger, MD
Alexander G. Chiu, MD
Philadelphia, PA

Introduction: The management of sinonasal papillomas has largely been based upon the biopsy proven identification of their histologic subtypes. The cylindrical and inverted subtypes are aggressively treated due to their potential for malignant transformation and higher incidence of recurrence. Fungiform papillomas are either locally excised or even observed since they are not known to exhibit malignant transformation, and have a lower incidence of recurrence. A potential flaw in this decision tree is encountered if the initial biopsy misguides the management plan. We present a case in which all three subtypes are found in the same specimen. The implications of this pathologic finding may change the way lateral wall sinonasal papillomas are managed.

Methods: A case report and literature review of the current management of sinonasal papillomas.

Results: A 53 year old male diagnosed with a right lateral nasal wall papilloma by office biopsy, underwent complete endoscopic excision of the tumor. Final pathology revealed a sinonasal papilloma with areas of fungiform, inverting, and cylindrical features.

Conclusions: This is the first reported case in the literature of sinonasal papillomas demonstrating multiple histologic subtypes. This case describes a situation in which all three subtypes are found in a resected lateral nasal wall papilloma. It illustrates that a biopsy of a lateral nasal wall papilloma may not be representative of the entire specimen. This may result in the inappropriate management of the lesion. In addition, when resecting sinonasal papillomas, collection and histologic examination of the entire specimen is necessary. This may identify further pathology within the specimen that may direct further management.

Studies in Paranasal Sinusitis

Amit Srikant Gir
Larry E. Duberstein, MD
New Orleans, LA

There are an estimated 32 million people suffering from chronic sinusitis in America today. Of those millions, about half occur in the southeast region alone due to fluctuations in weather patterns. Current treatments involve ineffective surgeries and drug regiments to cure underlying mucus. Using antibiotics administered through the bloodstream, our therapy hopes to eliminate bacteria thought to be in bone spaces of the nasal sinuses as well as the mucus. We feel this to be the most effective treatment rather than difficult cranial bone surgeries. To measure the efficacy of our hypothesis, we conducted an objective and subjective analysis of patient data collected from the past four years. This data included weekly nasal sinus photographs and patient forms collected during their treatment. To cure infected bone, the patient was placed on an intravenous antibiotic regiment that lasted, on average, twelve weeks. During the weekly visit, the patient was asked to rank their symptoms from one to ten. This data was then compiled to determine if symptoms related to bone disease had the largest changes. The objective outlook to this study involved assembling sinus photographs into a sinusitis scale of severity, arbitrarily based from one to five. The response forms and the photographs were compared for any relevant correlation in disease reduction. At the end of the study, we found that most patients felt better on an average eight weeks of therapy. The photographs that accompany each patient substantiate this conclusion.

Care Solutions, Inc. - Funding

Allergic Fungal Sinusitis with Extensive Bone Erosion of the Clivus Presenting with Diplopia: A Case Report

Joseph B Jacobs, MD
Shari D Reitzen,
Richard A Lebowitz, MD
New York, NY

A 43-year-old man with non-insulin dependent diabetes, environmental allergies, and chronic rhinosinusitis, presented with a 4 month history of increased nasal congestion, and progressive diplopia. Clinical examination revealed bilateral nasal polyposis and a right lateral gaze deficit, consistent with a

sixth cranial nerve palsy. CT of the paranasal sinuses demonstrated a large sellar mass with extensive bony erosion, and both supra- and infra-sellar extension. Differential diagnosis included allergic fungal sinusits (AFS) as well as a primary sellar or clival lesion. An endoscopic approach to the sphenoid sinus and clivus, with image guidance, was performed as a diagnostic, and potentially therapeutic, procedure. Material consistent with allergic mucin was encountered. Surgical treatment involved nasal polypectomy, wide marsupialization of the sphenoid sinus and removal of the extensive allergic fungal mucin. The patient awoke with complete resolution of his diplopia.

Discussion: Otolaryngologists should be aware of the potential for significant expansion and destruction of bone by AFS. Approximately 20% of patients with AFS demonstrate paranasal sinus expansion and bone erosion involving surrounding anatomic structures, including the orbit and cranial vault. Patients may present with signs and symptoms of ocular or intracranial involvement. These patients present a diagnostic challenge, and require aggressive surgical management of their disease. Endoscopic techniques, with image guidance, represent a minimally invasive approach to the diagnosis and management of this disease process.

Perennial allergic rhinitis. Therapy with franlukast and franlukast alternated with desloratadine

Salvador Flores, MD

This open label protocol was designed to demonstrate if franlukast alone or franlukast alternating with desloratadine is more effective in perennial allergic rhinitis

Effect of Heat and Antibiotic Killed Klebsiella Ozaenae on Ciliated Nasal Epithelium in Vitro

Jason Clark Friedrichs, MS
Jonathan Ferguson, MD
Rockford, IL

Introduction: Klebsiella ozaenae is bacterium that is frequently isolated from patients suffering from atrophic rhinitis (AR). The role that this bacterium plays in AR is poorly understood, but live bacteria have been shown to inhibit the ciliary activity of the nasal epithelium. This finding proposed a role for the bacterium in the pathogenesis of AR. However, individuals treated with antibiotics of a suitable spectrum for K. ozaenae continued to suffer from AR. This study was designed to show

the effects of heat and antibiotic killed K. ozaenae on ciliated nasal epithelium.

Methods: K. ozaenae obtained from stock was cultured in appropriate conditions. Equal aliquots of ciliated nasal epithelium in normal saline obtained from volunteers and killed bacterium were viewed under a slide microscope. Ciliary activity was measured as full or none at three hours when compared to normals.

Results: Normals showed no decrease in activity. Heat and antibiotic killed bacterium both showed ciliastasis at 3 hours. Activity was not regained after 24 hours of observation.

Conclusions: The ability of heat killed and antibiotic killed K. ozaenae to inhibit nasal ciliary activity further strengthens its role in the pathogenesis of atrophic rhinitis. Specifically, these recent experiments show that ciliastasis results at three hours post exposure. The fact that ciliastasis occurs in the absence of living bacteria suggests a causative agent independent of living bacteria. It may explain why limited success has been found with antibiotic treatment alone and further supports the treatment of atrophic rhinitis with nasal irrigation to physically remove remaining bacterial byproducts that inhibit the recovery of cilia activity.

Atypical Computed Tomographic Presentation of Fungal Sinusitis

Joshua Adam Gottschall, MD
Kathleen L. Yaremchuk, MD
Detroit, MI

Introduction: Fungal sinusitis, once considered rare, is more frequently encountered due to heightened awareness and improvements in culture technique. Characteristic radiographic findings of fungal sinusitis include areas of high attenuation on noncontrast computed tomography. Various patterns of high attenuation on standard bone and soft tissue windows have been reported including starry sky, homogenous ground glass, irregular linear and serpiginous. We present a case of fungal sinusitis with an unusual CT enhancement noted on lung windows.

Methods: Case report and review of literature.

Results: A 56 year-old male presents to the CICU in cardiogenic shock and fever of unknown origin. A noncontrast CT of the sinuses was obtained which did not demonstrate significant disease on standard bone and soft tissue windows. The study was evaluated in lung windows and a high-attenuation honeycomb pattern was noted in the right maxillary sinus. A

canine-fossa maxillary sinus tap, irrigation and culture revealed thick mucous that was positive for Aspergillus sp. and Candida Albicans. Treatment with systemic and topical antifungals did result in resolution of fevers and overall improvement.

Conclusion: Computed tomography is valuable in the diagnosis of fungal sinusitis. Characteristic features on CT are reported on standard bone and soft tissue windows. We present an unusual presentation of fungal sinusitis seen on lung windows, with a unique high attenuation pattern.

Evidence-Based Use of Topical Nasal Anesthesia for Flexible Transnasal Endoscopy

Rhoda Wynn, MD
Boris L. Bentsianov, MD
Brooklyn, NY

Background: No consensus exists among otolaryngologists regarding the routine use of topical nasal anesthesia before flexible transnasal endoscopy. The objective of this study is to evaluate the evidence in the literature on whether or not the topical nasal anesthesia improves the patient's experience.

Methods: Articles evaluating the use of topical nasal anesthetics for flexible transnasal endoscopy with outcome measures of pain or discomfort were identified. Those that compared the use of a topical anesthetic agent to either a placebo and/or no spray were selected for review. Articles evaluating topical nasal anesthesia for fiberoptic transnasal bronchoscopy or fiberoptic intubation were excluded because they introduced additional variables.

Results: Six clinical trials were identified using the specified criteria. All six were prospective, double-blind, randomized controlled trials. The anesthetic agents tested included lidocaine, tetracaine and cocaine. The conclusions of the studies reviewed varied, although the majority (four) of the trials indicated no statistically-significant differences between anesthetic and placebo in measures of pain/discomfort. However, there was one trial which concluded that topical nasal anesthesia improved patient comfort while the last suggested that the anesthetic made the experience worse for the patient.

Conclusions: Although variations in the study designs among the six trials evaluated exist, the preponderance of evidence seems to support that the routine use of topical nasal anesthetic prior to flexible transnasal endoscopy is of no additional benefit. This conclusion has potential impact on savings both financially and in clinical time for otolaryngologists.

Rhabdomyosarcoma of the Nasal Cavity and Paranasal Sinus in the Adult: A Case Report

Spencer Payne, MD
Kathleen Yaremchuk, MD
Detroit, MI

Introduction: Rhabdomyosarcoma (RMS) is a rare small round-cell tumor of soft tissue that mostly affects children. The incidence in the adult and middle-aged population is even less. Though case series exist for RMS, the presentation of this tumor in the paranasal sinuses or nasal cavity of the adult remains exceedingly uncommon.

Methods: Case report

Results: A 49 year old woman presented with a week long history of progressive nasal congestion, epiphora, and eye pain. Anterior rhinoscopy was performed and a completely obstructing mass seemingly originating from the right with extension into the left nasal cavity is found. Examination also found her to have bilateral proptosis, right cervical lymphadenopathy, left thyroid enlargement, and a right buccal mass. Radiologic examination revealed a large sino-nasal tumor centered in the right ethmoid sinus with extension through to bilateral maxillary sinuses and orbits. Erosion of the right cribiform plate was also noted. Histopathological evaluation revealed sheets of undifferentiated small neoplastic cells with some having abundant eosinophilic cytoplasm. Immunostaining is positive for Desmin, HHF-35, and Vimentin and negative for CK, S-100, LCA, and O13. The diagnosis of RMS was made. Review of the literature finds RMS of the nasal cavity and paranasal sinuses to be a rare entity in the adult. Management is reviewed and histopathologic and radiographic examples are provided.

Conclusions: This case report serves to review a rare tumor of the adult sinuses. Though uncommon, RMS should be included in the differential diagnosis of nasal neoplasms. Its aggressiveness demands swift and multi-modality therapy.

External Frontoethmoidectomy: Its Role in the Treatment of Complicated Frontoethmoid Rhinosinusitis

William Numa, MD
Daniel Gold, MD
Julie Takahashi, MD
Elie Rebeiz, MD
Boston, MA

At the conclusion of this presentation, the audience will understand the role of different surgical options in the treatment of complicated frontoethmoid sinusitis.

TITLE: "External Frontoethmoidectomy: Its role in the treatment of complicated Frontoethmoid Rhinosinusitis."

OBJECTIVES: 1. Illustrate the different options in the treatment of complicated frontoethmoid sinusitis. 2. Demonstrate current role of open frontoethmoidectomy in the treatment of complicated frontoethmoid sinusitis. 3. Enumerate examples in which intranasal endoscopic frontoethmoidectomy would be suboptimal in the treatment of frontoethmoid sinus complications.

INTRODUCTION: The advantages of intranasal endoscopic management of frontoethmoid rhinosinusitis are undeniable. However, becoming more proficient in the use of endoscopic techniques we have also become increasingly reliant on this approach, sometimes overlooking the role of external frontoethmoidectomy. In spite of the advances in optics, instrumentation, and image-guided navigation some patients may still be more adequately treated through an external open frontoethmoidectomy approach. We have compiled our experience in managing a series of patients presenting at a tertiary care facility with complicated frontoethmoid rhinosinusitis, resulting in complications including mucopyocele, orbital abscess, and meningitis. At the conclusion of this presentation, the audience will understand the various options in the treatment of complicated frontoethmoid sinusitis, and the advantages of external frontoethmoidectomy.

METHODS: Retrospective Case Series review.

RESULTS: We review the clinical presentation, decision process, surgical approach and outcome, as well as pitfalls to avoid in selecting such approach to address complicated frontoethmoid rhinosinusitis. There were no complications associated with the external approach, and the cosmetic results were satisfactory.

CONCLUSIONS: We must not forget about the usefulness of the open frontoethmoidectomy approach. Seasoned Otolaryngologists must make an effort to ensure the new generation of surgeons is adequately trained in using the open

frontoethmoidectomy technique, as it provides unique advantages in selected clinical scenario.

Patient Evaluation of Nasal Symptoms Following Surgical Correction of Minimal Anatomic Obstruction

Vishvesh Mehta, MD
Boris Bensianov, MD
Brooklyn, NY

Background: Nasal obstruction is one of the most common patient complaints to an otolarygnologist. Treatment modalities often include medical and/or surgical therapy. Some patients who have minimal anatomic obstruction secondary to turbinates and/or septum deviation are often improved by medical therapy. A diagnostic and therapeutic challenge is encountered with similar patients who fail all modalities of medical therapy and continue to have complaints of nasal obstruction. Surgical correction of the minimal anatomic obstruction may provide the patient with improved symptoms. The surgical correction of minimally obstructing turbinate hypertrophy and/or nasal septal deviation may be the patients only therapeutic option after failed medical therapy. The benefit to the patient with minimal anatomic obstruction is not clearly defined. This study evaluates the subjective improvement in nasal symptoms following surgical correction of minimal anatomic obstruction.

Methods: A retrospective review of twelve patients is presented who failed all modalities of medical therapy. All patients were treated with surgical correction at a tertiary care hospital and its affiliates. The patients underwent survey of nasal obstruction, pre and postoperatively.

Results: Patient's preoperative and postoperative surveys of nasal obstruction are presented. Patient's improvement in symptoms varies with the surgical procedure preformed.

Conclusions: Treatment of nasal obstruction often includes both medical and surgical therapy. Many patients continue to present after failed medical therapy with minimal physical findings of anatomic obstruction. Surgical correction is an option for treatment of such nasal obstruction and can provide the patient with improvement in symptoms.

Angiogenic Squamous Dysplasia in the Nasal Sinus Mucosa, A New Clinical Entity

Bruce W. Jafek, MD
Trudi Woodson, MD
Sherif Said, MD
Denver, CO

Keith, et al, have described Angiogenic Squamous Dysplasia (ASD) in the lung epithelium of patients at high risk for the development of lung carcinoma. This is a qualitatively distinct form of angiogenesis in which there is architectural rearrangement of capillary microvasculature. The rearrangement results in a unique lesion consisting of capillary blood vessels closely juxtaposed to and projecting into metaplastic or dysplastic epithelium. Genetic analysis of surface epithelium in a random subset of lesions revealed loss of heterozygosity at chromosome 3p in 53% of ASD lesions. No confirmed p53 mutations were identified. Compared with normal epithelium, proliferative activity was markedly elevated in ASD lesions. ASD occurred in 54 or 158 (34%) of high-risk smokers without carcinoma and in 6 of 10 with squamous carcinoma who underwent detailed fluorescence bronchoscopy. The presence of this lesion in high-risk smokers suggested to the authors that the aberrant pattern of microvascularization may occur at an early stage of bronchial carcinogenesis and be part of the multistep sequential morphological and molecular process preceding invasive lung cancer. (Keith, 2000) Following these observations, we were stimulated to seek similar changes in a series of sinus and nasal surgical specimens and found this same lesion in a limited number of specimens. While these lesions were identical histologically to those found in the lung, their significance is unknown. The histopathological and immunohistochemical characteristics of this lesion will be presented.

Conflict of interest: None

MEMBERSHIP

FELLOWS

Tom Abelson, MD
Beachwood, OH

Ronald Amedee, MD
New Orleans, LA

Vijay Anand, MD
New York, NY

Jack B. Anon, MD
Erie, PA

Nancy Appelblatt, MD
Sacramento, CA

Benjamin Asher, MD
Berlin, VT

Michael Avidano, MD
Stockbridge, GA

Gerald Bart, MD, FACS
Wichita, KS

Evan Bates, MD
Dallas, TX

Michael Benninger, MD
Detroit, MI

Philip Bernstein, MD
Sacramento, CA

Bill W. Berry, Jr., MD
Virginia Beach, VA

Bernard Bertrand, MD
B5530 Belgium

William Bolger, MD, FACS
Bethesda, MD

Timothy R. Boyle, MD
Marshfield, WI

Paul Brindley, MD
Houston, TX

Steven Buck, MD
Buffalo, NY

Duc Bui, MD
Westminster, CA

Robert Bumsted, MD
Chicago, IL

Richard Busch, MD
Bakersfield, CA

Thomas Calcaterra, MD
Los Angeles, CA

Karen Calhoun, MD
Galveston, TX

C. Ron Cannon, MD
Flowood, MS

James Chow, MD
Maywood, IL

Martin J. Citardi, MD
Cleveland, OH

Dean Clerico, MD
Kingston, PA

Lanny Close, MD
New York, NY

David B Conley, MD
Chicago, IL

Paul Cook, MD
Indianapolis, IN

Jacquelynne Corey, MD
Chicago, IL

Arthur Curtis, MD
Chicago, IL

Kim L. Dakin, MD
Opelousas, LA

John Del Gaudio, MD
Atlanta, GA

Hamilton Dixon, MD
Rome, GA

Norman Druck, MD
Chesterfield, MO

Robert Dunn, MD
Orange, CA

David Edelstein, MD
New York, NY

George Farrell, III, MD
Hobbs, NM

Berrylin Ferguson, MD
Pittsburgh, PA

Karen J. Fong, MD
Portland, OR

Marvin P. Fried, MD
Bronx, NY

William Friedman, MD
Saint Louis, MO

MEMBERSHIP

Andrew R. Ganz, MD
New York, NY

Seth M. Goldberg, MD
Rockville, MD

Michael Goldman, MD
Evanston, IL

M. Alan Goodson, MD
Birmingham, AL

Stephen D Goodwin, MD
Gretna, LA

Scott Graham, MD
Iowa City, IA

David Greene, MD
Naples, FL

Charles W. Gross, MD
Charlottesville, VA

James A Hadley, MD
Rochester, NY

Gady Har-El, MD
Hollis, NY

Hathaway E Harvey, MD
Chattanooga, TN

William Holmes, MD
Fairmont, MN

Norman Holzberg, MD
West Orange, NJ

Larry Hoover, MD
Kansas City, KS

Steven M. Houser, MD
Cleveland, OH

Mark J. Hoy, MD
Mt. Pleasant, SC

Scott Huebsch, MD
Cedar Rapids, IA

James Huerter, MD
Omaha, NE

Peter H. Hwang, MD
Portland, OR

Sande Irwin, MD
Vancouver, WA

Steven F. Isenberg, MD
Indianapolis, IN

Joseph Jacobs, MD
New York, NY

Bruce Jafek, MD
Denver, CO

Amin R. Javer, MD
Vancouver, BC

Sanjay Kantu, MD
Flushing, NY

Lawrence Kaufman, MD
Albany, NY

David Kennedy, MD
Philadelphia, PA

Eugene Kern, MD
Rochester, MN

Robert Kern, MD
Chicago, IL

Todd Kingdom, MD
Denver, CO

George G. Kitchens, MD
Montgomery, AL

Jay Klarsfeld, MD
Danbury, CT

Robert Knox, MD
Louisville, KY

Stilianos Kountakis, MD
Augusta, GA

Dennis Kraus, MD
New York, NY

Myles Krieger, MD
Hollywood, FL

Jeffrey Krivit, MD
Cedar Rapids, IA

John Krouse, MD, PhD
Detroit, MI

Frederick Kuhn, MD
Savannah, GA

Andrew Lane, MD
Baltimore, MD

Donald C. Lanza, MD
Cleveland, OH

Jeffrey LeBenger, MD
Summit, NJ

MEMBERSHIP

Donald Leopold, MD, FACS
Omaha, NE

Neal Lofchy, MD
Chicago, IL

Frank Lucente, MD
Brooklyn, NY

Charles H. Mann, MD
Cary, NC

Steven C Marks, MD
Havre de Grace, MD

Bradley F Marple, MD
Dallas, TX

Thomas McCaffrey, MD
Tampa, FL

F. Anthony McLeod, MD
Alexander City, AL

Ralph Metson, MD
Boston, MA

Joseph Mirante, MD
Ormond Beach, FL

Eric J Moore, MD
Rochester, MN

H. Christopher Moore, MD
Fullerton, CA

John Richard Morris, Jr., MD
Louisville, KY

H. Bryan Neel, III, MD, Phd
Rochester, MN

Erik G Nelson, MD
Gurnee, IL

Leonard Newton, MD
Ithaca, NY

Quoc Nguyen, MD
Huntington Beach, CA

Richard Orlandi, MD
Salt Lake City, UT

Laura Orvidas, MD
Rochester, MN

John Osguthorpe, MD
Charleston, SC

John Pallanch, MD
Sioux City, Ia

William Panje, MD
Chicago, IL

Thomas Pasic, MD
Madison, WI

William E Pate, MD
DeLand, FL

Elizabeth Payne, MD
Minneapolis, MN

Robert Pincus, MD
New York, NY

James Pitcock, MD
Mobile, AL

Jeffrey Powell, MD, DDS, FACS
Chesapeake, VA

B Manrin Rains, MD
Memphis, TN

Hassan H Ramadan, MD
Morgantown, WV

Mark Reinke, MD
Green Bay, WI

Anthony Reino, MD
New York, NY

Dale Rice, MD
Los Angeles, CA

Arthur Rosner, MD
Sterling Hts., MI

Edwin B. Jr. Ross, MD
Gretna, LA

Steven Schaefer, MD
New York, NY

Jerry Schreibstein, MD
Springfield, MA

Allen Seiden, MD
Cincinnati, OH

Bruce S Selden, MD
Coral Springs, FL

Reuben Setliff, III, MD
Sioux Falls, SD

Gavin Setzen, MD
Albany, NY

Michael Setzen, MD
Manhasset, NY

MEMBERSHIP

Adam Shapiro, MD
St. Thomas, VI

David Sherris, MD
Rochester, MN

Timothy Siglock, MD
Jefferson Valley, NY

Seth Silberman, MD
Solon, OH

Michael J. Sillers, MD
Birmingham, AL

Joe Frank Smith, MD
Dothan, AL

Ahmed M.S. Soliman, MD
Philadelphia, PA

James Stankiewicz, MD
Maywood, IL

Bruce Sterman, MD
Fairlawn, OH

Michael Stevens, MD
Sandy, UT

Michael Stewart, MD
Houston, TX

Fred J. Stucker, MD
Shreveport, LA

Krishnamurthi Sundaram, MD
FACS
Brooklyn, NY

Ronnie Swain, Sr., MD
Mobile, AL

Thomas Tami, MD
Cincinnati, OH

Robert Taylor, MD
Durham, NC

Paul Toffel, MD
Glendale, CA

Robert Toohill, MD
Milwaukee, WI

Richard Trevino, MD
San Jose, CA

Ralph Tyner, MD
Davenport, IA

Winston Vaughan, MD
Stanford, CA

Richard Waguespack, MD
Birmingham, Al

Welby Winstead, MD
Louisville, KY

Gregory Wolf, MD
Ann Arbor, MI

Arthur Wood, MD
Boardman, OH

Bilal Zaatari, MD
LEBANON

Gerald Zahtz, MD
Jamaica, NY

REGULAR

David A. Abraham, MD
Thief River Falls, MN

Robert A Akins, MD
Sioux Falls, SD

Paul Alberti, MD
North Haven, CT

Vinod Anand, MD
Jackson, MS

J. Noble Anderson, Jr., MD
Montgomery, AL

Thomas Andrews, MD
Saint Petersburg, FL

Joel Anthis, MD
Katy, TX

Sanford Archer, MD
Lexington, KY

Richard Arden, MD
Sterling Heights, MI

Harold Arlen, MD
South Plainfield, NJ

Michael Armstrong, MD
Richmond, VA

Joseph Atkins, Jr, MD
Philadelphia, PA

Mitchell B. Austin, MD
Evans, GA

H. Clifford Baggett, MD
Rocky Mount, NC

MEMBERSHIP

Sean Bailey, MD
Saint Louis, MO

Leslie L Baker, MD
Knoxville, TN

Stephen Bansberg, MD
Scottsdale, AZ

Darryk W. Barlow, MD
Portland, OR

Phillip Bartlett, MD
San Francisco, CA

James Barton, MD
Milwaukee, WI

Mark R. Bassett, MD
Spokane, WA

Pete Batra, MD
Cleveland, OH

William Bauer, MD
Newnan, GA

Daniel Becker, MD
Philadelphia, PA

Ernest Behnke, MD
Ashland, KY

Ann Bell, MD
Waverly, IA

William Belles, MD PC
Buffalo, NY

Carlos Benavides, MD
Manchester, CT

Thomas Benda, Jr., MD
Dubuque, IA

John Bent, MD
New York, NY

Leslie Berghash, MD
Port Saint Lucie, FL

Gerald Berke, MD
Los Angeles, CA

Joel M Bernstein, MD
Getzville, NY

Shelley R Berson, MD
Bardonia, NY

Michael Bertino, MD
San Antonio, TX

Nikhil Bhatt, MD
Elgin, IL

Neil Bhattacharyya, MD
Boston, MA

Andrew Blank, MD
Bayside, NY

Andrew Blitzer, MD
New York, NY

Charles Bluestone, MD
Pittsburgh, PA

Peter Boesen, MD
Des Moines, IA

Ann Bogard, MD
Winston Salem, NC

Robert E. Bonham, MD
Dallas, TX

Joseph Houston Bosley, MD
Shreveport, LA

Robert Boucher, MD
Winchester, VA

David Bowling, MD
Stoneham, MA

John Boyajian, MD
Boise, ID

Cheryl Braud, MD
Baton Rouge, LA

J. George Braun, MD
New York, NY

Jack Breaux, Jr., MD
Baton Rouge, LA

Robert Bridge, MD
Phoenix, AZ

William Briggs, MD
Arlington, TX

Jeffrey E. Brink, MD
Jacksonville Beach, FL

Kenneth Briskin, MD
Chester, PA

Orval E. Brown, MD
Dallas, TX

James Bryant, MD
Clarksburg, WV

John Buenting, MD
Raleigh, NC

Nicolas Busaba, MD
Boston, MA

MEMBERSHIP

David Caldarelli, MD
Chicago, IL

John Campbell, MD
Tulsa, OK

Dwayne T. Capper, MD
Iowa City, IA

Henry M Carder, MD
Dallas, TX

Peter Casano, MD
Flowood, MS

Roy Casiano, MD
Miami, FL

Peter Joseph Catalano, MD, FACS
Burlington, MA

Fayez Chahfe, MD
Utica, NY

Jerry Chapnik, MD
M5G 1X5 Canada,

Bradley J. Chastant, MD
Lafayette, LA

Rashid Chaudhry, MD
Brooklyn, NY

Wenfu Chen, MD
Chillicothe, OH

Alexander Chester, MD
Washington, DC

Dewey Christmas, Jr., MD
Dayton Beach, FL

William Cobb, MD
Plano, TX

D. Thane Cody, II, MD
Keokuk, IA

J. Robert Coltharp, Jr., MD
Hattiesburg, MS

Ted Cook, MD
Portland, OR

Rachel Cormier, MD
Geneva, NY

Peter D. Costantino, MD
New York, NY

Steven Coutras, MD
Cumberland, MD

Richard T. Crane, MD
Eau Claire, WI

Roger Crumley, MD
Orange, CA

Agnes Czibulka, MD
Guilford, CT

Kamal Daghistani, MD
Saudi Arabia,

Lawrence Danna, MD
West Monroe, LA

Terence Davidson, MD
San Diego, CA

William Davidson, MD
Lawrenceville, NJ

R. Alan Davis, MD
Bristol, TN

Spiros Davris, MD
Greece

Douglas Dawson, MD
Muscatine, IA

Richard Dawson, MD
Oklahoma City, OK

Larry H. Day, MD
Hattiesburg, MS

Richard De Persio, MD
Knoxville, TN

Thomas De Tar, MD
Post Falls, ID

Richard De Vore, MD
Cincinnati, OH

Richard J Depersio, MD
Knoxville, TN

Martin Desrosiers, MD
Canada,

Michael DeVito, MD
Albany, NY

David Dinges, MD
Dalton, GA

Peter Doble, MD
Twin Falls, ID

Thomas Dobleman, MD
Omaha, NE

Paul Donald, MD
Sacramento, CA

MEMBERSHIP

James Donegan, MD
Lebanon, NH

Glenn Drumheller, DO
Everett, WA

Larry Duberstein, MD
Memphis, TN

Wallace Duff, MD
Omaha, NE

Thane Duncan, MD
Cordova, Tn

James Duncavage, MD
Nashville, TN

Dory Durr, MD
Outremont, Quebec, Canada

Andrew Dzul, MD
St Clair Shrs, MI

John E. Eisenbeis, MD
Saint Louis, MO

Lee Eisenberg, MD
Englewood, NJ

E.Scott Elledge, MD
Birmingham, AL

Ivor A. Emanuel, MD
San Francisco, CA

Precha Emko, MD
Syracuse, NY

Joel Ernster, MD
Colorado Springs, CO

Karin Evan, MD
Minneapolis, MN

Akram Farag, MD
Mansfield, OH

Robert Faries, MD
Torrance, CA

Kenneth H. Farrell, MD
Fort Lauderdale, FL

Russell Faust, MD, PhD
Detroit, MI

Bruce Feldman, MD
Chevy Chase, MD

Robert Fieldman, MD
West Orange, NJ

Samuel Fisher, MD
Durham, NC

Robert A. Fishman, MD
St Clair Shrs, MI

Phillip B. Flexon, MD
Savannah, GA

Ray Fontenot, Jr., MD
Beaumont, TX

Mark L. Fox, MD
Scarsdale, NY

Michael D. Franklin, MD
Topeka, KS

Stephen Freifeld, MD
Springfield, NJ

Saul Frenkiel, MD
Canada H3T 1E2,

Rebecca Gaughan, MD
Olathe, KS

Clarence Gehris, MD
Witherville, MD

Mark E. Gerber, MD
Evanston, Il

Roland Gerencer, MD
Albequerque, NM

Franklyn Gergits, MD
Berwick, PA

John Gerwin, MD
Birmingham, AL

Nathan A. Geurkink, MD
Lebanon, NH

Paul Gittelman, MD
Mamroneck, NY

Richard Gliklich, MD
Boston, MA

Bradley E. Goff, MD
Cartersville, GA

Scott Gold, MD
New York, NY

Andrew Goldberg, MD
San Francisco, CA

Andrew Golde, MD
Atlanta, GA

Earl Golightly, MD
Griffin, GA

Richard L. Goode, MD
Stanford, CA

MEMBERSHIP

Roy Goodman, MD
White Lake, MI

Harsha Gopal, MD
Boston, MA

Benoit Gosselin, MD
Lebanon, NH

Jon Graham, MD
South Miami, FL

William Gross, MD
Murfreesboro, TN

Barbara Guillette, MD
Cranston, RI

Patrick Gullane, MD
Toronto, ON, Canada

Ray O. Gustafson, MD
Rochester, MN

Jose Gutierrez-Marcos, MD
MEXICO

Avraham Hampel, MD
Elkins Park, PA

Steven Handler, MD
Philadelphia, PA

William Harmand, MD
Syracuse, NY

Willard C. Harrill, MD
Hickory, NC

Monte O. Harris, MD
Ann Arbor, MI

Scott Edwin Harrison, MD
Jackson, MS

Makoto Hasegawa, MD
Tokyo - 6206 - JAPAN

Richard Haydon, III, MD
Lexington, KY

H. Hearnsberger, III, MD
Little Rock, AR

Arthur Hengerer, MD
Rochester, NY

David Henick, MD
Fort Lee, NJ

Daniel Hinckley, MD
Idaho Falls, ID

Ken-ich Hisamatsu, MD
Tokyo 101-8309 JAPAN

Khanh-Gien Hoang, MD
Charleston, SC

Seok-Chan Hong, MD
SOUTH KOREA

Carl T. Hook, MD, FACS
Norman, OK

Hunter Hoover, MD
Charlotte, NC

John Houck, MD
Oklahoma City, OK

Mark Howell, MD
Johnson City, TN

Abraham Hsieh, MD
Walnut Creek, CA

Kenneth Hughes, MD
Lexington, KY

Michael K. Hurst, MD
Morgantown, WV

Donald Ingram, MD
Festus, MO

William David Isenhower, MD
Greenwood, SC

Steven Issenberg, MD
Lewisburg, WV

Ian N. Jacobs, MD
Philadelphia, PA

John A. Jebeles, MD
Birmingham, AL

John Jiu, MD
Jonesboro, AR

Stephanie Joe, MD
Chicago, IL

Jonas Johnson, MD
Pittsburgh, PA

Jordan Josephson, MD
New York, NY

Charles Juarbe, MD
Bayamon, PR

Slobodan Jugo, MD
Greenville, KY

David Kaba, MD
Williston, ND

Zoheir J. Kaiser, MD
South Hill, VA

MEMBERSHIP

John Kalafsky, MD
Norfolk, VA

Jan L. Kasperbauer, MD
Rochester, MN

Edward Kass, MD
Waukesha, WI

Matthew Kates, MD
New Rochelle, NY

George Katsantonis, MD
St. Louis, MO

John Keebler, MD
Mobile, AL

Stephen M Kelanic, MD
Aurora, IL

Michael Kelleher, MD
Salisbury, MD

Robert M. Kellman, MD
Syracuse, NY

Jeffrey Kerner, MD
Lake Sucess, NY

Marc Kerner, MD
Northridge, CA

Thomas Kidder, MD
Milwaukee, WI

Charles Kimmelman, MD
New York, NY

Ronald Kirkland, MD
Jackson, TN

Jeffrey Kirsch, MD
Conway, AR

Joost L Knops, MD
Bellingham, WA

Robert Komorn, MD
Houston, TX

Charles Koopmann, Jr., MD
Ann Arbor, MI

Gary P Landrigan, MD
Burlington, VT

Arthur M. Lauretano, MD
Chelmsford, MA

William Lawson, MD, DDS
New York, NY

Amy D. Lazar, MD
Summerville, NJ

Robert Lebovics, MD
New York, NY

Richard Lebowitz, MD
New York, NY

Dennis Lee, MD, MPH
Bloomington, IL

Kelvin Lee, MD
New York, NY

Phillip Lee, MD
Mason City, IA

Sherrod Lee, MD
Peru, IL

Raymond Lesser, MD
Ardmore, PA

Howard L. Levine, MD
Cleveland, OH

Meron Levitats, MD
Lighthouse Point, FL

Robert G. Lisk, MD
Ellicott City, MD

Philip Liu, MD
Honesdale, PA

Drew Locandro, MD
Marietta, GA

Todd A. Loehrl, MD
Wauwatosa, WI

Lloyd Loft, MD
New York, NY

Mark C. Loury, MD
Ft. Collins, CO

Ray J. Lousteau, MD
New Orleans, LA

Valerie Lund, MD
UNITED KINGDOM

Rodney Lusk, MD
Fort Collins, CO

Kiyoshi Makiyama, MD
101-8309 Japan

Bruce T. Malenbaum, MD
Durham, NC

Casey R. A. Manarey, MD
New York, NY

Aditi Mandpe, MD
San Francisco, CA

MEMBERSHIP

Jeffrey Manlove, MD
St. Paul, MN

Scott Manning, MD
Seattle, WA

Louis Mariotti, MD
Lakeville, PA

Pierre Martin, MD
Cortland, NY

Richard A Martin, MD
Cape Girardeau, MO

Brian L. Matthews, MD
Winston-Salem, NC

Kenneth Mattucci, MD
Manhasset, NY

Robert McDonald, MD
Jefferson City, MO

Guy McFarland, MD
Iowa City, IA

Michael A. McGhee, MD
Benton, AR

John McMahan, MD
Chicago, IL

Mark Mehle, MD
Lakewood, OH

Robert Merrell, Jr., MD
Daytona Beach, FL

W. Davis Merritt, MD
Boise, ID

Janet Mertz, MD
Kansas City, MO

Robert Meyers, MD
Deerfield, IL

Harry C Midgley, III, MD
Jupiter, FL

David Milko, MD
Kalamazoo, MI

Pradip Mistry, MD
Norfolk, NE

Jeanne Renee Moneyhun, MD
Rockville, MD

Denise C. Monte, MD
E. Setauket, NY

J. Spencer Mooney, MD
Brookhaven, MS

Alice Morgan, MD
Cullman, AL

Charles Morgan, MD
Birmingham, AL

David R Morledge, MD
Bakersfield, CA

Todd Morrow, MD
West Orange, NJ

Richard A. Morton, Jr., MD
El Paso, TX

Ron L. Moses, MD
Houston, TX

Brooks Mullen, MD
Sequin, TX

Harlan Muntz, MD
Salt Lake City, UT

Michael P Murphy, MD
Minneapolis, MN

Andrew Murr, MD
San Fransisco, CA

John Murray, MD
West Palm Beach, FL

Robert Naclerio, MD
Chicago, IL

Ravi Nadarajah, MD
Indiana, PA

Matthew Nagorsky, MD
Philadelphia, PA

David Nash, MD
Stoneham, MA

Michael Neuenschwander, MD
Riverdale, GA

Brad Nitzberg, MD
Boca Raton, FL

Michael Nordstrom, MD
Milwaukee, WI

Joel Norris, MD
West Monroe, LA

Frederick Nunnally, MD
Dothan, AL

John O'Neill, MD
Westfield, MA

Robert Oberhand, MD
Westfield, NJ

MEMBERSHIP

Michael Paciorek, MD
Syracuse, NY

Ariadna Papageorge, MD
New York, NY

Michael Papsidero, MD
Garden Heights, OH

Albert Park, MD
Salt Lake City, UT

Nigel Pashley, MD
Denver, CO

Curtis J Perry, MD
East Greenwich, RI

Steven Peskind, MD
Plano, TX

Gary Petrus, MD
N Little Rock, AR

Perry Phillips, MD
Sheboygan, WI

Jay Piccirillo, MD
Saint Louis, MO

William Pierce, MD
Batavia, NY

Stephen Pincus, MD
Marina Del Rey, CA

Alan Pokorny, MD
Park City, UT

Louis Portugal, MD
Chicago, IL

Edward Porubsky, MD
Augusta, GA

William Potsic, MD
Philadelphia, PA

W. Bruce Povah, MD
Canada

John C. Price, MD
Lutherville, MD

Jordan Pritikin, MD
Chicago, IL

Timothy Queen, MD
Newport News, VA

Chris Quilligan, MD
Fulelrton, CA

Sherif Ragheb, MD
Moline, IL

Douglas E. Rapisarda, MD
Two Rivers, WI

Edward Reardon, MD
Quincy, MA

Seth Reiner, MD
Littleton, CO

Bruce Reisman, MD
Oceanside, CA

Harry J. Richter, Jr., MD
Belfast, ME

William Richtsmeier, MD, PhD
Cooperstown, NY

Donald Rochen, DO
West Bloomfield, MI

Anthony Rogerson, MD
Monroe, WI

John H Romanow, MD
Burlington, MA

J. Lewis Romett, MD
Colorado Spring, CO

Thomas Romo, III, MD
New York, NY

Inell C. Rosario, MD
Woodbury, MN

Roger Rose, MD
S. Salem, NY

Seth Rosenberg, MD FACS
Sarasota, FL

Louis Rosner, MD
Rockville Center, NY

Douglas Ross, MD
New Haven, CT

Eugene Ross, MD
Randolph, NJ

C. Allan Ruleman, Jr., MD
Memphis, TN

Pedro J Rullan-Marin, MD
San Juan, Pr

Alain Sabri, MD
Rochester, MN

Michael Sachs, MD
New York, NY

Salah Salman, MD
Boston, MA

MEMBERSHIP

Anthony Sanders, MD
Columbus, IN

J. R. Sarpa, MD
Bloomington, IN

Michael Saylor, MD
Hagerstown, MD

Stanley Schack, MD
Omaha, NE

Scott Schaffer, MD
Voorhees, NJ

Barry Schatikin, MD
Pittsburgh, PA

Michael Scherl, MD
Westwood, NJ

Todd Schneiderman, MD
Bridgewater, NJ

Michael L Schwartz, MD
West Palm Beach, FL

Susan Schwartz, DO
Farm Hills, MI

Michael Seicshnaydre, MD
Gulfport, MS

Peter Selz, MD
Denison, TX

Brent Senior, MD, FACS
Chapel Hill, NC

Anthony Sertich, Jr., MD
San Antonio, TX

Merritt Seshul, MD
Murfreesboro, TN

Guy Settipane, MD
Providence, RI

Howard Shaffer, MD
Fort Worth, TX

Frank Shagets, Jr., MD
Joplin, MO

Udayan K. Shah, MD
Philadelphia, PA

Stanley Shapshay, MD
Boston, MA

Daniel Sharkey, MD
Stuart, FL

Pramod Kumar Sharma, MD
Salt Lake City, UT

Michael B. Shaw, MD
Tulsa, OK

Alan Shikani, MD
Baltimore, MD

David Shoemaker, MD
Greensboro, NC

Michael Shohet, MD
New York, NY

Joseph Siefker, MD
Meridian, MS

Steven Silver, MD
Albany, NY

John Simmons, MD
Jasper, AL

George Simpson, MD
Buffalo, NY

Abraham Sinnreich, MD
Staten Island, NY

David Slavit, MD
New York, NY

Bruce M. Smith, MD
Fort Collins, CO

Timothy L. Smith, MD, MPH
Milwaukee, WI

Gary Snyder, MD
Bayside, NY

Carl Snyderman, MD
Pittsburgh, PA

Raymond Soletic, MD
Manhasset, NY

Robert Spears, MD
San Antonio, TX

James Spoden, MD
Cedar Rapids, IA

Sarah Stackpole, MD
Yonkers, NY

Kirk Steehler, DO
Erie, PA

Vernon H. Stensland, MD
Sioux Falls, SD

Gerald Stinziano, MD
Buffalo, NY

J. Pablo Stolovitzky, MD
Snellville, GA

MEMBERSHIP

William Stone, MD
Concord, NH

John Stram, MD
Boston, MA

Victor Strelzow, MD
Irvine, CA

Scott P. Stringer, MD, MS, FACS
Jackson, MS

Marshall Strome, MD
Cleveland, OH

Edward Bradley Strong, MD
Sacramento, CA

Mariel Stroschein, MD
Scottsdale, AZ

Joseph Sugerman, MD
Beverly Hills, CA

Robert F. Tarpy, MD
Lafayette, LA

Barry Tatar, MD
Glen Burnie, MD

Sherard Tatum, MD
Syracuse, NY

John Taylor, MD
La Mesa, CA

Jeffrey Terrell, MD
Ann Arbor, MI

Erica Thaler, MD
Philadelphia, PA

Stanley Thawley, MD
Saint Louis, MO

Lawrence Tom, MD
Philadelphia, PA

Stephen Toner, MD
Panama City, Fl

William Trimmer, MD
Reno, NV

Paul Vastola, MD
Brooklyn, NY

Giri Venkatraman, MD
Atlanta, GA

Thomas Viner, MD
Iowa City, IA

Eugenia Vining, MD
New Haven, CT

David Volpi, MD
New York, NY

Robert Ward, MD
New York, NY

Mark Wax, MD
Portland, OR

Dudley Weider, MD
Lebanon, NH

Debra Weinberger, MD
Cody, WY

Samuel Welch, MD, PHD
Little Rock, AR

Barry Wenig, MD
Chicago, IL

Ralph F Wetmore, MD
Philadelphia, PA

Ernest A. Weymuller, Jr., MD
Seattle, WA

Ronald Whitmire, MD
Gainesville, GA

Robert Williams, MD
East Aurora, NY

Leslie Williamson, MD
San Angelo, TX

Hobson L. Wilson, MD
Rockfledge, FL

Birgit Winther, MD
Charlottesville, VA

B Tucker Woodson, MD
Milwaukee, WI

J Robert Wyatt, MD
Mesquite, TX

Ken Yanagisawa, MD
New Haven, CT

Kathleen Yaremchuk, MD
Dearborn, MI

James Yee, MD
Folsom, CA

Matthew Yetter, MD
Colorado Springs, CO

Anthony Yonkers, MD
Omaha, NE

Warren H. Zelman, MD
Garden City, NY

MEMBERSHIP

ASSOCIATE

Mouwafak Muflih Al-Rawi, MD
Philadelphia, PA

Jeffrey Block, MD
Green Bay, WI

George Boris, MD
Culver City, CA

V. Richard Bowen, MD
Omaha, NE

Holly Christine Boyer, MD
Minneapolis, MN

Amy C. Brenski, MD
Dallas, TX

Brian Broker, MD
Narbeth, PA

Grady L. Bryant, Jr., MD
Hermitage, TN

Brad Buell, MD
Bismarck, ND

Andrew Campbell, MD
Sheboygan, WI

Harry Cantrell, MD
Camden, NJ

Daniel G. Carothers, MD
Chicago, IL

Stephen J. Chadwick, MD
Decatur, IL

Rakesh K Chandra, MD
Germantown, TN

Christopher Church, MD
Loma Linda, CA

Randall Cohen, MD
Tuscon, AZ

Daryl G Colden, MD
Lawrence, MA

Matthew Cosenza, DO
Chillicothe, OH

Michael Crawford, MD PC
Council Bluffs, IA

Michael Cruz, M.D., F.A.C.S.
Spokane, WA

Angela Damiano, MD
West Harrison, NY

Timothy D. Doerr, MD
Rochester, NY

Blanca I. Durand, MD
stockbridge, GA

Jay Dutton, MD
Chicago, IL

Moshe Ephrat, MD
New Hyde Park, NY

Jeffrey Fenwick, MD
Charleston, SC

Rick A. Fornelli, MD
Fairview, PA

Stephen Froman, MD
Coraopolis, PA

Ryan Gallivan, MD
Bend, OR

Elaina George, MD
Atlanta, GA

Randal B Gibb, MD
Payson, UT

Paulino E. Goco, MD
Murfreesboro, TN

Steven Goldman, MD
Beachwood, OH

John Griffin, MD
Macon, GA

Anil Gungor, MD
Pittsburgh, PA

Ronda Hamaker, MD
Indianapolis, IN

Firas Hamdan, MD
Perry, FL

Joseph Han, MD
Charlottesville, VA

Scott Hardeman, MD
St. Louis, MO

Richard L. Hebert, II, MD
Eunice, LA

Julius Hicks, MD
Birmingham, AL

Denis Hoasjoe, MD
Baytown, TX

Bruce Hudkins, MD
Tulsa, OK

MEMBERSHIP

Darrell Hunsaker, MD
San Diego, CA

Steve Hunyadi, Jr, MD
Wooster, OH

Hanil Ibrahim, MD
Quincy, MA

Hong-Ryul Jin, MD
Cheongju, SOUTH KOREA

Ashutosh Kacker, MD
New York, NY

Ken Kazahaya, MD
Philadelphia, PA

Savvas Kazanas, MD
GREECE

Daniel R. Keech, MD
Athens, TX

Matthew Kienstra, MD
Tampa, FL

Jean Kim, MD
Baltimore, MD

R. R. Leinhardt, MD
New York, NY

Jessica Lim, MD
Brooklyn, NY

Kenneth Mak, MD
Modesto, CA

Kanit Muntarbhorn, MD
Bankok, Thailand

Alfred Neumann, MD
Mobile, AL

Ralph Glen Owen, Jr., MD
Augusta, GA

James Palmer, MD
Philadelphia, PA

Raymond V. Paolini Jr., MD
Buffalo, NY

Alpen Patel, MD
Washington, DC

Bruce Peters, DO
Toms River, NJ

Charles Petrillo, MD
Clinton, CT

Christine Puig, MD
Auburn, WA

Ronald Pulli, MD
Pittsford, NY

Melissa Pynnonen, MD
Ann Arbor, MI

Jean-Jacques Rafie, MD
McKinney, TX

William J. Remington, MD
Decorah, IA

Seth Riddle, MD
Provo, UT

Jeffrey Roach, MD
Newton, MA

Shawn E. Rogers, MD
Edmonds, WA

Deborah Rosin, MD
Martinsville, NJ

Edward Rubin, MD
Denville, NJ

David Rudman, MD
Overland Park, KS

Charles Ruhl, MD
Providence, RI

Matthew W. Ryan, MD
Galveston, TX

Kelly Rydlund, MD
Lafayette, CO

Hamed Sajjadi, MD
San Jose, CA

Ali Sajjadina, MD
Pittsburgh, PA

Rodney J. Schlosser, MD
Charleston, SC

Nina Shapiro, MD
Los Angeles, CA

Beatrice Smith, MD
Anniston, AL

Doron Sommer, MD
CANADA

Ira Stein, MD
West Palm Beach, FL

David Steward, MD
Cincinnati, OH

Ron Swain, Jr., MD
Mobile, AL

MEMBERSHIP

Lisa Szubin, MD
Englewood, NJ

Hilary Timmis, Jr., MD
Bellvue, OH

Ewen Tseng, MD
Plano, TX

Charles Tucker, MD
West Hartford, CT

Mahlon VanDelden, MD
Evansville, IN

Michael Vietti, MD
Mansfield, OH

Glenn Waldman, MD
Los Angeles, CA

Manish Wani, MD
Katy, TX

Kurtis A. Waters, MD
Brainerd, MN

Edward Weaver, MD, MPH
Seattle, WA

Jeffrey Werger, MD FRCSC FACS
CANADA

Mark Wilson, MD
Saugatuck, MI

Erin Daniel Wright, MD
CANADA N6A 5B3

Bozena Barbara Wrobel
Omaha, NE

James Yeh, MD
Rockville, MD

Gregory Zachmann, MD
Roanoke, VA

Jill F. Zeitlin, MD
Pleasantville, NY

Jeffrey M Zimmerman, MD
Amherst, NH

RESIDENT

Chad Afman, MD
Cincinnati, OH

Lee Michael Akst, MD
Cleveland, OH

Phillip G Allen, MD
Albany, GA

Bryan Ambro, MD
Philadelphia, PA

Manali S. Amin, MD
Omaha, NE

Steven W. Barthel, MD
Cleveland, OH

Benjamin Bassichis, MD
Dallas, TX

Rami Batniji, MD
Albany, NY

Eric Baum, MD
Philadelphia, PA

Mary Beauchamp, MD
Maywood, IL

Garrett H. Bennett, MD
New York, New York

Richard T. Bergstrom, MD
Shaker, OH

DOV BLOCH, MD OTO
San Francisco, CA

David Bradley Bobbitt, MD
Cincinnati, OH

Michiel Bove, MD
Bronx, NY

Rebecca Brandsted, MD
St. Louis, MO

Russell Deane Briggs, MD
Galveston, TX

John Brockenbrough, MD
Maywood, IL

Laura Brown, MD
Birmingham, AL

Edward D Buckingham, MD
Galveston, TX

Jose Busquets-Ferriol, MD
San Juan, PR

Henry Frederick Butehorn III, MD
Albany, NY

Allen Butler, MD
Augusta, GA

Sydney Butts, MD
Bronx, NY

MEMBERSHIP

Benjamin Cable, MD
Iowa City, IA

Gerard Carvalho, MD
Redwood City, CA

Jon Chadwell, MD
Cincinnati, OH

Stephen W. Chandler, MD
Morgantown, WV

Binoy Chandy, MD
Shreveport, LA

Daniel Charous, MD
Philadelphia, PA

Scott Chiang, MD
Los Angeles, CA

Alexander Chiu, MD
Philadelphia, PA

Michael Cho, MD
San Francisco, CA

Kyle Choe, MD
New York, NY

Sung J Chung, MD
Crescent Springs, ky

Noam Cohen, MD
Philadelphia, PA

C. Michael Collins, MD
Cincinnati, OH

James Connolly, MD
Jackson, MS

Anthony J Cornetta, MD
Philadelphia, PA

Jason Cundiff, MD
Chicago, IL

Linda Dahl, MD
Bronx, NY

Myra Danish, MD
West Bloomfield, MI

George S Dawson, MD
Morgantown, WV

Michael Decherd, MD
Dallas, TX

David Denman, MD
Omaha, NE

Paul Di Biasse, MD
Steubenville, OH

William Dickey, MD
Chicago, IL

E. Nicholas Digges, MD
Omaha, NE

Joni Kristin Doherty, MD
Topanga, CA

David Donaldson, MD
Buffalo, NY

Alexander Donath, MD
St. Louis, MO

Wilson Dumornay, MD
Bronx, NY

Emily E. Epstein, MD
St. Louis, MO

Michelle Lee Facer, MD
Rochester, MN

Patrick C. Farrell, MD
Omaha, NE

Oren Friedman, MD
Philadelphia, PA

Michael A. Fritz, MD
Cleveland, Oh

Beverly Fulcher, MD
Jackson, MS

Chad Galer, MD
Omaha, NE

Suzanne K Galli, MD
New York, NY

Courtney West Garrett, MD
Chicago, IL

John Gavin, MD
Albany, NY

Bobak Ghaheri, MD
Portland, OR

Michael Gilbert, MD
Salt Lake City, UT

Matthew Don Gillihan, MD
Buffalo, Ne

Omar A. Gonzales-Yanes, MD
PUERTO RICO 00926

Quinton Gopen, MD
Los Angeles, CA

Joshua Gottschall, MD
Detroit, MI

MEMBERSHIP

Felicia J Grisham, MD
Nashville, TN

Neil D. Gross, MD
Portland, OR

Samuel Gubbels, MD
Porland, OR

Akash Gupta, MD
Cincinnati, OH

Jahmal Hairston, MD
Cincinnati, OH

Chris Hampson, MD
Maywood, IL

Christopher Hargunani, MD
Portland, OR

Kevin C. Harris, MD
Milwaukee, WI

Matthew Hearst, MD
Cincinnati, OH

Ryan Heffelfinger, MD
Philadelphia, PA

Edward Hepworth, MD
Albuquerque, NM

Brian Herr, MD
Maywood, IL

Samuel Hill, MD
Detroit, MI

Neil Hockstein, MD
Philadelphia, PA

Eric H. Holbrook, MD
Boston, MA

Raymond Howard, MD
Rome, GA

Kevin J Hulett, MD
Maywood, IL

Shannon Elizabeth Hunter, MD
Asheville, NC

Keith Hurvitz, MD
Los Angeles, CA

Masatuki Inouye, MD
Stanford, CA

Stacey Lynn Ishman, MD
Milwaukee, WI

Chandra Ivey, MD
Cincinnati, OH

Ofer Jacobowitz, MD
New York, NY

David Jakobowicz, MD
Bronx, NY

Kenneth Johnson, MD
Birmingham, AL

James Kallman, MD
Anchorage, AK

Madan N. Kandula, MD
Brookfield, WI

Seth Kanowitz, MD
New York, NY

Brian A. Kaplan, MD
Charlottesville, VA

Andrew Karpenko, MD
Detroit, MI

Srinivas Kaza, MD
Danville, PA

Mark L. Keller, MD
Omaha, NE

John D. Kilde, MD
Milwaukee, WI

Eugene Kim, MD
San Francisco, CA

Eugene J. Kim, MD
San Francisco, CA

Seungwon Kim, MD
Syracuse, NY

Sihun Alex Kim, MD
Detroit, MI

Robert E King, MD
Maywood, IL

Michael Kortbus, MD
New York, NY

Christina J Laane, MD
San Francisco, CA

Babak Larian, MD
Los Angeles, CA

Christopher Larsen, MD
Kansas City, KS

Bryan Leatherman, MD
Little Rock, AR

Jivianne Lee, MD
Los Angeles, CA

MEMBERSHIP

Walter Lee, MD
University Heights, OH

Jonathan M Levine, MD
Philadelphia, PA

Karen Lin, MD
New York, NY

Jonathan Lindman, MD
Birmingham, AL

David A Litman, MD
Johnstown, PA

Manuel Lopez, MD
Cincinnati, OH

Robert Lorenz, MD
Cleveland, OH

Lance Manning, MD
Rochester, MN

Belinda Mantle, MD
Birmingham, AL

Paul Martin, MD
Loma Linda, CA

Peter F Maurice, MD
Washington, DC

Clement McDonald, MD
Indianapolis, IN

James Wesley McIlwaine, MD
St. Louis, MO

Lee Ann McLaughlin, MD
New York, NY

Sean M McWilliams, MD
Birmingham, AL

Cem Meco, MD
AUSTRIA

Neelesh Mehendale, MD
Dallas, TX

Nicholas Mehta, MD
Cincinnati, OH

Jeremy Melker, MD
Gainsville, FL

Jonathan Mellema, MD
Cincinnati, OH

George A. Melnik, MD
Valparaiso, IN

Christopher Melroy, MD
Durham, NC

Tanya K. Meyer, MD
Milwaukee, WI

Oleg Militsakh, MD
Kansas City, KS

Robert S. Miller, MD
Cincinnati, OH

Timothy Miller, MD
Salt Lake City, UT

Ryan Mitchell, MD
Pontiac, MI

Christopher Muller, MD
Galveston, TX

Karsten Munck, MD
San Francisco, CA

Srikanth I Naidu, MD
Memphis, TN

Brian Neff, MD
Philadelphia, PA

Mark Nelson, MD
Cleveland, OH

Hoa Van Nguyen, DO
Calumet City, IL

Nghia Nguyen, MD
Detroit, MI

Thomas O'Donnell, MD
Danville, PA

Anit Patel, MD
Bronx, NY

Ankit M Patel, MD
Chicago, IL

Donald Perez, MD
Loma Linda, CA

Joel R Perloff, MD
Philadelphia, PA

Timothy Pine, MD
Reno, NV

Jayant M Pinto, MD
Chicago, IL

Steven Pletcher, MD
San Francisco, CA

Glen T. Porter, MD
Galveston, TX

Liana Puscas, MD
Sacramento, CA

MEMBERSHIP

Alexander Ramirez, MD
San Francisco, CA

Douglas Reh, MD
Portland, OR

Patrick Reidy, MD
Detroit, MI

Jacquelyn Reilly, MD
Sangus, MA

Dukhee Rhee, MD
Bayside, NY

Jeremy Richmon, MD
San Diego, CA

Anthony A. Rieder, MD
Waukesha, WI

Nabil M. Rizk, MD
EGYPT

Matthew Robertson, MD
Cincinnati, OH

Bret Rodgers, MD
Boise, ID

Alexander A Romashko, MD
Maywood, IL

Walter Rooney, MD
Cincinnati, OH

David Rosenberg, MD
New York, NY

Marc Rosenthal, MD
Sicklerville, NJ

Adam Ross, MD
Philadelphia, PA

John Ryzenman, MD
Cincinnati, OH

Bassem M. Said, MD
Cleveland, Oh

Frank Salamone, MD
Cincinnati, OH

Sharyar Samadi, MD
Philadelphia, PA

Mark Samaha, MD
CANADA

Ruwanthi Samaranayake, MD
Alameda, CA

Sreeedhar Samudrala, MD
Jackson, MS

Kenneth Sanders, MD
Shreveport, LA

Joseph Scharpf, MD
Cleveland, OH

Sara Scheid, MD
Philadelphia, PA

Michael Scheuller, MD
San Francisco, CA

James Schroeder, MD
Chicago, IL

Stacey L Schulze, MD
Milwaukee, WI

Heather Schwartzbauer, MD
Cincinnati, OH

Joseph Scianna, MD
Maywood, IL

Paul Scolieri, MD
Bethel Park, PA

Matthew Sdano, MD
Cincinnati, OH

Brook M. Seeley, MD
San Francisco, CA

Anand Shah, MD
Detroit, MI

Ashish Shah, MD
Cincinnati, OH

Shefari Shah, MD
Chicago, IL

Weiru Shao, MD
Minneapolis, MN

Samuel Shiley, MD
Portland, OR

Michel Siegel, MD
Houston, TX

Jason B Sigmon, MD
Omaha, NE

Damon Silverman, MD
Shaker Hts, OH

John Sinacori, MD
Syracuse, NY

Dana Smith, MD
Portland, OR

Ronald Smith, MD
Danville, PA

MEMBERSHIP

Mary C. Snyder, MD
Omaha, NE

Clementino Solares, MD
Cleveland Heights, OH

Andrew Ryan Specter, MD
Philadelphia, PA

Jeannine Stein, MD
Cleveland, OH

Michael Strodes, MD
Cleveland, OH

Howard Stupak, MD
San Francisco, CA

Das Subinoy, MD
Durham, NC

Greg Swanson, MD
Detroit, MI

Monica Tadros, MD
Washington, DC

Su Teoh, MD
Indianapolis, IN

Wyatt To, MD
Weston, FL

Vincent Toma, MD
W Bloomfield, MI

Hannah Vargas, MD
Albany, NY

Cheryl Varner, MD
Jackson, MS

T Venkatesan, MD
Chicago, IL

Raul Vila, MD
PUERTO RICO

Daniel Viner, MD
Iowa City, IA

Daniel D Vukas, MD
Matwood, IL

Bryan G Wachter, MD
Anchorage, AK

Curtis Walsh, MD
Maywood, IL

Bryan Wilcox, MD
Syracuse, NY

Mark Williams, MD
Cincinnati, OH

Sara K Wise, MD
Decatur, GA

Gabriel Wong, MD
Bronx, NY

Dorise Yang, MD
Chicago, IL

Thomas Yen, MD
San Francisco, CA

Dayton L. Young, MD
Omaha, NE

Philip Young, MD
Los Angeles, CA

Kathy Yu, MD
Carraboro, NC

David Yun, MD
Bronx, NY

Mark Zacharek, MD
Portland, OR

Warren Zager, MD
Philadelphia, PA

INTERNATIONAL

Eurico Almeida, MD
PORTUGAL 4050-115

Manuel Bernal-Sprekelsen, MD, PhD
Barcelona, Spain

Ozcan Cakmak, MD
Ankara, Turkey

A. Simon Carney, Dr.
South Australia

Kwai Onn Chan, MD
Vancouver, BC

Clive Anthony Chappel, MD
Australia NSW 2072

Seung-Kyu Chung, MD
Seoul, South Korea

Harvey Coates, MD
AUSTRALIA

Ricardo Sergio Cohen, MD
Argentina, SOUTH AMERICA

Carlos Cuilty-Siller, MD
Laredo, TX

MEMBERSHIP

Elimeleh Deutsch, MD
91004 ISRAEL

Imad El-Hayderi, MD
BELGIUM

Frank Elsworth, MD
AUSTRALIA

Samy S. Elwany, MD
EGYPT

Nizar Fakeeh, MD
SAUDI ARABIA

Andrew Gordon, MD
NEW ZEALAND

Jan Gosepath, MD
GERMANY

Robinson Granados, MD
Barranquilla, CO

Edgar Guerra, MD
06470 MEXICO

Moshe Harell, MD
ISRAEL

Alfredo Herrera, MD
Columbia,

Ahamefule Olu Ibekwe, MD
SAUDI ARABIA

Tasca Igmazio, MD
ITALY

Rong-San Jiang, MD
TAIWAN (ROC)

Suk-Chun Kim, MD
Sungnam, Kyonggi-do, KOREA

Milind. Kirtane, MD
INDIA, Maharashtr

J Michael Klossek, MD
FRANCE

Roee Landsberg, MD
ISRAEL

Ming-Ju Lee, MD
Falesburg, IL

Hsin-Ching Lin, MD, FARS
Feng Shang City, TAIWAN

Fausto-Infante Lopez, MD
MEXICO

Wolf Mann, MD
Mainz, GERMANY

Oleg Merculov, MD
RUSSIA

Damir Milicic, MD
Slavonski Brod, CROATIA, E

Ranko Mladina, MD
CROATIA 10.000

Mohsen Naraghi, MD
Tehran 15336, IRAN

Piero Nicolai, MD
Brescia, ITALY

T. Metin Onerci, MD
TURKEY

Pietro Palma, MD
ITALY

Kalpesh Patel, MD
London N3 1BD
UNITED KINGDOM

Pelayo Vilar Puig, MD
Edo. MEXICO 53920

Hwan-Jung Roh, MD
KOREA

Raymond Sacks, MD
AUSTRALIA

Tarik Sapci, MD
81070 TURKEY

Shlomo Sarfaty, MD
Tel Aviv, ISRAEL

Adrian Saurajen, MD
SINGAPORE 229862

Michael Strand, MD
5528 Hauugesund, NORWAY

Pongsakorn Tantilipikorn, MD
Bangkok, THAILAND

Diana Tobon, MD
Miami, FL

Matteo Trimarchi, MD
Milano, ITALY

Michael Vaiman, MD, PhD
ISRAEL

Leopoldo V?lez Rios, MD
MEXICO

Richard L. Voegels, MD
Sao Paulo, Brazil
SOUTH AMERICA

MEMBERSHIP

Hans-J Welkoborsky, MD, DDS, PhD
GERMANY

Peter Wormald, MD
Woodville South, SA

John Wyllie, MD
Lexington, KY

Altan Yildirim, MD
Sivas, TURKEY

Taskin Yucel, MD
TURKEY

HONORARY

Thomas McDonald, MD
Rochester, MN

EMERITUS

Stanley M. Blaugrund, MD
New York, NY

Charles Clark, III, MD
Durham, NC

James Dudley, MD
San Fransisco, CA

David Fairbanks, MD
Bethesda, MD

Tierry Garcia, MD
Indianapolis, IN

Howard Gelman, MD
Annapolis, MD

Eugene Hesdorffer, MD
Jackson, MS

Charles Kaluza, DO
Portland, OR

Herbert Kean, MD
Philadelphia, PA

Chandra Khasgiwala, MD
Andover, MA

Anthony Maniglia, MD
Cleveland, OH

Jean Marti, MD
Switzerland,

Robert McGrew, MD
Little Rock, AR

Winsor Morrison, MD
Hollister, MO

John Odess, MD
Chelsea, AL

Loring W. Pratt, MD
Fairfield, ME

Michael Riley, DO
Largo, FL

Alan Sogg, MD
Russell, OH

Edward Starinchak, MD
Granville, OH

M. Eugene Tardy, MD
Chicago, IL

Charles Wine, MD
Oklahoma City, OK

LIFE

Edward Brandow, Jr., MD
Albany, NY

Herbert Camp, MD
Midland, MI

Richard Carter, MD
Greenwood, SC

Gerald English, MD
Englewood, CO

George Facer, MD
Scottsdale, AZ

Ralph Gaskins, MD
Atlanta, GA

Harold Groves, DO
Eugene, OR

Sanford Hoffman, MD
Buffalo, NY

Frank L. Kardos, MD
Wayne, NJ

Assad Khoury, MD
Washington, NY

Michael Knowland, MD
South Portland, ME

Helen Krause, MD
Gibsonia, PA

MEMBERSHIP

William Lavelle, MD
Worcester, MA

Richard Mabry, MD
Duncanville, TX

William Mancoll, MD
Hartford, CT

Y. M. Naci, MD
Startford, CT

Supote Phipatanakul, MD
Valley Park, MO

Vittal Rao, MD
LaGrangeville, NY

Edward Razim, MD
Oak Brook, IL

C. Robinson, MD
Albuquerque, NM

John Sellers, MD
Norfolk, VA

Carl Sputh, MD
Indianapolis, IN

Richard Wehr, MD
Greer, SC

Alvin Wenger, MD
Land o Lakes, FL

Joseph West, MD
Kirkland, WA

Eiji Yanagisawa, MD
New Haven, CT

Richard Yules, MD
Boca Raton, FL

AFFILIATE

Michael J. Chandler, MD
New York, NY