

AMERICAN RHINOLOGIC SOCIETY

48th Annual Fall Scientific Meeting September 21, 2002 San Diego, California

Objectives: This program has been assembled to fulfill the educational needs of the membership of the American Rhinologic Society based partly on feedback from last year's meeting, as well as on conversations among the various members of the Board of Directors and Counselors.

From a large number of submitted abstracts the very best were blindly selected for presentation with a goal, however, to fulfill the perceived educational needs of the membership.

In addition, special panels were put together to augment the proper papers with the same goal in mind.

Commercial Support: This scientific program has been partially supported by unrestricted educational grants from Aventis Pharmaceuticals, Glaxo, Wellcome, Schering Pharmaceuticals, Bayer Pharmaceuticals, Bristol-Myers Squibb Co., Karl Storz Endoscopy-America, Inc., Medtronic Xomed, Ortho-McNeil, Smith & Nephew-ENT, Surgical Laser Technologies, Visualization Technology, Inc., Linvatec, Richard Wolf Medical Instruments Corporation.

As an accredited sponsor of CME activities, the American Rhinologic Society has adopted the standards of the ACCME and formulated a policy with regard to commercial support of educational activities. This educational program has been prepared in accordance with these standards and policies.

DISCLOSURE STATEMENT: In accordance with the policies on disclosure of the Accreditation Council for Continuing Medical Education and the Program/Education Advisory Committee of the American Rhinologic Society, presenters for this program have identified no personal relationships which, in the context of their topics could be perceived as a real or apparent conflict of interest. Those presenters who have identified any relationships with a commercial concern will announce the nature of that relationship at the meeting prior to their presentation.

AMERICAN RHINOLOGIC SOCIETY

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Conference Schedule

September 20, 2002

American Rhinologic Society

**1:00-2:30 Group Committee Meetings
Room 16A, Convention Center**

**1:00-2:30 Executive Committee Meeting
Room 16B, Convention Center**

**2:30-6:00 Board of Directors Meeting
Room 16A, Convention Center**

Conference Schedule

September 21, 2002

American Rhinologic Society

7:30 am

ARS Registration

Mezzanine Level

8:00am

ARS Annual Meeting Scientific Session

Rooms 16A and 16B

Opening Remarks

Paul H. Toffel, MD

President

Glendale, CA

Donald C. Lanza, MD

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Cleveland, OH

8:10 am

Coding Issues Confronting Rhinologists

Moderator

Joseph B. Jacobs, MD

**Re-Imbursement for Debridement,
Concurrent Turbinate and Septoplasty
During ESS**

Randa S. Blackwell

Financial Counselor

University of Maryland Dept. Otolaryngology

**Coding & Re-Imbursement for
Image Guided Surgery**

Frederick A. Kuhn, MD

CPT Coding Issues Yet to Come

Michael J. Sillers, MD

**Responding to the
ARS Memberships Survey**

Joseph B. Jacobs, MD

Immune Response & Fungus

Moderators

Heinz Stammberger, MD
Thomas V. McCaffrey, MD, PhD

8:45 am

Cell-Mediated Immune Function in Chronic Refractory Sinusitis

Robert D. Thomas, MD
Scott M. Graham, MD
Zuhair K. Ballas, MD
Iowa City, IA

Introduction: Immune dysfunction in chronic refractory sinusitis is surprisingly common. We propose to examine the evaluation of cell-mediated immunity and report the incidence of T-cell abnormalities in chronic refractory sinusitis.

Methods: The records of 104 patients with chronic refractory sinusitis, evaluated from 1991 to 1999, were reviewed retrospectively. The results of cell-mediated immune function testing were obtained. These tests comprised delayed-type hypersensitivity (DTH) skin testing against purified antigens (PPD, candida, trichophyton, and streptokinase), and in vitro response of T-cells to recall antigens (tetanus and mumps), mitogens, and alloantigen.

Results: 38 patients (36.5%) were anergic on DTH skin testing. 47 patients (45.2%) had a decreased proliferative response to the recall antigens (tetanus and mumps). All but one anergic patient had a decreased proliferative response to the recall antigens. 10 patients with a decreased proliferative response to the recall antigens had normal DTH skin testing. 32 patients (30.8%) had a decreased response to at least one mitogen. 6 patients (5.8%) had a decreased response to alloantigen. A total of 52 patients (50%) had at least one abnormality on cell-mediated immune testing. Patients with T-cell abnormalities averaged 4.5 episodes of sinusitis in the 12-month period prior to treatment. Following treatment with prophylactic antibiotics patients reduced the incidence of sinusitis to 1.6 episodes ($p=3D.0001$) per year.

Conclusions: The most sensitive test of cell-mediated immune function is the in vitro response to recall antigens (tetanus and mumps). A high incidence of T-cell dysfunction is present in patients with chronic refractory sinusitis. These patients may benefit from prophylactic antibiotics.

8:52 am

Fungal-Specific Immunoglobulin Levels in Nasal Mucus and Peripheral Blood in Patients with Chronic Rhinosinusitis and Healthy Controls

Larry K. Burton, Jr., MD
Jens U. Ponikau., MD
Hirohito Kita, MD
David A. Sherris, MD
Rochester, MN

Objective: Prior studies have shown that patients with chronic rhinosinusitis (CRS) have a unique cell-mediated immunity to *Alternaria* and other fungi which results in the recruitment, activation, and degranulation of eosinophils on the organisms. We hypothesized that CRS patients would demonstrate increased levels of fungal-specific immunoglobulins in their serum and nasal mucus as compared to healthy controls, enhancing the killing ability of eosinophils on their fungal targets.

Methods: Using enzyme-linked immunosorbent assay (ELISA) techniques, specific IgG, IgA, and IgE immunoglobulins against *Alternaria* (ALT), *Aspergillus* (ASP), *Penicillium* (PCN), and *Candida* (CAN) were quantified from nasal mucus and peripheral blood samples from 13 CRS patients and 15 healthy controls.

Results: Specific anti-fungal IgA and IgG immunoglobulins against all fungi tested were present in the blood and nasal mucus of both patients and controls. Immunoglobulin levels did not differ significantly between groups. The median mucus anti-ALT IgG antibody level in CRS patients was 2.1 micrograms/ml versus 3.2 micrograms/ml in healthy controls. The median mucus IgA anti-ALT antibody level was 11.8 micrograms/ml in CRS patients versus 10.6 micrograms/ml for healthy controls. The median serum anti-ALT IgG level in CRS patients was 632 micrograms/ml versus 1968 micrograms/ml in controls, and the median serum anti-ALT IgA level in CRS patients was 5.0 micrograms/ml versus 3.4 micrograms/ml in controls. Neither mucus nor serum IgG or IgA levels to ASP, PCN, or CAN differed significantly between the groups. IgE levels in both serum and mucus were undetectable above the sensitivity level of the assay (30 ng/ml).

Conclusion: These results suggest that both CRS patients and healthy controls have been exposed to fungal antigen, that both groups elicit a humoral response against fungi, but that increased levels of anti-fungal antibodies in nasal mucus or serum do not account for the clinical manifestations of CRS.

8:59 am

Discussion & Questions

Heinz Stammberger, MD

9:04am

Treatment of Refractory Chronic Rhinosinusitis with Amphotericin-B Nasal Irrigations

Ashutosh Kacker, MD

Robert Glasgold, MD

Vishal Banthia, MD

Vijay Anand, MD

New York, NY

Introduction: There is much debate surrounding the role of antifungal therapy in chronic rhinosinusitis (CRS) patients. It has been suggested that allergic fungal sinusitis (AFS) and chronic rhinosinusitis may share a common etiologic pathway. The goal of this study was to evaluate the potential role of amphotericin-B nasal spray/irrigations in treating patients with refractory chronic rhinosinusitis.

Design: Retrospective chart review of refractory chronic rhinosinusitis patients treated with topical amphotericin-B nasal irrigations. Subjective data regarding response to treatment was obtained through a questionnaire filled out by all subjects.

Methods: Refractory chronic rhinosinusitis patients were included in this study if they were maintained on topical amphotericin B for a minimum of two consecutive months and completed the patient questionnaire. Charts were reviewed to obtain patient specific data including: duration of amphotericin-B use, concurrent medications, medical and surgical history, and pre and post treatment endoscopic exams. Patients were asked to record changes in symptoms, side effects, and to rate overall improvement with treatment.

Results: Thirty-six patients with refractory chronic rhinosinusitis were reviewed, 20(56%) reported subjective improvement and 16(44%) reported no improvement following treatment. In the AFS group 19/32 (60%) had a good response compared to the group in which only 1 patient responded (1/4 25%). Endoscopic evaluation following treatment was clinically improved in 40% of patients reporting subjective improvement and 19% of patients reporting no change in symptoms. No patients experienced significant side effects from the amphotericin-B nasal irrigations.

Conclusions: The majority of refractory chronic rhinosinusitis patients reviewed noted subjective improvement in their overall condition with the use of amphotericin B nasal irrigations. Subjective improvement did not consistently correlate with improvement on clinical exam. Our experience suggests there may be a useful role for topical amphotericin-B in the management of patients with CRS. In order to better define the role of amphotericin B use in these patients who respond to treatment, a prospective randomized study will be beneficial.

9:11 am

Fungal Elements Are Present in Tissue Specimens of Patients with Chronic Rhinosinusitis

*Jan Gosepath, MD
Juergen Brieger PhD
Wolf J. Mann, MD PhD, FACS
Mainz, Germany*

Introduction: The role of fungal elements in the etiology of chronic rhinosinusitis (CRS) has been increasingly recognized and controversially discussed over the last years. It has been postulated, that fungal elements represent the immunologic target in the eosinophilic mucin, initiating and maintaining the disease process in these patients. The presence of fungi in nasal mucus has been demonstrated by different groups, but so far fungal antigens have not been described in sinonasal tissue, except for cases of invasive fungal disease. The aim of this study was to determine whether or not fungi or fungal elements are present in tissue specimens taken from patients undergoing microscopic endonasal surgery for CRS.

Methods: 30 surgical specimens were collected from patients suffering from CRS. 22 Patients had been tested positive for inhalant allergies, 4 were suffering from Aspirin intolerance. Samples were treated with a solution of Dithiotreitol (DTT) in order to digest any nasal mucus and ensure that only tissue was examined. A highly sensitive two-step Polymerase Chain Reaction (PCR) was applied to detect fungal DNA, using both one universal primer for unspecific detection of fungal elements and a second primer pair specific for alternaria.

Results: Fungal elements were detected in the majority of the 30 specimens by PCR analysis, equally with both primers.

Conclusions: It appears, that fungi can be detected within sinonasal tissue specimens of patients suffering from CRS, using the very sensitive method of PCR. The relevance of this finding in the etiology of CRS needs to be discussed.

9:18 am

Discussion & Questions

Thomas V. McCaffrey, MD, PhD

Medical Therapies for Chronic Rhinosinusitis

Moderators

*Richard R. Orlandi, MD
David R. Edelstein, MD*

9:23 am

Serial Minimal Invasive Endoscopic Sinus Surgery and Debridement for Invasive Fungal Sinusitis

Rajendra Bhayani, MD
Corine Horn, MD
Eli Grunstein, MD
Lianne DeSerres, MD
New York, NY

Objectives: Invasive fungal sinusitis is relatively rare disease which can lead to life threatening complications. Immunocompromised patients are generally affected. Early diagnosis and aggressive management is essential for optimal outcome. We report two cases of invasive fungal sinusitis which were diagnosed in very early stage. Both patients were managed with serial minimal invasive endoscopic sinus surgery and multiple debridements. Our management strategy is compared with review of literature.

Methods: Two patients who were undergoing treatment for acute lymphoid leukemia were diagnosed to have invasive fungal sinusitis with aspergillosis. First patient was 14 year old female and other patient was 20 year old male. First patient had four debridements using endoscopic approach and required right medial endoscopic partial maxillectomy, partial septectomy, excision of right lamina papyracea and part of right periorbita until fungus free margins were achieved. Other patient required three endoscopic debridements which included right inferior turbinectomy, partial septectomy, excision of the bony floor of nasal cavity. Both patients received amphotericin B. Both patients are being closely followed with clinical and endoscopic examination.

Results: After early, prompt histological and radiological diagnosis in both these patients multiple careful endoscopic debridements were carried out to successfully control the invasive fungal sinusitis. Using this approach the major surgical midface resection associated with its significant morbidity could be avoided.

Conclusion: Serial minimal invasive endoscopic sinus surgery and debridement for invasive fungal sinusitis can be an effective approach if it is diagnosed in early stage. High index of suspicion in an immunocompromised group of patients should lead to early diagnosis. It may be possible to avoid major midface resection and its morbidity using this approach in select cases.

9:30 am

Nasal Mucosal Absorption of Nebulized Betamethasone

Frederick Kuhn, MD
Ron Swain, Jr., MD
Savannah, GA

The management of allergic fungal sinusitis (AFS) has been problematic. The most effective treatment has been the use of systemic corticosteroids, however, long term side effects preclude their prolonged use. Consequently, we analyzed the use of nebulized betamethasone in 10 patients with documented AFS, anticipating low systemic absorption. These patients all met at least 4 of the 5 Kuhn/Bent criteria for AFS. These patients had been treated aggressively medically and surgically over a period of several years. All patients were treated with .8 mg of nebulized betamethasone intranasally bid for one week. On day 8 each patient had a baseline serum sample drawn. They were then given a treatment. Serial blood samples were drawn at 30 minutes, 1 hour, 2 hours, and 4 hours post treatment. A final sample was drawn after two additional weeks of treatment. These serum samples were then analyzed for betamethasone levels. Each patient was endoscopically staged at each visit. The betamethasone levels were undetectable in the first 3 patients. The serum levels and clinical stages for all 10 patients will be presented.

9:37 am

Discussion & Questions

Richard R. Orlandi, MD

9:45 am

Break with Exhibitors

10:15 am

Patient Use of Alternative Therapies for Sinusitis

*Winston C. Vaughan, MD
Christopher A. Church, MD
Alexander Chiu, MD
Stanford, CA*

Introduction: Despite advances in the medical and surgical management of patients with sinusitis, this disease continues to exert a significant effect on quality of life. Many patients have turned to non-traditional modalities in place of or in addition to physician-directed therapy. The extent of use and efficacy of alternative therapies in sinusitis has not been delineated.

Methods: 250 consecutive patients seen in a rhinology practice were evaluated by survey. Patients were polled regarding symptoms, previous surgery and use of traditional therapies such as steroids, antihistamines, antibiotics and saline nasal irrigation. Use, approximate cost, and effects of alternative therapies were evaluated. Subjective efficacy was determined by use of a visual analog scale for both alternative and standard treatments.

Results: Use of alternative therapies was found to be common in our patients. Nearly one-third of the respondents reported use of one or more modalities of alternative sinus care. Of these patients, two-thirds reported use of two or more different alternative therapies. The most common were herbal preparations, acupuncture, nutritional supplements and chiropractic manipulations. Patients assessment of efficacy was mixed. The majority of patients, however, noted more improvement with surgery and prescription medications than with alternative therapies. Adverse effects were infrequent and mild in severity.

Conclusions: Patients with sinusitis frequently use alternative therapies in addition to those provided by their otolaryngologist. Recognizing this widespread use may allow the physician to become familiar with the risks, benefits and interactions of alternative therapies compared with more established forms of care.

10:22 am

Use of Intravenous Antibiotics for Refractory Rhinosinusitis in Nonsurgical Patients: A Prospective Study

*Howard Levine, MD
Vijay Anand, MD
Michael Friedman, MD
Yosef Krespi, MD
Cleveland, Ohio*

Objective: Some patients with chronic sinusitis either have had unsuccessful surgery or refuse surgery. When oral antibiotics and traditional therapy has been unsuccessful, home intravenous antibiotics present an alternative treatment.

Methods: Patients were assessed prior to treatment using visual analog scales to measure the major and minor symptoms of rhinosinusitis. Computed tomographic (CT) scan findings were assessed using the Lund-MacKay staging system and nasal endoscopic findings as described by Levine and May. Medical diseases known to be associated with rhinosinusitis were documented and successfully managed. Endoscopic guided culture and sensitivities were obtained. Home intravenous antibiotics were given via PICC line after successful insertion with radiologic confirmation. The choice of the antibiotics were based on the culture report. Treatment was continued for 6 weeks with subsequent cultures obtained at week 3, 6, and 9. Nasal endoscopy, and rhinosinusitis symptoms were monitored at weeks 3, 6, and 9. A follow up CT scan was obtained at week 12.

Results: Significant improvement was seen in patients receiving home intravenous antibiotics when previous oral antibiotic treatment and/or surgery had failed.

Conclusion: Home intravenous antibiotics provide an excellent alternative to surgery for patients who either have had unsuccessful surgery or who do not wish to have surgery.

10:29 am

Discussion & Questions

David R. Edelstein, MD

Wound Healing & FESS

Moderators

Stilianos E. Kountakis, MD, PhD

Peter H. Hwang, MD

10:34 am

Effects of Topically Applied Biomaterials on Paranasal Sinus Mucosal Healing

Mendy Maccabee, MD

Peter H. Hwang, MD

Dennis Trune PhD.

Portland, OR

Introduction: Paranasal sinus mucosa may suffer morphologic and functional alterations as a result of surgical trauma. Mucosal stripping typically results in increased scarring and histologically abnormal mucosa. Various biomaterials have been considered as possible enhancers of mucosal wound healing. The aim of this study is to determine the effect of topical MeroGel and FloSeal on paranasal sinus mucosal healing in a rabbit model.

Methods: Bilateral maxillary sinuses of twelve New Zealand white rabbits were surgically opened and stripped of mucosa. In the left maxillary sinus, six rabbits had Merogel placed in the antrum, and the remaining six received FloSeal. The right maxillary sinuses were left unpacked to serve as controls. The animals were then sacrificed at two weeks and specimens were examined by light microscopy.

Results: MeroGel-treated mucosa showed massive fibrosis of the basal lamina, loss of the mucociliary blanket, failure of MeroGel resorption, and frank incorporation of Merogel fibers into the regenerated basal lamina. FloSeal-treated mucosa showed similar fibrosis of the basal lamina with loss of the mucociliary blanket and similar incorporation into the healed mucosa. Controls showed expected submucosal gland thinning, basal lamina fibrosis, and loss of cilia, but the basal lamina fibrosis seen in the MeroGel and FloSeal groups was markedly more prominent.

Conclusions: In a rabbit model, MeroGel and FloSeal appear to increase reactionary fibrosis of healing mucosa. In the short term these agents appear to be incompletely resorbed and grossly incorporated into healing tissue. Mucosal healing may be impaired by the application of these agents.

10:41 am

Bioengineering of Cartilage Using Human Nasal Chondrocytes Propagated in Microcarrier Spinner Culture

Alan H. Shikani, MD, FACS

David Fink, PhD

David S. Hungerford, MD

Carmelita G. Frondoza, PhD

Baltimore, MD

Objective: To test the effectiveness of nasal septal chondrocytes, propagated in Microcarrier Spinner Culture, as an alternative tissue sources of chondrocytic cells for cartilage grafts for head and neck surgery and for articular cartilage repair.

Materials And Methods: We have harvested chondrocytes from over 120 patients, ranging in age from 15 to 80 and undergoing repair of a deviated nasal septum, and propagated the cells in a microcarrier spinner culture system. The nasal chondrocytes proliferated and produced extracellular matrix components similar to that produced by articular chondrocytes.

Results: In microcarrier spinner culture on collagen beads, chondrocyte numbers increased up to 17-fold in two weeks. After a month, the microcarriers seeded with nasal chondrocytes began to aggregate, producing a dense cartilage-like material. The newly synthesized extracellular matrix was rich in high molecular weight proteoglycans, while the chondrocytes expressed type II collagen and aggrecan, but not type I collagen. Nasal chondrocytes seeded onto DAAG-chitosan scaffolds produced a hyaline cartilage-like tissue when implanted subcutaneously for 2 months in athymic mice.

Conclusion: These studies support the feasibility of engineering cartilage tissue using chondrocytes harvested from the nasal septum. This technology may have applications not only in craniomaxillofacial reconstructive surgery, but also in, plastic, and orthopedic surgery.

10:48 am

Discussion & Questions

Stilianos E. Kountakis, MD, PhD

10:53 am

Long-term Subjective Outcomes Following Functional Endoscopic Sinus Surgery (FESS)

Ayesha N. Khalid, MD
Sadeq A. Quraishi, MD
David W. Kennedy, MD
Palmyra, PA

Introduction: This study was performed to further evaluate the effect of chronic rhinosinusitis (CRS) on overall health status and quality of life (QOL), and to study the long-term effects of surgical intervention on general health parameters.

Methods: 50 records were randomly selected from a database of patients with a primary diagnosis of CRS. All patients underwent FESS, with 40 initial surgeries (80%) and 10 revisions (20%). SF-36 surveys were completed by all patients during the initial assessment visit and repeated post-surgery.

Results: 24 (48%) males and 26 (52%) females were followed over a minimum two-year period. Baseline QOL scores demonstrated significant differences between patients with CRS and published norms in 6/8 subscale parameters (Role Physical, Bodily Pain, General Health, Social Function, Vitality, and Mental Health). At a mean of 2.3 years post surgery, significant improvements in all six categories was evident ($p < 0.05$) with QOL scores within limits of published norms for the general population.

Conclusion: While several studies have demonstrated disease specific improvement following FESS and short term improvements in general health status have also been published, longer term studies evaluating the effect of surgery on general health status have not been reported. Our data demonstrates that FESS, combined with appropriate postoperative care, is effective at maintaining a significant improvement in the overall general health status of patients for at least 2 years following surgical intervention.

11:00 am

Revision Endoscopic Sinus Surgery: Reasons for Failure of Primary Surgery

Pierre Musy, MD
Stilianos E. Kountakis, MD, PhD
Charlottesville, VA

Objective: To determine the reasons patients with chronic sinusitis require revision functional endoscopic sinus surgery (FESS).

Methods: Data was collected prospectively on consecutive patients requiring revision FESS at a tertiary institution over a two-year period. Patients were evaluated with endoscopic examination of the sinonasal cavities and CT of the sinuses was performed after patients failed prolonged medical therapy for sinusitis. Information was also collected during the revision surgery.

Results: The most common anatomic factor associated with primary surgery failure was lateralization of the middle turbinate (67%) followed by incomplete anterior ethmoidectomy (57%), scarred frontal recess (39%), incomplete posterior ethmoidectomy (36%) and middle meatal antrostomy stenosis (31%). In addition, retained agger nasi and retained uncinate process were identified in 35 and 26% of the patients respectively. Recurrent polyposis was seen in 35% of the patients. Other factors such as persistent sphenoid disease and sphenoid ostium stenosis were less frequent. Thirteen patients (16%) had prior Caldwell Luc surgery as the only surgical modality and 2 (2.5%) patients had undiagnosed allergic fungal sinusitis.

Conclusion: Failure of primary FESS is most often associated with anatomic obstruction in the area of the ostiomeatal complex. Meticulous attention in this area during surgery with ventilation of obstructed anatomy as well as avoidance of scarring and turbinate destabilization may reduce the failure rate after primary FESS. In addition, patients with problems such as nasal polyposis require aggressive medical management to prevent recurrence.

11:07 am

Discussion & Questions

Peter H. Hwang, MD

11:15 am

**Technical Advances in Surgery of the
Sinuses and Anterior Skull Base**

Heinz Stammberger, MD

Abstract?????????

11:45 am

Poster Moderator Comments

Moderator

Steven Marks, MD

11:50 am

Awards and Presentations

Moderator

Paul H. Toffel, MD

12:15 pm

Lunch Break

1:00 pm

Controversies & Developments in Computer Aided Surgery

Moderator

Marvin P. Fried, MD

AAO-HNS Position on Indications for Image Guided Surgery

James M. Chow, MD

Future Directions in Computer Assisted Surgery

Martin J. Citardi, MD

Simulators in Training Sinus Surgeons

Marvin P. Fried, MD

Coding and Re-Imbursement for Image Guided Sinus Surgery

Frederick A. Kuhn, MD

FESS Outcomes/Imaging/Technical Advances

Moderators

James A. Hadley, MD

Robert M. Myers, MD

1:40 pm

Endoscopic Sinus Surgery in the Older Adult Population

Amy L. Sanders, MD

Karen J. Fong, MD

Peter H. Hwang, MD

Portland, OR

Introduction: As the American population ages, more older adults are becoming candidates for endoscopic sinus surgery (ESS). Weighing surgical risks and benefits becomes increasingly relevant in older patients. We reviewed the surgical outcomes and satisfaction of patients over the age of 60 undergoing ESS.

Methods: A retrospective chart review was performed of 87 patients aged 60 years or older that underwent ESS between 1997-2001. A total of 103 surgical events occurred. Patients were categorized by their age at time of surgery: 60-69 years (n=3D68); 70-79 years (n=3D24); and 80+ years (n=3D11). Patients were also contacted by telephone to evaluate their surgical experience and clinical outcomes.

Results: 34% of surgical events were primary surgery; 66% were revisions. The complication rate was 7.8%. There was one surgical complication (CSF leak) and 7 perioperative complications, including urinary retention, nausea, and deep venous thrombosis. The complication rates between age groups showed no statistically significant differences (X2 test, P>.32). 98% of patients were discharged on the day of surgery.

46 patients were successfully reached by phone. 61% rated their quality of life as very improved after surgery, and 26% were slightly improved. If making the choice over again, 85% would repeat the surgery. Additionally, 78% reported a decrease in number of physician visits for sinus problems.

Conclusions: Our findings support the use of ESS in older adults. Increasing age did not correlate with increased risk for complications. Moreover, the overall satisfaction of patients suggests that ESS is a well-tolerated and effective therapy for older patients.

1:47 pm

Outcome of Image Guided Endoscopic Sinus Surgery (Iguess) — A Five Year Study

*Ashutosh Kacker, MD
Abtin Tabaee, MD
Vijay K. Anand, MD
New York, NY*

Objective: To evaluate the usefulness of IGESS in a cohort of patients who underwent endoscopic sinus surgery over a period of 5 years.

Study Design: A retrospective study of all patients undergoing IGESS by the senior author at a tertiary care teaching hospital over a 5year period.

Material and Methods: All patients who underwent image guided sinus surgery with at least 1year follow-up were included in the study. Charts were reviewed for indication for image guided surgery, need for revision surgery and complications.

Results: A total of 120 patients underwent IGESS in the 5year period out of which 10 patients were lost to follow-up. There were 69 males and 41 females in the study and age ranged from 23 years to 79 years. Indications for the use of IGESS were revision sinus surgery in 86 pts, sphenoid sinus disease in 12 pts, CSF leak in 6 patients and isolated frontal sinus disease in 4 patients. 15 patients required revision surgery: 10 patients required revision endoscopic sinus surgery, 3 patients required an external open procedure and 3 patients required revision CSF leak closure. There were no cases of post-operative bleeding, infection, new CSF leak or orbital trauma in this study.

Conclusion: IGESS helps in avoiding trauma to the orbit and anterior skull base. Revision surgeries were performed for recurrent frontal sinus disease, recurrent nasal polyposis (Allergic Fungal Sinusitis or Cystic Fibrosis patients) or recurrent CSF leak due to other causes.

1:54 pm

Discussion & Questions

James A. Hadley, MD

1:59 pm

The Low Skull Base: An Invitation to Disaster

*James A. Stankiewicz, MD
Maywood, IL*

Introduction: Knowledge of anatomy including variations observed with endoscopy or CT scan is vital to the performance of safe endoscopic sinus surgery. The lower than normal skull base/cribriform plate is an anatomical variation which if not noted can lead to entrance into the brain causing major injury.

Method: Four case studies of chronic rhinosinusitis are reviewed where either the whole anterior skull base or cribriform plate is lower than usual are presented.

Results: All four cases had unilateral or bilateral entrance into the skull base/cribriform plate with brain in the biopsy specimen, postoperative CSF leak, and brain hemorrhage. One patient died from the injury and the other three had marked neurological sequelae.

Conclusion: The preoperative anatomy as determined by endoscopy and CT scanning has to be identified. Variations or abnormalities should be noted and taken into consideration for preoperative and operative planning. Failure to note skull base or cribriform anatomy variations may lead to brain entrance, injury, and death.

2:06 pm

Surgical Techniques for the Removal of Frontal Recess Cells Obstructing the Frontal Ostium

*Peter John Wormald, MD
Steven Zion Xun Chan, MD
North Adelaide, South Australia*

Cells obstructing the frontal ostium vary with the degree of frontal sinus penetration (classified according to Kuhn as type 3 and 4). This series describes the use of the axillary flap technique and the endoscopic modified Lothrop for the removal of type 3 and 4 Kuhn cells pneumatizing into the frontal sinus.

Materials and Methods: Out of a total of 200 patients undergoing endoscopic sinus surgery twenty-seven patients had a Kuhn 3 cell on one side and 11 had bilateral cells resulting in 49 sides undergoing an axillary flap approach for Kuhn 3 removal. In addition 3 K4 cells were deemed accessible from below and underwent the axillary flap approach giving 52 axillary flap approaches. 13 patients underwent an endoscopic modified Lothrop procedure for K4 cells not accessible from below.

Results: All patients who underwent both the axillary flap approach and the modified Lothrop had a patent frontal ostium confirmed endoscopically at the last followup visit. However, 8 of the thirty eight patients (21%) who underwent the axillary flap procedure had residual minor symptoms with 5 of the patients (38%) who underwent a modified Lothrop procedure having a recurrence of minor symptoms. Most of the patients who have recurrent symptoms have either chronic fungal sinusitis or nasal polyposis (both unfavourable prognostic groups).

Conclusion: The axillary flap and the endoscopic Modified Lothrop procedure can be used to successfully to remove ethmoidal cells that have pneumatized through the frontal ostium with good patency of the ostium post-operatively.

2:13 pm

Discussion & Questions

Robert M. Myers, MD

Olfaction/Adenoid Disease

Moderators

*Karen J. Fong, MD
Winston Vaughn, MD*

2:18 pm

The Effect of Cigarette Smoking and Ethanol on Olfactory Mucosa

*Sande Bartels, MD
Richard Hallworth, PhD
Donald A. Leopold, MD
Omaha, NE*

Introduction: The correlation of both smoking and alcohol exposure with decreased olfactory ability is well documented. We hypothesize that the effects of these agents may be due at least in part to morphologic changes in the sensory epithelium induced by the smoke exposure and that ethanol ingestion may potentiate these changes.

Methods: A previously developed animal model exists in which rats are exposed to cigarette smoke and are fed a liquid diet containing varying concentrations of ethanol. In this study, 48 rats were divided into 2 groups of 24. Group A smoked 2 packs per day, group B received no smoke exposure. The groups were subdivided into 4 sets of 6 animals each. Each set received a diet of either 0%,16%,26%, or 36% ethanol. After 12 weeks of exposure the animals were sacrificed, the heads were harvested and histologic cross sections were obtained of the nasal cavity.

Results: The study evaluates morphologic changes within the sensory and respiratory epithelium based on measurements of epithelial thickness, cross sectional length, cell density, ciliary density, and the ratio of sensory to respiratory epithelium present at defined locations within the nasal cavity. Data suggests that there are morphologic changes associated with cigarette smoke and ethanol exposure.

Conclusions: Long term ethanol and cigarette smoke exposure may induce morphologic changes in olfactory neuroepithelium which account for a decrease in olfactory ability. This effect may be potentiated by ethanol ingestion.

2:25 pm

Olfactory Function Before and After FESS for Chronic Sinusitis

Brian Perry, MD
Stilianos E. Kountakis, MD, PhD
Charlottesville, VA

Objective: To determine the effect of functional endoscopic sinus surgery (FESS) on olfactory function in patients with chronic sinusitis.

Methods: Prospective collection of data on consecutive patients undergoing FESS after failing prolonged medical therapy for chronic sinusitis at a tertiary institution. Patients were asked to grade multiple symptoms of chronic sinusitis including olfactory dysfunction from 0 to 10 with 0 representing normal function and 10 complete anosmia. In addition, data such as CT scores and the presence or absence of asthma were recorded and analyzed. Patients were followed up to 1 year after surgery.

Results: Data was collected on 178 patients who had sinus surgery over a 2-year period. The average olfactory dysfunction score before surgery was 4.9. This improved to 0.9 at one year after surgery ($p=3D0.00$). Higher CT scores as per Lund and MacKay correlated with higher olfactory dysfunction scores ($r=3D0.62$, $p<0.01$) and greater improvement after surgery ($r=3D0.82$, $p<0.01$). Patients with asthma ($n=3D38$) had higher preoperative olfactory dysfunction scores compared to patients without asthma ($n=3D140$), (6.8 v. 4.4, $p=3D0.0002$). Both patient groups had significant improvement in olfactory function one year after surgery with an overall improvement rate of 82% ($p=3D0.00$). Asthma patients recovered 66% of their olfactory function ($p=3D0.00001$) while patients without asthma recovered 87% ($p=3D0.00$). Patients with nasal polyps ($n=3D50$) had an average preoperative olfactory dysfunction score of 7.2 which improved to 1.5 at 1 year after FESS ($p=3D0.00$). Patients without nasal polyps ($n=3D128$) had an average olfactory dysfunction score of 4.1 which improved to 0.7 at 1 year after FESS ($p=3D0.00$).

Conclusion: Patients with olfactory dysfunction despite appropriate medical management for sinusitis benefit from FESS.

2:32 pm

Polymerase Chain Reaction Analysis of Adenoid Tissue in Chronic Sinusitis Versus Obstructive Sleep Apnea in the Pediatric Population - Preliminary Results

Ertan Esmer, MD
Peter Mathers, PhD
Hassan Ramadan, MD, MSc
Morgantown, WV

Introduction: There is some debate whether the surgical treatment of choice for pediatric chronic sinusitis should be endoscopic sinus surgery (ESS) or adenoidectomy. The goal of this study is to investigate the concept of adenoiditis as an etiology of pediatric chronic sinusitis. We aim to accomplish this goal by comparing the microbiological flora of adenoid tissue from children with chronic sinusitis versus obstructive sleep apnea (OSA) using polymerase chain reaction (PCR).

Materials and Methods: Adenoid tissue was obtained from consecutive adenoidectomies from children with chronic sinusitis and OSA from June 2001 to November 2001. Adenoid tissue was assayed with PCR to identify and amplify DNA sequences of the common aerobic pathogens implicated in chronic sinusitis. Results were then confirmed using Southern blot technique.

Results: A total of 43 patients were enrolled in this study (study group $n=3D20$, control group $n=3D23$). A positive result was defined as having a detectable band on gel electrophoresis of PCR-amplified samples and/or on Southern blot assay. Sixteen (80%) of 20 patients in the chronic sinusitis group had positive findings, versus 18 (78.2%) of 23 patients with positive results in the OSA group. The microbiological make-up of the positive results in both groups was similar.

Conclusion: Our preliminary data indicate no significant difference in the prevalence of the common aerobic pathogens implicated in pediatric chronic sinusitis between the two groups. This lends evidence against the theory that chronic adenoiditis is causative of chronic sinusitis. Because of our small sample size however, further study is needed to provide more valid evidence.

2:45 pm

Break with Exhibitors

Office Based Procedures & Advances

Moderator

Howard L. Levine, MD

3:15 pm

Guarded Transnasal Endoscopic Sphenopalatine Ganglion Phenolization for Facial Neuralgias in Twenty Patients

P. Perry Phillips, MD
Sheboygan WI

Introduction: The purpose of this study is to introduce the use of a common plastic drinking straw combined with endoscopic visualization to perform safe and effective phenolization of the sphenopalatine ganglion for relief of second division trigeminal neuralgias.

Methods: Twenty patients who failed medical therapy in our neurology department for second division trigeminal neuralgia or cluster headaches were studied. Initially their noses were sprayed with 4% xylocaine and 0.1% oxymetazoline solution. Following this, their ipsilateral sphenopalatine ganglia were then anesthetized with 100mg of cocaine flakes on a cotton carrier. Cocainization yielded near complete or complete relief of their facial pain. Their ipsilateral sphenopalatine ganglia were then phenolized with 88% phenol on a cotton carrier. The locations of their ganglia were confirmed by rigid endoscopy and the phenol carrier was guided through a trimmed drinking straw to prevent injury to their nasal mucosa.

Results: Sixteen of the twenty patients who had pain relief with cocainization responded well with phenolization relieving most or all of their trigeminal pain for at least 3 months. Subsequent treatment of their ganglia showed reproducible pain relief with pain free intervals as long as 2 years. No collateral nasal membrane trauma or synechialization of nasal membranes were noted.

Conclusions: Use of a plastic drinking straw and rigid endoscopic visualization greatly aid in the effectiveness and safety of sphenopalatine ganglion blocks with phenol. This novel approach will be demonstrated via videotape presentation.

3:22 pm

An Internet Otolaryngology Referral Center: A Preliminary Report

Eric D. Baum, MD
David W. Kennedy, MD
Daniel G. Becker, MD
Philadelphia, PA

Objective: To review our early experience with the UPenn Otolaryngology Referral Center Website, ENTConsult.org.

Methods: The use of Internet websites by physicians has been largely to provide information, usually medical information or practice information. While there was initial enthusiasm about the potential benefits of web-based "telemedicine" or "long-distance" medicine, the Internet has not yet become a route through which a significant number of organized referrals and consultations occur.

ENTConsult.org is an interactive website that allows a referring physician to select a PENN Otolaryngologist and share clinical information, including uploaded pictures, radiographs, and other images via the Internet. Traditional methods of long-distance consultation involve mailing clinical information, which is often slow and unwieldy, and discourages consultation. ENTConsult.org seeks to take advantage of

Internet functionality to facilitate efficient and timely consultation regardless of any of the participants' locations.

Results: In this report we review our initial experience with ENTConsult.org, including an overview of the website functionality and a detailed review of critical logistical considerations.

Conclusions: The UPenn Otolaryngology Referral Center Website, ENTConsult.org, offers considerable promise as an avenue for long distance referral and consultation.

3:29 pm

Discussion & Questions

Howard L. Levine, MD

Neoplasia and Their Management

Moderators

Carol R. Bradford, MD

Randal S. Weber, MD

3:34 pm

Inflammation & the Pathogenesis of Inverted Papilloma (IP)

Hwan-Jung Roh, MD

Gary Procop, MD

Martin Citardi, MD

Donald C Lanza, MD

Cleveland, OH

Backgrounds: Despite textbook classifications for the varied forms of sinonasal papilloma, surgical pathologists nationwide often find it difficult to specify the histopathological nature of a given papilloma. Moreover, the role of human papilloma virus (HPV) in the pathogenesis of sinonasal papillomas remains controversial, especially in IP.

Purpose: To verify the existing histopathological classification of sinonasal papillomas, and to evaluate the role of inflammation and HPV in the pathogenesis of sinonasal papillomas. Furthermore, this study proposes a novel pathological staging system for IP and suggests a hypothesis regarding its pathogenesis.

Materials and Methods: Pathological and retrospective chart review was performed in 41 patients with sinonasal papillomas who underwent surgery at Cleveland Clinic Foundation between 1995 and 2001. In situ hybridization technique is to be performed on the paraffin embedded tissue for HPV detection in each papilloma.

Results: Sinonasal papillomas are classified as exophytic squamous papilloma (14 cases), IP (25 cases), and cylindrical papilloma (2 cases). The IP are staged as I (3/25), II (15/25), III (7/25), and IV (3/25) according to pathological and clinical findings. Stage I is the earliest lesion having ciliated respiratory epithelium with squamous metaplasia or matured squamous epithelium and can easily be confused with an inflammatory polyp. Stage II is the most commonly found lesion. The surface mucosa has ciliated respiratory epithelium with partial loss and underlying squamous metaplasia resulting in endophytic growth. Numerous inflammatory cells such as neutrophils or eosinophils and macrophages are present in the epithelium. The stroma shows active inflammatory cells infiltration and

squamous metaplasia of ductal epithelium. Stage III is IP with dysplasia. The mucosa shows total loss of ciliated respiratory epithelium and the underlying squamous metaplasia changes into stratified squamous epithelium containing atypical cells. Inflammatory cells and macrophage are rare or absent in the epithelium. Stage IV is IP with invasive squamous cell carcinoma that includes stage II and III lesions.

Conclusion: Sinonasal papilloma is adequately classified according to existing descriptions. Moreover, IP can present in different histopathological stages within a given individual. IP can undergo dynamic transformation from a polyp-like appearance associated with inflammation to eventually become squamous cell carcinoma associated with HPV. This novel staging system can be used a foundation to further understand the pathogenesis of IP and can be used to predict its recurrence.

3:41 pm

Endoscopic Management of Sinonasal and Skull Base Tumors

*Amin R. Javer, MD
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Vancouver, Canada*

Objectives: Tumors of the sinonasal cavities and anterior skull base have traditionally been resected utilizing an open technique. With the advancements in endoscopic sinus surgery and more recently image guided surgical techniques, a significant number of tumors are being resected endoscopically. Obvious advantages exist, including quicker recovery time and reduced perioperative morbidity.

Methods: Eighteen of nineteen sinonasal and skull base tumors that presented to the center over a period of twenty four months were resected endoscopically by the senior author. Twelve inverting papillomas, two frontal recess osteomas, one chondrosarcoma, one adenoid cystic carcinoma, one esthesioneuroblastoma and one nasopharyngeal hemangioma were resected endoscopically. One frontal sinus lymphoma was resected using an open technique.

Results: The average time from diagnosis to surgery was 1.8 years for the Inverting Papilloma patients and 3.3 months for the remainder. The average number of previous surgeries was 1.0 for the Inverting Papilloma patients and 0.7 overall. Average time of surgery was 2.2 hours for the Inverting Papillomas and 2.6 hours/patient overall. No major complications occurred with the endoscopic technique. Mean follow-up time was 10 months. Four revision surgeries in three patients with Inverting Papilloma was required, with two patients awaiting completion surgery. Completion surgery was required for one patient with adenoid cystic carcinoma, and one with frontal recess osteoma. No subsequent recurrence has been detected in the non-inverting papilla group.

Conclusion: The endoscopic technique is viable for selected sinonasal and skull base tumors with reduced perioperative morbidity and results comparable to or better than the traditional open technique.

3:48

Discussion & Questions

Carol R. Bradford, MD

3:53 pm

Endoscopic Resection of Sinonasal Malignancies: A Preliminary Report

*Hwan-Jung Roh, MD
Donald C Lanza, MD
Martin Citardi, MD
William Bolger, MD
Cleveland, OH*

Background: Recent data have suggested that a transcranial piecemeal approach for the resection of ethmoid malignancies involving the cribriform plate yields local recurrence (LR), disease free survival (DFS) and overall survival (OS) rates that are comparable to combined en bloc craniofacial resection of certain malignancies. A minimally invasive endoscopic approach for the management of sinonasal malignancies offers the advantage excellent illumination, magnification and spares facial incisions while permitting maximal preservation of uninvolved vital structures.

Purpose: The purpose of this study is to evaluate the outcomes and morbidity of endoscopic resection combined with radiotherapy (XRT) and/or chemotherapy (CTx), and to discuss the intricacies of endoscopic sinonasal cancer resection.

Materials and Methods: Twenty subjects with sinonasal malignancies were identified between 1996-2002. Seven cases were excluded since their tumor was diagnosed endoscopically but not endoscopically resected. Thirteen remaining subjects had a minimally invasive endoscopic approach with or without combined neurosurgical resection. There were 3 cases of squamous cell carcinoma (SCC), 3 malignant melanoma, 2 adenocarcinoma, 1 Meibomian gland carcinoma, 1 leiomyosarcoma, 1 adenosquamous carcinoma, 1 chondrosarcoma, and 1 spindle cell carcinoma.

Results: The mean age was 63.5 (26-78) years and mean follow-up period was 27.3 months. Combined XRT with or without CTx pre/post-operatively was given to 12/13 patients. Nine cases were resected solely with an endoscopic approach and four cases in combination with neurosurgery. There were no peri- or postoperative deaths. The LR was 30.7% (4/13) including all 3 cases with malignant melanoma and one case with SCC patient who died due to cavernous sinus invasion. The distant metastasis rate was 23.0% (3/13) including 2 cases with malignant melanoma and one case with leiomyosarcoma. OS was 76.9% (10/13) and the mean follow-up duration was 33.9 (13-72) months. Eight cases remain free of disease (DFS, 61.5%, 8/13) by clinical, endoscopic, and radiographic (CT or MRI) surveillance, and their mean follow-up duration was 35.5 (13-72) months.

Conclusion: Minimally invasive endoscopic resection of sinonasal malignancies, with or without combined neurosurgery, and in combination with adjunctive therapies yields improved morbidities as well as LR, OS, and DFS that are comparable to traditional anterior craniofacial approaches in combination with adjuvant.

4:00 pm

Patterns of Treatment Failure in Nasal Cavity Cancer

Rick A. Fornelli, MD
Morgantown, WV

Introduction: Squamous cell carcinoma of the anterior nasal cavity (septum, vestibule, and floor) is rare. Staging and treatment of lymphatics is not standardized currently.

Methods: A retrospective review was conducted including 37 patients. Analysis included patterns of disease recurrence and treatment failure.

Results: Overall, 14(37%) patients developed regional recurrence in the submental or submandibular nodes. Salvage therapy was successful in only 3 of these patients. Ten patients had received prophylactic irradiation to the facial and cervical lymphatics. None of these patients failed regionally.

Conclusion: The peri-facial lymphatics should be routinely irradiated in patients with squamous cell carcinoma of the anterior nasal cavity to prevent regional recurrence of disease, which has a very poor prognosis when it occurs in this population of patients.

4:07 pm

Discussion & Questions

Randal S. Weber, MD

Surgery for Nasal Obstruction/CSF Leaks

Moderators

Brent A. Senior, MD
Martin J. Citardi, MD

4:12 pm

Advantages of Complete Endoscopic Septoplasty?

Scott R. Schaffer, MD, FACS
Susan A. Kohl, RN
Voorhees, NJ

Introduction: Deviation of the nasal septum is the rule rather than the exception. Many of our rhinology patients have benefited from septoplasty, and we recently began using a sinus endoscope for improved visualization and hemostasis during these procedures. This study reviews our initial experience with complete endoscopic septoplasty (CES) to determine the efficacy of this approach.

Methods: We utilized endoscopic visualization in 25 consecutive patients undergoing septoplasty for nasal obstruction and impaired sinus access/drainage (age range 18-66 years). The initial steps were typical of routine septoplasty. Hemostasis was achieved with endoscopic bipolar cautery and septal quilting sutures, which were also used to close mucosal defects. Septal splints were placed for one week, and patients were discharged on antibiotics, analgesics and steroid nasal spray. Nasal packing was avoided in all cases.

Results: All 25 patients reported improvement of their preoperative symptoms, and no patient received intraoperative nasal packing for hemostasis. Complications were: epistaxis on post-operative day 8 (n=3D1) and temporary nasal crusting (n=3D4). No patient developed serious complications or had significant residual septal deviation. However, intraoperative time was longer using the endoscope.

Conclusions: Clinical outcomes are excellent using this CES approach. There is less pain when nasal packing is not used. Complications are infrequent. Overall, the benefits of CES lead to improved patient satisfaction with greater patient-to-patient referrals. The major disadvantage of CES is longer operative time.

We now routinely use complete endoscopic septoplasty for patients with posterior or severe septal deviations and spurs.

4:19 pm

The Utility of Acoustic Rhinometry Data in the Pre and Post-Operative Evaluation of Patients Undergoing Functional Rhinoplasty

Minas Constantinides, MD

Lee Ann McLaughlin, MD

Philip J. Miller, MD

New York, NY

Objectives: To examine the utility of Acoustic Rhinometry in the pre and post-operative evaluation of patients with nasal obstruction undergoing functional rhinoplasty

Study Design: Prospective

Methods: Pre and Post-operative evaluations of nasal airflow were conducted on 15 patients with chronic nasal obstruction. Methods of evaluation included history and physical examination, data from pre and post-operative cottle maneuvers, and acoustic rhinometry data. Surgical procedures were tailored to structural abnormalities noted on physical examination and with the data obtained from cottle maneuvers and acoustic rhinometry measurements. The surgical procedures included: septoplasty, laser turbinoplasty, and placement of spreader and batten grafts. The patients were asked to complete a post-operative patient satisfaction questionnaire at approximately 6- 8 months after their operation.

Results: Most patients were satisfied with their functional post-operative results. In most cases, pre-operative acoustic rhinometry measurements correlated with data obtained from physical examination and cottle maneuver and provided useful information on the sites of nasal obstruction. Following functional rhinoplasty, subjective relief of nasal obstruction did not necessarily correlate with increased cross sectional area values obtained by post-operative acoustic rhinometry.

Conclusions: Acoustic rhinometry is a useful adjunct to cottle maneuver and physical examination for pre-operative planning of functional rhinoplasty for nasal valve obstruction. Subjective relief of nasal valve obstruction cannot always be confirmed by objective post-operative acoustic rhinometry measurements.

Key words: Acoustic Rhinometry, Nasal Valve Analysis, Functional Rhinoplasty

4:26 pm

Nasal Valve Obstruction

Hani Ibrahim, MD

Michael Friedman, MD

Chicago, IL

Introduction: Assessment of nasal obstruction is a routine part of the otolaryngologists evaluation. In the absence of obstructive masses, the assessment is commonly focused on the septum and inferior turbinates. Rarely is the nasal valve (internal and external) examined and addressed during assessment and surgical correction of the nasal airway. Overlooked nasal valve collapse results in incomplete resolution of nasal obstruction and, in some cases, disappointing postoperative results. The objective of this study is to define, through history, clinical exam, and acoustic rhinomanometry, the incidence of nasal valve obstruction in a population of patients assessed for nasal airway obstruction.

Methods: One hundred consecutive patients assessed for nasal airway surgery following failure of medical therapy were studied to determine whether valve obstruction was a contributing factor. Each patient underwent a detailed history and trial of Breathe-Rite strips. Results of Breathe-Rite use were recorded. The Cottle maneuver was performed on each patient and results recorded. The internal and external valve area was observed on deep inspiration and collapse recorded. Internal examination was performed with a nasal endoscope. Acoustic rhinomanometry was performed on each patient to assess the area of obstruction.

Results: Compilation of data from the history, physical, and acoustic rhinomanometry identified patients thought to have obstruction caused by 1) valve primarily, 2) septum/turbinate primarily, and 3) both valve and septum/turbinate obstruction. A significant number of patients have obstruction at the valve area as a sole or contributing cause of nasal airway obstruction.

Conclusion: Nasal valve collapse is a common cause of nasal airway obstruction. Preoperative identification should allow for more precise and effective surgical correction of the symptoms.

4:31 pm

Discussion & Questions

Brent A. Senior, MD

4:36 pm

Elevated Intracranial Pressures in Spontaneous Cerebrospinal Fluid (CSF) Leaks

Rodney J. Schlosser, MD
Eileen Maloney Wilensky, MSN
M. Sean Grady, MD
William E. Bolger, MD, FACS
Philadelphia, PA

Objective: Spontaneous CSF leaks represent a unique subset of patients that have previously been considered idiopathic. We present clinical, radiographic and surgical findings that indicate elevated intracranial pressures (ICPs) in this group and review the pathophysiology and unique management issues of spontaneous CSF leak patients.

Methods: Retrospective review of medical records, imaging studies and surgical treatment of spontaneous CSF leaks patients. ICP was measured by lumbar puncture post-operatively after cessation of all active CSF leaks.

Results: Fifteen patients with spontaneous CSF leaks were surgically treated from 1996-2002. The spontaneous group consisted primarily of obese, middle-aged females (12 of 15 patients). Twelve patients had adequate imaging of the sella turcica. Ten had completely empty sellas and two had partially empty sellas. Seven patients agreed to post-operative lumbar puncture. ICPs were elevated in all 7 patients (mean 26.4 cm water, range 17.3 to 34 cm water, normal 0-15 cm water). Surgical repair was 100% successful in leak cessation with a mean follow-up of 11.8 months.

Conclusion: Although the precise cause and mechanism of spontaneous CSF leaks is not fully understood, this study sheds light on important factors to consider. Patients with this condition have similar physical and radiographic findings, such as middle-age, female gender, obesity, and empty sella. Further investigation is needed to determine the exact cause of the condition, its relationship to elevated ICPs and if further medical or surgical treatments to correct the intracranial hypertension are warranted.

4:43 pm

The Bath-Plug Closure of Anterior Skull Base Cerebro-Spinal Fluid (CSF) Leaks

Peter John Wormald, MD
Mike McDonogh, MD
North Adelaide, South Australia

This study presents the technique and results of CSF leak closure by placement of a fat plug on the intra-cranial surface of the dura.

Design: Prospective cohort study of all consecutive patients undergoing endoscopic closure of an anterior skull base CSF leak using the bath-plug technique.

Setting: Tertiary Care Centre

Materials and Methods: Thirty patients presented with CSF leaks. Five were traumatic, 7 spontaneous, 8 iatrogenic and 10 associated with a meningo-encephalocele. The average age of the patients was 40 and the male to female ratio was 1:1. All patients underwent the bath-plug technique for closure of CSF leaks. The surgical technique is presented.

Results: Twenty-eight of the 30 patients had a successful primary closure of their CSF leak with 2 patients requiring a repeat procedure. After an average of 28 months follow-up there were no recurrent leaks in any of the patients. This gives a primary closure success rate of 93% and a secondary closure rate of 100%.

Conclusions: The bathplug technique for closure of anterior skull base CSF leaks is a reliable technique for a large variety of causes.

4:50 pm

Sellar Reconstruction: Is it Necessary?

*Robert Sonnenburg, MD
David White, MD
Brent Senior, MD
Chapel Hill, NC*

Introduction: Sellar reconstruction is a routine practice during transphenoidal approach to pituitary tumor resection. This practice exposes the patient to risks of donor site complications and may interfere with measuring post operative tumor reduction. We propose that it is not a necessary component of transphenoidal pituitary surgery in the absence of intraoperative CSF leak.

Methods: A retrospective chart review of 45 cases of minimally invasive pituitary surgery were reviewed. 36 cases were identified with no sellar reconstruction being performed. Age, sex, and revision surgery, postoperative cerebrospinal leak, days with lumbar drain, ophthalmoplegia, visual acuity loss, postoperative epistaxis, diabetes insipidus, development of empty sella syndrome, and length of stay were investigated in these cases.

Results: 31/36 cases were the primary procedure and 5/36 cases were revision surgery. Complication rates were low and compared favorably with those reported in the literature. 5 cases of transient diabetes occurred. There was 1 postoperative cerebrospinal fluid leak that required 4 days with a lumbar drain. No cases of empty sella syndrome developed. There were no cases of meningitis. The average length of stay was 2.04 days.

Conclusions: Sellar reconstruction during transphenoidal approach to pituitary tumor resection is not routinely required for patients without evidence of an intraoperative cerebrospinal fluid leak. This practice exposes the patient to the risks of donor site complications without reducing the rate of postoperative complications.

4:57 pm

Discussion & Questions

Martin J. Citardi, MD

5:00 pm

Business Meeting, All ARS Members Invited

Moderator

*Paul Toffel, MD
Donald C. Lanza, MD*

Poster Sessions

Moderator

Steven Marks, MD

The Use of Fibrin Glue as Hemostatic in Endoscopic Sinus Surgery

*Michael Vaiman
Ephraim Eviatar
Samuel Segal
Tel Aviv, Israel*

Objectives: Endoscopic sinus surgery (ESS) inevitable develops postoperative bleeding and usually ends with nasal packing. Nasal packing cause pain, rhinorrhea, inconvenience and postoperative bleeding still occur. The aim of our study was to compare the hemostatic properties of the second-generation surgical sealant Quixil to those of nasal packing in ESS.

Study design: A prospective randomized trial.

Methods: Sixty-four consecutive patients undergoing ESS were allocated by the sealed envelope method into two groups. After routine ESS, the operation was ended with Merocel nasal packing in Group I, and with aerosol application of Quixil sealant at the operative site in Group II. Hemostatic effects were evaluated objectively in the clinic by anterior rhinoscopy and endoscopy and assessed subjectively by the patients at follow-up visits.

Results: In Group I various types of postoperative bleeding occurred in 6% of patient. In Group II there were no postoperative bleeding. Drainage and ventilation of the paranasal sinuses were not impaired. There were no allergic reactions to the glue.

Conclusion: The aerosol application of fibrin glue can be readily performed in ESS, requires no special treatment (antibiotics), and appears to have adequate hemostatic effect. We conclude that the use of second-generation glue in ESS is well suited to stop nasal bleeding, is safe and more convenient.

Recording of Electro-Olfactograms Using Externally Placed Electrode

*Churnal Hari
Gireesh Kumaran
Liwei Wang
Tim Jacob*

Cardiff, United Kingdom

Introduction: Electro-olfactogram (EOG) is considered to be the summated generator potentials of the olfactory receptor cells and therefore represent the peripheral olfactory event. Recording of these electrical potentials in humans is met with difficulties, in view of the hidden anatomical position the olfactory cleft in the nasal cavity.

Aim: The aim of the study was to record the EOG simultaneously using an intranasal electrode and another set of electrodes placed externally over the bridge of the nose on either side to record similar events. To obtain additional information about the central processes involved in olfactory pathway scalp electrodes were used for recording olfactory evoked potentials

Methods: An air dilution olfactometer was used for the delivery of odor stimulants. Fifteen healthy volunteers from the university population participated in the study. Amyl acetate was used as odor stimulant. A method of self-introduction was used for inserting the intranasal electrode.

Results: In 11/15(73.3%) subjects EOGs were recorded, however the external electrode failed to record similar events. The recordings from the external electrodes showed biphasic responses similar to evoked potentials from scalp electrodes.

Conclusion: Self-introduction of intranasal electrode is a reliable technique for recording of EOGs. External electrode recordings resemble evoked potentials and probably represent evoked responses from the olfactory bulb.

Radiologic Evaluation of the Fovea Ethmoidalis

*Charles K. Oh
Nghia Nguyen
John H. Krouse*

Detroit, MI

Objective: To determine the prevalence of various depths of the fovea ethmoidalis according to the Keros classification system.

Study Design and Methods: Retrospective review of 200 coronal computed tomography (CT) scans of the paranasal sinuses

performed at a single academic institution. The height and depth of the ethmoid roof were examined in relation to the height above the cribriform plate. Scans were reviewed and measurements made on a computer imaging system.

Results/Conclusion: Keros classes type 1 and type 2 accounted for the majority of cases examined, with nearly 66% of the patients falling into the type 2 classification. Also, a significant number of patients demonstrated asymmetry between the right and left sides of the fovea ethmoidalis.

The Learning Curve in Minimally Invasive Pituitary Surgery

*Robert Sonnenburg
David White
Brent Senior
Chapel Hill, NC*

Introduction: Minimally invasive pituitary surgery is performed via an endoscopic endonasal transphenoidal approach. This provides excellent illumination, visualization, and magnification of the operative field, in addition, to avoiding complications associated with other approaches. In this study we examine the first 45 cases of minimally invasive pituitary surgery to determine if a learning curve exists for this technique.

Methods: A retrospective chart review was performed of the first 45 cases of minimally invasive pituitary surgery at a major academic medical center. Cases were divided into 3 groups of 15 patients each. Group characteristics including age, sex, and revision surgery were compared. Complication rates investigated included: death, intracerebral hemorrhage, intraoperative cerebrospinal fluid (CSF) leak, postoperative CSF leak, days with lumbar drain, meningitis, postoperative epistaxis, ophthalmoplegia, visual impairment, and diabetes insipidus. Other factors examined included intraoperative blood loss, length of stay, tumor histology, tumor volume reduction, and postoperative hormone level alterations.

Results: Groups were comparable in respect to characteristics studied. Statistically significant differences in complication rates and other factors between groups were not shown, although several trends appeared to develop.

Conclusion: This study does not demonstrate a learning curve for minimally invasive pituitary surgery. Factors such as the level of experience of the rhinologist/neurosurgeon team, resident participation, and number of cases studied explain this finding.

Sinonasal Infantile Myofibroma: An Extremely Rare Entity

*Carrie A. Roller, MD
Spiros Manolidis, MD
Houston, TX*

Introduction: Infantile myofibromatosis is a rare disease that typically presents before 2 years of age. Lesions are characterized by myofibroblastic proliferation and, while they may be locally invasive, are benign. Myofibromas may be solitary or multicentric. Multicentric lesions tending to be more aggressive than the solitary form, which may even spontaneously regress. While an estimated 60% of solitary lesions occur in the head and neck, typically they involve the skin and subcutaneous tissues. Treatment consists of resection, with recurrence rates reported up to 20 percent. This entity has not previously been reported as arising from the sinuses, though sinonasal leiomyomas have been reported.

Study design: Case report and review of the literature

Results: We reviewed the literature and found that the most common non-skin head and neck site for infantile myofibromas is by far the oral cavity, with 47 cases reported in the literature. Scattered reports exist of orbital and nasopharyngeal myofibromas, though we could discover no incidences of sinonasal infantile myofibroma. We present a case of a 22 month old child with a massive infantile myofibroma of the maxillary and ethmoid sinuses with encroachment on the septum, orbit, sphenoid and anterior cranial fossa.

Conclusions: Infantile myofibroma is a rare lesion, and this represents the first report of such a lesion arising from the nasal sinuses.

Diagnosis and Management Principles of Silent Sinus Syndrome

*Ravi Dahiya, MD
Gavin Setzen, MD
Albany, NY*

Background: Silent Sinus Syndrome is a rare entity which often presents first to the ophthalmologist or primary care physician. Though ophthalmologic findings are the first to be recognized, treating the underlying maxillary sinus disease is the key to management.

Objective: Our goal was to elucidate diagnosis and surgical management guidelines based on our recent experience with Si-

lent Sinus Syndrome as well the experiences of others reported in the literature.

Methods: We reviewed two recent cases at our institution as well as performed a comprehensive literature review. We searched for similarities in clinical presentation, previous sinonasal complaints, radiologic findings, surgical interventions and outcomes.

Results: Our patients both first presented to an ophthalmologist, one for diplopia the other with enophthalmos. The diagnosis was made with computed tomography and management was limited to endoscopic sinus surgery.

Conclusions: As the name suggests, Silent Sinus Syndrome presents with a lack of sinonasal complaints. Diagnosis is made by computed tomography during work up for other causes of enophthalmos or diplopia. The pathophysiology remains unclear though there are thought to be similarities to eustachian tube dysfunction. Endoscopic sinus surgery with or without subsequent orbital floor reconstruction are the mainstays of management. Outcomes of surgical management tend to be overwhelmingly favorable.

Endoscopic Surgery of Benign Sinonasal Tumors

*Tarika Bhuta
Hassan Ramadan
Morgantown, WV*

Objective: The treatment of benign sinonasal tumors is mostly surgical. Advancements in endoscopic techniques have allowed the resection of these tumors without an external approach. The aim of this study is to establish the efficacy of endoscopic techniques for treatment of benign sinonasal tumors.

Methods: Retrospective chart review of patients with benign sinonasal tumors who were treated with endoscopic management from June 1997 - December 2000.

Setting: Tertiary referral academic center.

Results: Fifteen procedures in 12 patients were performed using endoscopic surgery for the resection of inverted papilloma, nasal schwannoma, histiocytoma and hemangiopericytoma. In 9 patients endoscopic surgery was successful and the patients remain without evidence of disease with a median follow up of 21 months. In 2 patients the tumor extended laterally into the maxillary sinus and a concomitant Caldwell-Luc procedure had to be performed. One patient required a repeat endoscopic procedure to remove the tumor after it recurred less than 6 months after the initial surgery. One postoperative complication was en-

countered which consisted of intraoperative orbital hematoma that required orbital decompression.

Conclusion: Endoscopic sinonasal surgery is a feasible alternative to traditional open techniques for the management of benign sinonasal tumors.

Endoscopic Ligation of the Sphenopalatine Artery as Primary Management in Coagulopathies with Severe Posterior Epistaxis

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Objective: To present our experience with endoscopic ligation of the sphenopalatine artery in the treatment of coagulopathies with severe posterior epistaxis who had previously undergone conservative treatment.

Methods: Patients with established coagulopathy were treated with an endoscopic ligation of the sphenopalatine artery, after failing conservative procedures. The basic principle of the surgical technique is to identify the branches of the sphenopalatine artery through an endoscopic endonasal approach and to apply a titanium clip under direct vision.

Results: The endoscopic ligation of the sphenopalatine artery was performed unilaterally in all patients. It was possible to identify the sphenopalatine artery in all cases with a successful outcome using this surgical technique alone.

Conclusion: Endonasal endoscopic ligation of the sphenopalatine artery is an effective technique for treating severe posterior epistaxis in coagulopathies. It should be preferentially considered in patients with bleeding disorders who have failed conservative procedures, or as first-line management.

AIDS Presenting as an Atypical Nasal Infection

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AIDS associated illnesses are becoming increasingly common in the practice of otolaryngology. It is particularly important to identify these processes in patients who do not carry a diagnosis of HIV/AIDS, as recognition of HIV infection leads to the appropriate

antiretroviral therapy. We report a case of a nasal mass in a 22-year-old male previously undiagnosed with HIV/AIDS. Evaluation of this mass revealed chronic infection with *Salmonella* and associated eosinophilic inflammatory response. The clinical, histologic and microbiologic characteristics of this disease process are reviewed. The atypical presentation and microbiology of this lesion ultimately led to the diagnosis of AIDS in this patient. A high index of suspicion is required to make the diagnosis of HIV/AIDS in patients presenting with otolaryngologic disease.

The Utility of Acoustic Rhinometry Data in the Pre- and Post-Operative Evaluation of Patients Undergoing Septorhinoplasty

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Objectives: To examine the utility of Acoustic Rhinometry in the pre and post-operative evaluation of patients with nasal obstruction undergoing septorhinoplasty

Study Design: Prospective

Methods: Pre- and post-operative evaluations of nasal airflow were conducted on 15 patients with chronic nasal obstruction. Methods of evaluation included history and physical examination, data from pre- and post-operative modified Cottle maneuvers, and acoustic rhinometry data. Surgical procedures were tailored to structural abnormalities noted on physical examination and with the data obtained from the modified Cottle maneuvers and acoustic rhinometry measurements. The surgical procedures included: septoplasty, KTP laser turbinoplasty, and placement of spreader and alar batten grafts. The patients were asked to complete a patient satisfaction questionnaire at 6-8 months after their operations.

Results: Most patients were satisfied with their functional post-operative results. In most cases, pre-operative acoustic rhinometry measurements correlated with data obtained from physical examination and modified Cottle maneuvers and provided useful information on the sites of nasal obstruction. Following functional septorhinoplasty, subjective relief of nasal obstruction did not necessarily correlate with increased cross-sectional area values obtained by post-operative acoustic rhinometry.

Conclusions: Acoustic rhinometry is a useful adjunct to modified Cottle maneuver and physical examination for pre-operative planning of functional septorhinoplasty. Subjective relief of nasal valve obstruction cannot always be confirmed

by objective post-operative acoustic rhinometry measurements. We postulate that dynamic obstruction in weakened nasal valves is not always identifiable by the static measurements of acoustic rhinometry. Nasal valve surgery can improve dynamic obstruction without affecting cross-sectional nasal valve areas at rest.

Key words: Acoustic Rhinometry, Nasal Valve Analysis, Functional Rhinoplasty

Management of Silent Sinus Syndrome Without Primary Orbital Reconstruction

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Introduction: Silent sinus syndrome is a rare condition that presents with enophthalmos secondary to maxillary sinusitis. Imaging demonstrates isolated maxillary opacification with loss of bone in the orbital floor. Exclusion criteria for diagnosis are trauma, surgery, or symptoms of chronic rhinosinusitis. A review of the literature finds management typically involves ventilation of the involved sinus by either an open or endoscopic approach and orbital floor reconstruction. Recently we treated two patients by addressing only the sinus disease due to concern of reconstruction with plates or grafts near an infected site. The enophthalmos in both patients spontaneously resolved after drainage, debridement, and ventilation of the maxillary sinus without further intervention.

Methods: A retrospective chart review identified two patients who presented with enophthalmos, diplopia, and isolated asymptomatic chronic maxillary sinusitis. Both patients underwent Caldwell-Luc and maxillary antrostomies. Patients were followed post-operatively over a one-year period.

Results: All patients were treated without complications. The enophthalmos spontaneously resolved shortly after surgery. No patients required further orbital floor surgery. All patients were satisfied with their appearance.

Conclusions: Treatment of silent sinus syndrome should not necessarily involve orbital floor reconstruction at the time of sinus drainage. These cases demonstrate that some patients may only require management of the affected sinus. A third patient was found in the literature that was treated with endoscopic maxillary antrostomy alone with similar results. These findings suggest that primary orbital reconstruction may subject the patients to unnecessary risks of orbital floor surgery in the setting of infection.

Clinical Acoustic Rhinometry Assessment of Patients With Nasal Blockage

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Chicago,IL*

Objective: To review the acoustic rhinometry (AR) results of patients with clinical nasal blockage to assess its usefulness for clinical evaluation.

Study design: The acoustic rhinometry reports of 203 patients who applied to our allergy rhinology clinic with nasal blockage between January 1998 and January 2002 were analyzed.

Material and Methods: Each patient was studied pre and post decongestant from 0-6 cm on each side. Volumes and areas at 2, 4 and 6 cm were calculated, as was the percent change in each after decongestion, and between sides.

Results: The mean age of the patients were 43.39-/+ 15.04 years. Forty eight and 77/100 of the cases were male and 51.72% of the cases were female. Seventy three and 4/100 had an allergy history and 20.7% of them had previous nasal surgery for septal deviation, nasal polyps and/or chronic sinusitis. The volume increased in the left nostril from 8.46+/-4.05(predecongestant) to 11.89+/-14.88 (post decongestant) (mean+/-standard deviation) and in the right nostril from 9.03+/-4.96 (pre) to 11.71+/-5.57 (post). The nasal obstruction was usually mixed, including both abnormal congestion and structural obstruction in 71.9%. The irreversible part of the obstruction was usually of an anterior type alone (30.82%) or totally deviated to one side obstructing at all levels (30.82%). Irreversible nasal obstruction was seen in the middle of the nose in 9.59% while 13.01% and 15.75% of the cases showed an S type or posterior irreversible nasal obstruction alone respectively. Irreversible obstruction only was present in 11.8%, while 14.3% had only reversible obstruction. In those with irreversible obstruction, the location was total in 66.7% of the cases, posterior in 16.7%, anterior 12.5% and middle in 4.2% of the cases. AR results showed normal findings with no reversible or irreversible obstruction in 2% of the patients. An interesting finding was that 23.2% of cases showed paradoxical congestion after the application of the decongestant which could be attributed to either hypersensitivity to the topical nasal spray or rhinitis medicamentosa. The clinical correlation to the patients symptoms was 93.1%, whereas 6.9% of the patients showed results inconsistent with the clinical findings (including the 2% that were by AR but symptomatic).

Conclusion: AR can provide an index of changes in nasal geometry to assess the relative contributions of reversible and irreversible blockage at all levels of the nose.

Septal Perforation After Nontransseptal Sphenoid Sinus Surgery

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Background: Septal perforation is a known complication of transseptal sphenoid sinus or pituitary surgery. However, septal perforation after direct transnasal, nontransseptal, sphenoid sinus surgery has not been described. We report four cases of septal perforation in patients who had bilateral nontransseptal sphenoid sinus surgery in the past. We discuss the possible mechanism leading to this complication as well as the anatomic and vascular aspects of this type of surgery.

Patients and Methods: Between 1997 and 2001 we have seen 4 patients with posterior septal perforation who had previously had bilateral sphenoidotomy for sphenoid sinus or pituitary lesions.

Results: All 4 patients had posterior septal perforation involving the bony septum. All 4 patients had nontransseptal sphenoid sinus surgery. None of the patients had any septal or transseptal surgery and none of the patients had history of intranasal drug abuse. Three patients had bilateral transnasal sphenoid sinus surgery in other institutions and were referred to us for recurrent sinusitis and polyposis. The fourth patient had transnasal, nontransseptal, transsphenoidal pituitary surgery at our institution. The original procedure included cauterization of the nasoseptal division of the sphenopalatine artery on both sides. Also, because of CSF leakage, the procedure included repair of the sella turcica, obliteration of the sphenoid sinus, and tight bilateral nasal packing. Two months later, posterior septal perforation was identified.

Discussion: Bilateral sphenoid sinus surgery may compromise the nasoseptal division of both sphenopalatine arteries and may result in necrosis of the posterior septum. Postoperative aggressive nasal packing may contribute to the pressure and avascular necrosis.

Conclusions: We advise surgeons who perform bilateral sphenoidotomy or transnasal transsphenoidal pituitary surgery to make every possible attempt to preserve at least one of the nasoseptal arteries and to avoid aggressive nasal packing.

Massive Sinonasal Mucoceles: Diagnosis and Treatment

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Houston, TX*

Introduction: Sinonasal mucoceles themselves are not an infrequent occurrence, however clinically significant mucoceles are relatively rare. Growth is slow and insidious. Facial deformity or ocular problems may be the presenting complaint. In these cases the progression may be so slow as to go unnoticed until a significant functional or cosmetic deformity has occurred due to the presence of a massive mucocele. In others, an infection of the affected sinus may create a mucopyocele, causing a sudden abnormality which brings the problem to light acutely. Mucoceles which do not significantly alter craniofacial anatomy may be treated simply through an endoscopic approach, however in cases with significant anatomic deformity a more radical approach may be needed.

Study design: Retrospective review of case series

Results: We have treated seven massive mucoceles of the fronto-ethmoidal and maxillary sinuses over 36 months at the public hospitals affiliated with our institution. All were treated surgically with orbital reconstruction as necessary. Clinical features, diagnosis, treatment and outcome (up to 36 months) for large, deforming mucoceles and mucopyoceles are presented.

Conclusions: Massive sinonasal mucoceles and mucopyoceles present a treatment challenge due to their propensity to erode into surrounding structures such as the cranium and orbit.

Allergic Fungal Sinusitis-Changing Concepts

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New Delhi, India*

Objectives: To study the varying clinical profile of Allergic Fungal Sinusitis and propose a clinical classification of the same.

Methods: A retrospective study was carried out and data collected for a period from January 1995 to January 2001 of patients who had undergone endoscopic sinus surgery for recalcitrant sinonasal conditions including chronic sinusitis, nasal polyposis and allergic mucinous disease. A total of 247 primary endoscopic surgeries were done in this period. The clinical profile of these patients, radiological features, the surgical findings, pathological

findings and recurrence patterns were analysed and the patients were grouped into different classes.

Results and Conclusions: All patients had similar clinical presentation in terms of nasal symptoms and refractoriness to medical therapy. We believe that the clinical picture of recalcitrant sinusitis, ethmoidal polyposis and allergic mucinous disease are the various stages of allergic fungal sinusitis. The following clinical classification is proposed.

Stage 1-Stage of mucosal edema with or without polypoidal changes without allergic mucin

Stage 2-Stage of nasal polyposis/mucosal edema without allergic mucin

Stage 3-Stage of polyposis/mucosal edema with allergic mucin

Stage 4-Expansile disease with allergic mucin and facial and/or eye changes / intracranial extension.

The patients have all been studied and grouped into these categories and behaviour of the disease within each category has been analysed. We postulate that all clinical stages proposed in the classification are part of the spectrum of allergic fungal sinusitis which is a progressive disease. A patient can present in any one of these stages and requires endoscopic surgery with allergic and fungal prophylaxis to delay recurrences.

Midline Necrotizing Sinonasal Lesions: A Diagnosis and Treatment Algorithm with Clinicopathologic Correlates

*Richard W. Westreich
William Lawson
New York, NY*

Purpose: To assess the principal clinical and radiologic signs of midline destructive nasal lesions and provide management algorithms for diagnosis and management

Methods: Literature review and retrospective chart review.

Findings: 6 patients each with Wegener's Granulomatosis, Sarcoidosis, and Cocaine abuse and two unclassified lesions were analyzed with respect to symptoms, laboratory results, and radiologic studies. Diagnostic and management algorithms are presented using our findings combined with previous studies in the medical literature.

Conclusions: The selection of proper laboratory tests combined with findings present on radiologic studies should lead to diagnosis.

Inferior Turbinate Infusion: A New Route into Systemic Circulation (Pathological Aspect)

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Idea: Our successful experiment on drugs & liquids infusion through inferior turbinate as a substitute route of peripheral and central veins has been obtained (Nose 2000 Congress, Washington, DC, USA, Sept. 2000). Having studied the pathological changes of inferior turbinate after drugs & therapeutic liquids infusion, we have compared it with control cases.

Method: In 30 cases(21M,9F)with severe burn or low GCS admitted to ICU department who did not have any accessible peripheral vein ,weinserted a-20-g angiocatheter into inferior turbinate used as the main route of infusion to patients. Following patients death,both infusion and noninfusion sites have been necropsied and compared histopathologically.

Results: In 30 cases, mean age was 26.67 +/- 18.36(5-77 y) duration of angicatether remaining: 2.93 +/- 1.62 (1-6 days)(in 56.7% angiocatheter remained more than days). In 100% of cases different list of drugs & fluids infused. After necropsy of both inferior turbinates (one as injection site and the other as control) both severe inflammation and focal necrosis have been found in 1 case and abscess formation in another pathological finding in other cases revealed only mild to moderate inflammation. No case of thrombosis was found.

Conclusion: This study suggests:

1. IV line can be substituted with inferior turbinate drugs & liquids infusion, in some hemodynamic emergency situations which is not any instant access to circulation.
2. In other condition, inferior turbinate infusion like IV infusion can be considered due to rich sinusoids and blood lakes .

Endoscopic Removal of Inverted Papilloma of Nose and Paranasal Sinuses

*Ramesh Chandra Deka
Paramita Baruah
New Delhi, India*

Objectives: To analyse the effectiveness of endoscopic sinus surgery in the management of nasal and paranasal sinus inverted papillomas

Methods: An analysis of patients who had undergone endoscopic sinus surgery for inverted papilloma of the nose and paranasal sinuses between 1995 and 2001 was done. There were 6 patients included in the study of which 5 were male and one female. The patient data like clinical profile, radiological findings, operative findings and post operative follow up was analysed. All patients were requested via letters to come for an endoscopic assessment.

Results: Of the 6 patients two have required repeat surgery. Both these patients had bilateral disease and were inadvertently discovered to have inverted papilloma on histopathology. The remaining patients had unilateral limited disease and are free of recurrence at a follow up of 6 months to 3 years.

Conclusion: Endoscopic surgery is ideally suited in cases of inverted papilloma with limited extent. Endoscopy is also a useful tool to determine early recurrences of the disease.

Office Based "Snare" Anterior Mini Turbinectomy — Results of 40 Procedures with Acoustic Rhinometric Analysis

Rajendra Bhayani, MD

Prajoy Kadkade, MD

Eli Grunstein, MD

Hector Rodriguez, MD, FACS

New York, NY

Objectives: To evaluate the safety and efficacy of an office based procedure in which a new technique that resects the anterior portion of the inferior turbinate with snare is described. This technique is compared with historical methods of turbinate reduction that are performed in the operating room suite. A cost analysis is depicted and an algorithm of treatment for patients with inferior turbinate hypertrophy and mild deviated nasal septum is suggested.

Methods: Forty office based anterior snare mini turbinectomy procedures were performed in 22 patients. Eighteen patients had the procedure repeated on the contralateral side one month after the initial turbinectomy, four patients had a unilateral procedure performed on the side where they also had an associated anterior nasal septal deflection. Acoustic rhinometry was performed on all patients before and two weeks after each procedure. Description of the technique, patient selection and untoward side effects are presented.

Results: The size of the specimens resected ranged from 1.3 cm to 2.3 cm in length. Surgicel and Telfa packs were removed in all patients within 48 hours. No patients (0%), suffered from delayed bleeding requiring nasal packing. Two patients (5%), had a

mild vasovagal reaction during the infiltration of local anesthetic. Twenty out of 22 patients (95%) experienced an overall improvement of their breathing. Acoustic Rhinometry demonstrated increase in the minimal cross sectional area (MCA) of the nose in 34 / 40 (85%) sides.

Conclusion: Anterior mini turbinectomy can safely and effectively be performed in an office setting with excellent functional outcome, minimal morbidity and side effects and with a significant reduction in costs. This mini turbinectomy technique can also avoid potential long term complications such as atrophic rhinitis and empty nose syndrome.

ARS Dinner Symposium

**Novel Treatment Strategies for
Rhinosinusitis**

5:45-6:15 pm

Registration

5:45-6:30 pm

Cocktail Reception

6:35-6:45 pm

Introduction – Pt. Evaluation

Donald C. Lanza, MD

6:45-7:10 pm

**Pathogenesis & Treatment of Nasal
Polyposis: A European Perspective**

Heinz Stammberger, MD

7:10-7:15 pm

Q & A

7:15-7:35 pm

Leukotrienes and Airway Inflammation

Berrylyn J. Ferguson, MD

Leukotriene Blockers & Sinusitis

Steven M. Parnes, MD

7:35-7:45 pm

**Interleukin Therapy and
Immunoglobulin Therapy**

John H. Krouse, MD, PhD

7:45-8:00 pm

Panel Q & A

Dinner

NOTES

NOTES

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Carlos Cuilty-Siller, MD, Laredo, TX
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Perry Johnson, MD, Omaha, NE
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Stephen Pincus, MD, Marina Del Rey, CA
Timothy Pine, MD, Manhattan Beach, CA
Jayant M Pinto, MD, Chicago, IL
James Pitcock, MD, Mobile, AL
Steven Pletcher, MD, San Francisco, CA
Roger Plotkin, MD, New City, NY
Alan Pokorny, MD, Park City, UT
Glen T. Porter, MD, Galveston, TX
Louis Portugal, MD, Chicago, IL
Edward Porubsky, MD, Augusta, GA
William Potsic, MD, Philadelphia, PA
W. Bruce Povah, MD, Canada
Jeffrey Powell, MD, DDS, FACS, Chesapeake, VA
Loring W. Pratt, MD, Fairfield, ME

John C. Price, MD, Lutherville, MD
 Jordan Pritikin, MD, Chicago, IL
 Christine Puig, MD, Auburn, WA
 Pelayo Vilar Puig, MD, Edo., Mexico
 Ronald Pulli, MD, Pittsford, NY
 Liana Puscas, MD, Sacramento, CA
 Joseph Puzzi, MD, Pottsville, PA
 Timothy Queen, MD, Newport News, VA
 Chris Quilligan, MD, Fulelrton, CA
 Richard Quisling, MD, Hermitage, TN
 Lup Quon-Pang, MD, Honolulu, HI
 Jean-Jacques Rafie, MD, McKinney, TX
 Sherif Ragheb, MD, Moline, IL
 B Manrin Rains, MD, Cordova, TN
 Hassan H Ramadan, MD, Morgantown, WV
 Alexander Ramirez, MD, San Francisco, CA
 Emilio Godoy Ramirez, MD, CHILE
 Elizabeth Ransom, MD, Bloomfield Hills, MI
 Vittal Rao, MD, Wappingers Falls, NY
 Douglas E. Rapisarda, MD, Two Rivers, WI
 Christopher H. Rassekh, MD, FACS, Morgantown, WV
 Adrian Ratinoff, MD, Avellaneda, Argentina
 Edward Razim, MD, Oak Brook, IL
 Edward Reardon, MD, Quincy, MA
 Elie Rebeiz, MD, Boston, MA
 Patrick Reidy, MD, Detroit, MI
 Jacquelyn Reilly, MD, Bronx, NE
 Seth Reiner, MD, Littleton, CO
 Mark Reinke, MD, Green Bay, WI
 Anthony Reino, MD, New York, NY
 Bruce Reisman, MD, Oceanside, CA
 William Remington, MD, Minneapolis, MN
 Angelo Reppucci, MD, Memphis, TN
 Todd Reulback, MD, Lewisville, NC
 Dukhee Rhee, MD, Bronx, NY
 Edward Rhee, MD, Pomona, NY
 Theodore B. Rheney, MD, Asheville, NC
 Dale Rice, MD, Los Angeles, CA
 Harry J. Richter, Jr., MD, Belfast, ME
 William Richtsmeier, MD, PhD, Cooperstown, NY
 Seth Riddle, MD, Provo, UT
 Anthony A. Rieder, MD, Milwaukee, WI
 Michael Riley, DO, Largo, FL
 Nabil M. Rizk, MD, Egypt
 Jeffrey Roach, MD, Bronx, NE
 Wade Robinette, MD, Kansas City, MO
 C. Robinson, MD, Albuquerque, NM
 Donald Rochen, DO, Madison Heights, MI
 Bret Rodgers, MD, Cleveland, OH
 Hector Rodriguez, MD, New York, NY

Jeffrey D. Roffman, MD, Tinton Falls, NJ
 Shawn E. Rogers, MD, Edmonds, WA
 Anthony Rogerson, MD, Monroe, WI
 Hwan-Jung Roh, MD, Korea
 Renato Roithmann, MD, Porto Alegre, Brazil
 John H Romanow, MD, Burlington, MA
 Alexander A Romashko, MD, Maywood, IL
 J. Lewis Romett, MD, Colorado Spring, CO
 Thomas Romo, III, MD, New York, NY
 Walter Rooney, MD, Cincinnati, OH
 Inell C. Rosario, MD, Saint Paul, MN
 Roger Rose, MD, S. Salem, NY
 John Rosedeutscher, MD, Hermitage, TN
 Marc R Rosen, MD, Philadelphia, PA
 Zvi Rosen, MD, Israel
 David Rosenberg, MD, Cranford, NJ
 Seth Rosenberg, MD, Sarasota, FL
 Marc Rosenthal, MD, Philadelphia, PA
 Deborah Rosin, MD, Martinsville, NJ
 Arthur Rosner, MD, West Bloomfield, MI
 Louis Rosner, MD, Rockville Center, NY
 Adam Ross, MD, Philadelphia, PA
 Douglas Ross, MD, New Haven, CT
 Edwin B. Jr. Ross, MD, Gretna, LO
 Erin J Ross, RN, Cleveland, OH
 Edward Rubin, MD, Denville, NJ
 Ran Rubinstein, MD, Newburgh, NY
 Christopher Rucker, MD FACS, Spartanburg, SC
 David Rudman, MD, Overland Park, KS
 Charles Ruhl, MD, Providence, RI
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 Pedro J Rullan-Marin, MD, San Juan, PR
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 Robert Ryan, Jr., MD, Bonita Springs, FL
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 Daryoush Saadat, MD, Los Angeles, CA
 Steven Sabin, MD, East Brunswick, NJ
 Michael Sachs, MD, New York, NY
 Raymond Sacks, MD, St. Ives, Australia
 Bassem M. Said, MD, Cleveland, OH
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 Anthony Sanders, MD, Columbus, IN

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Phillip R. Say, MD, Omaha, NE
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Dean Schaeffer, MD, Goldens Bridge, NY
Scott Schaffer, MD, Voorhees, NJ
Joseph Scharpf, MD, Cleveland, OH
Barry Schatikin, MD, Pittsburgh, PA
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Kenneth Scheinberg, MD, Wichita, KS
Michael Scherl, MD, Westwood, NJ
Michael Scheuller, MD, San Francisco, CA
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Richard Schmidt, MD, Philadelphia, PA
Todd Schneiderman, MD, Smyrna, GA
Erik Schoenberg, MD, West Orange, NJ
Kenneth Schoenrock, MD, Toledo, OH
Jerry Schreiberstein, MD, Springfield, MA
James Schroeder, MD, Chicago, IL
Stacey L Schulze, MD, Milwaukee, WI
Susan Schwartz, DO, Farm Hills, MI
Heather Schwartzbauer, MD, Cincinnati, OH
John Schweinfurth, MD, Nashville, TN
Craig Schwimmer, MD, Baltimore, MD
Joseph Scianna, MD, Maywood, IL
Paul Scolieri, MD, Cleveland, OH
Brook M. Seeley, MD, Cleveland, OH
Michael Seicshnaydre, MD, Gulfport, MS
Allen Seiden, MD, Cincinnati, OH
Stuart Selkin, MD FACS, Melville, NY
John Sellers, MD, Norfolk, VA
Peter Selz, MD, O'Fallon, IL
Brent Senior, MD, FACS, Chapel Hill, NC
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Merritt Seshul, MD, Murfreesboro, TN
Maher Sesii, MD, Redondo Beach, CA
Reuben Setliff, III, MD, Sioux Falls, SD
Guy Settipane, MD, Providence, RI
Gavin Setzen, MD, Albany, NY
Michael Setzen, MD, Manhasset, NY
Howard Shaffer, MD, Fort Worth, TX
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Udayan K. Shah, MD, Philadelphia, PA
Djakhangir Shamsiev, MD, Tashkent, Uzbekistan

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Lawrence Shapiro, MD, Los Alamitos, CA
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Daniel Sharkey, MD, Stuart, FL
Pramod Kumar Sharma, MD, Salt Lake City, UT
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David Slavitt, MD, New York, NY
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Bruce M. Smith, MD, Fort Collins, CO
Joe Frank Smith, MD, Dothan, AL
Lorraine M. Smith, MD, Los Angeles, CA
Maynard Smith, MD, Richmond, VA
Ronald Smith, MD, Bronx, NY
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Thomas Soss, MD, Burlingame, CA
Michael Spafford, MD, Albuquerque, NM
Robert Spears, MD, San Antonio, TX
Andrew Ryan Specter, MD, Philadelphia, PA

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James Spoden, MD, Cedar Rapids, IA
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James Stankiewicz, MD, Maywood, IL
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Robert Stanley, MD, Middleton, WI
Edward Starinchak, MD, Granville, OH
Gregory Stearns, MD, Chula Vista, CA
Kirk Steehler, DO, Erie, PA
Ira Stein, MD, Livonia, MI
Jeannine Stein, MD, Cleveland, OH
Albert Steiner, MD, Owings Mills, MD
Vernon H. Stensland, MD, Sioux Falls, SD
Bruce Serman, MD, Akron, OH
Edward Stevens, MD, Las Vegas, NV
Michael Stevens, MD, Sandy, UT
David Steward, MD, Cincinnati, OH
Michael Stewart, MD, Houston, TX
Gerald Stinziano, MD, Buffalo, NY
Gerald D Stinziano, MD, DDS, Buffalo, NY
William Stone, MD, Concord, NH
John Stram, MD, Boston, MA
Victor Strelzow, MD, Irvine, CA
Scott P. Stringer, MD, MS, FACS, Jackson, MS
Michael Strodes, MD, Cleveland, OH
Marshall Strome, MD, Cleveland, OH
Edward Bradley Strong, MD, Sacramento, CA
Mariel Stroschein, MD, Scottsdale, AZ
William Stubbs, MD, Vero Beach, FL
Fred J. Stucker, MD, Shreveport, LA
Howard Stupak, MD, San Francisco, CA
Joseph Sugerman, MD, Beverly Hills, CA
Krishnamurthi Sundaram, MD, Staten Island, NY
Charles Suntra, MD, Brockline, MA
Dana Suskind, MD, New Orleans, LA
Ronnie Swain, MD, Mobile, AL
Ronnie Swain, Jr., MD, Atlanta, GA
Greg Swanson, MD, Detroit, MI
Lisa Szubin, MD, Englewood, NJ
Thomas Tami, MD, Cincinnati, OH
Hasan Tanyeri, MD, Chicago, IL
M. Eugene Tardy, MD, Chicago, IL
Robert Tarpy, MD, Lafayette, LA
Jacob Tasher, MD, Amsterdam, NY
Barry Tatar, MD, Glen Burnie, MD
Sherard Tatum, MD, Syracuse, NY

John Taylor, MD, La Mesa, CA
Robert Taylor, MD, Durham, NC
Benjamin Teitelbaum, MD, Milwaukee, NY
Jeffrey Terrell, MD, Ann Arbor, MI
Erica Thaler, MD, Philadelphia, PA
Dai Thanh, MD, Vietnam
Stanley Thawley, MD, Saint Louis, MO
Hilary Timmis, Jr., MD, Bellvue, OH
Wyatt To, MD, Cleveland Heights, OH
Diana Tobon, MD, Miami, FL
Paul Toffel, MD, Glendale, CA
Lawrence Tom, MD, Philadelphia, PA
Vincent Toma, MD, W. Bloomfield, MI
Stephen Toner, MD, Panama City, FL
Robert Toohill, MD, Milwaukee, WI
Richard Trevino, MD, San Jose, CA
William Trimmer, MD, Reno, NV
Minh Trong, MD, Ho Chi Minh City, Vietnam
Ewen Tseng, MD, Plano, TX
Charles Tucker, MD, W Nartford, CT
Ralph Tyner, MD, Davenport, IA
William Updegraff, MD, Poughkeepsie, NY
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Benito Uy, MD, Quezon City, PH
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Mahlon VanDelden, MD, Evansville, IN
Hannah Vargas, MD, Albany, NY
Samuel Varghese, MD, Cincinnati, OH
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Paul Vastola, MD, Brooklyn, NY
Winston Vaughan, MD, Stanford, CA
Leopoldo Velez Rios, MD, Mexico
T. Venkatesan, MD, Chicago, IL
Giri Venkatraman, MD, Atlanta, GA
Michael Vietti, MD, Mansfield, OH
Raul Vila, MD, Guaynabo, PR
Pelayo Vilar-Puig, MD, Mexico City, ME
Douglas Villaret, MD, Gainesville, FL
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Thomas Viner, MD, Iowa City, IA
Eugenia Vining, MD, Guilford, CT
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Erich Voigt, MD, New York, NY
David Volpi, MD, New York, NY
Mark A. Voss, MD, Fairbanks, AK
Daniel D Vukas, MD, Matwood, IL
Bryan G Wachter, MD, Maywood, IL
Richard Waguespack, MD, Birmingham, AL
Glenn Waldman, MD, Los Angeles, CA

Curtis Walsh, MD, Maywood, IL
John Wanamaker, MD, Syracuse, NY
Robert Ward, MD, New York, NY
Walter Ward, MD, Winston Salem, NC
Steve P. Warman, MD, Glen Head, NY
Kurtis A. Waters, MD, Brainerd, MN
Daniel Watson, MD, San Antonio, TX
Mark Wax, MD, Portland, OR
Edward Weaver, MD, MPH, Seattle, WA
Lyle D. Weeks, MD, El Paso, TX
Richard Wehr, MD, Greer, SC
Julie Wei, MD, Rochester, MN
Dudley Weider, MD, Lebanon, NH
Debra Weinberger, MD, Cody, WY
Samuel Welch, MD, Little Rock, AR
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Ivin Wenger, MD, Land o Lakes, FL
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Jeffrey Werger, MD, Canada
John Werning, MD, Toledo, OH
Joseph West, MD, Kirkwood, MO
Ralph F Wetmore, MD, Philadelphia, PA
Ernest A. Weymuller, Jr., MD, Seattle, WA
Mark Whitaker, MD, Danville, PA
Ira White, DO, Bloomington, IN
James White, MD, Dubuque, IA
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Ken Yanagisawa, MD, New Haven, CT
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James Yeh, MD, Rockville, MD
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Altan Yildirim, MD, Turkey
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Dayton L. Young, MD, Omaha, NE
M. Young, PhD, Hines, IL
Philip Young, MD, Los Angeles, CA
Kathy Yu, MD, Chapel Hill, NC
Taskin Yucel, MD, Ankara, Turkey
Richard Yules, MD, Boca Raton, FL
David Yun, MD, Bronx, NY
Bilal Zaatari, MD, Saida, Lebanon
Mark Zacharek, MD, Detroit, MI
Warren Zager, MD, Philadelphia, PA
Gerald Zahtz, MD, Jamaica, NY
Lloyd Zbar, MD, Glen Ridge, NJ
Jill F. Zeitlin, MD, Pleasantville, NY
Warren Zelman, MD, Garden City, NY
Shane Zim, MD, Los Angeles, CA
Jeffrey M Zimmerman, MD, Philadelphia, PA

Dr. Maurice H. Cottle Honor Award

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

1978

The Nasal Cycle in the Laboratory Animal

Winston M. Campbell, MD, Mayo Clinic, Rochester, MN
Eugene B. Kern, MD, Mayo Clinic, Rochester, MN

1979

*The Physiologic Regulation of Nasal Airway Resistance
During Hypoxia and Hypercapnia*

T.V. McCaffrey, MD, Mayo Clinic, Rochester, MN
Eugene B. Kern, MD, Mayo Clinic, Rochester, MN

1980 Two Awards Given

*Growth Pattern of the Rabbit Nasal Bone Region
A Combined Serial Gross Radiographic Study
with Metallic Implants*

Bernard G. Sarnat, MD, Los Angeles, CA
Abbee Selman, DDS, Los Angeles, CA

Sleep Disturbances Secondary to Nasal Obstruction

Kerry D. Olsen, MD, Mayo Clinic, Rochester, MN
Eugene B. Kern, MD, Mayo Clinic, Rochester, MN
Phillip R. Westbrook, MD, Mayo Clinic, Rochester, MN

1984

*Nasal Problems in Wood Furniture Workers –
A Study of Symptoms and Physiological Variables*

Borje Drettner, MD, Sweden
Bo Wihlhelmsson, MD, Sweden

1987

*Eustachian Tube and Nasal Function During Pregnancy
A Prospective Study*

Craig S. Derkay, MD, Pittsburgh, PA

1988

*The Effect of Kiebsiella Ozenae on Ciliary Activity
in Vitro: Implications for Atrophic Rhinitis*

Jonathan Ferguson, MD, Mayo Clinic, Rochester, MN

1990

*The in Vivo and in Vitro Effect in Phenylephrine
(Neo Synephrine) on Nasal Ciliary Beat Frequency
and Mucoilliary Transport*

P. Perry Phillips, MD, Mayo Clinic, Rochester, MN

1991

*Ultrastructural Changes in the Olfactory Epithelium
in Alzheimer's Disease*

Bruce Jafek, MD, University of Colorado, Denver, CO

1992

*A Scanning Electron Microscopic Study of Smoking and
Age Related Changes in Human Nasal Epithelium*

Steven Kushnick, MD, New York, NY

1993

Mucociliary Function in Endothelins 1, 2 & 3

Finn Ambie, MD, Mayo Clinic, Rochester, MN

1996

*Capsacin's Effect on Rat Nasal Mucosa
Substance P Release*

Frederick A. Kuhn, MD, Savannah, GA

1999

*Subacute Effects of Ozone-Exposure on
Cultivated Human Respiratory Mucosa*

Joseph Gosepath, D. Schaefer, C. Broomer, L. Klimek, R. G.
Amedee, W. J. Mann, Mainz, Germany

2000

*Capsacin's Effect on Trigeminal Nucleus
Substance P Release*

Frederick A. Kuhn, MD
Savannah, Georgia

Golden Head Mirror Honor Award For Meritorious Sharing in the Service of Rhinology

The Golden Head Mirror Honor Award was first given by Dr. Cottle to colleagues who were chosen because of "Meritorious Sharing in the Service of Rhinology." The first pair of Golden Head Mirror cuff links were given by Dr. Cottle to Dr. George Fisher in 1948.

A

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

B

Pat A. Barelli, US
Fred W. Beck, US*
Carlos G. Benavidee, US
Bernard Blomfield, US*
Max Bornstein, US*

C

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

D

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

F

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

G

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

H

Richard B. Hadley, US*
Robert M. Hansen, US*

Edward W. Harris, US*
Raymond L. Hilsinger, US*
Kenneth H. Hinderer, US*
Leland R. House, US
Sandy Hoffman, US
Egbert Huizing, The Netherlands

J

Gerald F. Joseph, US

K

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

L

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

M

Henry Merriman, US*
Lewis E. Morrison, US

N

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

O

Joseph H. Ogura, US*
Harold Owens, US

P

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

R

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

S

Pieter H. Schmidt, The Netherlands
Thomas C. Smersh, US
Maynard P. Smith, US
Pinckney W. Snelling, US*
Carl B. Sputh, US
Heinz Stammberger, Austria

Albert Steiner, US*
Sydney L. Stevens, US*
Fred Stucke, US
Giorgio Sulsenti, Italy
Edward A. Swartz, US

T

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

W

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

* Deceased

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Baltimore, MD

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Portland, OR

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Mexico, DF, Mexico

Bernard Butterworth, PhD
Kansas City, MS

D. Thane R. Cody, MD, PhD
Ponte Verde Beach, FL

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Leiden, Holland

H.A.E. van Dishoeck*
Leiden, Holland

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Salt Lake City, UT

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New Orleans, LA

Branimir Gusic, MD
Zagreb, Yugoslavia

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Beijing, China

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Thomas J. McDonald, MD
Rochester, MN

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Ryo Tschiasny, MD*
Cincinnati, OH

Richard C. Webster, MD*
Brookline, MA

Jim Zinreich, MD
Baltimore, MD

* Deceased