Program

2001

AMERICAN RHINOLOGIC SOCIETY

SPRING MEETING

May 13 thru 15, 2001

Palm Desert Springs Marriott Resort & Spa

Palm Springs, California

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

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SPRING MEETING
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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
2001 COSM
Marriott Desert Springs

Joint Session with American Academy of Otolaryngic Allergy
Sunday, May 13, 2001
(1:00 – 5:00 pm)
Salon F

1:00pm **Introduction**
(Paul Toffel, MD, Edwin Boyd, MD)
Moderator: Paul H. Toffel, MD, Los Angeles, CA

1:05 **Significance of Eosinophilia in Chronic Rhinosinusitis**
Mani H. Zadeh, MD, New York, NY; Clark Huang, MD, New York, NY; Vijay Anand, MD, New York, NY

1:11 **Cetirizine Decreases the IL-4, IL-5, and INF-gamma Gene Expressions in Nasal Associated Lymphoid Tissue of Sensitized Mice**
Hong-Ryul Jin, MD;Yoshitaka Okamoto, MD; Zensei Matsuzaki, MD; Shuichiro Endo, MD

1:17 **Interleukin 9 May Explain Goblet Cell Metaplasia and Mucus Hyper-secretion Associated with Allergic Rhinitis**
RE Harson, MD, Iowa City, IA; Y SuMin, MD, Iowa City, IA; J Zabner, MD Iowa City, IA; SM Graham, Iowa City, IA

1:23 **Treatment of Allergic Fungal Sinusitis with High Dose Itraconazole: A Twelve Year Retrospective Review**
B. Manrin Rains III, MD, Memphis, TN; Corey W. Mineck, MD, Memphis, TN

1:29 **Malingering and the Smell Identification Test**
Michael H. Stevens, MD, Salt Lake City, UT; Louis Monti, MD, Salt Lake City, UT

1:35 **Extensive Degranulation of Eosinophils in the Mucin of Chronic Rhinosinusitis**
Jens Ponikau, MD, Rochester, MN; David Sherris, MD, Rochester, MN; Eugene Kern, MD, Rochester, MN; Hirohito Kita, MD, Rochester, MN

1:41 ***Discussant:*** **Michael S. Benninger, MD, Detroit, MI**

1:47 **PANEL: Management of Middle and Inferior Turbinates in ESS**
Moderator: Dale Rice, MD, Los Angeles, CA
Panelists: William H. Friedman, MD, St. Louis, MO; Eugene B. Kern, MD, Rochester, MN; Donald C. Lanza, MD, Cleveland, OH; Richard L. Mabry, MD, Dallas, TX; Bradley F. Marple, MD, Dallas, TX

2:45 **BREAK WITH EXHIBITORS**

3:15 **PANEL: Antimicrobial Management of Rhinosinusitis: The Good, The Bad, and The Ugly Bugs**
Moderator: James A. Hadley, MD, Rochester, NY
Panelists: Vijay K. Anand, MD, New York,

NY; Michael J. Sillers, MD, Birmingham, AL; Michael D. Poole, MD, Houston, TX
Moderator: Winston Vaughan, MD, Palo Alto, CA

4:05 **Application of Topical Nasal Steroids Following Endoscopic Sinus Surgery**
Richard A. Lebowitz, MD, New York, NY; James Lee, MD, New York, NY; Kelvin C. Lee, MD, New York, NY; Joseph B. Jacobs, MD, New York, NY

4:11 **The Effects of Fluticasone Propionate on Nasal Epithelia Potential**
Scott M. Graham, MD, Iowa City, IA; Shaun N. Scott, MD, Iowa City, IA; Joseph Zabner, MD, Iowa City, IA; Jan Launspach, RN, Iowa City, IA

4:17 **Nasopharyngeal Carriage of Haemophilus Influenzae, Streptocococcus Pneumoniae, and Moraxella Catarrhalis in Healthy Patients**
David H. Chi, MD, Charlottesville, VA; Pamela French, MD, Charlottesville, VA; J. Owen Hendley, MD, Charlottesville, VA; Birgit Winther, MD, Charlottesville, VA

4:23 ***Discussant:*** **William E. Bolger, MD, Philadelphia, PA**

4:30 **PANEL: Sinus and Allergy Health Partnership: Marketing Otolaryngology**
Panelists: James A. Stankiewicz, MD, Maywood, IL; Michael S. Benninger, MD, Detroit, MI

5:00 **ADJOURN**

5:00-7:00 **ARS Committee Meetings**
Suite V, Suite III, Suite J

5:00-7:00 **ARS Executive Committee Meetings**
Chairman's Boardroom

7:00-10:00 **ARS BOARD OF DIRECTORS MEETING**
Salons H & I

Monday, May 14, 2001
(1:00 – 5:00 pm)
Salon F

12:00 **LUNCH WITH EXHIBIITORS**

1:00 **Introduction, Business Meeting, and Socioeconomic Report**
Moderator: Joseph B. Jacobs, MD, New York, NY

1:20 **Endoscopic Repair of Anterior Skull Base Defects with Acellular Dermal Allograft**
Martin J. Citardi, MD, Cleveland, OH; Daniel Hurley, MD, St. Louis, MO

1:26 **Sinus Inflammation Associated with Contralateral Inverted Papilloma**
Richard R. Orlandi, MD, Salt Lake City, UT; Adam Rubin, MD, Ann Arbor, MI; Jeffrey E. Terrell, MD, Ann Arbor, MI; Donald C. Lanza, MD, Cleveland, OH

1:32 **Comparison of Endoscopic Sinus Surgery With and Without Image Guidance**
Marvin P. Fried, MD, Bronx, NY; Vikrant Moharir, MD, Bronx, NY; Jennifer Shin, MD, Boston, MA; Marta Taylor-Becker, MD, Boston, MA

1:38 **Tension Orbital Pneumocele Secondary to Nasal Obstruction from Cocaine Abuse**
Carlos Ayala, MD, Boston, MA; Lynnette Watkins, MD, Boston, MA; Daniel Deschler, MD, Boston, MA

1:44 **Computer-Aided Image-Guided Endoscopic Sinus Surgery in Unusual Cases of Sphenoid Disease**
Vijay K. Anand, MD, New York, NY; Samuel M. Lam, MD, New York, NY; Clark Huang, MD, New York, NY

1:50 ***Discussant:*** **James A. Stankiewicz, MD, Maywood, IL**

1:56 **PANEL: Integration of Computer-Assisted Surgery into ESS Practice**
Moderator: Paul H. Toffel, MD, Los Angeles, CA
Panelists: Winston Vaughan, MD, Palo Alto, CA; Martin J. Citardi, MD, Cleveland, OH; Michael J. Sillers, MD, Birmingham, AL; Marvin P. Fried, MD, Bronx, NY

2:45 **BREAK WITH EXHIBITORS**
*Moderator:*Donald C. Lanza, MD, Cleveland, OH

3:15 **The Transvestibular Approach: A New Technique in Rhinoplasty**
Nabil S. Fuleihan, MD, New York, NY

3:21 **The Percutaneous Columellar Strut**
David C. Bloom, MD, San Diego, CA; Craig L. Cupp, San Diego, CA

3:27 **Cartilage Reshaping. Prospects for the Future**
Michael W. Keefe, MD, Orange, CA; Alex Rasouli, MD, Orange, CA; Roger L. Crumley, MD, Orange, CA; Brian J. Wong, MD, Orange, CA

3:33 **Powered Rasping, Does It Work on Cartilage?**
C. M. Bergeron, MD, Irvine, CA; Roger L. Crumley, MD, Irvine, CA; Brian J. Wong, MD, Irvine, CA

3:39 ***Discussant:*** **Paul H. Toffel, MD, Los Angeles, CA**
Moderator: **James A. Hadley, MD, Rochester, NY**

3:45 **Long Term Follow-Up on the Endoscopic Modified Lothrop Procedure**
Rodney J. Schlosser, MD, Charlottesville, VA; Gregory C. Zachmann, MD, Roanoke, VA

3:51 **Management of the Orbit in Invasive Fungal Sinusitis**
Jay M. Dutton, MD, Chicago, IL; Robert M. Bumsted, MD, Chicago, IL

3:57 **10-Year Experience with the Endoscopic Management of Benign Sinonasal Tumors**
Scott D. London, MD, Charlottesville, VA; Charles W. Gross, MD, Charlottesville, VA

4:03 **The Healing of the Nasal Mucosa in Sheep. Does Nasal Packing Make a Difference?**
P. J. Wormald, MD, Woodville, Australia; D. McIntosh, MD, Woodville, Australia; A. Cowin, MD, Woodville, Australia

4:09 ***Discussant:*** **David J. Osguthorpe, MD, Charleston, SC**

4:15 **INTERNATIONAL PANEL: Transnasal Micro-Endoscopic Surgery of the Paranasal Sinuses and the Skull Base**
Moderator: Aldo Stamm, MD, Sao Paulo, Brazil
Panelists: Valerie Lund, MD, London, England; Jean-Michel Klossek, Poitiers Cedex, France

5:00 **ADJOURN**

6:30 **ARS Corporate Affiliates Reception**
Salons H & I

7:00 **ARS Corporate Affiliates Dinner**
Salons H & I

Joint Session with Triologic Society
Tuesday, May 15, 2001
(8:00 am – 12:00 pm)
Salon F

8:00 **Announcements**
(Edward Applebaum, MD, Paul Toffel, MD)
Moderator: Charles W. Gross, MD, Charlottesville, VA

8:05 **Effects of Nasal Saline Spray on Human Neutrophils**
Mark Boston, MD, Norfolk, VA; Eric J. Dobratz, BS, Norfolk, VA; E. Stephen Buescher, MD, Norfolk, VA; David H. Darrow, MD, DDS, Norfolk, VA

8:13 **Immediate Reconstruction of Extruded Nasal Implants with Irradiated Rib Cartilage**
J. Madison Clark, MD, Portland, OR; Ted A. Cook, MD, Portland, OR

8:21 **Polymorphisms of the Leukotriene C4 Synthase Gene in Patients with Chronic Hyperplastic Sinusitis**
Pablo Arango, MD, Charlottesville, VA; Stilianos E. Kountakis, MD, PhD, Charlottesville, VA

8:29 **DISCUSSION**

8:35 **Sinonasal Undifferentiated Carcinoma: The University of Virginia Experience 1991-2000**
Pierre Y. Musy, MD, PhD, Charlottesville, VA; James F. Reibel, MD, Charlottesville, VA; Paul A. Levine, MD, Charlottesville, VA

8:43 **Candidate Thesis – A Stepwise Surgical Technique Using the Medial Orbital Floor as the Key Landmark in Performing Endoscopic Sinus Surgery**
Roy R. Casiano, MD, Miami, FL

8:51 **Candidate Thesis – Clinical Effects of Implementing a Navigational System for Sinus Surgery**
Edward J. Reardon, MD, Quincy, MA

8:59 **DISCUSSION**

9:10 ***Invited Guest Speaker:*** **Aldo Stamm, MD, Sao Paulo, Brazil**
Transnasal Endoscopic Surgery from Minimal to Maximal

9:45 **BREAK WITH EXHIBITORS**
Moderator: Richard Mabry, MD, Dallas, TX

10:15 **Endoscopic Management of 108 Sinus Mucoceles with 0.9% Recurrence Rate**
Gady Har-El, MD, Brooklyn, NY

10:23 **At What Age Should Endoscopic Sinus Surgery be Considered in Children?**
Hassan H. Ramadan, MD, Morgantown, WV

10:31 **Combined Medial Endoscopic Endonasal and Lateral Internal Orbital Decompression for Severe Graves' Orbitopathy – Technique with Treatment Algorithm**
Ashutosh Kacker, MD, New York, NY; Mark Murphy, MD, New York, NY; Lanny G. Close, MD, New York, NY; Michael Kazim, MD, New York, NY

10:39 **DISCUSSION**

10:50 **PANEL: Evolution of Surgical Indications and Management of Sinus Disease**

Moderator: Frederick A. Kuhn, MD, Savannah, GA

Panelists: David Kennedy, MD, Philadelphia, PA; Valerie Lund, MD, London, England; Charles W. Gross, MD, Charlottesville, VA

11:35 **Posterior Epistaxis: A New Paradigm for a New Millennium**

Darrell A. Klotz, MD, Rochester, NY; Mark R. Winkle, MD, Grand Rapids, MI; Jeremy Richmon, BA, Rochester, NY; Arthur S. Hengerer, MD, Rochester, NY

11:43 **A Computer-Assisted Anatomical Study of the Frontal Recess**

Roee Landsberg, MD, Chicago, IL; Michael Friedman, MD, Chicago, IL

11:51 **Analysis of Failure in Frontal Sinus Obliteration**

James N. Palmer, MD, Savannah, GA; Frederick A. Kuhn, MD, Savannah, GA

12:00 **ADJOURN/LUNCH**

SCIENTIFIC MEETING

American Rhinologic Society
Scientific Session
May 13, 2001
Palm Desert Springs Marriott Resort & Spa
Palm Springs , California

1:05 **Significance of Eosinophilia In Chronic Rhinosinusitis**

Mani H Zadeh; Clark Huang; Vijay Anand

Introduction: The purpose of this study is to investigate the impact of serum eosinophilia in the prognosis of chronic sinusitis. Eosinophils and mast cells are now considered to play a major role in the pathogenesis of chronic sinusitis. Studies have demonstrated a correlation between peripheral eosinophilia and extensive sinus disease on CT scans. To date there has not been a study looking at the clinical course of patients with chronic sinusitis and serum eosinophilia.

Methods:: A retrospective chart review of 620 patients who had sinus surgery for chronic sinusitis, by the senior author, was performed. Patients with elevated pre-operative serum eosinophil counts were selected.

Results: Of the 620 charts reviewed 31 (5%) had an elevated serum eosinophil count. All patients treated had a history of chronic sinusitis. Of the 31 patients with pre-operative serum eosinophilia 24 (77%) had polypoid disease on presentation, 8 (26%) had allergic fungal sinusitis, and 10 (32%) had asthma. Pre-operatively all had received multiple courses of antibiotics and 8 (26%) had been prescribed systemic steroids. Twenty six (84%) have had more than one operation. Post-operatively 13 (42%) have required systemic steroids, 29 (94%) have had repeat sinus infections requiring antibiotics, and 10 (32%) have had recurrence of polyps. Of note, all patients with very high eosinophil counts had multiple infections and polyps post-operatively, and all required revision surgery.

Conclusions: Serum eosinophilia indicates a poor prognosis in chronic sinusitis. Patients with eosinophilia should

be counseled appropriately and the physician should be aware of the chronicity of the disease.

1:11 Cetirizine Decreases the IL-4, IL-5, and INF-gamma Gene Expressions in Nasal Associated Lymphoid Tissue of Sensitized Mice

Hong-Ryul Jin; Yoshitaka Okamoto; Zensei Matsuzaki; Shuichiro Endo

Background: Though the action of cetirizine dihydrochloride (cetirizine), a potent histamine H1-receptor antagonist, has been well known, its effect on the cytokine profiles in the nasal immune inductive site has not been elucidated yet. Object: The effect of cetirizine on the cytokine profiles in the nasal associated lymphoid tissue, which is a principal mucosal lymphoid tissue of the respiratory tract in rodents, was studied. Methods: Two different doses of cetirizine were given intraorally for five days before the nasal challenge of ovalbumin in sensitized mice. The control group was given normal saline instead of cetirizine, and the normal group had no sensitization or medication. The cytokine gene expressions in the nasal associated lymphoid tissue taken from the mice were investigated with real-time quantitative RT-PCR. The effect of cetirizine on the allergic symptom score, histamine threshold, and the eosinophil count in the nasal septal mucosa were also examined.

Results: Compared with the normal mice, the sensitized mice showed significantly increased levels of IL-4 and IL-5 gene expression though the increase of INF-Ñ* gene expression was not significant. In the cetirizine groups, the levels of expression of IL-4, IL-5, and INF-Ñ* in the nasal associated lymphoid tissue were significantly decreased compared with those of the control group. The cetirizine groups also showed decreased nasal symptom score, histamine threshold, and eosinophil count in the nasal septal mucosa compared with the control group.

Conclusions: Cetirizine reduced the levels of expression of IL-4, IL-5, and INF-gamma in the nasal associated lymphoid tissue of ovalbumin-sensitized mice. Cetirizine also reduced the acute allergic symptom, histamine sensitivity, and eosinophil count in the nasal septal mucosa.

Key Words: cetirizine, IL-4, IL-5, INF-gamma, nasal associated lymphoid tissue, sensitized mice

1:17 Interleukin 9 May Explain Goblet Cell Metaplasia and Mucus Hypersecretion Associated with Allergic Rhinitis

Harson RE; SuMin Y; Zabner J; Graham SM

Introduction: Interleukin 9 (IL-9) has been shown to increase the number of goblet cells and mucus production in rodent airways. In atopic diseases, the levels of IL-9 in the lungs are increased. We studied the functional and phenotypic effect of human IL-9 on primary cultures of human airway as a model for allergic rhinitis.

Methods: Primary human airway epithelia was grown on milli-cell filters with an air-fluid interface. Cells were exposed to 50ng/ml rhIL-9 on the basolateral side of the cell culture. Differentiated cells as well as freshly seeded cells were exposed to media containing rhIL-9 for 7 and 14 days. Goblet cells were identified with confocal microscopy using fluorescein-5-isothiocyanate (FITC) labeled Jacalin (JAC). JAC is a lectin which has specificity for secretory cells and was shown to co-localize with PAS-positive goblet cells when visualized by light microscopy.

Results: Exposure to IL-9 resulted in a significant increase in the number of goblet cells as measured by PAS and lectin-specific binding (JAC) ($p < 0.001$). Moreover, this treatment resulted in changes in mucus, bicarbonate and antimicrobial peptide secretion. The effect of IL-9 was, however, minimal when applied to already well-differentiated airway epithelia. Finally, the increase in the number of goblet cells resulted in a tenfold decrease in the ability of adenoviruses to infect human airway epithelia.

Conclusions: IL-9 has multiple effects on human airway epithelia that may play a role in the pathogenesis of allergic rhinitis.

1:12 Treatment of Allergic Fungal Sinusitis with High Dose Itraconazole: A Twelve Year Retrospective Review

B. Manrin Rains, III M.D.; Corey W. Mineck, M.D.

Since its original description in the early 1980s, our understanding of allergic fungal sinusitis (AFS) has continued to evolve. The goal of the present research is to discuss the efficacy of managing AFS patients using protocol including endoscopic sinus surgery, high dose itraconazole, and low dose bursts of oral corticosteroids.

A 12-year retrospective chart review was conducted to extract demographic and management data on 139 patients meeting the AFS criteria of atopy, positive fungal culture or smear, eosinophilic mucin, nasal polyposis, and characteristic computed tomography findings.

The median age at presentation was 44 years with women affected 60% more often than men. Patients averaged 3.5 positive cultures (maximum of 16) over the mean follow-up time of 31.4 months (maximum 11.7 years). Of 487 fungi isolated, aspergillus (19.5%), alternaria (13.6%) and fusarium (11.7%) were most common. Average itraconazole therapy duration was 129 days (400 milligrams qd, 300 milligrams qd, 200 milligrams qd for 1 month each or until clinically clear). Patients averaged 4.2 courses of corticosteroids (prednisone 30 milligrams qd, 20 milligrams qd for 3 days each, 10 milligrams for 7 days). Recurrence (fungal reappearance 90 days after therapy discontinuation) was found an average of 2.17 times in 69 patients (50.3%). Reoperation was required in 17 (20.5%) of 83 patients initially managed by the senior author.

The use of itraconazole, low dose corticosteroids, and endoscopic surgery is a safe and clinically effective regimen in the management of AFS. Our clinical experience suggests medical management of AFS recurrences with itraconazole may avoid revision surgery. A prospective randomized trial to evaluate the specific contribution of itraconazole is under development.

1:29 Malingering and the Smell Identification Test

Michael H. Stevens, MD; Louis Monti, MD, PhD

Introduction: Participants should be able to understand the limitations of the Smell Identification Test in evaluating mailingerers.

Methods A recent advertisement has suggested that the Smell Identification Test is an easy test for evaluating malingering. This statement is correct if the patient scores between 0 and 5 correct, which as stated in the manual, represents probable malingering.

However, 30% of a group of 158 subjects that were instructed to cheat scored 5 or above on the test, as reported in the instruction manual. These patients therefore may be incorrectly diagnosed as anosmic.

In cases where litigation is involved or where a head injury has occurred, objective testing such as obtaining an electro-olfactogram may be very valuable. We have used a combination of electro-olfactograms and chemo sensory event related potentials to evaluate patients with head injuries which cannot only help us to determine the functional status of the system, but can also help to determine site of lesion.

1:35 Extensive Degranulation of Eosinophils in the Mucin of Chronic Rhinosinusitis Patients

Jens Ponikau, M.D.; David Sherris, M.D.; Eugene Kern, M.D.; Hirohito Kita

Introduction: The hallmark of chronic rhinosinusitis (CRS) with and without nasal polyposis is the intense eosinophilic inflammation of the mucosa as well as the damaged epithelium. The lesions in the epithelium were found to be associated with the deposition of the toxic Major Basic Protein (MBP) from the eosinophils.

Methods: Surgical specimens of 18 CRS patients were examined using immunohistochemistry and electronmicroscopy with immuno-gold labeling techniques. A polyclonal antibody against MBP was used to examine tissue and mucin for extracellular and extragranular deposition of MBP as a marker of eosinophilic degranulation.

Results: Abundant numbers of eosinophils were identified in the tissue of all CRS patients. Intact eosinophils were present, as well as clusters of free eosinophil granules (CFEGs) were found throughout the tissue. Only small amounts of free MBP were found in the tissue of 6/18 patients (33%). The MBP labeling under the electron microscope confirmed that MBP was still within the free granule and was not released into the tissue. The mucin of all CRS patients (18/18) was intensively infiltrated with clusters of eosinophils, in which large amounts of free MBP were found. The electron microscope examination confirmed that MBP released out of the granule.

Conclusions: Our findings challenge the current notion that eosinophils mainly degranulate in the tissue of CRS patients. In contrast, we can now offer evidence that this degranulation occurs outside in the mucin, where the free MBP reaches toxic levels and damages the epithelium, which is essential for the secondary bacterial infection to occur.

4:05 Application of Topical Nasal Steroids Following Endoscopic Sinus Surgery

Richard A. Lebowitz, MD; James Lee, MD; Kelvin C. Lee, MD; Joseph B. Jacobs, MD

Introduction: To determine the intranasal localization of self administered topical nasal steroids in patients who had undergone endoscopic sinus surgery.

Methods: A prospective study of 20 patients at NYU Medical Center. Patients were instructed to use a colorized nasal steroid spray in their usual manner, after which they underwent fiberoptic nasal endoscopy to determine the location of the medication on the nasal and sinus mucosa. The examination was repeated after 15 minutes to assess mucociliary redistribution patterns of the medication.

Results: There is direct deposition of the topical nasal steroid spray in the middle meatus/ethmoid bed.

Conclusions: Endoscopic sinus surgery with medialization or partial resection of the middle turbinate allows for direct application of topical steroids to the middle

meatus.This does not occur in patients who have not undergone sinus surgery.

4:11 The Effects of Fluticasone Propionate on Nasal Epithelial Potential

Scott M. Graham, MD; Shaun N. Scott, MD; Joseph Zabner, MD; Jan Launspach, RN

Introduction: Human airway epithelium maintains homeostasis of fluid and salt composition at the airway surface by regulated transport of sodium and chloride ions. The volume and composition of this fluid has been shown to be important in such diseases as cystic fibrosis, nasal inflammatory conditions and nasal polyposis. The presence of functional epithelial sodium and chloride channels in the airway can be evaluated electrically by measuring the voltage across the nasal epithelium (Vt). Fluticasone propionate is commonly used to treat nasal inflammatory disease and we examined its effect on ion transport.

Methods: A double-blind prospective trial was performed on 12 healthy volunteers. Subjects were randomized to receive either fluticasone propionate or normal saline nasal spray twice daily for 2 weeks. We measured the nasal voltage at baseline, day 3 and 14, and 2 weeks after cessation of treatment. The basal voltage, the change in voltage after pefursion with amiloride (sodium channel blocker) and the change in voltage after perfusion with isoproterenol in a low chloride buffer (chloride channel activator) were recorded. Saccharin clearance times were also measured.

Results: Two week treatment with fluticasone propionate resulted in a significant increase in the change in Vt after perfusion with amiloride ($p= 0.03$). There was no significant change in the group treated with normal saline. These findings were also observed on day 3 and were completely reversed after the 2 week washout period. The increase in amiloride-sensitive Vt did not result in a decrease in mucociliary clearance.

Conclusions: This study suggests that the beneficial effects of nasal steroids may rely in part on increased epithelial sodium absorption.

4:17 Nasopharyngeal Carriage of Haemophilus Influenzae, Streptococcus Pneumoniae, and Moraxella Catarrhalis in Healthy Patients

David H. Chi, MD; Pamela French, MD; J. Owen Hendley, MD; Birgit Winther, MD

Background: The nasopharyngeal carriage rates of the common bacterial pathogens of sinusitis are important because nasopharyngeal secretions are propelled into the paranasal sinuses during noseblowing. We examined the efficiency of three different methods of obtaining nasopharyngeal samples for accurate detection of pathogens.

Methods: 99 healthy adult volunteers had nasopharyngeal sampling with three separate techniques: 1) Swab through the nose. 2) Swab through the mouth. 3) Aspiration through the nose. The samples were then inoculated on three selective agars and cultured.

Results: 73% of the adults had at least one pathogen detected in the nasopharynx when results from all samples were combined. The detection rates using peroral swab was 65% compared to 38% for catheter aspiration and and 28% for pernasal swab ($p < 0.001$). The most common organism retrieved was S. pneumoniae in 45%, followed by M. catarrhalis in 33% and H. flu in 30% of volunteers.

Conclusions: Combined results of all three techniques demonstrated that one or more pathogen was present in the nasopharynx of 73% of the volunteers. The peroral swab had the highest bacterial recovery rate, and the pernasal swab had the lowest yield. S. pneumoniae was the most common pathogen in the nasopharynx, present in 45% of volunteers. The high carriage rate of these nasopharyngeal bacteria in asymptomatic volunteers may have a role in the subsequent development of sinusitis.

Joint Session with American Academy of Otolaryngic Allergy
Monday, May 14, 2001
(1:00 – 5:00 pm)
Salon F

1:20 Endoscopic Repair of Anterior Skull Base Defects with Acellular Dermal Allograft

Martin J. Citardi, MD; Daniel Hurley, MD

Introduction: Since its introduction 15 years ago, endoscopic techniques for the closure of cerebrospinal fluid leaks have been widely accepted. Generally, these endoncopic repairs require autografts (such as temporalis fascia) and/or turbinate composite flaps (bone and mucosa). In order to avoid the morbity associated with autograft harvest, we have used acellular dermal allograft (AlloDerm, Life Cell Corporation) for the endoscopic reconstruction of anterior cranial skull base defects.

Methods: Under endoscopic visualization, the skull base defect was identified and then repaired with a layered closure of acellular dermal allograft, autogenous septal bone/cartilage, and acellular dermal allograft. These layers were placed on the intracranial side of the defect against the dura. Tisseel surgical sealant (Baxter Healthcare Corporation, Deerfield, IL) was applied over the reconstruction. Finally supportive nasal packing was placed. Lumbar drains (placed intraoperatively and maintalned for 3-5 days) were used in selected cases.

Results: Five patients with 7 anterior skull bass defects (5 ethmoid roof, 1 frontal sinus posterior table, 1 sphenoid) underwent the described technique with complete success between September 1, 1997 and October 31, 2000. No postoperative CSF rhinorrhea was observed. Serial nasal endoscopy confirmed remucosalization graft reconstruction. Mean follow-up has been 13 months (range 9-36 months).

Conclusion: Acellular dermal allograft may be used for the endoscopic reconstruction of anterior skull based defects.

The acellular dermal allograft supports the ingrowth of native tissues for closure of the skull base defect. Since this approach avoids issues associated with autogenous graft harvest, has low overall morbidity and has a high likelihood of success, endoscopic reconstruction with acellular dermal allograft may emerge as the preferred method for the repair of these anterior skull bon defects.

1:26 Sinus Inflammation Associated with Contralateral Inverted Papilloma

Richard R. Orlandi, MD; Adam Rubin, MD; Jeffrey E. Terrell, MD; Donald C. Lanza, MD

Introduction: In order to assess the association of unilateral inverted papilloma (IP) and contralateral sinus inflammation, a retrospective analysis of computerized tomography (CT) findings in patients with unilateral IP, patients with other unilateral sinonasal tumors, and normal controls was performed.

Methods:: Each patient's pre-operative CT scan was evaluated with a modified Lund-MacKay scoring system. The scores for the sides opposite the IPs were compared to the sides contralateral to other sinonasal tumors as well as to normal controls.

Results:: Comparison of scores from inverted papilloma sides did not differ significantly from those of other sinonasal tumors. The contralateral sinus scores in IPs were higher than the sides opposite the other sinonasal tumors. These in turn were higher than the normal controls. Direct comparison of the inverted papilloma contralateral sides to the normal controls revealed a clear difference.

Conclusions: Unilateral IPs are associated with contralateral inflammation as detected by CT. This degree of contralateral inflammation is greater than that seen in other sinonasal tumors. The etiology of this association is unclear. A recent histologic review suggested IP is an inflammatory polyp and not a true papilloma. Our data further suggest inflammation may be involved in the pathogenesis of IP. Inverted papilloma may be an unusual viral-influenced expression of inflammation, a morphologically altered nasal polyp. Further work is needed in order to better understand

the pathophysiology and behavior of IP and to define its relationship to sinus inflammation.

1:32 Comparison of Endoscopic Sinus Surgery With and Without Image Guidance

Marvin P. Fried, M.D.; Vikrant Moharir, M.D.; Jennifer Shin, M.D.; Marta Taylor-Becker, M.D.

Methods: Image guidance based on preacquired computed tomography (CT) scans of the patient is a technique used to assist the physician during endoscopic sinus surgery (ESS). This study seeks to compare ESS with and without image guidance, analyzing a number of parameters that can impact on efficacy.

Methods: Retrospective chart review at a tertiary care referral center. The study group consisted of ninety-seven consecutive patients confirmed to have undergone ESS using an electromagnetic interoperative image guidance system (IGS). The control group consisted of sixty-one consecutive patients who underwent ESS, before the IGS was available at the study hospital. The main outcomes measured were analysis of patient profile, including coexisting conditions such as asthma and polyposis, assessment of which specific sinuses underwent surgical treatment, major and minor complications, estimated blood loss (EBL), operative time, and the need for repeat surgery.

Results: The IGS group had: 74% patients with polyposis; more sinuses,on average, which underwent surgical revisions; one major and three minor complications; an average EBL of 134 cc, an average procedure time of 154 minutes; one patient needed repeat surgery in a three month follow up period. The non-IGS group had: 40% patients with polyposis;seven major and one minor complications; an average EBL of 94 cc; three patients who needed repeat surgery within three months.

Conclusions: The use of an image guidance system for endoscopic sinus surgery can reduce the complications associated with the procedure and may allow for a more thorough operation. However, operative time and estimated blood loss may be increased.

Key Words: Endoscopic sinus surgery, image guidance, complications.

1:38 Tension Orbital Pneumocele Secondary to Nasal Obstruction from Cocaine Abuse

Carlos Ayala M.D.; Lynnette Watkins M.D.; Daniel Deschler M.D.

Objective: Cocaine abuse causes a myriad of complications within the sinonasal cavity. We describe a case of tension pneumocele within the orbit due to spontaneous rupture of the lamina papyracea after aggressive nose blowing against nasal obstruction from cocaine abuse.

Methods and Results: A 29-year-old man presented with new diplopia, proptosis and pain of the left eye. Visual acuity was within normal limits, but Hertel exophthalmometry demonstrated 2.5mm proptosis of the left eye. Remaining head and neck exam was significant for a granular, exophytic mass of the mid septum bilaterally with left sided obstruction from synechia. History was significant for nasal obstruction (Left > Right) with cocaine abuse in the recent past. Imaging studies revealed a stable subperiosteal pneumocele at the left medial orbit. Uncomplicated external ethmoidectomy revealed a 4mm dehiscence at the lamina papyracea below the anterior ethmoid artery. The left-sided nasal synechia were lysed and splints were placed.

Conclusions: Tension pneumocele of the orbit is a rare occurrence and has never been reported in the setting of nasal obstruction from cocaine abuse. Management must be expedient to avoid vision loss but intervention must also take into account related effects of cocaine abuse on the sinonasal tract and overall health.

1:44 Computer-Aided Image-Guided Endoscopic Sinus Surgery in Unusual Cases of Sphenoid Disease

Vijay K. Anand, M.D.; Samuel M. Lam, M.D.; Clark Huang, M.D.

Introduction: The vital neurovascular structures that border the sphenoid sinus make extensive sphenoid sinus surgery hazardous despite the advent of endoscopic sinus surgery (ESS). Computer-aided image-guided endoscopic sinus surgery (CAIGESS) has facilitated safer surgery by providing real-time analysis of complex, three-dimensional anatomic landmarks. We present 6 cases of atypical sphenoid disease, which greatly benefited from the unique superiority of CAIGESS in avoiding surgical complications.

Methods: & Results: Six cases of unusual sphenoid-sinus disease, which were managed with CAIGESS, were retrospectively reviewed. Two cases of cerebrospinal fluid (CSF) leak with concomitant meningoencephalocele of the sphenoid sinus were successfully managed with this technique. An inverting papilloma originating from the sphenoid sinus was completely exenterated. One patient, who experienced a lateral-rectus muscle palsy from sphenoid sinusitis, underwent successful sinusotomy with CAIGESS, which permitted identification and avoidance of optic-nerve injury in an overlying Onodi cell. Another patient, who had refractory left-sided sphenoid sinusitis despite 2 ESS procedures, was found to have an obliquely oriented intersinus septum which misled the previous surgeons to enter the contralateral sphenoid sinus. CAIGESS allowed accurate identification and removal of the intersinus septum and relief of the sinusitis. Finally, a sphenoid mucocele that developed after prior pituitary surgery was safely decompressed with CAIGESS.

Conclusions: CAIGESS offers a new and effective adjunct to ESS in selected revision or difficult sinus cases. This surgical approach has proven invaluable in complicated sphenoid cases where the surrounding neurovascular anatomy could otherwise be jeopardized.

3:15 The Transvestibular Approach: A New Technique in Rhinoplasty

Nabil Fuleihan

The limited exposure of the lower lateral cartilage using the transcartilaginous approach results in significant asymmetries in the nasal tip specially in the region of the nasal domes and intermediate or middle crura. The author presents a new technique for exposing the the lower lateral cartilage. Through a marginal incision, the whole endonasal surface of the lower lateral cartilage can be exposed allowing perform-

ing reduction, application of interdomal sutures and rearrangement techniques to the lateral and medial crura. The author discusses results of his experience using this new approach in 450 rhinoplasties.Emphasis is put on the surgical steps, advantages and disadvantages. The transvestibular approach has proven to be a reliable approach that improves the predictability of endonasal rhinoplasty.

3:21 The Percutaneous Columellar Strut

David C. Bloom; Craig Cupp

Support of the nasal tip is often improved by the use of a nasal strut placed between the medial crura. The two most common approaches are through the open columellar incision during an open rhinoplasty and a posterior approach through a complete or hemi-transfixion incision during a closed rhinoplasty or septoplasty. The C-Strut is a transcolumellar approach to provide additional support to the tip after septoplasty. It may be useful in preventing tip ptosis when septal injury has reduced the contribution of the septum to tip support following trauma or surgery. This involves making a small vertical incision in the columella and placing a cartilage strut through this incision into a pocket between the medial crus of the lower lateral cartilage. This is easily accomplished and may be performed either before or after closure of the hemi-transfixion incision. A clinical case is presented with a detailed description of the percutaneous C-Strut technique and results of its application. The C-strut is another technique in the armentarium of the nasal surgeon.

3:27 Cartilage Reshaping, Prospects for the Future

Michael W. Keefe, MD; Alex Rasouli; Roger Crumley, MD; Brian JF Wong, MD

Introduction: Altering the shape of cartilage is limited by the availability and warping of suitable donor tissue. Laser mediated cartilage reshaping and the biophysical changes accompanying this process have been described in detail. Recently, radiofrequency (RF) instruments have been developed which can control the time-dependent spatial distribution of temperature during heating like that achievable with photothermal heating.

Methods: We used RF energy to reshape cartilage and documented the changes in the tissue optical properties and surface temperature during heating. Chondrocyte viability was assessed after heating as well as after a week in tissue culture following heating.

Results: Cartilage specimens were successfully reshaped using RF heating. The new curved shape was maintained and documented over a 14-day observation period. Diffusely transmitted light from a diode laser aimed at the RF heated cartilage was collected. A change was noted in the graphic representation of the data, which was shown to correlate with the onset of accelerated stress relaxation in studies of photothermal heating. Surface temperature during RF heating was found to be greater than the temperature required for stress relaxation and less than the temperature at which complete denaturation occurs. Chondrocyte survival after RF heating was up to 46% as compared to matched controls.

Conclusions: RF generated accelerated stress relaxation is a viable alternative to traditional cartilage reshaping techniques as well as to laser mediated accelerated stress relaxation. The process needs to be optimized to maximize chondrocyte survival, thereby minimizing the resorption of grafted tissue.

3:33 Powered Rasping, Does It Work on Cartilage?

C.M. Bergeron; R.L. Crumley; B.J.F. Wong

In this study the tissue mass reduction rate incident to the use of a powered rasp (XPS 2000-Feathertouch System, Xomed,Jacksonville, FL) was measured as a function of generator frequency and rasp “coarseness”, in fresh porcine nasal bone and septal cartilage, using a specially designed jig to provide specimen stability. Specimen mass was measured before and after 60 seconds of powered rasping using manufacturer supplied “coarse” and “fine” rasps at source frequencies of 3000, 4000, and 5000 Hz. The rasped surface was inspected using a dissection microscope and images were recorded digitally. Using a “coarse” rasp, mass reduction was 2.07, 3.55, and 2.59 mg/s for 3,000, 4,000, and 5,000 Hz respectively. “Fine” rasps reduced tissue at a rate of 3.14, 4.15, and 3.14 mg/s for 3,000, 4,000, and 5,000 Hz re-

spectively. An average of 2 kg of force was applied to the area of contact (interface of active surface of rasp and specimen). A setting of 4,000 Hz resulted in the greatest mass reduction rate for both fine and coarse rasping of dorsal nasal bone. Other notable findings included the observation that powered rasping of flat porcine nasal septal cartilage yielded no mass loss, despite over 5 kg of applied force through all generator frequencies. The powered rasp did remove very small amounts of cartilage when applied to a bent or irregular surface. The present experimental apparatus can also be used to evaluate conventional rhinoplasty instruments while allowing uniform specimen orientation and constant applied force. The design of powered rasps and suggestions for optimal rasp design and operation are discussed in the context of tissue biomechanics and clinical applications.

3:45 Long Term Follow-up on the Endoscopic Modified Lothrop Procedure

Rodney J. Scholosser, MD; Gregory C. Zachmann, MD

Introduction: At the conclusion of this presentation, the participants should be able to discuss long term results regarding the success rate, complications, indications and contraindications for the endoscopic modified Lothrop procedure.

Methods: Surgical treatment for chronic inflammatory disease of the frontal sinus has remained a controversial and frustrating area for rhinologists. The gold standard has been the osteoplastic flap with frontal sinus obliteration. In an attempt to preserve the frontal sinus while minimizing morbidity and achieving an acceptable success rate, we have been performing the endoscopic modified Lothrop or frontal drill-out, for patients who have failed traditional medical and surgical therapy. We performed the modified Lothrop on 55 patients between 1993 and 1998. The average age of our patients was 45 years (range 24-89 years) and each had an average of 2.5 prior sinus surgeries. The modified Lothrop was successful in 76% of patients (42/55). Of the 13 patients who initially failed, 5 underwent successful revision of their modified Lothrop, bringing the overall success rate to 85%

(47/55). Eight patients (15%) eventually underwent osteoplastic flap with frontal sinus obliteration, two of those after attempted revision of their modified Lothrop. Our overall complication rate was 14% (5% major, 9% minor). Mean follow-up was 27.1 months after performing the modified Lothrop. Failures occurred a mean of 11 months after initial Lothrop. In conclusion, the modified Lothrop is a technically challenging operations that provides an acceptable alternative to the osteoplastic flap with obliteration. Success rates can be increased if the surgeon follows strict patient selection criteria.

3:51 Management of the Orbit in Invasive Fungal Sinusitis

Jay M. Dutton, MD; Robert M. Bumstead, MD

Introduction: Invasive fungal sinusitis represents the most emergent and fatal condition in all of rhinology. Although uniformly fatal when first described more than a century ago, a greater understanding of this disease and Its underlying causes have greatly improved cure rates. Unfortunately, these improved cure rates have clouded the indIcatlons for exenteration when the orbit is involved. Whereas orbital involvement once mandated exentoration, more recent data has suggested that there may be exceptions to this rule. This study attempts to more clearly define the indications and contraindications for orbital exenteration in invasive fungal sinusitis.

Methods: A case series and review of the literature.

Results: Two complementary cases of invasive fungal sInusitis are presented which vary widely In their initial presentation, management of the orbit, and ultimate outcome. An extensive literature review is performed to set forth guidelines In the management of the orbit for this condition.

Conclusion: Although invasive fungal sinusitis represents a lifethreatening condition, it is not uniformly fatal. In fact, even when the orbit has been invaded the eye may, be salvaged in certain situations. These case reports demonstrate the difficult decisions that may be encountered in managing the orbits of patients with invasive fungal sinusitis, and

this literature review helps set forth guidelines so these declsions may be easier for practitioners In the future.

3:57 10 Year Experience with the Endoscopic Management of Benign Sinonasal Tumors

Scott D. London, MD; Charles W. Gross. MD

A variety of benign tumors present in the nasal and parmasal sinusms, We review our experience over the last 10 years with these tumors, many of which are unusual, and discuss presentation, diagnostic considerations, and therapeutic options, Representative cases will be presented, including pleomorphic adenoma, ameloblastoma. meningiorna, cholesterol gransuloma, ossifying fibroma, fibrous dysplasia and osteomas. With the treatnment of were complex cascs being undertaken endoscopically, the need for individual therapeutic consideration and close follow-up is stressed. The combination of removal of benign tumors endoscopically and endoscopic surveillance in the outpatient setting has allowed a less radical surgical approach while resulting in decreased morbidity and better tumor control.

4:03 The Healing of the Nasal Mucosa in Sheep. Does Nasal Packing Make a Difference?

P.J. Wormald; D. McIntosh; A. Cowin

Introduction: Endoscopic sinus surgery has advanced the management of mucosal disorders of the nose and paranasal sinuses. With the precision that current technology allows, diseased mucosa can be removed with minimal loss of normal tissue. However, despite this accuracy, it is still necessary in some instances to remove the full thickness of the nasal mucosa. The implications for this are that bare areas remain which may result in mucus stasis and crusting.

There are a growing number of products that are claimed to promote tissue healing but these have not been assessed in a scientific manner. This study aims to examine the effect of different nasal packing materials in a controlled manner using a sheep animal model.

Methods: Full thickness injuries were made on both lateral nasal walls in sheep. One side was left unpacked as a control and the other side was packed with either Merocel

 or Merogel . Serial biopsies were then taken to chart the progress of tissue healing. These biopsies were studied using both light and electron microscopy.

Results: Preliminary results evaluating epithelial height and cilia return for both types of nasal packing showed improved healing rates compared to controls, with the Merogel  treatment group healing better that the Merocel  treated group.

Conclusions: Nasal packing is beneficial in post-operative healing with Merogel  showing more promise than Merocel &#61666.