2004 Program Book

American Rhinologic Society

ARS Registration

3rd Floor Promenade

REGISTRATION TIMES:

September 18	8:00 am – 3:30 pm
September 19	7:00 am – 4:00 pm
September 20	7:00 am – 10:00 am

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Welcome Note . . .

As current President of the American Rhinologic Society, I wish to personally welcome you to the 50th Anniversary Celebration and Scientific Meeting of the American Rhinologic Society. Fellows, members and guests of the ARS have benefited from the scientific educational meetings, presentations as well as the social activities since the inception of the Society by Dr Maurice Cottle in 1954.

The Golden Anniversary Meeting will honor David W. Kennedy, MD, a leader in rhinology and Past President of the Society for his many contributions as a teacher, instructor and benefactor to the ARS.

This two-day meeting planned by the Program Committee will offer a wealth of information for the rhinologist. Panel discussions of relevant issues in sino-nasal disorders, surgical techniques and basic science are planned as well as oral presentations of new information.

Rhinology continues to be on the forefront medical awareness as rhinitis and sinusitis play heavily in the eyes of the public. This meeting will solidify the concepts of management of these problems keen to our patients. I encourage active attendance and gratefully acknowledge the participation of the physicians who have given their time and efforts to enhance this meeting.

As a Fellow of the Society, I would like to extend my appreciation to all the participating corporate affiliates for their loyal support to the ARS.

James A. Hadley, MD, FACS

Accreditation Statement

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

The American Rhinologic Society designates this educational activity for a maximum of 20.5 category 1 credit(s) toward the AMA Physician's Recognition Award. Each physician should claim only those hours that he/she actually spent on the educational activity

Mission Statement

The American Rhinologic Society's mission is to serve, represent and advance the science and the ethical practice of rhinology. The Society promotes excellence in patient care, research and education in Rhinology and Sinusology. The American Rhinologic Society is dedicated to providing communication and fellowship to the members of the Rhinologic Community through ongoing medical education, patient advocacy, and social programs.

Corporate Sponsors

The American Rhinologic Society wishes to thank the following Corporate Sponsors for their unrestricted grants which in their entirety are to award research grants. These sponsors do not contribute to the continuing medical education of these meetings.

Diamond Sponsor:	Merck & Co., Inc
Platinum Sponsor:	Abbott Pharmacuetical Company
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Silver Sponsor:	Bayer, Karl Storz Endoscopy, Medtronic Xomed, Schering Pharmaceutical
Bronze Sponsor:	Priority Healthcare, Richard Wolf Medical, Sinucare
Friends of the Society:	Alcon Laboratories, Inc., Applied Technologies, Baxter Surgery, BrainLab, Ellman International, Neilmed Pharmaceutical, Ortho McNeil Pharmaceutical, Restore Medical, Stryker Labs

Disclosure Policy

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

Disclosures

The following faculty/presenters have disclosed the following relationships:

Vijay Anand, MD:	Consultant /GE Medical Navigational Consultant-Medical Advisory Board / Sinucare
Kwai-Onn Chan, MD:	Discussion includes off-label drug "Mitomycin C"
Rakesh Chandra, MD:	Research support from Gyrus ENT
Yoo-Sam Chung, MD	Study supported by a grant from the Asan Institute for Life Sciences, Seoul, Korea
Berrylin J. Ferguson, MD	Consultant/ Aventis Pharmaceutical, Abbott Pharmaceutical, Glaxo Smith Klein, Schering Speaker: Aventis Pharmaceutical, Abbott Pharmaceutical, Glaxo Smith Klein, Astra Zeneca, Merck & Co, Inc, Pfizer Pharmaceutical
James A. Hadley, MD	Consultant and speaker/ Abbott Pharmaceutical, Aventis Pharmaceutical, Glaxo Smith Klein, Merck & Co, Inc, Pfizer, GE Medical Systems
Howard Levine, MD:	Medical Director / SinuCare Speaker's Bureau / Aventis, Glaxo Smith Klein, Astra Zeneca Consultant / Medtronic Xomed
R. J. Schlosser, MD:	Consultant/ BrainLab, Aventis Pharmaceutical
P. J. Wormald, MD:	Royalties received from Medtronic-Xomed Research funding from Medtronic-Xomed

Disclosures

The following faculty/presenter have indicated that they have no disclosures:

Fereidoon Behim, MD
A.S. Carney, MD
Robert Caughley, MD
Steven P. Chase, MD
Seung-Kyu Chung, MD
Yoo-Sam Chung, MD
Kyung-Su Kim, MD
Sung-Kyun Kim, MD
Peter Clement, MD
Martin Desrosiers, MD
Marvin P. Fried, MD
Jeung Gweon Lee, MD
Emer E. Lang, MD
Hsin-Ching Lin, MD
Elizabeth Mahoney, MD
Ranko Mladina, MD
Richard Orlandi, MD
Sampath Parthasarathy, MD
Joel R. Perloff, MD
Hwan-Jung Roh, MD
Alicia Sanderson, MD
Bradley Schulte, MD
Stanley M. Shapshay, MD
Sok Jea Shin, MD
Nancy M. Smythe, MD
Young Rak Son, MD
Samuel S. Spicer, MD
Michael G. Stewart, MD
Urmen Upadhyam, MD
Bradford A. Woodworth, MD
Bozenz B. Wrobel, MD
Altan Yildirim, MD
Jong-Bum Yoo, MD
Joo-Heon Yoon, MD

ARS Candidates for Membership

Associate Member

Marc G. Dubin, MD
Kevin C. McMains, MD

Affiliate Member

Gary J. Stadtmauer, MD

Resident Member

Michael Edward Navalta, MD
Matthew D. Proctor, MD
Joseph Raviv, MD
Alicia R. Sanderson, MD
James A. Sipp, MD
Bradford A. Woodworth, MD
Rhoda Wynn, MD

Regular Member

Laurence J. DiNardo, MD
Evan R. Reizer, MD
Feodor Ung, MD

International Member

Christopher L. Brown, MD
Firas Farhat, MD
Ing Ruen Lim, MD

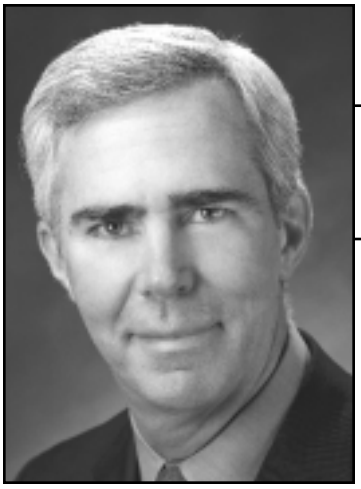
American Rhinologic Society 50th Anniversary Meeting Highlights
Hilton Hotel, New York City, September 18-20 2004

The American Rhinologic Society is celebrating our 50th Anniversary. We have organized 3 days of scientific presentations including moderated panel discussions, instructional courses, keynote speakers, oral papers and posters. David Kennedy is the Guest of Honor. As we all know David was instrumental in developing endoscopic techniques as well as the concepts of functional sinus surgery. We will be hearing a great deal about this during the meeting. The faculty includes many of the most highly respected leaders from the Rhinologic community both nationally and internationally. Our meeting is partially coinciding with the American Academy of Otolaryngology Fall Meeting which is taking place throughout the Jacob Javits Convention Center. I want to thank the Academy leadership and President Jennifer Derebery for their ongoing cooperation with our society. As I compose this note our registration has far outreached our earlier predictions. The society thanks each registrant for your support and attendance. If you are not a present member of the American Rhinologic Society please speak with any of us concerning the benefits of such membership.

The scientific program is highlighted by breakfast symposia Sunday and Monday as well as Saturday and Sunday evening social events. More information is available concerning these activities within this program book and registration, if still available, can be obtained at the ARS registration desk. Please be sure to attend and interact in a more informal setting with your colleagues and the faculty.

I want to personally thank all of the Board, Society Members and our staff that have been instrumental with the organization of this special event. In addition, our faculty both nationally and internationally deserves a great deal of credit for their effort and time that has been expended for this educational process. Lastly, a thank you to all our corporate supporters whose unrestricted educational grants have made this meeting possible.

Joseph B Jacobs MD
Program Chair
President-Elect



James A. Hadley, MD, FACS

President

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

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

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

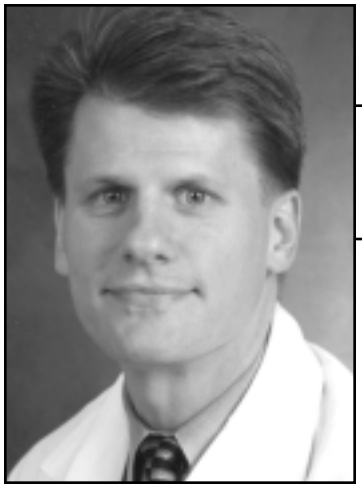
Joseph Jacobs

President-Elect

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

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

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



Michael Jay Sillers, M.D.

First Vice President

Michael Jay Sillers, M.D.

James J. Hicks Associate Professor of Surgery
Division of Otolaryngology-Head and Neck Surgery
University of Alabama at Birmingham

HOSPITAL / OTHER APPOINTMENTS

July 1996-present
Medical Director, Otolaryngology, The Kirklin Clinic, Birmingham, AL

July 1994-present
University Hospital, Birmingham, AL

EDUCATION

University of Alabama School of Medicine
Doctor of Medicine (1988)

POSTDOCTORAL TRAINING

1988-93 Residency in Otolaryngology
University of Alabama at Birmingham

1993-94 Clinical Rhinology and Sinus Fellowship
Medical College of Georgia

AWARDS/HONORS

1983 Phi Beta Kappa

2001 American Academy of Otolaryngology-Head and Neck Surgery Award

2004 Alpha Omega Alpha, University of Alabama at Birmingham

PROFESSIONAL SOCIETIES

American Academy of Otolaryngology-Head and Neck Surgery, *Member*
American Rhinologic Society, *Fellow*
Society of University Otolaryngologists-Head and Neck Surgeons, *Member*
Medical Association State of Alabama
American College of Surgeons, *Fellow*
The Triological Society, *Candidate Fellow*

1999-2000 President, Alabama Society of Otolaryngology - Head and Neck Surgery

2003-2004 American Rhinologic Society, First Vice President

1999 to present
Editorial reviewer: American Journal of Rhinology

2000 to present
Editorial reviewer: The Laryngoscope

2002 to present
Editorial reviewer: Journal of Otolaryngology

Submissions:

Sillers MJ, Kuhn FA, Vickery CK. *Radiation exposure in paranasal sinus imaging.* Otolaryngol H N Surg 112(2):248-51, February 1995.

Sillers MJ, Kuhn FA, Wood A. *Endoscopic surgery of the frontal recess.* Current Opinion in Otolaryngology & Head and Neck Surgery 3:36-40,1995.

Sillers MJ, Morgan CE, Gammal TE. *Magnetic Resonance Cisternography and Thin Coronal Computerized Tomography in the Evaluation of Cerebrospinal Fluid Rhinorrhea*. Am J Rhinol 11(5): 387-392, September-October 1997.

Griffin JW, **Sillers MJ**. *The Physiologic Effects of An External Nasal Dilator*. Laryngoscope 107: 1235-1238, September 1997.

Tseng E, Narducci CA, Willing SJ, **Sillers MJ**. *Angiographic Embolization for Epistaxis: A Review of 114 Cases*. Laryngoscope 108: 615-619, April 1998.

Brodish BN, Morgan CE, **Sillers MJ**. *Endoscopic Resection of Fibro-Osseous Lesions of the Paranasal Sinuses*. Am J Rhinol 13(1): 11-6, January-February 1999.

Neumann AM Jr, Pasquale-Niebles K, Bhuta T, **Sillers MJ**. *Image-Guided Transnasal Endoscopic Surgery of the Paranasal Sinuses and Anterior Skull Base*. Am J Rhinol 13(6): 449-54, November-December 1999.

Gibbons MD, Gunn CG, Niwas S, **Sillers MJ**. *Cost Analysis of Computer-Aided Endoscopic Sinus Surgery*. Am J Rhinol, 15(2) : 71-75, March-April 2001.

Gibbons M, **Sillers MJ**. *Minimally Invasive Approaches to the Sphenoid Sinus.* Otolaryngol H N Surg, 126(6):635-641, June 2002.

Sillers MJ, Lindman JP. *Operative Trephination for Non-acute Frontal Sinus Disease.* Op Tech Otolaryngol H N Surg, 15(1): 67-70, 2004.

Howard L. Levine M.D.

Second Vice President

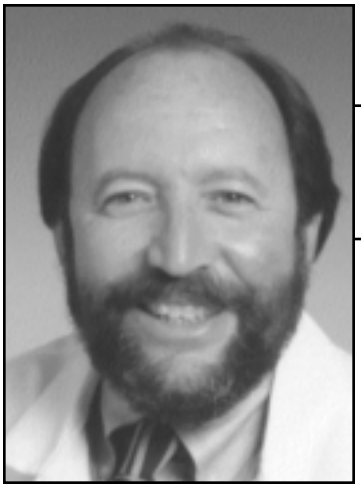
Howard L. Levine, MD, is Director of the Cleveland Nasal-Sinus & Sleep Center at Marymount Hospital (part of the Cleveland Clinic Health System) in Cleveland, Ohio. He is also the director of Marymount Hospital Nasal and Sinus program.

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

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

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

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



Marvin P. Fried, M.D., FACS

Secretary

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

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

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

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

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

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

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

David W. Kennedy

Treasurer

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

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

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

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

Donald C. Lanza, M.D.

Immediate Past President

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

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

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

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

Invited International Faculty

Dr. Carlos Cuilty Siller

Dr. Peter John Wormald

Dr. Metin Onerci

Dr. Christian Buchwald

Dr. Valerie Lund

Dr. Claus Bachert

Dr. Wolf Mann

Dr. Silvain Lacroix

Dr. Heinz Stammberger

Dr. Paolo Castelnuovo

Dr. Ranko Mladina

Dr. Vladimir Kozlov

Dr. Peter Clement

Dr. Piero Nicolai

Dr. Aldo Stamm

Dr. Ruby Pawankar

Dr. Jan Gosepath

Claus Bachert, M.D., Ph.D.

Dr. Bachert did his studies in medicine at the Ruprecht-Karls-University in Heidelberg and Mannheim, and then his Residency at the same institution. He was nominated Extraordinary Professor of Otolaryngology in 1994, and is currently at the University of Gent in Belgium. He has been Guest Professor at the Kyung-Hee University of Seoul, Korea, as well as the Medical University of Hanoi in Vietnam. His area of particular interest is allergology and immunology of the upper airway, allergic rhinitis and sinusitis, nasal polyposis, and endoscopic sinus surgery. His a member of both the German and Belgian Societies for Otolaryngology Head and Neck Surgery, the German and Belgian Societies for Allergology and Clinical Immunology, the German Society for Skull Base Surgery, the American Academy of Allergy and Immunology, the European Rhinologic Society, the European Academy of Facial Surgery, and the Collegium Internationale Allergologicum. He has been awarded the Karl-Hansen Prize from the German Society of Allergy and Clinical Immunology. The Research Prize from the European Rhinologic Society, as well as the Belgian Society for Allergy and Clinical Immunology Research Prize. He is Chief Editor of *Allergologic*, and the *EAACI Newsletter.* He is on the Editorial Board of *Clinical Experiemental Allergy, Allergo-Journal, European Archives of Otolaryngology, Rhinology,* as well as referee in a number of international journals. He has participated in numerous International Symposia on Experimental Rhinology and Immunology of the Nose, as well as offering regional and international courses on a broad range of topics in rhinology. He is currently Chairman of the Otolaryngology Section, and Member of the Executive Committee of the DGAI, the Executive Committee of the Subcommittee on Allergology, Immunology and Environmental Medicine of the German Society of Otolaryngology-Head and Neck Surgery, as well as member of the WHO initiative "ARIA."

Peter Adelin Richard Clement, M.D.

Dr. Clement studied medicine at the Universities of Ghent and Brussels, and then Otolaryngology at the University of Brussels. He is Chairman of the Department of Otolaryngology-Head and Neck Surgery at the Free University Hospital of Brussels. He was a Research Associate in Neuro-otology at the Ceders Sinai Medical Center, Los Angeles. He is the recipient of the George Davey Howells Prize in Otolaryngology (1999). He is a member of a number of many international societies, including the Nederlandse Vereniging voor Allergologie, Stichting Bevordering Rhinologie, Nederlandse Vereniging voor Keel-Neus-en Oorheelkunde van het Hoofd-Halsgebied, Nederlands-Valaamse Werkgroep voor Pediatrische Otorhinolaryngologie, American College of Allergy, American Academy of Facial, Plastic and Reconstructive Surgery, American Academy of Allergy and Immunology, American Academy of Otolaryngic Allergy, American Academy of Otolaryngology -Head and Neck Surgery Foundation Club Isambert (Association d'Anciens Chefs de Clique ORL de Paris) S.I.N.U.S. (Societe Internationale pour les nouveautes a Usage Sinusologique), E.R.S. (European Rhinologic Society), EAACI (European Academy of Allergology and Clinical Immunology), The Joseph Society (European Academy of Facial Plastic Surgery), Member of International Advisory Council I.S.I.A.N. (International Symposium on Infection and Allergy of the Nose, and The Royal Society of Medicine.

He is on the Editorial Board of the *Acta Otorhinolaryngologica* Belgica, *Rhinology, Ear, Nose and Throat*, and the *American Journal of Rhinology*.

He is the General Secretary and Treasurer of the International Rhinologic Society, and the Chairman of the Collaboration Committee between EUFOS and Central and Eastern Europe. He is the author of more 220 publications in the field of vestibulometry, rhinomanometry, nasal allergy, endoscopic sinus surgery, and pediatric sinusitis. He has organized several national and international congresses, as well as international courses in Brussels and abroad.

Jan Gosepath, M.D., Ph.D.

Dr. Goespath received his M.D. degree from the Johannes Gutenberg Universitet, Mainz, Germany, as well as his Ph.D. on "The Pathophysiology and Immunology of Nasal Polyposis." He received the Maurice H. Cottle Award by the American Rhinologic Society in 1999. He is a member of a number of medical societies, including the Germany Society of Otorhinolaryngology, Head and Neck Surgery, the Vereinigung Suedwestdeutscher Hals- Nasen- Ohrenaertzte, the European Skull Base Society, European Academy of Otology and Neurotology, American Rhinologic Society, American Academy of Otolaryngology-Head and Neck Surgery, and the American Head and Neck Society.

He has been a contributor to a number of international meetings, and Chairs the International Faculty Committee for the 50th ARS Anniversary Meeting.

Wolf J. Mann, M.D., Ph.D.

Dr. Mann received his M.D. from Freiburg Medical School in Germany, with subsequent training in pathology at Saarbrucken, general and plastic surgery at the Medical College of Ohio, and otolaryngology at Freiburg. He received his Ph.D. from the University of Freiburg. He was elected Chairman of the Department of Otolaryngology at Mainz Medical School in 1988, and served as Chief of Staff of Mainz Medical School from 1993 to 1995. He has been the President of the German Ultrasound Society, and awarded an Honorary Doctorate from the Medical Faculty in Rostov/Don, Russia, as well as Yaroslavl, Russia. His particular areas of interests are allergy and environmental medicine, and plastic and reconstructive surgery. He is a members of the German Otolaryngolocic Society, the German Society for Endoscopy, the French Otolaryngology Society, the American Bronch-Oesophagological Society, the American Laryngological Association, the American Skull Base Society, the American Academy of Otolaryngology-Head and Neck surgery, the European Skull Base Society, the Triologic Society, the American Society for Head and Neck Surgery, the American Rhinologic Society, the American Neurotologic Society, and the American Otologic Society. He is an Honorary Member of the Brazilian Rhinologic Society, and Society for Esthetic Facial Surgery, the Greek Otolaryngology Society, the Greek Otolaryngology Society, and the Russian Rhinologic Society. He has been an honored and keynote speaker at numerous international meetings. He is a member of the Editorial Board of the *Journal of Ultraschall, Journal of HNO, Journal of Laryngology/Otology, Laryngoscope, the Russian Journal of Rhinology, Current Opinion in Otolaryngology and Head and Neck Surgery, and the Annales d'Otolaryngologie et de Chirurgie Cervico faciale.* He is the Editor and author of seven textbooks in general otolaryngology, ultrasonography, allergy, microneurosurgery, and neurootology.

Ranko Mladina, M.D.

Professor Ranko Mladina is the Head of the Referral Centre for Rhinosinusology and Endoscopic Sinus Surgery, Ministry of Health, Republic of Croatia in Zagreb. He is a member of the IFOS of Standing Committee for Rhinology and Allergology, Member of the Croatian Academy of Medical Sciences, The Country Delegate of Croatia to the European Rhinologic Society, and the European Society of Pediatric Otorhinolaryngology. He is a member of the International Committee for the Standardization in Acoustic Rhinometry. He is an Honorary Member of the Brazilian Rhinologic Society, a member of the International Consensus on Nasal Allergy in Children, a member of the International Society for Endonasal Laser Surgery, Head of the Division for Rhinosinusology and Plastic Surgery, appointed teacher at Sienna University, member of the Editorial Board of the Korean Journal of Rhinology, Member of the Scientific Committee o the Rivista Italiana di Otorinolaringologia audiologia et foniatria, a member of the Editorial Board of Russian Rhinology, member of the American Rhinologic Society, as well as a member of the Associzione Italiana di Chirurgia Esetica e Funzionale Rhinocervocofacciale, and Vice-President of the Croatian Society for Endoscopic Surgery. He has also Past-President of the International Society for Nasal Polyposis.

Dr. Mladina has been an invited speaker in more than eight-five international meeting, congresses, symposia, and courses, and an author of eight-six paper, published in internationally peer reviewed journals. He is an author of six books.

T. Metin Onerci, M.D.

Dr. Onerci is a Professor of Otorhinolaryngology at the Hacettepe University, Faculty of Medicine, Ankara, Turkey. He is a member of a number of international societies, including the Collegium Amitas Oto-Rhino-Laryngologicum, American Triological Society, American Academy of Otolaryngology-Head and Neck Surgery, American Society for Head and Neck Surgery, American Rhinologic Society, European Rhinologic Society, International Rhinologic Society, International Society of Otorhinolaryngologic Allergy and Immunology, German Otolaryngology Association (Deutsche Gesellschaft fur Hals-Nasen-Ohren Heilkund).

He is on the Editorial Board of the *Pro Otology* where is an Associate Editor, as well as the *Laryngoscope,* and the *International Journal of Rhinology.*

He is currently President of the International Society of Otorhinolaryngologic Allergy and Immunology, President Elect of the European Rhinology Society, the President of the International Symposium on Infection and Allergy of the Nose, current President of the Turkish Rhinology Society, as well as President of the Otorhinolaryngology-Head and Neck Society of Turkey.

Ruby Pawankar, MD, D.Med Sci

Prof. Dr. Ruby Pawankar did her medical graduation from the Armed Forces Medical College, Pune, India, specialized in ENT from the B.J Medical College Pune, India and did her doctorate in ENT and Allergology from the Nippon Medical School, Tokyo, Japan. She is currently an Assoc. Professor at the Dept. of Otolaryngology, Nippon Medical School, Tokyo, Guest Professor, Dept. of Pediatrics, Showa Univ School of Medicine Tokyo and Dept. Otolaryngology, Kyung Hee Univ Sch of Medicine (Korea).
She is a Member of the Board of Directors of the World Allergy Organization-(WAO), Executive Committee Member of the WHO Rhinitis Guidelines Initiative (ARIA) and Chair of its Asia-Pacific Affiliate, Vice-Chair of the Rhinitis Committee of the American Academy of Allergy Asthma and Immunology, Founding President of the International Symposium on Allergic Rhinitis (ISBAAR) and President of the 9th Asian Research Symposium in Rhinology and 10th Biennial Congress of the Trans-Pacific Allergy and Immunology Society (19-23rd November, 2004, Mumbai, India). She has held several key positions in international congresses such as the World Allergy Congress, ISIAN, International Rhinology Congress etc. She is the Chair of the International Advisory Board for the 11th Congress of the International Rhinology Society 2005, in Sydney and a member of the Allergy Adhoc Committee of the International Federation of Otolaryngology Societies (IFOS). She is a member of several academic societies and an author of several Consensus documents on Rhinosinusitis and Allergic Rhinitis

Dr. Pawankar has received several prestigious academic awards and grants, has published more than 65 book chapters and 300 original papers and reviews. She has lectured in more than 40 countries and delivered more than 600 lectures. She is an Editorial Board Member of several international journals like Am J Rhinology, Current Opinion Allergy & Clinical Immunology, Journal of the World Allergy Organization, Int Archives of Allergy & Applied Immunology, Clinical Experimental Allergy, Allergy & Hypersensitivity, Asian Pacific J of Otolaryngology, Ind J Rhinology, etc.

Her main areas of specialization are ENT and Allergology. Areas of Expertise and interest within these fields are the pathogenesis, diagnosis and treatment of Allergic rhinitis, Rhinosinusitis, nasal polyposis, asthma, etiopathogenesis and treatment of OME, and inner ear diseases.

Carlos Cuilty Siller

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Date of Birth: March 21, 1961

Place of Birth: Torreon, Coahuila, Mexico

Status: Married, two children 18 months of age

Residency: Universidad Autonoma de Nuevo Leon

Research Fellowship: Rhinology at the Medical College of Georgia

Co-Founder of the Neurological Institute:
Oca Hospital and Clinic, Monterrey, Mexico

President:
Credentials Comittee at Hospital Santa Engracia, Monterrey, Mexico

Aldo Stamm

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

Christian von Buchwald, M.D., D.M.Sc

Dr. von Buchwald received his M.D. degree from the University of Copenhagen, and his DMSc from the same institution in 1996. This latter was based on his thesis on Sinonasal Papillomas. In 2001, he became a member of the Collegium Oto-Rhino-Laryngolicum. He is a Consultant and a member of the staff of the Department of Head and Neck Surgery at Rigshospitalet Hospital in Copenhagen. He holds the rank of Associate Professor in Otorhinolaryngology at the University of Copenhagen. He has chaired and organized three international course on Computer-Aided Endoscopic Sinus Surgery, as well as three international head and neck surgical courses. He has lectured internationally. His primary areas of interest are sinonasal surgery, computer-aided surgery, endoscopic sinus surgery, head and neck surgery, as well as surgical education.

P.J. Wormald, M.D.

Prof. Wormald has pursued an academic career over the last 14 years. After doing fellowships in the United Kingdom with Prof. George Browning, he spent time as a senior lecturer with Prof. Sellars at the University of Cape Town and as an Associate Professor with Prof. van Hasselt in Hong Kong. During this time he has written 4 books and 6 chapters and published over 90 peer-reviewed articles.

In April 1998 he took up the Chair of Otolaryngology Head & Neck Surgery which is a combined appointment between the Adelaide and Flinders Universities.

He has a specific interest in Rhinology and in endoscopic sinus surgery (ESS) and has built a national and international reputation in this field.

Over the past 12 years he has been invited to speak at over 35 ESS courses around the world. In addition he has been invited to speak as the key-note speaker to a large number of national and international meetings on various rhinological topics.

As part of his rhinological research program, Prof. Wormald has put together a research team that has successfully developed the sheep as an animal model. The sheep has been developed as a model of eosinophilic sinusitis and this allows research into the various aspects of nasal disease and surgery. In addition he has put together a research team of scientists and PhD students to explore the role of the acquired and innate immune systems in the aetiology of chronic rhinosinusitis. The interaction of fungal antigens with the acquired immune system has been extensively studied at both the systemic and local level. The innate immune system's interaction with both fungal and bacterial antigens has also been researched with emphasis on the roles played by defensins, cathelicidins, surfactant and matrix metallanoproteases. This in combination with the development of a unique 4-channel 24 hr pH probe has allowed extensive research to be conducted into the aetiology of chronic rhinosinusitis.

Prof Wormald has also developed an extensive series of new surgical techniques and instruments and has a particular interest in the anatomy of the sinuses and frontal sinus surgery, endonasal DCR surgery, CSF leak closure and sinonasal tumour surgery.

Special Thanks

to the ARS 50th Anniversary Program Committee and Moderators

Program Committee Chair: Joe Jacobs

Co-Chairs: Stil Kountakis, Todd Kingdom

Members: Allen Seiden, Peter Hwang, Jim Palmer, John DelGaudio, Kelvin Lee, Mike Sillers, Rich Orlandi, Todd Kingdom

Additional Moderators:

Andy Murr, Andy Lane, BJ Ferguson, Karen Fong, Jay Dutton, Kathy Yaremchuk, Pete Batra, Rich Lebowitz, Rob Kern, Tim Smith, Winston Vaughn, Roy Casiano, Jean Vining, Rick Chandra

Saturday, September 18, 2004

ARS 50th Golden Anniversary Gala Dinner

7:00 p.m. – 10:30 p.m.

Guest of Honor

David W. Kennedy, M.D.

Sponsored by Merck & Co., Inc.

(Present ticket at the door)

East Ballroom

12:45 p.m. – 1:15 p.m.
Opening Ceremony

1:15 p.m. – 2:00 p.m.

Keynote Speaker – Guest of Honor

The Future of Fess David W. Kennedy, MD

2:10 p.m. – 3:30 p.m.
Oral Paper Presentations
Mercury Ballroom and Trianon Ballroom

East Ballroom

4:00 p.m. – 4:30 p.m.
Panel: *Maximal Medical Therapy*
Moderator: James A. Hadley, M.D.
Panelist: Berrlyn J. Ferguson, M.D., Richard Orlandi, M.D., Eugenia Vining, M.D.

4:30 p.m. – 5:00 p.m.
Superantigens and CRS
Robert Kern, M.D., David B. Conley, M.D.

5:00 p.m. – 5:30 p.m.
An Update on Nasal Polyposis
Claus Bachert, M.D.

Breakout Minisessions

Trianon Ballroom	Mercury Ballroom
4:00 p.m. – 4:30 p.m. *Principals of Frontal Sinus Surgery* **Moderator:** Peter-John Wormald, M.D. **Panelists:** Martin J. Citardi, M.D., Michael Sillers, M.D.	4:00 p.m. – 4:30 p.m. *Panel-Olfactory Loss Associated with Nasal and Sinus Disease – Conductive or Sensory* **Moderator:** Allen Seiden, M.D. **Panelists:** Robert Kern, M.D., Donald Leopold, M.D., Karen Fong, M.D.
4:30 p.m. – 5:00 p.m. *Frontal Sinus Surgery-Decision Making in Difficult Cases* Chul Hee Lee, M.D., Hwan-Jung Roh M.D., Hong-Ryul Jin M.D.	4:30 p.m. – 5:00 p.m. *The Role of Allergy in CRS with Nasal Polyposis* Ruby Pawankar, M.D.
5:00 p.m. – 5:30 p.m. *Real Time Image Guided Endoscopic Sinus Surgery* Vijay Anand, M.D.	5:00 p.m. – 5:30 p.m. *Extended Endoscopic Skull Base Surgery* Aldo Stamm, M.D.

Saturday, September 18, 2004

7:00 p.m. – 10:30 p.m.

ARS 50th Golden Anniversary Gala Dinner

Trianon Ballroom
Hilton New York Hotel

Guest of Honor

David W. Kennedy, M.D.

Sponsored by Merck & Co., Inc.
(Present ticket at the door)

Mercury Ballroom

Inflammation

Moderators: Berrlyn J. Ferguson, M.D., Richard Orlandi, M.D., Robert Kern, M.D., Allen Seiden, M.D.

2:10 p.m. – 2:15 p.m.
Superantigens And Chronic Sinusitis III: Systemic And Local Response To Staphylococcal Toxins
David B. Conley, M.D., Tripathi Anju, M.D., Leslie C. Grammer, M.D., Robert C. Kern, M.D.
Chicago, IL

2:15 p.m. – 2:20 p.m.
Inflammatory Pathway Gene Expression In Chronic Hyperplastic Sinusitis
Vijay K. Anand, M.D., Ashutosh Kacker, M.D., Andres Orjuela, M.D., Jenny Xiang, M.D.
New York, NY

2:20 p.m. – 2:25 p.m.
Serum Response To Staphylococcal Superantigens In Chronic Sinusitis With Polyps
Anju Tripathi, M.D., David B. Conley, M.D., Leslie C. Grammer, M.D., Robert C. Kern, M.D.
Chicago, IL

2:25 p.m. – 2:30 p.m.
Elevated Serum Glycodelin In Chronic Sinus Disease-A New Diagnostic Tool?
Emer E. Lang, M.D., Sampath Sampath, M.D., Giri Venkatraman, M.D.
Atlanta, GA

2:30 p.m. – 2:45 p.m.
Discussion

2:45 p.m. – 2:50 p.m.
cDNA Gene Array Analysis Of Cytokine Expression In Chronic Rhinosinusitis
Robert L. Eller, M.D., Michael J. Sillers, M.D., Eben Rosenthal, M.D. Melissa Talbert, M.D.
Birmingham, AL

2:50 p.m. – 2:55 p.m.
Demonstration of Biofilm in Human Chronic Bacterial Rhinosinusitis
Berrylin J. Ferguson, M.D., Donna Stolz, Ph.D.
Pittsburgh, PA

2:55 p.m. – 3:00 p.m.
The Bacteriologic Efficacy of Telithromycin Versus Moxifloxacin in the Treatment of Acute Maxillary Rhinosinusitis
Berrylin J. Ferguson, M.D., James A. Hadley, M.D.
Pittsburgh, PA

3:00 p.m. – 3:05 p.m.
An Evaluation Of Effect Of Pterygopalatine Fossa Injection With Local Anaesthetics And Adrenaline In The Control Of Nasal Bleeding During Endoscopic Sinus Surgery
Peter-John Wormald, M.D., Theodore Athanasiadis, M.D., Guy Rees, M.D. Robinson Simon, M.D.
Woodville, Australia

3:05 p.m. – 3:25 p.m.
Discussion

Trianon Ballroom

Sinus Surgery

Moderators: Todd Kingdom, M.D., Jay Dutton, M.D., Pete Batra, M.D., Richard Lebowitz, M.D.

2:10 p.m. – 2:15 p.m.
Long-Term Medical Management of Anosmia Related to Chronic Sinusitis
Kristen J. Otto, M.D., Emer Lang, M.D., John M. DelGaudio, M.D., Giridhar Venkatraman, M.D.
Atlanta, GA

2:15 p.m. – 2:20 p.m.
Technique Selection in Orbital Decompression for Thyroid-related Orbitopathy
Edmund A. Pribitkin, M.D., Brian Kung, M.D., Peter J. Savino, M.D., Jurij R. Bilyk, M.D.
Philadephia, PA

2:20 p.m. – 2:25 p.m.
The Effect Of The Type Of Anaesthetic Agent On The Surgical Field During Endoscopic Sinus Surgery
Langton-Hewer Claire, M.D., Peter John Wormald, M.D., Jonathon Perks, M.D. Robert van Renen, M.D.
Woodville, Australia

2:25 p.m. – 2:30 p.m.
Combined Endoscopic Trephination And Endoscopic Frontal Sinusotomy For Management Of Complex Frontal Pathology
Pete S. Batra, M.D., Martin J. Citardi, M.D., Donald C. Lanza, M.D.
Cleveland, OH

2:30 p.m. – 2:45 p.m.
Discussion

2:45 p.m. – 2:50 p.m.
The Sphenoid Sinus Rescue Procedure (SSR): Early Experience & Follow Up
Boris I. Karanfilov, M.D., Frederick A. Kuhn, M.D., Mark G. Dubin, M.D.
Columbus, OH

2:50 p.m. – 2:55 p.m.
Endonasal Endoscopic Orbital Decompression
Ranko Mladina, M.D.
Croatia

2:55 p.m. – 3:00p.m.
Sinonasal Disease in Cystic Fibrosis. Genotype-Phenotype Relationship.
Steven Chase, M.D., Marcella Bothwell, M.D.
Columbia, MO

3:00 p.m. – 3:05p.m.
Evaluation of Postoperative Pain Following Sinonasal Surgery
Sarah K. Wise, M.D., John M. DelGaudio, M.D.
Atlanta, GA

3:05 p.m. – 3:25 p.m.
Discussion

3:30 p.m. – 4:00 p.m.
Break with Exhibitors

Trianon Ballroom

Sunday, September 19, 2004
6:30 a.m. – 7:45 a.m.
Breakfast Symposium

"The Role of Macrolides in the Management of ABRS"

Moderator: James A. Hadley, M.D.
Panelist: Valerie Lund, M.D., Todd Kingdom, M.D., Richard Orlandi, M.D.

Sponsored by an Unrestricted Education Grant from Abbott Pharmaceuticals

8:00 a.m. – 8:45 a.m.
The Present and Future Role of Computer Assisted Sinus Surgery
Moderator: Wolf Mann, M.D.
Panelists: Ralph Metson, M.D., Marvin P. Fried, M.D., Joseph B. Jacobs, M. D.

8:50 a.m. – 10:00 a.m.
Oral Paper Presentations
Mercury Ballroom and Rendezvous Trianon

Trianon Ballroom

10:30 a.m. – 11:30 a.m.
Moderated Panel – Great Debate
The Role of Fungi and Bacteria in CRS
Moderator: Heinz Stammberger, M.D.
Panelists: Claus Bachert, M.D. , Silvain Lacroix, M.D., Donald C. Lanza, M.D., Jens Ponikau, M.D.

11:30 a.m. – 12:00 p.m.
Awards and Presentations

12:00 p.m. – 1:00 p.m.
Lunch Break: Exhibit Viewing / Poster Viewing

Trianon Ballroom

1:00 p.m. – 1:45 p.m.
Recurrent Massive Polposis-Surgical and Medical Options
Moderator: Vladimir Kozlov, M.D.
Panelists: Bradley Marple, M.D., Silvain Lacroix, M.D., Andrew Murr, M.D., Metin Onerci, M.D.

1:45 p.m. – 2:30 p.m.
Panel-Complications in FESS – Recognition and Treatment
Moderator: James Stankiewicz, M.D.
Panelists: Heinz Stammberger, M.D., John DelGaudio, M.D.

2:30 p.m. – 3:00 p.m.
Endoscopic Resection of Sinonasal Malignancy
Donald C. Lanza, M.D.

Breakout Seminars – Mercury Ballroom

1:00 p.m. – 1:40 p.m.
Endoscopic Orbital Surgery Including Endonasal DCR and Optic Nerve Decompression
Moderator: Valerie Lund, M.D.
Panelists: Ranko Mladina, M.D., Todd Kingdom, M.D., Ralph Metson, M.D.

1:40 p.m. – 2:20 p.m.
Newer Antibiotics and Guidelines for Treatment of ARS and CRS
Moderator: Michael Benninger, M.D.
Panelists: David Edelstein, M.D., Michael Poole, M.D.

2:20 p.m. – 3:00 p.m.
Pediatric Endoscopic Sinus Surgery
Moderator: Rodney Lusk, M.D.; **Panelists:** Outcomes of Surgical Management of Children with Cystic Fibosis, Peter Clement, M.D., and GERD and Its Role in Pediatric Sinusitis, David Walner, M.D.

Breakout Seminars – Rendezvous Trianon

1:00 p.m. – 1:30 p.m.
Low Dose ASA Desentization
Jan Gosepath, M.D.

1:30 p.m. – 2:10 p.m.
Endoscopic Approaches to the Frontal Sinus and the Modified Lothrop Procedure
Moderator: Frederick A. Kuhn, M.D.
Panelists: Stilianos Kountakis, M.D., Charles Gross, M.D.

2:10 p.m. – 3:00 p.m.
State of the Art in Diagnosis and Repair of CSF Leaks
Moderator: Michael Sillers, M.D.
Panelists: Silvain Lacroix, M.D., Brent Senior, M.D.

3:00 p.m. – 3:30 p.m.
Break with Exhibitors

Mercury Ballroom

SinoNasal Mucosa

Moderators: Winston Vaughan, M.D., Timothy Smith, M.D., Rakesh Chandra, M.D., Karen Fong, M.D.

8:50 a.m. – 8:55 a.m.
The Role of Eosinophilia in Nitric Oxide-Mediated Tissue Injury in Chronic Sinusitis
Marc A. Tewfik, M.D., Saul Frenkiel, M.D., Julio Freire Bernardes, M.D., David H. Eidelman, M.D.
Montreal, Canada

8:55 a.m. – 9:00 a.m.
Decreased Nasal Mucosal Sensitivity In Older Subjects
Donald A. Leopold, M.D., Bozena Wrobel, M.D., Eric Holbrok, M.D., Alexander Bien, M.D.
Omaha, NE

9:00 a.m. – 9:05 a.m.
Evidence of Mucosal Injury in an Animal Model of Chronic Sinusitis
Joel R. Perloff, M.D., James N. Palmer, M.D.
Philadelphia, PA

9:05 a.m. – 9:10 a.m.
Quantification of Ciliary Beat Frequency in Sinonasal Epithelial Cells Using Differential Interference Contrast Microscopy and High Speed Digital Video Imaging
Ioana Schipor, M.D., James N. Palmer, M.D., Akiva Cohen, M.D., Noem Cohen, M.D.
Philadelphia, PA

9:10 a.m. – 9:25 a.m. Discussion

9:25 a.m. – 9:30 a.m.
Effectiveness Of Intraoperative Mitomycin C In Maintaining The Patency Of A Frontal Sinusotomy – A Preliminary Report Of A Double-Blind Randomized Placebo-Controlled Trial
Kwai-Onn Chan, M.D., Amin R. Javer, M.D., Yotis Tsaparas, M.D.
Vancouver, British Columbia

9:30 a.m. – 9:35 a.m.
Composition of Hyaluronan Affects Wound Healing in the Rabbit Maxillary Sinus
Matthew Proctor, M.D., L. D. McGill, M.D., Glen D. Prestwich, M.D., Richard R. Orlandi, M.D.
Salt Lake City, UT

9:35 a.m. – 9:40 a.m.
A Prospective Single Blind Randomized Controlled Study Of Use Of Hyaluronic Acid Nasal Packs (Merogel®) In Patients After Endoscopic Sinus Surgery
Peter John Wormald, M.D., Neil Boustred, M.D., Le Tong, M.D., Sacks Ray, M.D.
Woodville, Australia

9:40 a.m. – 9:45 a.m.
Delivery Of Nebulized Saline To The Nasal Cavity: A Radionuclide Distribution Study
Peter H. Hwang, M.D., Rachel Woo, M.D., Karen J. Fong, M.D.
Portland, OR

9:45 a.m. – 10:00 a.m. Discussion

Rendezvous Trianon

SinoNasal Tumors-Techniques

Moderators: Roy Casiano, M.D., Kelvin Lee, M.D., Michael Sillers, M.D.

8:50 a.m. – 8:55 a.m.
Endonasal Approach for the Resection of Esthesioneuroblastoma
Umamaheswar Duvvuri, M.D., Ricardo Luis Carrau, M.D., Carl H. Snyderman, M.D., Amin B. Kassam, M.D.
Pittsburgh, PA

8:55 a.m. – 9:00 a.m.
Sinonasal Undifferentiated Carcinoma with Intracranial Extensions
Paul J. Donald, M.D.
Sacramento, CA

9:00 a.m. – 9:05 a.m.
Surgical Management of Frontal Sinus Osteomas
Robert E. Sonnenburg, M.D., Beth Peigh, M.D., Frederick A. Kuhn, M.D.
Chapel Hill, NC

9:05 a. m. – 9:10 a.m.
Endoscopic Transsphenoidal Approach to Petrous Apex Lesions
Umamaheswar Duvvuri, M.D., Carl Snyderman M.D., Amin Kassam M.D.

9:10 a.m. – 9:25 a.m. Discussion

9:25 a.m. – 9:30 a.m.
Intermittent Intracranial Hypertension As A Possible Cause Of Recurrent Spontaneous Cerebrospinal Fluid Rhinorrhea After Surgical Treatment
Omar El-Banhawy, M.D., Ahmed Halaka, M.D., Heshmat Ayad, M.D., Mohammed El-Kholy, M.D.
El-Mansoura, Egypt

9:30 a.m. – 9:35 a.m.
Efficacy of CSF Fistula Repair: Sensitive Quality Control Using Beta-Trace Protein Test
Cem Meco, M.D., Erich Arrer, M.D., Gerhard Oberascher, M.D.
Salzburg, Austria

9:35 a.m. – 9:40 a.m.
Staged Endoscopic and Combined Open/Endoscopic Approach in the Management of Inverted Papilloma of the Frontal Sinus
Marc G. Dubin, M.D., Robert E. Sonnenburg, M.D., Christopher T. Melroy, M.D., Brent A. Senior, M.D.
Chapel Hill, NC

9:40 a.m. – 10:00 a.m. Discussion

10:00 a.m. – 10:30 a.m.
Break with Exhibitors

Trianon Ballroom

3:30 p.m. – 4:00 p.m.
Keynote Speaker – Heinz Stammberger, M.D.
Advances in Endoscopic Image Guided Navigation CT/MR Fusion and Volume Mapping

4:00 p.m. – 4:30 p.m.
Panel – Advances in Powered Instrumentation
Moderator: David W. Kennedy, M.D.
Panelists: Aldo Stamm, M.D., Peter Clement, M.D., Pete Batra, M.D.

4:30 p.m. – 5:00 p.m.
Where Are We and What Do We Know About Sinus Headache?
Howard Levine, M.D., Curtis P. Schreiber, M.D.

Breakout Seminars – Mercury Ballroom

4:00 p.m. – 4:20 p.m.
Low Dose Macrolide Therapy in Chronic Sinusitis with Nasal Polyposis
Ruby Pawankar, M.D.

4:20 p.m. – 4:40 p.m.
Pressures Generated During Nose Blowing and a Possible Impact on Frontal Sinusitis
Peter Clement, M.D.

4:40 p.m. – 5:00 p.m.
Management of Nasopharyngeal Tumors in Adult and Pediatric Patients
Piero Nicolai, M.D.

Breakout Seminars – Rendezvous Trianon

4:00 p.m. – 4:20 p.m.
Reflux and Sinusitis
John DelGaudio, M.D.

4:20 p.m. – 5:00 p.m.
The Nose and Its Influence on Snoring/ Sleep Apnea
Kelvin Lee, M.D.
Panelists: Edward Weaver, M.D., M.P.H., David Steward, M.D., M.P.H.

7:00 p.m. – 10:00 p.m. – **SUNDAY**

ARS 50th Gala Presidential Reception

Sponsored by
GE Navigation and Karl Storz Endoscopy
Rainbow Room by Capriani –
30 Rockefeller Plaza
(Tickets must be presented at door)

Trianon Ballroom

6:45 a.m. – 7:45 a.m.
Merck Breakfast Symposium
Sponsored by an Unrestricted Educational Grant from Merck & Co., Inc.
Moderator: Michael Sillers, M.D.

The Inflammation Pathway in CRS, Pathophysiology, Implications for Treatment
Bradley Marple, M.D.,
Valerie Lund, M.D.,
Jan Gosepath, M.D.

8:00 a.m. – 9:30 a.m.
Oral Paper Presentations

Mercury Ballroom

Allergy-Antibiotics
Moderators: Andrew Lane, M.D., John DelGaudio, M.D., Andrew Murr, MD., James Palmer, M.D.

8:00 a.m. – 8:05 a.m.
Detection Of Amin Acids In Human Nasal Mucosa Using Microdialysis Technique: Increased Glutamate In Allergic Rhinitis
Hwan-Jung Roh, M.D., Hyun-Sun Lee, M.D., Soo-Geun Wang, M.D., Eui-Kyung Goh, M.D.
South Korea

8:05 a.m. – 8:10 a.m.
Suppression Of Allergic Response By Cpg Motif Oligodeoxynucleotide In Allergic Rhinitis Animal Model
Chul Hee Lee, M.D., Ji-Hun Mo, M.D., Chae-Seo Rhee, M.D., Song-wha Quan, M.D.
Seoul, Korea

8:10 a.m. – 8:15 a.m.
Efficacy Of Long Term Sublingual-Oral Immunotherapy In Allergic Rhinitis
Cemal Cingi, M.D., Aynaci Sevilay, M.D., Hamdi Cakli, M.D., Kezban Gurbuz, M.D.
Turkey

8:15 a.m. – 8:20 a.m.
The Peroxide Tone In Human Nasal Mucosa With Allergy
Masato Miwa, M.D., Yoko Iwasaki, M.D., Mayumi Matsunaga, M.D., Kensuke Watanabe, M.D.
Japan

8:20 a.m. – 8:35 a.m.
Discussion

8:35 a.m. – 8:40 a.m.
Evidence Based Recommendations for Antimicrobial Nasal Washes in Chronic Rhinosinusitis
Scott P. Stringer, M.D., Kimberly Elliott, M.D.
Jackson, MO

8:40 a.m. – 8:45 a.m.
Treatment of Chronic Rhinosinusitis Caused by Methicillin-Resistant Staphylococcus Aureus
Vijay K. Anand, M.D., Casey R.A. Manarey, M.D., Clark Huang, M.D.
New York, NY

Rendezvous Trianon

Outcomes-Therapeutic Techniques
Moderators: Peter Hwang, M.D., Todd Loehrl, M.D., Kathleen Yaremchuk, M.D., Stilianos Kountakis, M.D., Eugenia Vining, M.D.

8:00 a.m. – 8:05 a.m.
Exploring The Association Between Symptoms And Objective Testing In Rhinosinusitis
Michael G. Stewart, M.D., Timothy L. Smith, M.D.
Houston, TX

8:05 a.m. – 8:10 a.m.
Reliability of the University of Miami Chronic Rhinosinusitis Staging System (UMCRSS)
Roy R. Casiano, M.D., David Adam Lehman, M.D.
Miami, FL

8:10 a.m. – 8:15 a.m.
Comparison of Maxillary Sinus Aspirate v. Middle Meatal Swab for Culture in Acute and Chronic Sinusitis: A Meta Analysis
Marc G. Dubin, M.D., Charles S. Ebert, M.D., Charles Coffey, B.S., Brent A. Senior, M.D.
Chapel Hill, NC

8:15 a.m. – 8:20 a.m.
Long Term Outcomes Of Endoscopic Repair Of Csf Leaks And Menigoencephaloceles
James A. Stankiewicz, M.D., Jodi D. Zuckerman, M.D.
Maywood, IL

8:20 a.m. – 8:35 a.m.
Discussion

8:35 a.m. 8:40 a.m.
Terminal Branching Of The Internal Maxillary Artery And Clinical Implications: A Cadaveric Study
Gustavo A. Diaz-Reyes, M.D., Nikhil J. Bhatt, M.D.
Oak Park, IL

8:40 a.m. – 8:45 a.m.
Anatomic Risk Factors for Sinus Disease: Fact or Fiction?
Robert J. Caughey, M.D., Mark Jameson, M.D., Charles W. Gross, M.D., Joseph K. Han, M.D.
Charlottesville, VA

8:45 a.m. – 8:50 a.m.
Clinical Investigation Of Non-Biofilm-Forming Pseudomonas Aeruginosa
Jonathan Eric Cryer, M.D., Ioana Schipor, M.D., Joel Perloff, M.D., James Palmer, M.D., J. Christopher Post, M.D., Harvy Coates, M.D.
Philadelphia, PA

8:50 a.m. – 9:05 a.m.
Discussion

9:05 a.m. – 9:10 a.m.
Evidence For Biofilm Formation In Chronic Rhinosinusitis
Walid Abou-Hamad, M.D., Jean Barbeau, Ph.D., Martin Desrosiers, M.D.
Canada

WITHDRAWN

9:10 a.m. – 9:15 a.m.
1000 Consecutive Cases of Olfactory Impairment from the Nasal Dysfuction Clinic in San Diego: Rhinological Aspects
Margaret Amy Chen, M.D., Paul E. Gilbert, Ph.D., Terence M. Davidson, M.D., Claire Murphy, Ph.D.
San Diego, CA

9:15 a.m. – 9:20 a.m.
A New Drug Protocol for the treatment of Chronic Refractory Sinusitis
Peter Catalano, M.D.

9:20 a.m. – 9:30 a.m.
Discussion

8:45 a.m. – 8:50 a.m.
New Classification of Nasal Vasculature Patterns in Hereditary Hemorrhagic Telangiectasia
Elizabeth J. Mahoney, M.D., Stanley M. Shapshay, M.D.
Boston, MA

8:50 a.m. – 9:05 a.m.
Discussion

9:05 a.m. – 9:10 a.m.
Use Of Topical Corticosteroids Is Associated With Lower Bacterial Recovery Rate In Individuals Undergoing Ess For Chronic Rhinosinusitis
Martin Desrosiers, M.D., Saul Frenkiel, M.D., Abdolmohsen Hussain, M.D., Joseph Marsan, M.D.
Canada

9:10 a.m. – 9:15 a.m.
The Immunological Inflammation in Allergic Fungal Sinusitis, Chronic Fungal Sinusitis and Chronic Rhinosinusitis
A.Simon Carney, M.D., Lor-Wai Tan, M.D., Damian Adams, M.D., Peter-John Wormald, M.D.
Australia

9:15 a.m. – 9:20 a.m.
Medical Students' Attitudes Towards The Use Of An Endoscopic Sinus Surgery Simulator As A Training Tool
Aylon Y. Glaser, M.D., Charles B. Hall, Ph.D., Jose I. Uribe, M.D., Marvin P. Fried, M.D.
Bronx, NY

9:20 a.m. – 9:30 a.m.
Discussion

Trianon Ballroom

9:30 a.m. – 10:00 a.m.

ARS Business Meeting

10:00 a.m. – 10:30 a.m.
Break with Exhibitors

10:30 a.m. – 10:55 a.m.
Surgical Simulation
Marvin P. Fried, M.D.

11:00 a.m. – 11:30 a.m.
Outcomes in Rhinology and Sinus Surgery
Moderator: Timothy Smith, M.D.
Panelist: Mickey Stewart, M.D., Peter Hwang, M.D.

11:30 a.m. – 12:00 p.m.
Biomaterials in Surgical Rhinology
Moderator: Peter Hwang, M.D.
Panelists: Richard Orlandi, M.D., Peter-John Wormald, M.D., Rakesh Chandra, M.D.

Breakout Seminars – Mercury Ballroom

10:30 a.m. – 11:15 a.m.
Regional Variations in End State Chronic Rhinosinusits
Moderator: James Palmer, M.D.
Panelists: Rodney Schlosser, M.D., Robert Kern, M.D., Richard Orlandi, M.D., Martin Desrossier, M.D., Alex Chiu, M.D.

11:15 a.m. – 12:00 p.m.
Biofilms in CRS
James Palmer, M.D., Joel Perloff, M.D.

Breakout Seminars – Rendezvous Trianon

10:30 a.m. – 11:15 a.m.
Endoscopic Approaches for SinoNasal Neoplasms and JNA
Moderator: Christian Buchwald, M.D.
Panelists: Paolo Casteluovo, M.D., Wolf Mann, M.D., Pete Batra, M.D., Metin Onerci, M.D.

11:15 a.m. – 12:00 p.m.
The Role of Postoperative Care and the Prevention of FESS Failure
Moderator: Valerie Lund, M.D.
Panelist: David W. Kennedy, M.D., Carlos Cuilty-Siller, M.D.

Trianon Ballroom

12:00 p.m. – 1:00 p.m.
Panel – How the Experts Utilize CPT Coding Appropriately in Nasal and Sinus Surgery
Moderator: Michael Setzen, M.D.
Panelists: Frederick A. Kuhn, M.D., Michael Sillers, M.D., Richard Waguespack, M.D., Mary LeGrand (Karen Zupko and Associates)

American Rhinologic Society

Breakfast Symposium

"The Role of Macrolides in the Management of ABRS"

Moderator: James A. Hadley, M.D.

Panelists: Valerie Lund, M.D., Todd Kingdom, M.D., Richard Orlandi, M.D.

Sunday September 19, 2004

6:30 am – 7:45 am

Trianon Ballroom

New York Hilton Hotel

Sponsored through an Unrestricted Educational Grant from
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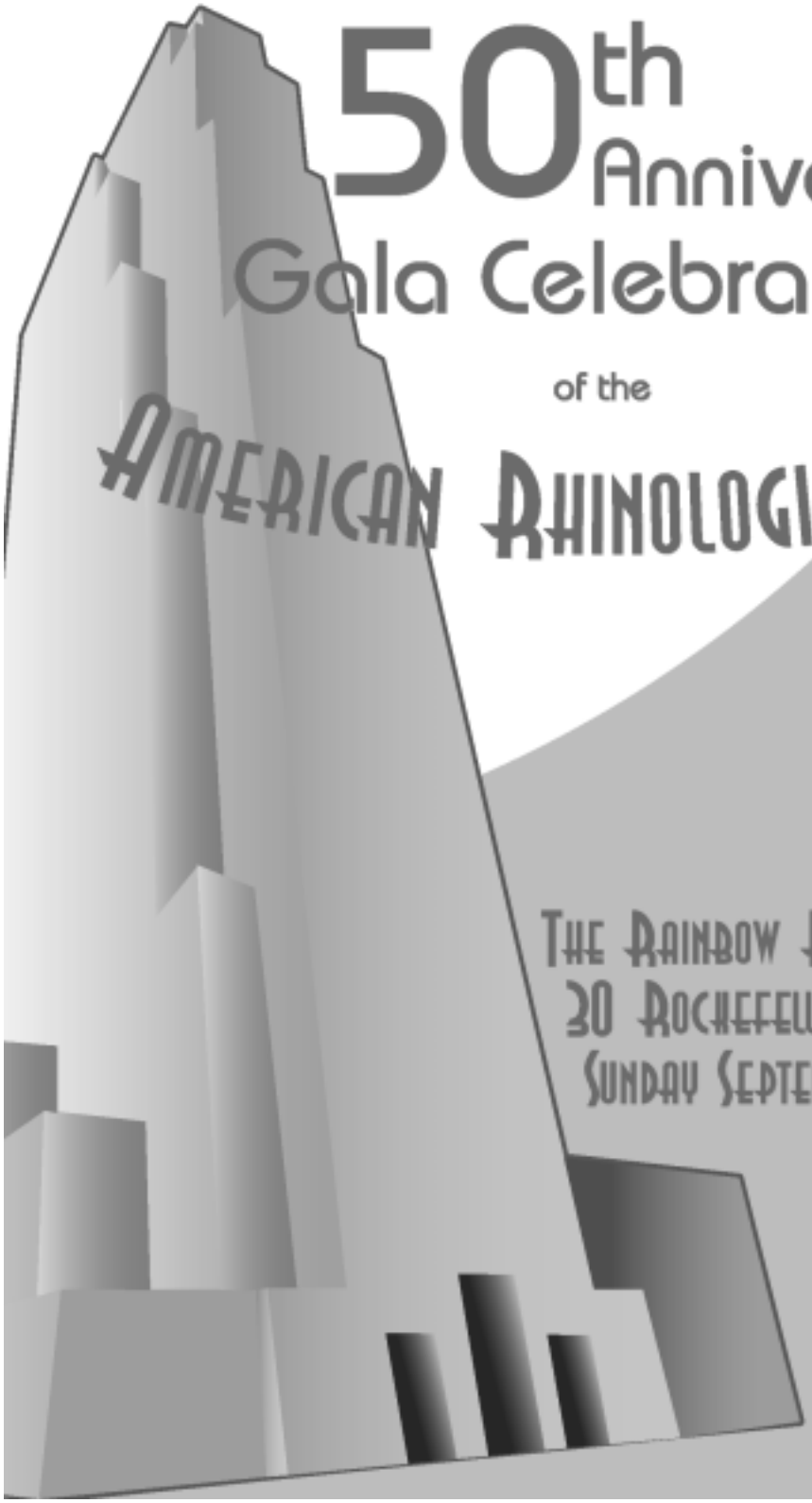
of the

American Rhinologic Society



The Rainbow Room
30 Rockefeller Plaza
Sunday September 19, 2004

imagination at work

American Rhinologic Society Breakfast Symposium

"The Inflammatory Pathway in Chronic Rhinosinusitis: Pathophysiology and Implications for Treatment"

Valerie Lund, M.D.
Bradley Marple, M.D.
Jan Gosepath, M.D.

Monday, September 20, 2004
Hilton New York
6:30 AM to 8:00 AM
Trianon Ballroom

Seating is limited to 200 people

***Supported by an unrestricted educational grant by Merck**

Rhinelander North and Center / Exhibit Hall

Poster Viewing: 9/18/04, 1:00 pm – 6:00 pm; 9/19/04, 7:00 am – 6:00 pm; 9/20/04, 7:00 am – 1:00 pm

Poster Questions/Discussion: Rhinelander North & Center 9/19 at 12:00 pm

754
Documenting for Dollars, Compliantly
Barbara J. Cobuzzi, C.P.C.

757
Endonasal Endoscopic Dacryocystorhinostomy in Small Children
Ranko Mladina, M.D.

759
Quality Of Life Improvements With And Without Computer Assistance In Sinus Surgery: An Outcomes Study
Amin R. Javer, M.D., Krista Genoway, M.D., Kwai Onn Chan, MBBS

761
Computed Tomography in Constructing Custom Septal Buttons
Daniel Louis Price, M.D., David A. Sherris, M.D.

762
Empty Nose Syndrome associated with Middle Turbinate resection
Steven M. Houser, M.D.

763
Bacteriology Of Sinus Cavities Of Asymptomatic Individuals After Endoscopic Sinus Surgery.
Hassan Al-Shamari, M.D., Walid Abou-Hamad, M.D.

767
Early Effect Of Exogenous Na Hyaluronate On Mucociliary Clearence
Altam Yildirim, M.D.

768
Isolated Spehnoid Sinus Disease: Etiology and Management
Pete Batra, M.D., Aaron Douglas Friedman, M.D., Samer , M.D., Donald C. Lanza, M.D.

769
A New Classification System Of The Deviated Nose And Its Implication In Treatment
Yong-Ju Jang, M.D., Si-Hyeong Lee, M.D., You-Sam Chung, M.D., Bong-Jae Lee, M.D.

772
Effectiveness Of Intraoperative Mitomycin C In Maintaining The Patency Of A Frontal Sinusotomy – A Preliminary Report Of A Double-Blind Randomized Placebo-Controlled Trial
Kwai-Onn Chan, M.D., Amin R. Javer, M.D., Yotis Tsaparas, M.D., Casey Manarey, M.D.

773
Endoscopic Management Of Malignant Sinonasal Tumours
Kwai-Onn Chan, M.D., Amin R. Javer, M.D.

774
A Development Of Rhinovirus Infection Model Using Organ Culture Of Turbinate Mucosa
Yong Ju Jang, M.D., Si Hyung Lee, M.D., Hyun Ja Kwon, M.D., Bong-Jae Lee, M.D.

776
Catheter and antibiotic related complications of ambulatory intravenous antibiotics for chronic refractory rhinosinusitis
Vijay Anand, M.D., Ashutosh Kacker, M.D.

777
Patterns Of Innervation Of The Anterior Maxilla: A Cadaver Study With Relevance To Canine Fossa Puncture
Simon R. Robinson, FRACS, Peter-John Wormald, M.D.

779
Presentation and Management of Extensive Fronto-Orbital-Ethmoid Mucoceles
Kevin C. McMains, M.D., Mark Herndon, M.D., Stilianos E. Kountakis, M.D.

781
Sinonasal-Type Hemangiopericytoma of the Sphenoid Sinus
Hsin-Ching Lin, M.D., I-Hung Lin, M.D.

782
A New Protocol For The Treatment Of Allergic Fungal Sinusitis
Roee Landsberg, M.D., Yoram Segev, Ari DeRowe, M.D.

783
Bacteriology Of Chronic Rhinosinusitis In Relation To Middle Meatal Secretion
Rong-San Jang, M.D.

784
Toxic Shock Syndrome Associated with Absorbable Nasal Packing
Ray Van Metre, M.D., Hassam Ramadan, M.D.

785
Navigation Systems in Residency Training Program
Hassan Ramadan, M.D., Ray Van Metre, M.D.

786
Association of a Calcium Sulfate Concretion to Biofilms
Jose A. Sanclement, M.D., Hassan Ramadan, M.D., Diane Berry

787
Expression of 12- and 15-Lipoxygenase in Murine and Human Nasal Mucosa
Kyung-Su Kim, M.D., Hee-Sun Chun, M.D., Joo-Heon Yoon, M.D., Jeung Gweon Lee, M.D.

790
"Vertex-to-Floor" Position Delivers Topical Nasal Drops to Olfactory Cleft after FESS
Pete S. Batra, M.D., Steven B. Cannady, M.D., Martin J. Citardi, M.D., Donald C. Lanza, M.D.

791
A New Procedure For The Short Screening Of Olfactory Function Using Five Items From The "Sniffin`Sticks" Identification Test Kit
Christian Mueller, M.D., Bertold Renner, M.D.

793
Migraine and Intranasal Contact Point
Behin Fereidoon, M.D., Marcelo Bigal, M.D., Babek Behin, M.D., Richard Lipton, M.D.

794
Bilateral Blindness Caused by Angiofibroma: A Clinical Catastrophe and Result of the Surgery
Mohsen Naraghi, M.D.

795
Elevated Nitric Oxide Metabolite Leves In Human Chronic Sinusitis
Moshen Naraghi, M.D., Ahmad Reza Dehpour, Ph.D., Armin Faradjzadeh, M.D., Mohammad Reza Ebrahimkhani, M.D.

796
Dynamic Rhinoplasty: The Spring Concept for Correction
Mohsen Naraghi, M.D.

797
Presence Of Surfactant Lamellar Bodies In Normal And Diseased Sinus Mucosa
Bradford A. Woodworth, M.D., Rodney J. Schlosser, M.D., Bradley A. Schulte, M.D., Samuel S. Spicer, M.D.

805
Combined Extended Midface Degloving and Endoscopic Approach for Resection of Sinonasal Lesions
Parul Goyal, M.D., Sherard Tatum, M.D.

809
Ethmoiditis In A Diabetic As A Cause Of Superior Orbital Fissure Syndrome – A Silent And Potent Threat To Vision
Michael Edward Arellano Navalta, M.D., Celso Vega Ureta, M.D., Gil Mendoza Vicente, M.D., Peter Del Rosario Jarin, M.D.

813
Biomechanical Properties of Nasal Septal Cartilage. Part I: Tension
Jeremy D. Richmon, M.D., August Sage, B.S., Deborah Watson, M.D., Robert Sah, Ph.D

814
An Evidence-Based Review Of The Medical Treatment Of Chronic Rhinosinusitis In Adults
Jason G. Cundiff, M.D., Stephanie Joe, M.D.

817
Rhinocerebral Mucormycosis and Hyperbaric Oxygen Therapy: A 20-Year Experience
Christopher A. Church, M.D., Paul T. Russell, M.D., Richard Sample, RCP, Takkin Lo, M.D.

819
Endoscopic Management of Orbital Blow-out Fracture
Zain Kadri, M.D.

820
Surgical Management of Frontal Sinus Osteomas
Robert E. Sonnenburg, M.D., Beth Peigh, M.D., Frederick A. Kuhn, M.D.

821
Image-Guided Sinus Surgery Opinions & Trends: A National Survey
Matt Brocknor, M.S., Ankit M. Patel, M.D., Winston C. Vaughan, M.D.

822
The Effect Of Histamine On Rhinovirus-16 Infection In Airway Epithelial Cells
Yong Ju Jang, M.D., Yoo-Sam Chung, M.D., Hyun Ja Kwon, M.D., Bong-Jae Lee, M.D.

823
An Update in the Endoscopic Management of Benign Sinonasal Tumors
WITHDRAWN
Alessandro de Notaris, M.D., Clifford Phillips, M.D., Joseph C. Han, M.D., Charles W. Gross, M.D.

824
Clinical Characteristics Of Maxillary Sinus Organized Hematoma
Bong-Jae Chung, M.D., Yoo-Sam Chung, M.D., Yong Ju Jang, M.D., Si-Hyung Lee, M.D.

825
The Histopathological Characteristics in Patients with Nasal Polyposis
Yune Sung Lim, M.D., Chae Seo Rhee, M.D., Sun Young Wang, M.D., Jae Li Park, M.D.

829
Evidence Of Turbinate Atrophy With Aging: Evaluation By Acoustic Rhinometry And Rhinomanometry
Chae-Seo Rhee, M.D., Dong Hwan Roh, M.D., Ji-Hun Mo, M.D., Yang-Ji Min, M.D.

831
Proliferation, Angiogenesis And Hormonal Markersin Juvenile Nasopharyngeal Angiofibroma
Ta^{a}kin ÖMER YÜCEL, M.D., GÜLESER KILIÇ, M.D., ARZU SUNGUR, M.D.

834
Modeling Pre- & Post-Operative Airflow And Odorant Delivery Pattern In The Nasal Cavity: A Quantitative Evaluation Of Surgical Intervention
Kai Zhao, Ph.D., Edmund Pribitkin, M.D., Beverly J. Cowart, Ph.D., Pamela Dalton, Ph.D.

835

Use of Acupuncture in the Treatment of Sinonasal Symptoms: Results of a Practitioner Survey

Steven Daniel Pletcher, M.D., Jenny E. Lee, MHS, Joseph S. Acquah, LAc, Andrew N. Goldberg, M.D.

836

Chronic Invasive Fungal Rhinosinusitis in Immunocompetent Patients

Pete Batra, M.D., Lee Michael Akst, M.D., Martin J. Citardi, M.D., Donald C. Lanza, M.D.

838

The Role of Biofilms in Chronic Rhinosinusitis

Alicia Ruth Sanderson, M.D., Darrell Hunsaker, M.D., Jeff Leid, Ph.D.

844

Intracranial mucocele: An Unusual Complication of Endoscopic Repair of Cerebrospinal Fluid Rhinorrhea

Urmen D. Upadhyay, B.S., Donald A. Annino, M.D., Ellie E. Rebeiz, M.D.

846

Nasal Airflow During Respiratory Cycle

Seung-Kyu Chung M.D., Young Rak Son, MD, Seok Jae Shin, M.D.

850

Do Pulmonary Function Tests Improve in Patients with Cystic Fibrosis after Functional Endoscopic Sinus Surgery?

Giri Venkatraman, M.D., Patel Avani, B.S., Justin Wise, MSC, James Andrew, M.D.

851

The Role Of Hyperbaric Oxygen Therapy In The Management Of Invasive Fungal Sinusitis

Ing Ruen Lim, M.D., James Palmer, M.D.

852

New Description Method And Classification System Of Septal Deviation

Hong-Ryul Jin, M.D., Yeong-Seok Choi, M.D., Joo-Yun Lee, M.D., See-Ok Shin, M.D.

855

Analysis Of Survival Rate According To Revised AJCC System In Sinonasal Squamous Cell Cancer

Chae-Seo Rhee, M.D., Dong-Gu Hur, M.D., In-Sang Kim, M.D., Yang-Gi Min, M.D.

857

WITHDRAWN

Maxillary Osteomyelitis Caused By Mycobacterium Chelonae and Actinomyces Israelii

David Young Healy, M.D., Alexander Edward Stewart, M.D., Terence E. Johnson, M.D., Ben J. Balough, M.D.

861

Surgical Management of Frontal Sinus Osteomas

Robert E. Sonnenburg, M.D., Frederick A. Kuhn, M.D., Beth Peigh, FNP

862

Cocaine-Induced Midline Nasal Necrosis Presenting With Proptosis And Acute Vision Changes

Konstantin Vasyukevich, M.D., David Gitler, M.D.

863

Intrinsic Antimicrobial Properties Of Sinus Secretions

Jivianne Tan Lww, M.D., Keith Blackwell, M.D., Ericka Valore, B.S., Thomas Ganx, M.D., Ph.D.

864

Radiofrequency Surgery Using 4.0 MHz Radiowave Technology in Rhinology

Mahmoud Moravej, M.D.

865

A Modified Shaver-Concho-Suction Method For Inferior Turbinate Reduction: 8 Years Experience

Josef Lindenberger M.D., Ph.D.

ARS Research Award

2004

Superantigens and Chronic Sinusitis II: Analysis of T Cell Receptor VB Domain in Nasal Polyps

David B. Conley, MD, Anju Tripathi, MD, Kristin A. Seiberling, MD, Leslie C. Grammar, MD, Robert C. Kern, MD

2003

Nitric Oxide and Collagen Expression in Allergic Upper Airway Disease

Marc A. Tewfik, CSc, Julio F. Bernardes, MD, Jichaun Shan, MD, Michelle Robinson, BSc, Saul Frenkiel, MD, David H. Eidelman, MD

2000

An Animal Model for Allergic Fungal Sinusitis

Felicia Grisham, MD

Histologic Study of the Superior Turbinate

Donald Leopold, MD

International Research Award Winners

2002

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

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

2003

Nitric Oxide and Collagen Expression in Allergic Upper Airway Disease

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

Golden Head/Mirror Honor Award

For Meritorious Teaching in Rhinology

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

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

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

C
Jamie Carillo, Mexico*
James Chessen, US*
Maurice H. Cottle, US*

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

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

G
Irwin E. Ganor, US
Norman E. Ginsberg, US*
VernonD. Gray, US*
Charles Gross, US
Harvey C. Gunderson, US

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

J
Gerald F. Joseph, US

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

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

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

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

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

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

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

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

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

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

* Deceased

Dr. Maurice 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, Eugene B. Kern, MD, Mayo Clinic, Rochester, MN

1979
The Physiologic Regulation of Nasal Airway Resistance During Hypoxia and Hypercapnia
T.V. McCaffrey, MD, Eugene B. Kern, MD, Mayo Clinic, Rochester, MN

1980 (Two Awards Given)
Growth Patters of the Rabbit Nasal Bone Region – A Combined Serial Gross Radiographic Study with Metallic Implants
Bernard C. Sarnat, MD, Abbee Selman, DDS, Los Angeles, CA

Sleep Disturbances Secondary to Nasal Obstruction
Kerry D. Olsen, MD, Eugene B. Kern, MD, 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, Bo Wihlelnisson, MD, Sweden

1987
Eustachian Tube and Nasal Function During Pregnancy – A Prospective Study
Craig S. Derkay, MD, Pittsburgh, PA

1988
The Effects of Klebsiella 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 Mucoolliary Transport
P. Perry Phillips, MD, Mayo Clinic, Rochester, MN

1991
Ultrastructural Changes in the Olfactory Epithelium in Alzheimer's Disease
Bruce Jafek, MD, University of Colorado, Denver, CO

1992
A Scanning Electron Microscopic Study of Smoking and Age Related Changes in Human Nasal Epithelium
Steven Kushnick, MD, New York, NY

1993
Mucociliary Functioning Endothelins 1, 2 & 3
Finn Ambie, MD, Mayo Clinic, Rochester, MN

1996
Capsacin's Effect on Rat Nasal Mucosa Substance P Release
Frederick A. Kuhn, MD, Savannah, GA

1999
Subacute Effects of Ozone-Exposure on Cultivated Human Respiratory Mucosa
Joseph Gosepath, MD, D. Schaefer, MD, C. Broomer, MD, L. Klimek, MD, R.G. Amedee, MD, W.J. Mann, MD, Mainz, Germany

2000
Capsacin's Effect on Trigenonal Nuciens Substance P Release
Frederick A. Kuhn, MD, Savannah, GA

2002
Bioengineering of Cartilage Using Human Nasal Chondrocytes Propagated in Microcarrier Spinner Culture
Alan H. Shikani, MD, David J. Fink, PhD, Afshin Sohrabi, MHS, Phong Phan, BS, Anna Polotsky, MD, David S. Hungerford, MD, Carmelita G. Frondoza, PhD, San Diego, CA

ARS New Investigator Award

2004

Assessment of Bacterial Biofilms in Sinusitis
James N. Palmer, M.D.

2002

Characterization of Eosinophil Peroxidase-Induced Tissue Damage in Sinonasal Polyposis and Chronic Rhinosinusitis
Martin J. Citardi, MD

Influence of Estrogen on Maturation of Olfactory Neurons
Karen J. Fong, MD

2001

Apoptosis in the Aging Olfactory Mucosa
David B. Conley, MD

ARS Poster Awards

2004

1ST PLACE:

Longterm Effects of Floseal Nasal Packing after ESS
Rakesh K Chandra, MD, David B. Conley, MD, Robert Kern, MD

2ND PLACE:

Evidence-based Use of Topical Nasal Anesthesia for Flexible Transnasal Endoscopy
Rhoda Wynn, MD, Boris L. Bentsianov, MD

3RD PLACE:

Pneumocele of the Maxillary Sinus: Case Report and Literature Review
B. Todd Schaeffer, MD

Martin J. Citardi, MD.
ARS Information Technology Officer

The ARS Information Technology Committee (as well as its predecessor, which was part of the ARS newsletter) was created by the ARS Board of Directors to oversee ARS efforts on the Internet. The initial efforts focused upon the creation and maintenance of a public web site, but over the past few years, the ARS IT Committee has assumed a greater role as more ARS functions have moved to a web-based model.

Because the ARS is a small society with rich intellectual property, the Internet has offered the unique opportunity for the ARS to present itself on a global scale. An added benefit has been improved day-to-day operations, which have facilitated recent growth.

The ARS IT Committee develops and maintains the entire ARS web presence through a close working relationship with Wildfire Internet (www.wildfireinternet.com), which has created custom applications for ARS use. In practice, the ARS has deployed a series of modules. Each module provides specific functions, and all of the modules share a unified web-based interface and provide access to the ARS databases. Together, this framework is ARS Information Services.

The ARS web effort can be divided into two parts. The first part is the public web site, which provides information for general users, patients, member physicians and other healthcare professionals. It has emerged a primary means for communication from the Society to the membership and the world.

The second part, which is considerably larger and more complex, supports day-to-day ARS operations:

- e-Abstract Module (paperless system for abstract submission, review and web-based publication)
- e-Survey Module (Internet-based surveys of users of the ARS web site)
- Member Services (membership records, including dues administration, invoicing and payment)
- ARS Messenger (mailing system that generates messages to the membership via E-mail, fax or regular mail)
- Scientific Meeting Registration Module (on-line meeting registration for scientific events)
- Special Event Registration Module (on-line meeting registration for special events)

Thus, ARS IT Committee has facilitated the transition to a nearly paperless, Internet-based system. In the process, many ARS practices have become standardized, and the ARS has become more efficient.

Later this year, the ARS will deploy a new web site, which will feature a new design and site organization, as well as added functionality.

If you have any questions, please contact the ARS IT Committee at arsinfo@american-rhinologic.org.

ARS Newsletter, "Nose News"

The American Rhinologic Society Newsletter, "Nose News" serves as the public face of the society to the membership of the American Academy of Otolaryngology/Head and Neck Surgery. Nose News is published three times a year and has the purpose to report critical ARS information with regard to society activity, upcoming meetings, and patient advocacy issues to nearly 10,000 otolaryngologists throughout the USA. In addition, it serves as a source of clinical content for readers with its "Case of the Quarter" section, while "Point of View" allows rhinologists with differing opinions on current "hot-button" issues to explain "their side of things."

Now in its sixth year of publication, the newsletter has gone through many layout and stylistic changes, initially under the founding leadership of J. David Osguthorpe of the Medical University of South Carolina, and more recently by Brent Senior of the University of North Carolina. Of course, many behind the scenes individuals have contributed as well as writers of various features, but we have been particularly pleased during this 50th Anniversary year to have had the design assistance from Sinus Pharmacy and Molly Reid. Indeed, corporate partners have played a significant role in the success of Nose News, for during its entire history, Nose News has remained entirely self-funded by contributions from these corporate partners, having no impact on the American Rhinologic Society's bottom-line, a meaningful feat for such a sizeable endeavor. Many can be recognized, but I owe a special debt of gratitude to Gyrus ENT for their year-long sponsorship of 2003 and 2004.

For the 51st year of our ARS, 2005, exciting changes to Nose News will be occurring with changing leadership. Beginning with the spring edition, control of Nose News will be shifted to the able hands of Rich Orlandi of the University of Utah. Welcome Rich!

Past Presidents of ARS

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

* Deceased

Treatment Of Chronic Rhinosinusitis Caused By Methicillin-Resistant Staphylococcus Aureus

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Conflict of Interest/Disclosure: Dr.Anand-GE Medical: Scientific/medical advisor and SinuCare:Scientific/medical advisor

Objective/hypothesis: This study was designed to examine the success of treatment and eradication of Methicillin-resistant Staphylococcus Aureus (MRSA) causing chronic rhinosinusitis (CRS). The authors feel that the most effective treatment is intravenous Vancomycin therapy for at least four weeks. Study Design: A comprehensive-retrospective chart analysis. Materials and Methods: All patients with CRS and a positive MRSA middle-meatal culture seen in a tertiary care Otolaryngology referral office in New York City between April 2001 and March 2003 were identified. A comprehensive review of their charts was undertaken. Results: There were 264 cultures in 173 patients included in the study. This revealed 13 positive MRSA cultures found in 11 patients. Six patients were treated with Vancomycin (IV or nebulized) and five with oral antibiotics. Of those treated with Vancomycin 83.3% were MRSA negative on follow-up endoscopic middle-meatal culture. Of the five patients treated with oral antibiotics only 20% were MRSA negative on follow-up middle meatal culture. Conclusion: MRSA is an under reported cause of recalcitrant CRS with a 9.22% incidence in our population. We found the most effective method for eradicating and treating MRSA causing CRS was intravenous Vancomycin. The duration of antibiotic treatment was at least 4-6 weeks. Further treatment was based on the result of an endoscopically directed middle-meatal culture performed at the end of the initial 4-6 week treatment. A follow-up culture was performed two weeks after completion of the treatment which revealed an 83.3% MRSA eradication rate with intravenous Vancomycin and a 20% eradication rate with oral antibiotics.

The Peroxide Tone In Human Nasal Mucosa With Allergy

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Yoko Iwasaki, MD
Mayumi Matsunaga, MD
Kensuke Watanabe, MD
Koshigaya, Saitama JAPAN

Conflict of Interest/Disclosure: None Disclosed

To investigate the role of reactive oxygen species in the pathogenesis of allergic rhinitis, we examined the contents of lipid peroxide (LPO), prostaglandin D2 (PGD2) and activities of superoxide dismutase (SOD), glutathione peroxidase and catalase in nasal mucosa obtained from patients with allergic and non-allergic rhinitis. The levels of LPO and PGD2 were higher than in patients with allergic rhinitis than in those without allergic rhinitis. Activities of three antioxidative enzymes were similar between patients with allergic and non-allergic rhinitis. We concluded that the peroxide tone in nasal mucosa may be especially involved in the pathogenesis of allergic rhinitis.

Clinical Evaluation and Symptoms of Olfactory Impairment: 1000 Consecutive Cases from the Nasal Dysfunction Clinic in San Diego

Margaret Chen, MD
Paul Gilbert, Ph.D.
Terence Davidson, MD
Claire Murphy, Ph.D.
San Diego, CA

Conflict of Interest/Disclosure: None Disclosed

Clinical Evaluation and Symptoms of Olfactory Impairment: 1000 Consecutive Cases from the Nasal Dysfunction Clinic in San Diego
Rebecca Harris, M.A., Paul E. Gilbert Ph.D., Margaret A. Chen, MD, Terence M. Davidson, MD & Claire Murphy, Ph.D.
Introduction: Olfactory disturbances significantly impact nutrition, hygiene, and safety. Normal aging, upper respiratory infection, inflammatory processes, head trauma, and other etiologies are frequently implicated. The present study describes olfactory impairment using symptom ratings and psychophysical measures of olfactory function. Methods: 1000 consecutive patients (503 male, 497 female, ages 7-90) presenting to a nasal dysfunction clinic with complaints of chemosensory dysfunction were evaluated. Nasal symptoms were assessed by self-report. Olfaction was assessed by odor threshold, identification, and detection. Medical diagnosis was made based on history and nasal endoscopy.
Results: Diagnosis. Chi-squared analysis revealed significant differences between genders. More males were diagnosed with inflammatory processes and toxin exposure, while more females were diagnosed with post-viral processes. The most common diagnosis in 20-79 year old patients was inflammation; in patients 7-19, head trauma, and in patients 80-89, post-viral. Olfactory function. Olfactory threshold performance declined significantly with advancing age. No significant difference was found between genders. Among diagnostic categories, patients with inflammatory diagnoses performed significantly better than others. Symptom ratings. Patients with inflammatory processes rated more symptoms as significantly bothersome. Those with post-viral smell loss were most likely to report parosmias. Patients diagnosed with head trauma rated smell loss as significantly more severe than other patients. Conclusions: This large cross-sectional population study of patients presenting to a nasal dysfunction clinic describes olfactory characteristics of various patient groups by etiology, age, and gender.

Evidence For Biofilm Formation In Chronic Rhinosinusitis

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Conflict of Interest/Disclosure: Dr Desrosiers has consulted, participated on advisory board, or received research funding or been a speaker for: Abbott, Alcon, Aventis, Bayer, Bristol-Myer Squibb Canada, Chiron Corporation, Dynavax Corporation, Glaxo-Wellcome, Merck, Respironics-HealthScan, Schering None of these arrangements were significant to the point they could be considered to be exclusive.

WITHDRAWN

Aims: Chronic sinusitis is a frequent pathology characterized by the persistence of the infection or the inflammation of paranasal sinus cavities. It has always been difficult to explain why antibiotic therapy in individuals with normal immunity is unable to resolve these chronic infections with bacteria that are sensitive to antibiotics on in-vitro testing. The presence of biofilms has been demonstrated in chronic otitis media with effusion and in chronic tonsillitis, and are believed to be implicated in the pathogenesis of these diseases. We wished to determine if biofilms were present on the mucosa in chronic rhinosinusitis. Setting: Tertiary, academic centre based prospective trail Method: Population: Consecutive unselected patients undergoing primary or revision endoscopic sinus surgery for diagnoses of surgery of chronic rhinosinusitis and nasal polyposis. Exclusion criteria: Individuals having taken antibiotics or oral prednisone over the previous month, cystic fibrosis or chronic medical conditions with potential for immunosuppression. At the time of surgery, biopsy of the anterior ethmoid bulla was performed and processed for immunohistocytochemistry for evaluation of production of exopolysaccharide and transmission electron microscopy for evidence of biofilm formation. Results: Eight patients were assessed in this preliminary investigation. Exopolysaccharide production and/or biofilm formation could be demonstrated in most samples studied. Conclusion: Biofilms are present on the mucosa of individuals undergoing ESS for chronic rhinosinusitis. The presence of biofilms in CRS may help understanding some unexplained clinical findings in the disorder, and open the door to new avenues for therapy.

Use Of Topical Corticosteroids Is Associated With Lower Bacterial Recovery Rate In Individuals Undergoing Ess For Chronic Rhinosinusitis

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Conflict of Interest/Disclosure: Dr Desrosiers has consulted, participated on advisory board, or received research funding or been a speaker for: Abbott, Alcon, Aventis, Bayer, Bristol-Myer Squibb Canada, Chiron Corporation, Dynavax Corporation, Glaxo-Wellcome, Merck, Respironics-HealthScan, Schering None of these arrangements were significant to the point they could be considered to be exclusive.

Aims: It is a frequent fear that use of intranasal topical corticosteroids will favour growth of bacterial organisms in chronic sinusitis. We wished to determine if the use of topical corticosteroids contributes to bacterial presence in the sinus cavities. Setting: Tertiary, academic centre based multi-centre, prospective open-label trial Method: Population: Consecutive unselected patients undergoing primary or revision endoscopic sinus surgery for diagnoses of chronic rhinosinusitis, nasal polyposis, or acute recurrent sinusitis. Use of topical corticosteroids in the previous week was documented. At the time of surgery, cultures of the ethmoid sinus cavity were performed using a standardised technique to minimise contamination from the nasal vestibule. Aerobic culture and sensitivity obtained. Individuals having taken antibiotics or oral prednisone over the previous month were excluded, as were individuals with cystic fibrosis or chronic medical conditions with potential for immunospression. Results: 155 patients were evaluated. Topical corticosteroids were being used by 96 / 155 or 61.5%. There were significantly more patients with atopy, asthma and polyps in the group treated with topical corticosteroids. The overall rate of bacterial recovery was lower in the group tretad with the topical corticosteroid (35.4% v. 61.6%, p=0.001). Staphylococcus aurues isolates wre presnet in 15.6% vs. 25.0%n Coagulase –neagtive staphylococci recovered in 12.5% vs. 23.3%, and gran negative bacteria in 7.3% vs 3.3%. Conclusion: The use of intranasal topical corticosteroids is associated with significantly lesser rates of bacterial recovery in patients with chronic rhinosinusitis. This held true both for individuals undergoing first time and revision surgeries. There was a trend for this being secondary to reduction of staphylococcal organisms, but sample size in the subgroups precluded these from attaining significance. The mechanism for this is unknown, but may represent normalization of non-specific defence mechanisms impaired by the underlying inflammation, or reduction of levels of bacteria to sub-detection thresholds. The increased rate of Gram-negative organisms in this population is unexplained. These results suggest that topical corticosteroids are beneficial in the management of chronic sinus disease, and offer an additional basis for their efficacy.

Sinonasal Undifferentiated Carcinoma with Intracranial Extensions

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Conflict of Interest/Disclosure: None Disclosed

Sinonasal undifferentiated carcinoma (SNUC) is a rare malignancy of the paranasal sinuses and considered by some to be uniformly fatal. At the UCDMC Center for Skull Base Surgery, over the past 15 years we have had an experience with 12 such tumors. Most tumors arose in the ethmoid sinuses. All but 1 had a combined intracranial-extracranial resection through the anterior fossa-transcranial route and post-operative irradiation. The 12th patient had a transfacial subcranial approach. There are 4 who have survived free of disease at 14 years to 8 months follow-up. The average follow-up was 6 years, 3 months. One patient died of a pulmonary embolism in the first post-operative week, a second died of a bowel infarction 3 months post operatively. Three patients died of their disease at 20, 18 and 8 month's post operatively: one with local recurrence and distant metastasis and the other 2 with local control but distant disease. The 3 survivors are at 32, 48 and 192 months.

Staged Endoscopic and Combined Open/Endoscopic Approach in the Management of Inverted Papilloma of the Frontal Sinus

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Conflict of Interest/Disclosure: None Disclosed

Introduction: The endoscopic management of inverted papilloma has gained increasing popularity over the last decade. Although early concerns over an increased risk of recurrence seem to have been allayed, the appropriate management of lesions involving the frontal sinus and frontal recess has yet to be determined. Study Design: Retrospective Review Methods: The results of all patients with inverted papilloma managed by the senior author (BAS) from 2000-2004 were reviewed. Results: A total of 18 patients were treated between October 2000 and January 2004. Six patients had frontal sinus involvement at the time of initial evaluation. One of these patients had isolated frontal sinus involvement. These patients were managed with either initial endoscopic resection with determination for the need for an additional procedure at the time of endoscopic resection (n=5) or open/endoscopic approach for isolated frontal sinus involvement (n=1). Of the 5 patients who had their disease managed endoscopically, three were determined at the initial procedure to need an osteoplastic flap and were subsequently managed successfully with a combined approach. One other patient was initially successfully managed endoscopically but ultimately required an osteoplastic flap for definitive management. The fifth patient was managed entirely endoscopically with multiple procedures. All patients treated with this protocol remain disease free with an average follow up of 17.6 months. Conclusions: The limitations of endoscopic resection of inverted papilloma of the frontal recess can be managed with staged procedures. Initial endoscopic resection of posterior disease with subsequent open treatment of the frontal recess has been successful in our experience.

Effectiveness of intraoperative Mitomycin C in maintaining the patency of a frontal sinusotomy – A preliminary report of a double-blind randomized placebo-controlled trial

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Conflict of Interest/Disclosure: None Disclosed

Introduction Post-operative scarring in the frontal recess is the commonest cause of iatrogenic frontal sinusitis. Topical Mitomycin-C (MMC) is an anti-fibroblastic agent that has been shown to reduce clinical scarring. This is a preliminary report of a double-blind randomized placebo-controlled trial using MMC to determine it's effectiveness in keeping frontal sinusotomies (FS) patent. Methods All patients with chronic rhinosinusitis undergoing primary or revision bilateral image-guided endoscopic sinus surgery were enrolled. Patients requiring frontal sinus stents and those with allergic fungal sinusitis were excluded. After completion of the FS, dimensions of the FS were measured using curved Frazer suction diameters. Neuropatties soaked in 0.5mg/ml of MMC were then placed into one frontal recess for 4 minutes in a randomized manner. A saline control was used for the other side. The primary surgeon was blinded to the sides intraoperatively and throughout the follow-up period. Measurements of the FS were repeated at 1, 3 and 6 months. Results At present, fourteen patients have been followed-up for at least three months. In the control group, the FS had decreased by 46.7% compared to 24.9% in the MMC group. There was a strong trend indicating that the anterior-posterior diameters, transverse diameters and cross-sectional areas of the frontal sinusotomies decreased less on the MMC side than the control side. The differences, however, do not reach statistical significance. There was also no statistical difference between primary and revision cases. Conclusion Our early data seems to suggest that topical MMC may be effective in reducing post-operative frontal sinus scarring.

Comparison of Maxillary Sinus Aspirate v. Middle Meatal Swab for Culture in Acute and Chronic Sinusitis: A Meta Analysis

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Brent Senior, MD
Chapel Hill, NC

Conflict of Interest/Disclosure: None Disclosed

Objective: Compare cultures of endoscopic middle meatal swabs and maxillary sinus aspirates. Study Design: Meta Analysis Methods: A computerized key word search was performed using sinusitis, bacteriology, sinus, meatus, antral, culture, endoscopic swab and microbiology. Abstracts were reviewed to assess relevance. Bibliographies of applicable articles were reviewed for additional articles. Articles included for analysis compared the results of endoscopic middle meatal cultures to aspirate cultures. Fixed and random effect models were used to calculate a pooled estimate based on transformed sensitivities and specificities. Results: A total of 188 cultures were compared from seven studies. A pooled sensitivity of 85% (95% CI: 0.75, 0.91) and specificity of 56% (95% CI: 0.43, 0.68) was obtained. Conclusion: The use of endoscopic middle meatal cultures is non-invasive method to determine the bacteriology of the maxillary sinus. Based this analysis, the middle meatal swab is a sensitive method to obtain a culture diagnosis for bacterial sinusitis compared to the gold standard.

Exploring the association between symptoms and objective testing in rhinosinusitis

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Conflict of Interest/Disclosure: None Disclosed

INTRODUCTION: There is currently great interest in the relationship between the presence of symptoms and other patient-based (subjective) outcomes such as quality of life (QOL), and results from other objective diagnostic testing, such as computed tomography (CT) scan and nasal endoscopy. The authors will present new data as well as review and synthesize results from their own prospective studies on objective and subjective outcomes in chronic rhinosinusitis (CRS) and nasal obstruction. Those results will be compared to other rhinologic studies and findings from other otolaryngologic diseases. –METHODS: Prospective multi-center outcome-based studies on CRS and nasal obstruction, using validated outcomes instruments and standardized objective rating scales. RESULTS: A prospective study on 90 patients with CRS revealed good correlations within different objective (r=0.59) and subjective measures (r=0.39), but weak associations between objective and subjective measures (r=0.18-0.28). In a prospective multi-center outcomes study on septoplasty for nasal obstruction (n=59), the association between symptoms and anatomic severity of obstruction was nonexistent (r=0.02); in addition, anatomic severity did not predict improvement after septoplasty (r=0.005). Prior studies on CRS by the authors and others, using different validated instruments and staging systems, have also found very weak correlations between symptoms and objective testing (r from 0.01 to 0.16). CONCLUSIONS: These findings indicate that subjective and objective measures of rhinologic disease are assessing distinct constructs or domains of underlying pathology, and therefore objective testing (such as nasal endoscopy and CT scan) and QOL outcomes instruments are each important in the assessment of patients with rhinologic disease.

The Role of Eosinophilia in Nitric Oxide-Mediated Tissue Injury in Chronic Sinusitis

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Julio Bernardes, MD
David Eidelman, MD
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Conflict of Interest/Disclosure: Although this data has not been presented at another meeting, the manuscript for this abstract is presently undergoing review at Otolaryngology - Head and Neck Surgery. Unfortunately, for this reason it will not be eligible for submission to your journal.

Introduction: Excessive production of nitric oxide (NO) in chronic sinusitis can contribute to oxidative injury by leading to protein nitration, detected as the presence of 3-nitrotyrosine (3NT). The aim of this study is to investigate the presence of 3NT and its relationship to inflammatory cell influx in nasal mucosa, under normal and disease conditions. Methods: Observational study employing immunocytochemistry to assess the presence of 3NT, inducible nitric oxide synthase (iNOS), eosinophils, mast cells, neutrophils and lymphocytes in ethmoid sinus mucosal biopsies from normal controls and subjects with allergic and non-allergic chronic sinusitis and nasal polyposis. Results: 3NT was more evident in biopsies from sinusitis patients (2.67 ± 0.14, $n = 21$) than in healthy mucosa (0.43 ± 0.2, $n = 7$, $P<0.01$), but scores in atopic and non-atopic subjects were similar. Co-localization studies confirmed that 3NT was largely confined to eosinophils. No relationship was found between 3NT and other immune cells. 3NT detection was not correlated with the amount of immunostaining for iNOS. Conclusion: Regardless of atopic status, chronic sinusitis is accompanied by 3NT formation, which is largely restricted to the eosinophils, and likely driven by the action of eosinophil peroxidase, rather than by NO levels.

Combined Endoscopic Trephination And Endoscopic Frontal Sinusotomy For Management Of Complex Frontal Pathology

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Conflict of Interest/Disclosure: None Disclosed

Introduction: The advances in endoscopic sinus surgery have revolutionized the management of frontal sinus disease. Despite the successes, the purely endoscopic approach has its limitations, especially in patients with alterations in anatomy due to surgical manipulation or complex frontal sinus pneumatization patterns. The purpose of this study is to evaluate the efficacy of the "above and below" approach, which incorporates frontal sinus trephination with a standard endoscopic frontal sinusotomy, in management of these difficult cases. Methods: Chart review was performed on patients undergoing the combined approach between October 1999 and December 2003. Demographic data, symptomatology, previous surgery, and primary pathology were determined. Outcome was assessed based on subjective symptom relief and objective endoscopic patency postoperatively. Results: Sixteen patients with a mean age of 48.6 years underwent the combined approach. The primary pathology included mucoceles (12), frontal sinusitis (2), inverted papilloma (1) and pneumocephalus (1). A total of 26 procedures including 19 above and below approaches were performed. Postoperatively, headaches resolved in 42%, improved in 42%, and remained unchanged in 16% of the patients. Ocular symptoms resolved in 71% and improved in 29% of the patients. Endoscopic patency of the frontal sinusotomy was confirmed in 13 of 16 cases (81%) at mean follow-up of 15.3 months. Conclusions: Management of complex frontal sinus pathology may require adjunct approaches in conjunction to the standard endoscopic techniques. In this series, the "above and below" approach was successfully utilized in 16 patients. The combined approach may serve as an important adjunct tool for management of complex frontal sinus disease.

Evidence Based Recommendations for Antimicrobial Nasal Washes in Chronic Rhinosinusitis

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Kimberly Elliott, MD
Jackson, MS

Conflict of Interest/Disclosure: None Disclosed

Introduction: Chronic rhinosinusitis refractory to medical and surgical therapy is a difficult problem for patients and physicians. Topical antimicrobial nasal irrigations are commonly employed for treatment with great variation in methodology and without clear scientific support for current treatment formulations. The purpose of this study was to develop a scientific rationale for creating standardized recommendations for clinical practice in the use of topical antimicrobial washes for chronic rhinosinusitis. Methods: An extensive review of basic science and clinical literature on the treatment of chronic rhinosinusitis with topical antimicrobial washes was completed. Pharmacokinetics of and organism susceptibility to appropriate topically applied antimicrobial agents were reviewed Results: The most common organisms associated with chronic rhinosinusitis were identified. The relevant pharmacokinetics of drugs targeted at these organisms will be presented. Nackel's guidelines break points were identified to help establish the most effective concentration of the identified drugs. Recommendations for agent selection, agent concentration, length of treatment, dosing schedule, and methods of irrigation will be presented. Conclusions: Antimicrobial nasal washes provide a potentially effective treatment for the growing population of patients who remain symptomatic after appropriate medical and surgical intervention. This study establishes the basic principles supporting this treatment option and offers rational, evidence-based treatment guidelines. The study has identified additional areas which need to be investigated before prospective clinical trials can be effectively undertaken.

Detection Of Amino Acids In Human Nasal Mucosa Using Microdialysis Technique: Increased Glutamate In Allergic Rhinitis

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Hyun-Sun Lee, MD
Soo-Geun Wang, MD
Eui-Kyung Goh, MD
Busan, South Korea

Conflict of Interest/Disclosure: None Disclosed

Background: The basic principle of microdialysis is to mimic the passive function of a capillary blood vessel by perfusing physiologic perfusate into a dialysis tube implanted in the nasal mucosa. The perfusate analyses chemically and reflects the composition of the extracellular fluid. Objectives: This study is designed (1) to measure the concentration(conc) of known neurotransmittering amino acids in the central nervous system, glutamate, aspartate, serine, taurine, and GABA, in human nasal mucosa (2) to evaluate the difference of conc between normal and allergic mucosa and to infer the role and action of the changed amino acids in allergic rhinitis. Methods: The subjects consisted of two groups: allergic group (n=10) with house dust mite allergy and aggravated rhinitis symptoms at the time of microdialysis, and normal control group (n=10) with no proven allergen and not taken any medication before 4 weeks of the study. Microdialysis probe was designed suitable to nasal mucosa using Cuprophan hollow fiber (200§– internal diameter/300§– outer diameter, 45kDa molecular weight cut-off). After verification of probe, microdialysis was done in the inferior turbinate submucosa. Collecting four perfusates for 120 minutes at the interval of 30 minutes after discarding the first perfusate of 60 minutes, the conc of amino acids was analyzed using high performance liquid chromatography. Statistical analysis was done using student t-test. Results: There was no significant difference of GABA, aspartate, serine, and taurine conc between both groups. However, the conc of glutamate in allergic group was significantly higher ($p<0.004$) than in normal group. Conclusions: Taken together with these results and literature review regarding to monosodium glutamate in Chinese restaurant syndrome, glutamate receptor of cholinergic nerve in airway, and therapeutic effect of N-acetyl-aspatyl-glutamate in allergic rhinitis suggest that glutamate is one of the potent neurotransmitter of parasympathetic nerve in the nasal cavity. And microdialysis technique could be a very useful tool of pharmacokinetics in situ and local organ chemistry for diagnostic and therapeutic purpose in the nasal cavity.

Evaluation of Postoperative Pain Following Sinonasal Surgery

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Conflict of Interest/Disclosure: None Disclosed

Background. Pain following sinonasal surgery concerns both patient and surgeon. Factors affecting sinonasal postoperative pain have not been extensively examined. Methods. Utilizing a prospective survey design, sinonasal surgery patients evaluated their daily postoperative pain (0 to 10 scale), pain location, and medication use. Results. One-hundred twenty-seven sinonasal surgery patients consented to participate. One-hundred fifteen patients returned surveys, with 100 surveys appropriate for analysis of the six-day postoperative period. Pain score and medication use were evaluated with respect to sex, primary/revision case, nasal packing, and other factors. Repeated measures ANOVA's and Chi-square analysis were conducted ($p < .05$). Pain ratings and pain medication use declined significantly over the postoperative period ($p < .05$). Mean pain score at postoperative day (POD) 1 was 3.61 and at POD 6 was 1.72. Mean medication use was 1.37 tabs on POD 1 and 0.55 tabs on at POD 6. Additionally, a significant interaction existed, such that narcotic medication use declined from 1.91 tablets on POD 1 to 0.52 tablets on POD 6, whereas non-narcotic medication use remained steady ($p < .05$). Periorbital pain was most frequent (46.3%), whereas unilateral facial pain was reported least (0.04%). A significant difference was found in the distribution of reported pain location ($p < .05$). Finally, the difference in pain rating between primary and revision procedure for females (0.65) was less than that for males (1.12); this interaction was also significant ($p < .05$). Conclusion. Pain rating and medication use following sinonasal surgery is affected by a variety of patient and operative factors.

Elevated Serum Glycodelin in Chronic Sinus Disease: A New Diagnostic Tool?

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Conflict of Interest/Disclosure: None Disclosed

Background: Symptoms associated with bacterial and non-bacterial sinus disease overlap. There is no objective test for the diagnosis of bacterial sinus disease; such a diagnostic test would prove beneficial to physicians. Our data suggests that glycodelin may be a useful marker of disease severity – and may play a role in diagnosis of sinus disease in the future. Methods: Patients referred for evaluation of sinus complaints were included in this study. A detailed history was taken, nasal endoscopy performed and a computed tomographic scan of sinus obtained. Venous blood was drawn for analysis. Using the Enzyme Linked Immunosorbant Assay technique, glycodelin levels in the serum were measured. Results: 30 patients and 13 control subjects aged 15 - 65 years were included. Glycodelin levels in the patients' serum were compared to normal controls and correlated with endoscopic findings. The mean concentration in patients with severe polyposis and/or purulence was significantly higher- 38.3ng/ml (standard deviation(S.D) 17.5) than in patients with no polyps/purulence- 18.4ng/ml (SD 5.1) ($p< 0.001$). Patients previously treated with oral steroid therapy had lower levels of serum glycodelin. Glycodelin levels above 21.5ng/ml in plasma correlated with the presence of severe nasal polyposis and /or purulent nasal secretions (sensitivity = 82.35%, specificity= 92.31%). Conclusions: Our data indicates that glycodelin, a novel inflammatory mediator with potent angiogenic and immunosuppressive properties, may play an important role in the pathogenesis of chronic sinusitis and nasal polyps. A serum glycodelin assay could serve as a diagnostic test in identifying those patients who would benefit from antibiotic therapy.

Efficacy Of Long Term Sublingual-Oral Immunotherapy In Allergic Rhinitis

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Conflict of Interest/Disclosure: None Disclosed

The aim of this study is to evaluate the clinical efficacy of sublingual-oral immunotherapy in allergic rhinitis due to various allergens in our patients and besides to demonstrate its effects by objective methods such as skin prick tests and specific Ig E analysis. The first one hundred patients that were diagnosed as allergic rhinitis and treated with sublingual-oral immunotherapy and followed for two years took part in this study. The initial findings were statistically compared by the data obtained at the end of the period. All symptoms such as nasal discharge, sneezing, nasal congestion, and itching, and all clinical findings such as color of lower turbinate, turbinate congestion, and nasal discharge observed by physician were significantly decreased after sublingual-oral treatment for two years ($p<0.001$). A significant reduction in skin test reactivity was found when we compared the initial and the final tests. The difference between before and after treatment levels of specific IgE levels for D. pteronyssinus, D. farinea, and grasses were significant ($p<0.001$), where not significant for cereals ($p=679$ ns). Neither the correlation between the recovery of clinical findings and age nor the correlation between the recovery of clinical findings and sex were statistically significant (age: $r=-0.076$, $p=0.453$, sex: $r=-0.004$, $p=0.97$). The efficacy of the treatment by means of symptom evaluations was more than expected in our study. A certain effect of this recovery might be due to its placebo effect, but it is supported by the improvement in skin tests and specific Ig E levels.

The Effect Of The Type Of Anaesthetic Agent On The Surgical Field During Endoscopic Sinus Surgery

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Conflict of Interest/Disclosure: None Disclosed

Objectives Bleeding during endoscopic sinus surgery may increase complications and negatively effect the surgery and its outcome. The aim of this study is to compare the surgical field in patients in whom total intravenous anaesthesia is used when compared to isofluorane. Study design A prospective randomised single-blinded controlled trial. Methods Sixty patients undergoing endoscopic sinus surgery were randomly assigned to receive either isofluorane with repetitive doses of alfentanil (n=28) or total intravenous anaesthesia via a propofol and remifentanil infusion (n=32) for their general anaesthesia. The surgeon was blinded as to the method of anaethesia used. The surgical field was graded every 15 minutes using a validated scoring system. The mean arterial pressure, heart rate and end tidal CO2 concentration were recorded. The extent of the surgical procedures performed and the Lund/Mackay CT scores were also noted. Results The two groups were matched for surgical procedure and CT scores. There was no significant difference in MAP and end tidal CO2 concentration between the two groups. Mean HR was higher in the intravenous anaesthesia group but this did not reach statistical significance. A significantly better surgical field score was recorded in the intravenous anaesthesia group. Conclusion Intravenous anaesthesia using propofol-remifentanil improves the quality of the surgical field when compared with inhalation anaesthesia using isofluorane-alfentanil.

Suppression of Allergic Response by CpG motif oligodeoxynucleotide in Allergic Rhinitis Animal Model

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Conflict of Interest/Disclosure: None Disclosed

Recently allergic diseases are increasing as the society is getting more and more industrialized. Although many therapeutic options for prevention and treatment of the allergic disease have been developed, the true allegen desensitization remains a challenging goal. The classic immunotherapy using protein-based allergen has a limited efficacy. It is also inconvenient and has a risk of anaphylaxis. Recent reports revealed that immunostimulatory DNA sequences (ISS-ODN, CpG motif) have been shown to act as a strong Th1 response-inducing adjuvants and that DNA-based vaccination might be an effective therapeutic option for treatment of allergic diseases. In our study, we investigated whether Dermatophagoides farinae (Der f)/ISS-ODN conjugate has anti-allergic effects in the allergic rhinitis mouse model, which is sensitive to house dust mite. C57BL/6 mice were systemically and then locally sensitized with crude extract of Der f. After injection of ISS-ODN or Der f/ISS-ODN conjugate, several parameters of allergic response were evaluated. Scratching and sneezing symptoms, and eosinophilic infiltration into nasal mucosa were suppressed by injection with ISS-ODN only and I Der f/ ISS-ODN conjugate. IL-5 level in nasal lavage fluid is decreased and IFN-gamma level in nasal lavage fluid is increased by injection Der f/ ISS-ODN conjugate. Der f-specific IgE antibody was decreased by co-injection with ISS-ODN and Der f/ISS-ODN conjugate, but they were not statistically significant. TGF-beta was significantly increased in Der f/ISS-ODN conjugate group. The results suggest Der f/ ISS-ODN conjugate and ISS-ODN should have anti-allergic effects in the allergic rhinitis model of Der f allergen. Allergic response developed by house dust mites could be more effectively reduced by injection with Der f /ISS-ODN conjugate than by injection with ISS-ODN only.

Long-Term Medical Management of Anosmia Related to Chronic Sinusitis

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Conflict of Interest/Disclosure: None Disclosed

Long-Term Medical Management of Anosmia Associated with Chronic Sinusitis Introduction Anosmia is an extremely troublesome symptom for select patients with chronic sinonasal disease. Proposed etiologies of this anosmia include mechanical obstruction of the olfactory cleft, and olfactory neuron death caused by bacteria and inflammation. Our hypothesis is that the mucosal inflammation is the true etiology. Medical control of this inflammation with a regimen acceptable for long-term daily use is the subject of this study. Methods The records of twelve patients who presented with anosmia related to chronic sinusitis were reviewed. All patients were followed for a minimum of one year. Patients underwent initial physical examination, and University of Pennsylvania Smell Identification Testing (UPSIT). Patients were then treated with a combination of systemic and topical corticosteroids and, in necessary cases, endoscopic sinus surgery (ESS). A maintenance regimen of a topical nasal steroid and leukotriene receptor antagonist (LTRAs) was then employed. Serial UPSIT exams were administered and recorded during the treatment time. Results On initial UPSIT exam, 10 of 12 patients exhibited total anosmia; one each had severe microsmia and moderate microsmia. At last follow-up, there were 5 out of 11 patients with normosmia, 5 patients with mild microsmia, and 2 with moderate microsmia on UPSIT evaluation. The average UPSIT score increase from initial to last follow-up was 17.5 points. Conclusion Our regimen of burst corticosteroid therapy and ESS followed by maintenance therapy with topical nasal steroids and LTRAs has provided lasting symptom control for the anosmic patients in our series. The true role of the leukotrienes in this disorder remains to be elucidated.

Medical Students' Attitudes Towards The Use Of An Endoscopic Sinus Surgery Simulator As A Training Tool

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Modern adult learning theory characterizes self-directed learning as most effective. While studying the effectiveness of an endoscopic sinus surgery simulator (ES3) as a training tool, and acknowledging that its successful integration into a training program is dependent on its acceptance and self-driven use by trainees, we sought to determine our study subjects' attitudes towards the simulator. Methods: Twenty six medical students were enrolled and trained in our ES3 study. Each student was asked to complete a 28-item questionnaire upon completion of training. This questionnaire contained 10-point Likert scale instruments, yes/no questions, and one open-ended question. Results: All but four subjects responded to the questionnaire. 90.9% of the respondents rated the training benefit derived from the simulator's novice mode as 6 or greater on a 10-point scale; the mean was 7.82 (± 2.22). The training benefit of the intermediate mode was also scored highly, with a mean score in the 7-9 range for all but one component – heart rate response to actions performed. Trainees appreciated the simulator's ability to help them adapt to a three-dimensional space on a two-dimensional display. They also noted its strengths in elucidating intranasal anatomy. Conclusions: Medical students enrolled in our study, as a group, felt that the ES3 provided them with significant training benefits. Though subjective, these attitudes, coupled with objective data indicating that there is a measurable benefit from use of the ES3 will ensure its full acceptance and utilization in otolaryngology training programs.

Efficacy of CSF Fistula Repair: Sensitive Quality Control Using Beta-Trace Protein Test

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Conflict of Interest/Disclosure: None Disclosed

Objective: Following cerebrospinal fluid (CSF) fistula repairs the goal of watertight sealing may always not be achieved, causing postoperative CSF leakages. These require reliable diagnosis and further treatment, as they could trigger vital complications such as meningitis. Our aim is to assess the novel application of Beta-Trace-Protein (ßTP) test for the postoperative screening and confirmation of dura repair success. Method: Prospectively, we investigated 32 consecutive patients who underwent dura repair in our department since July 2001. Three and seven days after surgery, their postoperative nasal secretion has been collected using nasal sponges. Together with patient's serum, they were analyzed for the CSF marker ßTP, to detect or rule out postoperative CSF leakage. Results: Postoperative CSF diagnostic results were negative in 29 patients, indicating 91% dura repair success at the first step. Three patients required additional surgery, in which the CSF leaks were verified intraoperatively. Two of them initially had anterior skull base tumors with large dural involvement resulting in substantial dura defects (>5x4cm) and the last one had a skull base fracture after head trauma. After the revision surgeries their ßTP test results were also negative, indicating successful dura repair. Conclusion: Dura repairs should be controlled for the absence of postoperative CSF leakage. In our hands, the sensitive, fast and inexpensive ßTP test has shown its value as an effective postoperative screening tool for dura repair success confirmation. Therefore, we consider this test as the novel "standard-of-care" after dura repair and reserve invasive and more expensive techniques as second choice.

Decreased Nasal Mucosal Sensitivity In Older Subjects

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Conflict of Interest/Disclosure: Medtronic Xomed Corp - Consultant

Introduction: The sensitivity of the human nasal cavity mucosa to touch is not known, and preliminary data from our testing has suggested that older people have less sensitivity. This information would be useful to assist in understanding the symptoms patients have regarding airflow perception. Methods: The threshold of mucosal sensitivity to tiny jets of air was assessed in seventy subjects with healthy nasal cavities, half younger than 40, and half older than 49 years of age. The stimuli were placed at nine locations in each nasal cavity, and test-retest measures were made. Results: Statistically significant ($p < 0.003$) decreases were found for all points tested in the older group compared to the younger group. The testing procedure produced test-retest correlation coefficients between 0.4 and 0.8. In general the more sensitive locations were in the anterior nasal cavity. Conclusions: We have measured the threshold for touch in nine places in 140 nasal cavities, and have determined that the variability and sensitivity of these measurements among people varies by age and the distance from the nostril. This would make sense because it is known that general cutaneous sensitivity decreases with age, and the anterior nostril is where the nose first senses inhaled nasal airflow. This may have implications for nasal surgery and medical therapy.

Inflammatory Pathway Gene Expression In Chronic Hyperplastic Sinusitis

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Conflict of Interest/Disclosure: None Disclosed

Hypothesis: Patients with chronic hyperplastic sinusitis (CHS) have an altered inflammatory pathway, which is genetically expressed compared to normal subjects Study design: IRB approved prospective study comparing the gene expression in the sinus mucosa patients with CHS and normal subjects using microarray technology. Material and Methods: Total RNA samples were harvested from the sinus mucosa biopsies of 14 patients and 4 normal controls using the Affymetrix® recommended protocol and purified by using the RNeasy Mini kit®. The data for 22,000 genes on the GeneChip U133A® were generated from 18 hybridizations. All parameters from all of the samples, including background value, noise, percentage of genes present, scaling factor and internal controls met the requirement for analysis. Affymetrix GeneChip 5.0® was used as the image acquisition software for the U133A chips. Data normalization, log transformation, statistical analysis and pattern study were performed with GeneSpring® software. Comparison between the diseases and normal controls was performed using Welch t-test with log transformed data. The cut-off for p-value was set at 0.05. Results Welch t-test, a parametric test assuming unequal variances was applied directly to the data. There are totally 1283 genes scored as differentially expressed between groups. P value, the probability of a false positive was set to less than 0.05. Hierarchical clustering was applied to study co-expression patterns of the 1283 significant genes. The Inflammatory pathway was overlaid with differential expressed gene list. Four genes involved in inflammatory pathway Interleukin (IL)-6, IL-12A, IL-13 and Tumor Necrosis Factor (2) which abnormally expressed in the patients with chronic hyperplastic sinusitis Conclusion There is abnormal expression of four major genes of the inflammatory pathway (IL-6, IL-12A, IL-13 and TNF (2)) in patients with chronic hyperplastic sinusitis compared to normal population

Anatomic Risk Factors for Sinus Disease: Fact or Fiction?

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Sinonasal anatomic variants have been postulated as a risk factor for sinus disease. Therefore, a study was conducted to examine the correlation of sinus disease to septal deviation, concha bullosa, and infraorbital ethmoid cells (IOC). Methods: 250 consecutive sinus and orbital CT scans were examined at the University of Virginia over a two year period. Coronal, sagittal, and axial views were examined for the presence and size of concha bullosa and IOC. Septal deviations were measured by examining the width of the nasal cavity at the level of the maxillary sinus ostium. The severity of mucosal thickening in the maxillary, ethmoid, and frontal sinuses were recorded. The correlation between mucosal disease of the sinuses to the anatomic variants was then compared. Results: CT images were reviewed in 250 consecutive studies (500 sides). Of the 500 sides, 67.2% of sides had some level of mucosal thickening. Concha bullosa and Haller cells were both present in 27% of the sides. Concha bullosa was associated with maxillary sinus disease ($p<0.01$). IOC was associated with both ethmoid ($p<0.05$) and maxillary ($p<0.01$) mucosal disease. Frontal sinus disease had no significant correlation with these anatomic variants ($p>0.05$). For sinuses with IOC or concha bullosa, there was a greater association of sinus disease with larger anatomic variants. Narrow nasal cavities were also significantly associated with maxillary sinus disease ($p<0.01$). Conclusions: Septal deviation, concha bullosa, and infraorbital ethmoid cells contribute to the narrowing of the osteomeatal complex, and are associated with the maxillary and ethmoid mucosal disease.

Composition of Hyaluronan Affects Wound Healing in the Rabbit Maxillary Sinus

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Conflict of Interest/Disclosure: Drs. Prestwich and Orlandi are founders and officers of Sentrx Surgical, Inc.

Background: Hyaluronan (HA) is a ubiquitous component of the extracellular matrix. HA and its derivatives have been used in the sinuses to reduce scarring and possibly promote wound healing. However, in recent animal studies, HA esters exhibited inflammatory effects. Mitomycin C (MMC) is another potential anti-scarring treatment. This study prospectively evaluated the effects of three different HA constructs on wound healing in the rabbit maxillary sinus: (i) a novel crosslinked HA hydrogel, (ii) the crosslinked HA gel containing covalently-bound MMC, and (iii) a woven HA ester (Merogel®). Methods: Ostia were created in the maxillary sinuses of 15 New Zealand white rabbits with one side randomly chosen for treatment. After 14 or 21 days the size of the maxillary ostia were recorded and the tissue was examined under light microscopy. Results: Animals treated with the novel HA and HA-MMC hydrogels demonstrated an increased ostial diameter compared to untreated controls. Merogel®-treated sinuses showed no improvement, with a trend toward a smaller ostium than controls. Histologic examination showed that Merogel® tended to cause increased fibrosis and granulomatous inflammation, while heterophilia was slightly increased in the HA hydrogel-treated animals. Blinded observation noted foamy macrophages surrounding the residual Merogel® in each specimen while no similar reaction was noted near the residual HA or HA-MMC hydrogels. Conclusion: This study suggests that the degree of ostial narrowing, inflammation, and fibrosis depend on the formulation of the hyaluronan used. Minimal, if any, additional benefit is seen with addition of MMC to the HA hydrogel in this pilot study.

A Prospective Single Blind Randomized Controlled Study Of Use Of Hyaluronic Acid Nasal Packs (Merogel®) In Patients After Endoscopic Sinus Surgery.

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Conflict of Interest/Disclosure: The research projects received financial support from Medtronic Xomed.

Aims This study was designed to assess the value of Merogel® nasal packing after endoscopic sinus surgery (ESS) on the development of synechia, edema and infection in the post-operative period Study Design A multi-centre prospective single blind randomized controlled study comparing Merogel® nasal packing with no packing in the same patient after ESS. Materials and Methods After informed consent, 42 patients were randomized to receive Merogel® nasal pack on one side after bilateral ESS. Patients were assessed 2 weeks and 4-6 weeks post-operatively and the presence of synechia, mucosal edema and sepsis was graded (minor/minimal; < ? of the middle meatus/moderate; > ? of the middle meatus/severe) on both sides with the observer blinded to the side that had been packed. Results The median Lund and MacKay score was 7 for both the packed and unpacked sides. At 2 weeks in the side packed with Merogel®, there were 12 minor synechia, 34 patients with mild mucosal edema and 4 with moderate, 12 patients with mild sepsis and 2 with moderate sepsis. In the unpacked side there were 8 minor synechia, 28 patients with mild mucosal edema and 6 with moderate and 11 patients with mild sepsis. At 4-6 weeks the side packed with Merogel®, there were 7 mild synechia, 10 mild edema and 5 with mild infection while the unpacked sides had 8 with mild synechia, 13 with mild edema and 8 with mild infection. 11 patients did not return for their second scheduled visit at that time point. There was no statistical difference in any of these paramenters using the Wilcoxon Signed Rank Test ($p > 0.05$). Conclusions Merogel® does not decrease the rate of synechia formation, edema or infection after ESS but does not have any detrimental effect on the healing process.

An evaluation of effect of pterygopalatine fossa injection with local anaesthetics and adrenaline in the control of nasal bleeding during endoscopic sinus surgery

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Conflict of Interest/Disclosure: None Disclosed

Aim Bleeding in the surgical field during endoscopic sinus surgery (ESS) can result in incomplete surgery and may increase the risk of major complications. This study evaluates the effect of pterygopalatine fossa infiltration with lidocaine and adrenalin on bleeding in the surgical field during ESS. Study Design A prospective double blind randomized trial of the effect of lidocaine 2 mls 2% and 1:80000 adrenalin infiltration into the pterygopalatine fossa. Materials and Methods 55 patients were randomized to receive a unilateral transoral infiltration of the pterygopalatine fossa with 2 mls 2% and 1:80000 adrenalin. The operating surgeon was blinded as to which side had been infiltrated at the start of surgery. The surgical field was graded on a previously validated surgical field grading scale every 15 minutes with the side being operated upon alternated every 30 minutes. The CT scans were graded according to the Lund and MacKay scale. The pulse, mean arterial blood pressure, the end-tidal CO2 and sevoflurane concentration was monitored with each surgical field observation. Results In 28 patients the right side was injected while in 27 the left side was injected. At each individual time point from 30 minutes to 3.5 hours there was a significant difference in surgical grade between injected and non-injected sides in favour of the injected side ($p = 0.019$). The difference between surgical grades averaged across all time points was slight but significant. The injected side had an overall mean of 2.59 compared to 2.99 for the non-injected side. Conclusion Injection of the pterygopalatine fossa results in an improved surgical field during ESS.

Technique Selection in Orbital Decompression for Thyroid-related Orbitopathy

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Conflict of Interest/Disclosure: None Disclosed

Purpose: To highlight technique refinements in transnasal endoscopic medial orbital decompression and investigate whether combination with a transconjunctival (TC) or a transmaxillary (TM) approach to inferior orbital decompression results in less postoperative infraorbital hypesthesia or sinusitis. Methods: Retrospective IRB approved chart review of 200 transnasal endoscopic medial orbital decompressions combined with either simultaneous transconjunctival or transmaxillary (TM) inferior orbital decompressions. A single surgeon performed all the transnasal endoscopic medial orbital decompressions. Similarly, a single surgeon performed all the TC or TM inferior orbital decompressions. Results: Primary indications included optic neuropathy (46%) and exposure keratopathy (54%). Average decompression was 3.2 mm (range 1-10mm). Incidence of hypesthesia at 3 months for combined endoscopic and TC approach was 5% versus 21% for combined endoscopic and TM approach ($P<.01$). Combined endoscopic and TC approach showed an early sinusitis rate of 5% versus 30% for combined endoscopic and TM approach ($P<.01$). No incidences of visual loss, progressed optic neuropathy, cerebrospinal fluid leak or diplopia without existing preoperative diplopia occurred. Conclusion: Combined transnasal endoscopic medial and TC inferior orbital decompression permits safe, predictable results with fewer side effects than combined transnasal endoscopic medial and TM inferior orbital decompression in the treatment of thyroid-related orbitopathy.

Th2 Immunological Inflammation in Allergic Fungal Sinusitis, Chronic Fungal Sinusitis and Chronic Rhinosinusitis

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Non-invasive fungal sinusitis is a heterogenous group of conditions including Allergic Fungal Sinusitis (AFS), where atopy to fungi is present, and Chronic Fungal Sinusitis (CFS) where fungi can be stained and/or cultured but systemic levels of specific IgE are normal. Th2-mediated cascades have been postulated to be the major inflammatory response in patients with AFS although other mechanisms may also be involved. The detailed mucosal cytological status of CFS has not yet been studied in great depth. Methods: Using a meticulous patient selection algorithm over a 2-year period, infundibular mucosal tissue from patients with AFS, CRS, Chronic Rhinosinusitis (CRS) and normal controls was studied (n=20 per group). Following isopentane/liquid nitrogen snap fixation, immunohistochemistry for mast cells, eosinophils and IgE cells was performed. Cell counts per unit area were calculated by computer analysis. Results: Mast cell numbers were greater in AFS than CFS, CRS or controls ($p<0.01$). Eosinophil numbers were increased in AFS and CRS compared to CRS and controls ($p<0.01$). IgE cells were high in AFS but of an intermediate level in CFS when compared to CRS and controls ($p<0.05$). Conclusions: Patients with AFS seem to exhibit a classical Th2 inflammatory response in nasal mucosal tissue but a sub-group of CFS patients show evidence of a similar Th2 cascade implying that \entopy\" (local allergy without atopy) may be occuring in some or all of these patients. "

Terminal Branching Of The Internal Maxillary Artery And Clinical Implications: A Cadaveric Study.

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Conflict of Interest/Disclosure: None Disclosed

Terminal branching of the internal maxillary artery and clinical implications: a cadaveric study. Introduction: Endoscopic ligation of the sphenoplatine artery (SPA) is not universally successful. The purpose of this study is to further enhance the delineation of the terminal branching of the SPA and to find possible causes for failure of the traditional endoscopic ligation of this vessel. Material and methods: Dissections of the pterygomaxillary fossa were performed in 15 cadaver specimens. Endoscopic approach and identification of the terminal branches of the SPA was followed by open dissection of coronal sections of the heads in order to better delineate the vascular anatomy. Each dissection was recorded digitally on video and photographically. The digital technique enhanced and magnified the images which facilitated the delineation of the vessel. Results: In 9 of the 15 heads the posterior nasal artery running in the inferior aspect of the sphenoid sinus had a larger caliber than the anterior branch of the SPA. We identified a small branch of the greater palatine artery supplying the inferior turbinate in 4 of the specimens. Of utmost importance was the fact that the posterior nasal artery had an entrance in the nasal cavity significantly distant from the anterior branch of the SPA. Conclusion: There is confusion and lack of information in the literature about the nomenclature, the relative importance and the spatial anatomical relationship of the terminal branches of the SPA. Our study helps to clarify this subject and is a step forward in the refinement of the endoscopic management of refractory epistaxis.

Evidence of Mucosal Injury in an Animal Model of Chronic Sinusitis

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Conflict of Interest/Disclosure: Dr. Palmer: GE Medical Systems, Ortho-Macneil Speaker Board

Background: Ciliary dysfunction has been implicated in many conditions that result in sinusitis. Furthermore, damage to cilia has been documented in sinusitis using scanning electron microscopy (SEM). Most of these studies have examined chronically infected sinus mucosa. We evaluated the damage to cilia of the paranasal sinus mucosa in an animal model of sinusitis. Experiment: We infected the right maxillary sinus in 18 New Zealand White rabbits with Pseudomonas Aeruginosa at log phase growth. The animals were sacrificed at 1, 2, 5, 10, or 20 days post-infection. We then used SEM to examine the paranasal sinus mucosa in the infected sinus and compared it to the uninfected maxillary sinus as a control. Results: We identified ciliary injury and clearance in fourteen of eighteen animals. The changes included ciliary loss, ciliary matting, rupture of epithelial and goblet cells, and separation of intercellular connections. At 20 days, we also noted slight regrowth of cilia in cleared areas of mucosa. These findings were in contrast to the control side, where there was no evidence of any damage to the mucosa or cilia. Conclusion: Acute infection of the paranasal sinuses results in damage to the ciliated mucosa of the respiratory epithelium. These early findings may lead to the more extensive damage noted to the mucosa of patients with chronic sinusitis.

The Bacteriologic Efficacy of Telithromycin Versus Moxifloxacin in the Treatment of Acute Maxillary Rhinosinusitis

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Conflict of Interest/Disclosure: Ferguson, BJ: Consultant: Aventis, Glaxosmith Kline, Schering, Abbott Speakers Bureau: Merck, Aventis, Glaxosmith Kline, Pfizer,Abbott Hadley, JA: Consultant/Speaker's Bureau: Aventis, Glaxosmith Kline, Abbott

Introduction: Telithromycin, a ketolide, has a tailored spectrum of activity against pathogens commonly associated with acute rhinosinusitis. Methods: Adult patients (N=349) were randomized 1:1 to oral telithromycin 800 mg qd for 5 days, or moxifloxacin 400 mg qd for 10 days, for the treatment of acute maxillary rhinosinusitis in a double-blind study. Bacterial cultures were obtained through endoscopic middle meatal aspirations and rhinoscopic deep nasal swabs (Calgiswab). Bacteriologic outcomes (ie, satisfactory, unsatisfactory, indeterminate) were assessed in patients with pathogens of interest (Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis, Staphylococcus aureus, Streptococcus pyogenes). Results: Pathogens of interest were identified in 27.3% (15/55) and 25.6% (75/293) of patients by endoscopic aspiration and Calgiswab, respectively. Ninety pathogens of interest were isolated from 348 patients: S pneumoniae, 8.6% (n=30); H influenzae, 8.6% (n=30); S aureus, 4.3% (n=15); M catarrhalis, 3.2% (n=11); and S pyogenes, 1.1% (n=4). Satisfactory bacteriologic outcome occurred in 94.1% (32/34) of evaluable telithromycin-treated and 93.9% (31/33) of moxifloxacin-treated patients for all pathogens of interest. Clinical success was associated with a satisfactory bacteriologic outcome in 98.4% (62/63) of patients. Telithromycin was safe and well tolerated. The most commonly reported adverse events were gastrointestinal. Conclusions: Telithromycin for 5 days and moxifloxacin for 10 days had comparable bacteriologic and clinical efficacy for the treatment of acute bacterial rhinosinusitis. There was similar retrieval of pathogens with 2 noninvasive methods.

Reliability of the University of Miami Chronic Rhinosinusitis Staging System (UMCRSS)

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Conflict of Interest/Disclosure: None Disclosed

Introduction / Objectives: Staging disease severity in a multitude of otolaryngologic conditions has been recognized to be essential in guiding treatment, as well assessing outcome. Multiple staging systems for chronic rhinosinusitis (CRS) have been proposed, with the Lund-MacKay CT Staging System currently recommended by the Task Force on Rhinosinusitis. Limitations of the Lund-Mackay system include the lack of a clear representation for the extent of ethmoidal or dependent sinus involvement, the presence of bone erosion, or bilaterality of disease. Furthermore, no endoscopic staging system has been examined for its reliability in the clinical setting. This study aims to evaluate the inter-observer reliability of the UMCRSS. Materials and Methods: A prospective cohort of 55 patients undergoing endoscopic sinus surgery for CRS were evaluated and staged according to the UMCRSS by three examiners from a pool of seven participating examiners. Separate CT and endoscopic staging (I through III) was performed on all patients. Data were analyzed by the VassarStats software for kappa values of agreement. Results: Analysis of inter-observer reliability for CT staging demonstrated a mean kappa value of 0.83. Inter-observer reliability for endoscopic staging revealed a mean kappa value of 0.68. CT versus endoscopic examination staging was compared, demonstrating a mean kappa value of 0.42. Conclusions: The UMCRSS offers a comprehensive and reliable means of staging CRS. Inclusion of both CT and endoscopic criteria provides a reliable and more comprehensive tool for staging patients with CRS.

Long Term Outcomes Of Endoscopic Repair Of Csf Leaks And Menigoencephaloceles

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Conflict of Interest/Disclosure: None Disclosed

Introduction: While it is common practice today to repair CSF leaks with or without meningoencephaloceles endoscopically, no paper has investigated 5-10 year success rates to ascertain long term recurrence rates of CSF leak and or meningoencephalocele. Method: 50 CSF leaks and meningoencephaoloceles from 9/1985 - 10/2003 were evaluated retrospectively. In addition, a world\'s literature review was completed. A questionaire requesting long term results was obtained and sent to all authors who had greater than 5 year follow-up. Results: Of the 50 patients of the senior author who were retrospectively reviewed, 31 CSF leaks and/or encephaloceles with a greater than 5 year follow-up were identified. Recurrence rate for CSF leak was 5/18 (28%) and encephalocele 1/13(8%). Eleven patients had a greater than 10 year follow-up; 2/11(18%) recurred. All patients except one were repaired successfully using endoscopic techniques. The medline search identified 32 studies discussing endoscopic/microscopic repair of CSF leak and/or encephalocele. A questionaire was sent to these authors, and 22/32 responded. A total of 151 patients had a greater than 5 year follow-up with a 42/151 (27%) recurrence rate. Nineteen patients had follow-up for greater than 10 years, with a recurrence rate of 3/19 (16%). Conclusion: Greater than 70% of patients who undergo intranasal endoscopic or microscopic repair of CSF leaks and/or meningoencephaoloceles will have successful repair at 5 year or greater follow-up. Successful endoscopic repair of recurrences is usually the rule with minimal morbidity. In comparison to the morbidity and mortality associated with craniatomy, endoscopic/microscopic repair has stood the test of time and is a valid treatment option.

New Classification of Nasal Vasculature Patterns in Hereditary Hemorrhagic Telangiectasia

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Hereditary hemorrhagic telangiectasia (HHT) is a disorder characterized by the triad of recurrent epistaxis, telangiectasia and a family history of the disease. Management of recalcitrant epistaxis in HHT remains a challenging problem for otolaryngologists. The precise coagulation of telangiectasias with the Nd-YAG laser has demonstrated efficacy in the treatment of HHT-associated epistaxis. Despite the Nd-YAG laser's success, results are variable and patient selection is critical in ensuring a successful outcome. We propose a new classification of nasal vasculature patterns in HHT as a means for guiding Nd-YAG laser photocoagulation candidacy. Methods: In a retrospective study, the records of 40 patients who underwent Nd-YAG laser photocoagulation for HHT were reviewed. Outcomes following Nd-YAG laser treatment were correlated with three different nasal vasculature patterns: (1) isolated telangiectasia or individual small arteriovenous malformation; (2) diffuse interconnecting vasculature with "feeder" vessels; (3) large solitary arteriovenous malformation which may be associated with scattered telangiectasia. Results: Types I and II were the most common vasculature patterns seen in this patient population. Patients with types I and III patterns demonstrated greater improvement in intensity and frequency of epistaxis following Nd-YAG laser photocoagulation. Patients with type II patterns fared better with septodermoplasty. Conclusions: Successful treatment of epistaxis in the context of HHT has long frustrated otolaryngologists. The Nd-YAG laser modality has demonstrated efficacy in the treatment of epistaxis in HHT; this study shows that analysis of patients' nasal vasculature patterns can improve therapeutic stratification of patients. Proper patient selection using this new classification scheme will improve the management of epistaxis in patients with HHT.

Sinonasal Disease in Cystic Fibrosis. Genotype-Phenotype Relationship.

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Identification of the gene responsible for causing cystic fibrosis has provided substantial data for genotype-phenotype analysis. Previous studies have found positive correlations with pulmonary and pancreatic disease severity and the homozygous £GF508 genotype. This study examines the relationship between genotype and phenotype in sinonasal disease. Methods: A retrospective chart review was performed of cystic fibrosis patients treated at University of Missouri Health Care. Patients were divided into homozygous *f´*F508, and those who are not. Clinical variables included; genotype, presence of polyp disease, age of polyp occurrence, history of sinus surgery, history of repeat sinus surgery, and degree of sinus disease by graded CT scans. Results: 103 of 138 patients with a known genotype have been reviewed. For the *f´*F508 mutation, 41% are homozygous. Presence of polyp disease, recorded by anterior rhinoscopy, is 67.4% and 66.7% for homozygous and non-homozygous respectively. Incidence of sinus surgery is 27.9% and 40.4%. Of those who have undergone surgery, 38.5% of homozygous patients have undergone more than one procedure versus 28% of non homozygous. Data comparing severity of disease as recorded by grading CT scans has yet to be evaluated. Conclusions: Genotype phenotype relationships have been reported in the literature with homozygous *f´*F508 patients regarding pulmonary and pancreatic disease severity. There is minimal and conflicting data in the literature regarding sinonasal involvement and its relationship to genotype. Our data suggest little difference between groups. Further investigation is being performed, including correlation of CT grading with genotype.

Quantification of Ciliary Beat Frequency in Sinonasal Epithelial Cells Using Differential Interference Contrast Microscopy and High Speed Digital Video Imaging

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Conflict of Interest/Disclosure: None Disclosed

Introduction Mucociliary clearance is an important airway defense mechanism, and is generally studied by measuring airway epithelial ciliary beat frequency (CBF). Conventional analysis methods have relied on photodiode detectors or video recordings of substances moving across a ciliated field. Recent studies using tracheal epithelium have shown that at physiologic temperatures there is poor correlation between CBFs measured using conventional methods and those using high speed digital video capture. Thus, in order to more rigorously quantify upper airway CBF under physiologic conditions we have incorporated a high speed digital video imaging system. This is the first report of sinonasal epithelial ciliary beat frequency analysis performed using high speed video digital analysis. Methods Biopsy samples of sinonasal epithelium bathed in lactated Ringer's solution were placed in a temperature controlled microscope stage chamber. An edge of tissue containing beating cilia was observed at a magnification of 630x using differential interference contrast (DIC) microscopy. The images were captured using a high speed digital camera with a sampling rate of 250 frames per second. Ciliary beat frequency was determined using computerized data analysis. Results The mean nasal ciliary beat frequency was calculated from a minimum of 5 regions for each sample. Temperature curves were generated for both normal and chronically infected subjects. Conclusions Analysis of high speed digital video images of sinonasal ciliary beat frequency observed under DIC microscopy is a powerful method for the investigation of environmental as well as host influences on mucociliary clearance within the upper airways.

The Sphenoid Sinus Rescue Procedure (SSR): Early Experience & Follow Up

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Conflict of Interest/Disclosure: None Disclosed

Introduction: The sphenoid sinus rescue procedure (SSR) is a functional endoscopic surgical approach to correct an iatrogenically scarred and obstructed sphenoid sinus. Sphenoid ostium stenosis is a difficult problem to correct; however, this technique opens the sphenoid ostium by creation of an inferior based local mucoperiosteal advancement flap which interrupts the geometry of circumferential scar formation. Methods: A retrospective review of 9 patients (11 sides) who underwent SSR procedures between August of 1997 and November of 2003 is reported. Stereotactic computer aided surgery was employed for all procedures. Endoscopic surveillance and digital photo archiving was used to document patency. Results: Eight females and one male with an average age of 56.1 years old were followed post-operatively for an average of 24.6 months. Eight sides remained patent after one procedure and three sides required a revision procedure to maintain patency. The average number of sphenoidotomies prior to undergoing the SSR procedure was 3.2. Co-morbid conditions of asthma, cystic fibrosis or allergic fungal sinusitis were present in all patients. Conclusions: The SSR procedure is a challenging but highly efficacious endoscopic technique that serves to discourage circumferential scar formation at the sphenoid ostium thus maintaining patency.

Delivery Of Nebulized Saline To The Nasal Cavity: A Radionuclide Distribution Study

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Conflict of Interest/Disclosure: Kurve Technologies: Research support Bayer Pharmaceuticals: Consultant Aventis Pharmaceuticals: Consultant Abbott Laboraties: Speakers Bureau

Introduction: Nebulization has garnered attention as a favorable means of delivering topical therapies to the nose and sinuses. However, data regarding the anatomic distribution of nebulized particles are limited. This pilot study seeks to characterize distribution patterns of nebulized particles in normal subjects and post-surgical sinus patients. Methods: 15 subjects were studied in 3 comparisons: spray bottle vs. vortex-propelled nebulizer in normal subjects; passive nebulizer vs. vortex nebulizer in normal subjects, and spray bottle vs. vortex nebulizer in post-surgical sinus patients. 1 cc of technetium-99m DTPA-labeled saline (1 milliCurie) was administered in each test. Each subject served as his/her own control. Nose, lungs, and stomach were imaged. Results: In normals, the vortex nebulizer demonstrated a focal intranasal distribution with reduced nasopharyngeal, pharyngeal, and gastric penetration compared to both passive nebulizer and spray bottle. 2/5 normal subjects demonstrated probable frontal sinus penetration by vortex nebulizer, while no maxillary sinuses were penetrated. The ethmoid and sphenoid sinuses could not be adequately evaluated due to signal overlap. In post-surgical patients, the vortex nebulizer again showed more focused intranasal distribution than spray bottle, but minimal penetration of the paranasal sinuses despite surgically patent sinuses. Conclusions: Vortex nebulizer appears to deliver a more directed cloud of particles to the nasal cavity compared to passive nebulizer and spray bottle, with reduced involvement of extranasal structures. Sinus penetration is inconsistent in normals and postoperative patients, with occasional frontal sinus penetration and no evidence of maxillary sinus penetration. These delivery patterns may assist in the consideration of efficacy of various topical treatment modalities.

Demonstration of Biofilm in Human Chronic Bacterial Rhinosinusitis

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Conflict of Interest/Disclosure: BJ Ferguson: consultant: Aventis, Glaxosmith Kline, Abbott, Schering speaker\'s bureau: Aventis, Glaxosmith Kline, Abbott, Astra Zeneca, Merck

Bacterial biofilms are one explanation for the clinical observation of improvement of signs and symptoms of bacterial chronic rhinosinusitis (BCRS) in patients on antibiotics but failure to achieve cure with antibiotics. Biofilms exist as a community of bacteria living on a foreign surface or within the body on a surface with impaired host defense, such as a denuded or impaired mucociliary surface, surrounded by a glycocalyx. Biofilms generate planktonic, non-adherent bacterial forms that may metastasize infection and generate systemic illness. These planktonic bacteria are susceptible to antibiotics, unlike the adherent biofilm. Biofilms have been demonstrated in other organ systems, but not in BCRS. We reviewed 3 cases of CRS using electron microscopy to assay for typical colony architecture of biofilms. In two cases, a fungus ball with saprophytic infection and allergic fungal sinusitis, no biofilm was demonstrated. In the third case, of CBRS, responsive to antibiotics but recurrent with antibiotic withdrawal, biofilms of bacteria were demonstrated. On electron microscopy (EM), cross sections of bacteria, consistent with structures seen in biofilms along with the "glycocalyx" of inert cellular membrane materials were demonstrated. Culture of the material grew staphylococcus aureus. The patient's symptoms were never cured with directed antibiotics, nasal steroid sprays or nasal lavages. Surgery directed to removal of biofilm and surrounding mucosa was curative. Biofilms are refractory to antibiotics and often only cured by mechanical debridement. We believe this is the first EM of probable bacterial biofilm documentation in CRS in humans.

Intermittent Intracranial Hypertension As A Possible Cause Of Recurrent Spontaneous Cerebrospinal Fluid Rhinorrhea After Surgical Treatment

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Conflict of Interest/Disclosure: None Disclosed

BACKGROUND Idiopathic intracranial hypertension (IIH) is a disorder of unknown etiology. The primary problem is elevated intracranial pressure (ICP). The mechanisms of occurrence of cerebrospinal fluid rhinorrhea (CSF) in association with an idiopathic intracranial hypertension have not been completely clarified. To the best of our knowledge, this is the first study in the English literatures to postulate intermittent intracranial hypertension as a possible cause of recurrent spontaneous cerebrospinal fluid rhinorrhea after surgical treatment. OBJECTIVE: To study 6 cases with recurrent spontaneous cerebrospinal fluid fistulae after surgical treatment associated with intracranial hypertension. METHODS: Between June 1997 and December 2003, 10 patients with spontaneous CSF rhionrrhea associated with intracranial hypertension and empty sellae (9 with primary and 1with secondary empty sellae) were diagnosed and managed. They failed to respond to adequate conservative medical treatments. Clinical assessments including preoperative nasal endoscopy, ophthalmic, endocrine and radiological evaluations were done prior to surgery. Opening CSF pressure was elevated in all patients. Eight patients (7 with primary and 1 with secondary empty Sellae) underwent skull base reconstruction via endoscopic endonasal approach with free autologous grafts. Two patients were treated by lumboperitoneal shunting; upon the discovery of elevated opening lumbar CSF pressure and failure localize the site of CSF fistula. BACKGROUND Idiopathic intracranial hypertension (IIH) is a disorder of unknown etiology. It is commonly associated with an empty sellae, caused by herniation of subarachnoid cerebrospinal fluid through an absent or patulous diaphragma sellae. The mechanisms of occurrence of cerebrospinal fluid rhinorrhea (CSF) in association with IIH and empty sellae have not been completely clarified. Very little were published about recurrent CSF rhinorrhea after surgical treatment in patients with intracranial hypertension associated with an empty sellae. OBJECTIVE: To study if there is a relation between intracranial hypertension associated with empty sellae and recurrent spontaneous CSF rhinorrhea after surgical treatment. METHODS: Between June 1997 and December 2003, 10 patients with intracranial hypertension associated with an empty sellae (9 with primary and 1with secondary) presented with spontaneous CSF rhinorrhea were diagnosed and managed. They failed to respond to adequate conservative medical treatments Clinical assessments including preoperative nasal endoscopy prior to surgery were done. Ophthalmic, endocrine and radiological evaluations (plain x-ray, plain CT scans, CT cisternogram and MRI) were done prior to surgery. Opening lumber CSF pressure was elevated in all patients. Eight patients (7 with primary and 1 with secondary empty Sellae) underwent skull base reconstruction via endoscopic endonasal approach with free autologous grafts. Two patients were treated by lumboperitoneal shunting; upon the discovery of elevated opening lumbar CSF pressure and failure localize the site of CSF fistula. RESULTS: After surgery, CSF rhinorrhea ceased for all patients, but 7 patients (70%) experienced recurrences of the rhinorrhea 6 months to 2 years after surgery (mean 8 months). These patients were multiparous females of childbearing age with history of recent weight gain, under treatment for hypertension and recurrent episodes of sever headache with visual disturbances without evidence of papilledema. These symptoms are among the manifestations of intracranial hypertension. Conclusion: The authors propose intermittent intracranial hypertension is probably the cause of spontaneous CSF recurrence. More researches need to be done to clarify the rule of elevated intracranial pressures in spontaneous cerebrospinal fluid leaks and its recurrence.

Superantigens and Chronic Sinusitis III: Systemic and Local Response to Staphylococcal Toxins

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Conflict of Interest/Disclosure: None Disclosed

INTRODUCTION: Increasing evidence suggests that staphylococcal exotoxins may play a key role in the pathogenesis of chronic sinusitis and nasal polyposis (CS/NP). In other diseases, these toxins induce a local superantigen response at the site of exposure, triggering clonal expansion of T-cell populations expressing specific TCR V-beta domains. The particular V-beta domains expanded are characteristic of the inciting toxin and this is termed the V-beta signature. In addition, in some patients specific IgE directed against the toxin(s) is also elicited. The current study will assess polyp tissue and serum for concordance of these two responses in CS/NP patients. METHODS: This study consists of a prospective analysis of 12 CS/NP patients undergoing sinus surgery. Flow cytometry was used to analyze the distribution of 24 specific TCR V-beta domains in lymphocytes from polyp tissue and blood. Clonal proliferation was defined as mean normative percentage + 2 S.D. Serum from the patients was assessed for the presence of IgE directed against 3 common staphylococcal exotoxins: SEA, SEB and TSST-1. RESULTS: 9/12 patients demonstrated a V-beta signature in CD4+ polyp lymphocytes characteristic of local exposure to one of the three toxins. 9/12 patients also generated a serum IgE response to SEA, SEB or TSST-1. Only 5/12 demonstrated both a systemic IgE response and a local superantigen response to the same toxin. CONCLUSIONS: The current results indicate that CS/NP patients frequently demonstrate both a local superantigen response and a systemic IgE response to Staph toxins. The low level of correlation suggests that these processes are distinct; however concordance of the processes should predict increased sensitivity to the specific toxin.

Serum Response to Staphylococcal Superantigens in Chronic Sinusitis with Polyps

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Conflict of Interest/Disclosure: None Disclosed

Introduction: IgE to staphylococcal superantigens has been demonstrated previously in the serum of patients with chronic sinusitis/nasal polyposis (CS/NP). These superantigens activate T cells expressing specific V-beta domains. Objective: To correlate clonal proliferation of staphylococcal exotoxin B and Toxic Shock Syndrome-1 specific V-beta domains (CD4 and CD8) in the blood of CS/NP patients with or without IgE to SEB or TSST-1 in the serum. Methods: IgE antibodies to staphylococcal exotoxins B (SEB) and Toxic Shock Syndrome Toxin-1 (TSST-1) were measured in the serum of 17 individuals with CS/NP prior to functional endoscopic sinus surgery. Flow cytometry was used to analyze the SEB and TSST-1 specific TCR V-beta domains from the blood of these patients. Results: SEB and TSST-1 specific IgE antibodies were detected in 8/17(47%) and 13/17 (76%) of the patients with polyps respectively. Clonal expansion of SEB and TSST-1 specific V-beta TCR domains were detected in 10/17 (59%) and 9/17 (53%) of the patients respectively. 4/8 (50%) and 9/9 (100%) with serum IgE to SEB and TSST-1 had SEB and TSST-1 specific V-beta clonal expansion in blood respectively. Conclusion: Evidence of staphylococcal exotoxin specific IgE antibodies and clonal proliferation of specific V-beta domains in the lymphocytes from blood suggests a potential link between IgE mediated inflammation and superantigen induced inflammation in CS/NP patients.

Endoscopic Transsphenoidal Approach To Petrous Apex Lesions

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Several approaches to the petrous apex have been described, including the transsphenoidal approach. The main advantage of the transsphenoidal approach is the ability to preserve hearing and balance. We report our experience with the use of image-guided endoscopic transsphenoidal approach for lesions of the petrous apex. Materials & Methods: We retrospectively reviewed the management of four petrous apex lesions diagnosed on MRI scans. Two patients presented with expansile masses of the petrous bone. A second patient presented with severe headaches and a history of breast cancer. The third patient presented with otalgia for 1.5 years and a hypoglossal palsy. An image-guided endoscopic transsphenoidal approach was used to access the lesions in all cases. Coarse diamond burrs were used to remove pneumatized bone and define the internal carotid artery. Following removal of pathology, silastic stents were placed in the petrous apex of two patients. Fat grafts were used in all cases to cover the internal carotid artery. Results: The age range of the patients was 39-59 years. All operations were performed without complications. All patients experienced post-operative relief of symptoms. Definitive tissue diagnosis was obtained in all cases (cholesterol granuloma, benign inflammatory tissue and osteomyelitis). Conclusion: The transsphenoidal approach, as originally described, was limited to lesions that closely abut the posterior wall of the sphenoid sinus. With the advent of image guidance and endoscopic drills this limitation has been obviated. Our experience indicates that the image-guided transsphenoidal approach is an attractive option for patients with petrous apex lesions.

Endonasal Approach for the Resection of Esthesioneuroblastoma

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Esthesioneuroblastomas are rare neural tumors that frequently require extensive cranio-facial resections. These tumors are usually approached through a craniotomy. We report our experience with complete endoscopic resection of esthesioneuroblastoma. Materials & Methods: We retrospectively reviewed the management of three esthesioneuroblastomas. One patient presented with nasal obstruction and a nasal mass on MRI. A second patient presented with nasal obstruction, rhinorrhea and epistaxis. The third patient was diagnosed after surgery for symptoms of sinusitis. A fully endoscopic approach was used to resect the lesions in all cases. After piece-meal resection of the tumor, complete anterior cranio-facial and cribiform plate resection was accomplished without facial incisions. The cranial base was repaired using an inlay graft technique. Results: The age range of the patients was 15-68 years. All operations were performed without complications. All patients experienced post-operative relief of symptoms. There were no CSF leaks. One patient was re-admitted for cerebritis, 4 months post-operatively. All patients are free of disease, with a minimum follow-up of 6 months. Conclusion: Our experience indicates that a fully endoscopic approach can be used for the extirpation of esthesioneuroblastomas confined to the nasal vestibule, without violating oncologic control. Transnasal endoscopy can be used to perform complete anterior cranio-facial and cribiform plate resection in an en-bloc fashion.

cDNA Gene Array Analysis Of Cytokine Expression In Chronic Rhinosinusitis

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Conflict of Interest/Disclosure: None Disclosed

Background: In-situ hybridization and immuohistochemisty techniques have previously identified many important cytokines involved in chronic rhinosinusitis. We present a study of CRS cytokine analysis using gene array technology to cytokines in the pathogenesis of chronic rhinosinusitis. Methods: Basic health data and endoscopic and radiographic scores were collected on patients undergoing endoscopic sinus surgery. Tissue was collected endoscopically from the middle meatus and preserved by the snap-freezing method. RNA was extracted, quantified, and checked for quality. Genetic expression within the tissue was visualized using a cytokine and inflammatory cascade cDNA gene-array. Target genes were identified and the expression data was numerically captured using photoanalysis software. Data were then normalized to the inherent controls within the gene array and groups were compared. Results Cytokine expression was analyzed in 6 patients with CRS and a normal control. The expression of IL-5 and other cytokines (including Tumor Necrosis Factor (TNF), TNF receptors, and Colony Stimulating Factor) was consistently higher in patients with more significant disease as measured either by the clinical scoring systems or by the patient type (nasal polyps, asthmatic, etc). Specifically, patients with nasal polyps and asthma had IL-5 expression 3 times that of the normal control. Patients with high endoscopic and radiographic clinical scores also expressed IL-5 two and three times as much as normal controls, respectively. Conclusion Gene array technology identified known interleukins in CRS. This preliminary data supports the role of IL-5 in CRS and our understanding that the clinical burden of disease correlates with cytokine activity in the sinus tissue.

Surgical Management of Frontal Sinus Osteomas

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Osteomas are the most common benign neoplasm of the paranasal sinuses. Frontal sinus osteomas can be asymptomatic or cause frontal pain, headache, and outflow tract obstruction. Several surgical approaches are at the disposal of the sinus surgeon for addressing these tumors including open, combined, and endoscopic techniques. A variety of patient and tumor characteristics play a key role in surgical planning for successful treatment of these tumors. Methods: A retrospective chart review was performed of patients referred for evaluation and treatment of frontal sinus osteomas. Patient characteristics including age, sex, location of osteoma, and symptoms were recorded. Treatment course was reviewed with emphasis on surgical planning, surgical approach selection, intraoperative findings, complications, and long term results including recurrence and frontal ostium patency. Results are compared with other reported series and cases in the literature. Results: 11 patients were included in the study, six men and five women. Age ranged from 17 to 59 years. Presenting complaints were recorded. Two patients underwent an open approach, one patient underwent a combined approach, and eight patients underwent a completely endoscopic approach. Complication rates were low. Follow up ranged from one week to six years with an average follow-up of 12 months. Conclusion: Resection of symptomatic frontal sinus osteomas can be a challenging surgical task. Choosing the appropriate surgical approach based on individual patient characteristics allows for complete tumor resection with low complication rates and excellent long-term results.

Clinical Investigation of Non-biofilm-forming Pseudomonas aeruginosa

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Conflict of Interest/Disclosure: None Disclosed

Introduction Biofilms are three-dimensional bacterial aggregates exhibiting enhanced antibiotic resistance that have been implicated in chronic infections. We have identified bacterial biofilm-like structures in our rabbit model of sinusitis as well as on stents placed in the frontal recess of patients with chronic sinusitis. These structures need further characterization. Therefore, we evaluated a non-biofilm-forming mutant strain of pseudomonas grown on stent material. Methods Stent material was incubated in Luria-Bertani broth with fluorescently-labelled wild-type pseudomonas or mutant pseudomonas unable to form biofilms. After 72h, the stent material was removed and analyzed by three methods. Scanning electron microscopy (SEM) was used to confirm presence of biofilm-like structures, light microscopy following alcian blue staining was used to identify the exopolysaccharide matrix, and epifluorescence microscopy was used to confirm bacterial presence. Results Stent material incubated with wild-type pseudomonas demonstrated three-dimensional structures comprised of bacteria and copious alcian blue-avid exopolysaccharide matrix when examined with a combination of SEM, light and epifluorescence microscopy. The mutant pseudomonas strain produced only bacterial monolayers devoid of significant amounts of alcian blue-avid exopolysaccaride matrix. Conclusions We combined multiple microscopy techniques to demonstrate the three-dimensional structure and constituent elements of a biofilm. There is a phenotypic difference between the bacterial communities formed by wild-type pseudomonas and the non-biofilm-forming pseudomonas strain on stent material. This knowledge can be used not only for further study of bacterial biofilms in human infections but may also suggest a role for genetic strategies in preventing the growth of bacterial biofilms.

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Documenting for Dollars, Compliantly

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Conflict of Interest/Disclosure: None disclosed

Documentation is becoming key more and more, not only for compliance, but for reimbursement for the physician. Payers are continually denying claims inappropriately and the only way to get them paid is to appeal and submit with documentation. It is difficult to impossible to get the docor paid without high quality documentation from the physician. Additionally, it is this documentation on which we count on to correctly and completely code the services which were provided by the provider. Incomplete, sketchy operative notes will result in incomplete coded services and ultimeately underpaid services. This class is designed to teach the physician to identify the opportunities to document better and create opportunities for better reimbursement while providing better, more compliant documentation for the chart.Documentation is becoming key more and more, not only for compliance, but for reimbursement for the physician. Payers are continually denying claims inappropriately and the only way to get them paid is to appeal and submit with documentation. It is difficult to impossible to get the docor paid without high quality documentation from the physician. Additionally, it is this documentation on which we count on to correctly and completely code the services which were provided by the provider. Incomplete, sketchy operative notes will result in incomplete coded services and ultimeately underpaid services. This class is designed to teach the physician to identify the opportunities to document better and create opportunities for better reimbursement while providing better, more compliant documentation for the chart.

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Endonasal Endoscopic Dacryocystorhinostomy in Small Children

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Conflict of Interest/Disclosure: None Disclosed

Endoscopic Endonasal Dacryocystorhinostomy In Small Children Canalisation of the nasolacrimal apparatus usually occurs at the same time throughout its length. However, its distal end has been shown to be occluded by a membrane in 73% of otherwise normal still-born foetuses at term. For typical dacryocystocoeles, a regime of warm compresses and massage, with regular ophthalmologic review to check for the first signs of dacryocystitis, seems to be reasonable. Should dacryocystitis supervene, the child should be admitted to hospital for the intravenous administration of antibiotics and probing of the nasolacrimal apparatus. Should the dacryocystocoele recur or epiphora ensue, and repeated probing does not give the result, it may be necessary to intubate the nasolacrimal apparatus or perform a dacryocystorhinostomy. McDonough and Meiring were the first to advocate endonasal endoscopic dacryocystorhinostomy (EEDCR), in 1989. Using new instrumentation and techniques for endoscopic sinus surgery in general, many authors have proved that EEDCR can be performed with lower morbidity in children and with success rates equal or even better to those achieved with the traditional external approach. The most important advantages of EEDCR over an external approach are: no external scar visible, lacrimal pump remains intact, morbidity degree is much lower, whereas revision, if needed, is much easier to perform. The authors will present several rare cases of very small children, ranging from 2-9 months of age, operated by means of EEDCR because of so called megadacryopyocoele. Key words: Endonasal endoscopic dacryocystorhinostomy (EEDCR), children, small ENDOSCOPIC ENDONASAL DACRYOCYSTORHINOSTOMY IN SMALL CHILDREN Canalisation of the nasolacrimal apparatus usually occurs at the same time throughout its length. However, its distal end has been shown to be occluded by a membrane in 73% of otherwise normal still-born foetuses at term. For typical dacryocystocoeles, a regime of warm compresses and massage, with regular ophthalmologic review to check for the first signs of dacryocystitis, seems to be reasonable. Should dacryocystitis supervene, the child should be admitted to hospital for the intravenous administration of antibiotics and probing of the nasolacrimal apparatus. Should the dacryocystocoele recur or epiphora ensue, and repeated probing does not give the result, it may be necessary to intubate the nasolacrimal apparatus or perform a dacryocystorhinostomy. McDonough and Meiring were the first to advocate endonasal endoscopic dacryocystorhinostomy (EEDCR), in 1989. Using new instrumentation and techniques for endoscopic sinus surgery in general, many authors have proved that EEDCR can be performed with lower morbidity in children and with success rates equal or even better to those achieved with the traditional external approach. The most important advantages of EEDCR over an external approach are: no external scar visible, lacrimal pump remains intact, morbidity degree is much lower, whereas revision, if needed, is much easier to perform. The authors will present several rare cases of very small children, ranging from 2-9 months of age, operated by means of EEDCR because of so called megadacryopyocoele. Key words: Endonasal endoscopic dacryocystorhinostomy (EEDCR), children, small

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Quality of Life Improvements with and without computer assistance in sinus surgery: An Outcomes Study

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Conflict of Interest/Disclosure: None Disclosed

Objective: Chronic rhinosinusitis affects millions of North Americans and has been increasing annually since 1991. This study aims to evaluate the effectiveness of functional endoscopic sinus surgery done with (CASS) and without (FESS) the use of computer assistance on patient quality of life. To the best of our knowledge there is no current study that measures the difference in patient quality of life with and without image guidance in endoscopic sinus surgery. Methods: A non-randomized prospective study was performed on ninety-five patients. A quality of life (RSOM-31) questionnaire was administered to patients prior to surgery and six months following surgery during a three-year enrolment period. Patients assessed both rhinologic and non-rhinologic symptoms using a statistically validated scoring system. Statistical analysis was performed using both independent and paired student t-tests when appropriate. Results: Statistically significant improvement ($p< 0.001$) in mean score analysis following sinus surgery was seen in all symptom subgroups for both surgical techniques. Chronic rhinosinusitis patient quality of life restrictions were greatest in areas of nasal symptoms and sleep deprivation, which were significantly improved by endoscopic sinus surgery. Despite the CASS patients having a greater disease stage (3.6 vs. 2.6), analysis of quality of life improvements demonstrated greater overall improvement when sinus surgery was performed with the use of computer assistance. Conclusion: Although the long term effect of computer assistance on sinus surgery (CASS) as measured by patient quality of life remains relatively unknown, this technique appears to provide patients with greater quality of life improvements over traditional FESS techniques. Objective: Chronic rhinosinusitis affects millions of North Americans and has been increasing annually since 1991. This study aims to evaluate the effectiveness of functional endoscopic sinus surgery done with (CASS) and without (FESS) the use of computer assistance on patient quality of life. To the best of our knowledge there is no current study that measures the difference in patient quality of life with and without image guidance in endoscopic sinus surgery. Methods: A non-randomized prospective study was performed on ninety-five patients. A quality of life (RSOM-31) questionnaire was administered to patients prior to surgery and six months following surgery during a three-year enrolment period. Patients assessed both rhinologic and non-rhinologic symptoms using a statistically validated scoring system. Statistical analysis was performed using both independent and paired student t-tests when appropriate. Results: Statistically significant improvement ($p< 0.001$) in mean score analysis following sinus surgery was seen in all symptom subgroups for both surgical techniques. Chronic rhinosinusitis patient quality of life restrictions were greatest in areas of nasal symptoms and sleep deprivation, which were significantly improved by endoscopic sinus surgery. Despite the CASS patients having a greater disease stage (3.6 vs. 2.6), analysis of quality of life improvements demonstrated greater overall improvement when sinus surgery was performed with the use of computer assistance. Conclusion: Although the long term effect of computer assistance on sinus surgery (CASS) as measured by patient quality of life remains relatively unknown, this technique appears to provide patients with greater quality of life improvements over traditional FESS techniques.

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Computed Tomography in Constructing Custom Septal Buttons

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Conflict of Interest/Disclosure: None Disclosed

Goals: To demonstrate the method used at our institution for fashioning septal buttons with the use of computed tomography. Methods: Mayo Clinic patients with large septal perforations over the last 20 years were treated with silastic septal buttons constructed using computed tomography. The efficacy of this technique has be demonstrated (Price, DL; Sherris, DA; Kern, EB. Computed Tomography for Constructing Custom Nasal Septal Buttons Arch Otolaryngol Head Neck Surg, Nov 2003; 129: 1236 – 1239). To fashion these buttons, a sagittal CT scan through the septum is obtained, from which a custom silastic button is carved to precisely obturate the perforation. Flanges are fashioned so that they fit the patient's internal nasal anatomy. This video shows the precise techniques used, including patient evaluation, creation of the septal button, and button insertion. Please note that this video presentation does not discuss the results in patients who have received this treatment, as these results have been published and presented elsewhere. This video has never been presented previously. Goals: To demonstrate the method used at our institution for fashioning septal buttons with the use of computed tomography. Methods: Mayo Clinic patients with large septal perforations over the last 20 years were treated with silastic septal buttons constructed using computed tomography. The efficacy of this technique has be demonstrated (Price, DL; Sherris, DA; Kern, EB. Computed Tomography for Constructing Custom Nasal Septal Buttons Arch Otolaryngol Head Neck Surg, Nov 2003; 129: 1236 – 1239). To fashion these buttons, a sagittal CT scan through the septum is obtained, from which a custom silastic button is carved to precisely obturate the perforation. Flanges are fashioned so that they fit the patient's internal nasal anatomy. This video shows the precise techniques used, including patient evaluation, creation of the septal button, and button insertion. Please note that this video presentation does not discuss the results in patients who have received this treatment, as these results have been published and presented elsewhere. This video has never been presented previously.

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Empty Nose Syndrome Associated With Middle Turbinate Resection

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Conflict of Interest/Disclosure: None Disclosed

Introduction Empty Nose Syndrome (ENS) is a term coined by Eugene Kern to describe the appearance of a sinus cat scan after tissue loss; an iatrogenic version of atrophic rhinitis. The syndrome is most notable for paradoxical nasal obstruction: the patient describes the sensation of nasal stuffiness, while an examination demonstrates a widely patent nasal cavity. Commonly the inferior turbinate (IT) has been surgically resected. Middle turbinate (MT)resection may also be associated with ENS. Methods A representative case of ENS associated with MT resection is discussed. The subject's nasal cavity was implanted with acellular dermis to offset the missing turbinate tissue. Results Improvement in this representative patient will be explained. The etiology and treatment of ENS will be explored. Conclusion ENS is a poorly understood condition. These patients may be rehabilitated with medical and/or surgical therapy. Introduction Empty Nose Syndrome (ENS) is a term coined by Eugene Kern to describe the appearance of a sinus cat scan after tissue loss; an iatrogenic version of atrophic rhinitis. The syndrome is most notable for paradoxical nasal obstruction: the patient describes the sensation of nasal stuffiness, while an examination demonstrates a widely patent nasal cavity. Commonly the inferior turbinate (IT) has been surgically resected. Middle turbinate (MT)resection may also be associated with ENS. Methods A representative case of ENS associated with MT resection is discussed. The subject's nasal cavity was implanted with acellular dermis to offset the missing turbinate tissue. Results Improvement in this representative patient will be explained. The etiology and treatment of ENS will be explored. Conclusion ENS is a poorly understood condition. These patients may be rehabilitated with medical and/or surgical therapy.

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Bacteriology Of Sinus Cavities Of Asymptomatic Individuals After Endoscopic Sinus Surgery

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Conflict of Interest/Disclosure: Has consulted, participated on advisory board, or received research funding or been a speaker for: Abbott, Alcon, Aventis, Bayer, Bristol-Myer Squibb Canada, Chiron Corporation, Dynavax Corporation, Glaxo-Wellcome, Merck, Respironics-HealthScan, Schering None of these arrangements were significant to the point they could be considered to be exclusive.

Aims: Exacerbations of symptoms following endoscopic sinus surgery (ESS) are frequently managed with antibiotics. However, culture endpoints to therapy are undetermined as there is no current knowledge of 1) what is normal flora and 2) what levels of contamination of the sinus cavities is normal and acceptable, and what is pathogenic. We wish to determine the resident flora in asymptomatic subjects having ESS and determine the level of bacteria present. This will help more adequately interpret results of sinus cultures done in symptomatic individuals after ESS. Setting: Tertiary, academic centre based, prospective trial Method: Population: Patients having previously undergone ESS for inflammatory disease of the paranasal sinuses greater than twelve weeks previously with no more than mild symptoms (Facial pain/ pressure,nasal discharge and nasal obstruction) and normal nasal endoscopy are being recruited. Exclusion criteria: Use of nasal irrigations, antibiotic or oral prednisone < 28 days, systemic disease causing immunospression or cystic fibrosis. Use of a topical corticosteroid is permitted. Aerobic cultures are being performed by protected culture swab and lavage of the sinus cavity for identification and quantitative determination of the level of bacterial presence. Results: Forty-two patients are being recruited to adequately power this study. Results will be analysed for type of bacteria recovered and quantitative results of bacterial culture. Correlation between swab and lavage cultures results, and identification of factors associated with positive culture will be assessed as well. Conclusion: We expect that characterizing the resident flora of the sinuses after ESS will allow 1) To better understand the role of colonizing bacteria in creating sinus disease and 2) To better interpret culture results in diseased individuals by better differentiating between \'normal\' sinus bacteriology and abnormal states. Aims: Exacerbations of symptoms following endoscopic sinus surgery (ESS) are frequently managed with antibiotics. However, culture endpoints to therapy are undetermined as there is no current knowledge of 1) what is normal flora and 2) what levels of contamination of the sinus cavities is normal and acceptable, and what is pathogenic. We wish to determine the resident flora in asymptomatic subjects having ESS and determine the level of bacteria present. This will help more adequately interpret results of sinus cultures done in symptomatic individuals after ESS. Setting: Tertiary, academic centre based, prospective trial Method: Population: Patients having previously undergone ESS for inflammatory disease of the paranasal sinuses greater than twelve weeks previously with no more than mild symptoms (Facial pain/ pressure,nasal discharge and nasal obstruction) and normal nasal endoscopy are being recruited. Exclusion criteria: Use of nasal irrigations, antibiotic or oral prednisone < 28 days, systemic disease causing immunospression or cystic fibrosis. Use of a topical corticosteroid is permitted. Aerobic cultures are being performed by protected culture swab and lavage of the sinus cavity for identification and quantitative determination of the level of bacterial presence. Results: Forty-two patients are being recruited to adequately power this study. Results will be analysed for type of bacteria recovered and quantitative results of bacterial culture. Correlation between swab and lavage cultures results, and identification of factors associated with positive culture will be assessed as well. Conclusion: We expect that characterizing the resident flora of the sinuses after ESS will allow 1) To better understand the role of colonizing bacteria in creating sinus disease and 2) To better interpret culture results in diseased individuals by better differentiating between \'normal\' sinus bacteriology and abnormal states.

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Early Effect Of Exogenous Na Hyaluronate On Mucociliary Clearence

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Conflict of Interest/Disclosure: None Disclosed

Objective: To determine the early effect 1 % Na hyaluronate on mucociliary clearence function. Study Design: Animal Model Methods: 1% Na hyaluronate was introduced into the maxillary sinuses of rabbits by Cudwell-Luc procedure. Physiological solution of 1 % NaCl was introduced into the maxillary sinuses of control group to equalize the influence of Na for both groups. There were 11 rabbits for each group. Technetium-99m (Tc-99m) diethylenetriamine pentaacetate (DTPA) dynamic scintigraphic imaging was performed to evaluate mucociliary clearence function on all rabbits 72 hours after the surgical procedure. From the dynamic images, circular "regions of interest" (ROIs) were drawn on maxillary sinus region and time-activity curves were obtained. All ROIs were applied by the same investigator to eliminate the inter-observer variations. Linear fits were applied to all time-activity clearance curves. Decay correction was applied according to the physical half-life (6 hrs) of Tc-99m by multiplying with a decay correction constant. Decay corrected half-emptying times (T?) (min) of radiopharmaceutical from the maxillary sinuses were calculated on time activity curves. The data was analyzed with student-T test by SPSS/Windows program. Result: All though mean values of mucociliary clearence rate of Na hyalorunate group was slightly bigger than the control group, there were no statistically significant difference between them. Conclusion: There is no early effect of exogenous 1 % Na hyaluronate on mucociliary clearence function. Key Words: Na Hyaluronate, Mucociliary Clearence Objective: To determine the early effect 1 % Na hyaluronate on mucociliary clearence function. Study Design: Animal Model Methods: 1% Na hyaluronate was introduced into the maxillary sinuses of rabbits by Cudwell-Luc procedure. Physiological solution of 1 % NaCl was introduced into the maxillary sinuses of control group to equalize the influence of Na for both groups. There were 11 rabbits for each group. Technetium-99m (Tc-99m) diethylenetriamine pentaacetate (DTPA) dynamic scintigraphic imaging was performed to evaluate mucociliary clearence function on all rabbits 72 hours after the surgical procedure. From the dynamic images, circular "regions of interest" (ROIs) were drawn on maxillary sinus region and time-activity curves were obtained. All ROIs were applied by the same investigator to eliminate the inter-observer variations. Linear fits were applied to all time-activity clearance curves. Decay correction was applied according to the physical half-life (6 hrs) of Tc-99m by multiplying with a decay correction constant. Decay corrected half-emptying times (T?) (min) of radiopharmaceutical from the maxillary sinuses were calculated on time activity curves. The data was analyzed with student-T test by SPSS/Windows program. Result: All though mean values of mucociliary clearence rate of Na hyalorunate group was slightly bigger than the control group, there were no statistically significant difference between them. Conclusion: There is no early effect of exogenous 1 % Na hyaluronate on mucociliary clearence function. Key Words: Na Hyaluronate, Mucociliary Clearence

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Isolated Spehnoid Sinus Disease: Etiology and Management

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Conflict of Interest/Disclosure: None Disclosed

Background: Early recognition and management of sphenoid sinus disease is critical considering the vital anatomic location of the sphenoid sinus. Literature addressing management of isolated sphenoid sinus pathology is sparse at best. Methods: A retrospective chart review of isolated sphenoid sinus pathology between January 1997 and December 2003 was conducted. Clinical characteristics, diagnosis, treatment strategy, and outcomes were reviewed. Results: The study population consisted of 50 patients with a mean age of 51, ranging from 12 to 80 years. The male:female ratio was 2:3. Presenting symptoms included headache or facial pain/pressure (88%), rhinorrhea (46%), and nasal congestion (26%), with over one third of the patients having a chief complaint lasting for one year or longer. All patients underwent CT imaging, which demonstrated bony changes (42%), a mass (24%), or complete opacification of the sphenoid sinus (22%). Eighty percent required surgical intervention for proper diagnosis or recalcitrant symptoms (28 endoscopic transnasal approach, 11 endoscopic transethmoid approach, and 1 external sphenoidotomy). The most frequent histopathological diagnoses were: sinusitis (40%), fungal ball (20%), neoplasm (14%), and mucocele (12%). Treatment resulted in clinical and/or endoscopic improvement or resolution in 87% of the study population. Conclusion: The presenting symptoms of isolated sphenoid sinus disease can be nonspecific and may therefore result in an inordinate delay in diagnosis. Nasal endoscopy and radiologic imaging are central to making an accurate and timely diagnosis. Medical treatment and/or minimally invasive surgical techniques can successfully manage the vast majority of these patients. Background: Early recognition and management of sphenoid sinus disease is critical considering the vital anatomic location of the sphenoid sinus. Literature addressing management of isolated sphenoid sinus pathology is sparse at best. Methods: A retrospective chart review of isolated sphenoid sinus pathology between January 1997 and December 2003 was conducted. Clinical characteristics, diagnosis, treatment strategy, and outcomes were reviewed. Results: The study population consisted of 50 patients with a mean age of 51, ranging from 12 to 80 years. The male:female ratio was 2:3. Presenting symptoms included headache or facial pain/pressure (88%), rhinorrhea (46%), and nasal congestion (26%), with over one third of the patients having a chief complaint lasting for one year or longer. All patients underwent CT imaging, which demonstrated bony changes (42%), a mass (24%), or complete opacification of the sphenoid sinus (22%). Eighty percent required surgical intervention for proper diagnosis or recalcitrant symptoms (28 endoscopic transnasal approach, 11 endoscopic transethmoid approach, and 1 external sphenoidotomy). The most frequent histopathological diagnoses were: sinusitis (40%), fungal ball (20%), neoplasm (14%), and mucocele (12%). Treatment resulted in clinical and/or endoscopic improvement or resolution in 87% of the study population. Conclusion: The presenting symptoms of isolated sphenoid sinus disease can be nonspecific and may therefore result in an inordinate delay in diagnosis. Nasal endoscopy and radiologic imaging are central to making an accurate and timely diagnosis. Medical treatment and/or minimally invasive surgical techniques can successfully manage the vast majority of these patients.

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A New Classification System Of The Deviated Nose And Its Implication In Treatment

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Conflict of Interest/Disclosure: None Disclosed

Introduction It is important to have a good classification system of deviated nose describing the deformity as illustrative as possible.In this study, we intended to propose a new classification system to better describe the morphological characteristics of the deviated nose. Methods The medical records and facial photos of 75 patients with deviated nose who underwent rhinoplasty were analyzed. We assumed that the nasal dorsum is composed of two subunits; bony dorsum and cartilaginous dorsum. The types of deviation in our classification system are: type I, tilted bony dorsum, tilted cartilaginous dorsum to opposite direction; type II, tilted bony dorsum, concavely or convexly bent cartilaginous dorsum; type III, straight bony dorsum, tilted cartilaginous dorsum; type IV, straight bony dorsum, bent cartilaginous dorsum, type V: tilted bony and cartilaginous dorsum to the same direction. Results: There were 24 cases (32 %) of type I deviation. The number of type II and III was 19 each (25.3 %). The numbers of type IV and V were 7 (9.3%) and 6 (8%). While an endonasal approach was selected for the management in 9 out of 24 type I and 3 out of 19 type II deviation, open rhinoplasties were performed for the rest of cases. Suboptimal correction or recurrent deviation was found in 3 cases in type III, 1 in type IV, and 1 in type V deformity. Conclusion: The new classification system for the deviated nose could be useful in diagnosing and planning the optimal treatments for deviated nose. Introduction It is important to have a good classification system of deviated nose describing the deformity as illustrative as possible.In this study, we intended to propose a new classification system to better describe the morphological characteristics of the deviated nose. Methods The medical records and facial photos of 75 patients with deviated nose who underwent rhinoplasty were analyzed. We assumed that the nasal dorsum is composed of two subunits; bony dorsum and cartilaginous dorsum. The types of deviation in our classification system are: type I, tilted bony dorsum, tilted cartilaginous dorsum to opposite direction; type II, tilted bony dorsum, concavely or convexly bent cartilaginous dorsum; type III, straight bony dorsum, tilted cartilaginous dorsum; type IV, straight bony dorsum, bent cartilaginous dorsum, type V: tilted bony and cartilaginous dorsum to the same direction. Results: There were 24 cases (32 %) of type I deviation. The number of type II and III was 19 each (25.3 %). The numbers of type IV and V were 7 (9.3%) and 6 (8%). While an endonasal approach was selected for the management in 9 out of 24 type I and 3 out of 19 type II deviation, open rhinoplasties were performed for the rest of cases. Suboptimal correction or recurrent deviation was found in 3 cases in type III, 1 in type IV, and 1 in type V deformity. Conclusion: The new classification system for the deviated nose could be useful in diagnosing and planning the optimal treatments for deviated nose.

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Effectiveness Of Intraoperative Mitomycin C In Maintaining The Patency Of A Frontal Sinusotomy – A Preliminary Report Of A Double-Blind Randomized Placebo-Controlled Trial

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Conflict of Interest/Disclosure: None Disclosed

Introduction Post-operative scarring in the frontal recess is the commonest cause of iatrogenic frontal sinusitis. Topical Mitomycin-C (MMC) is an anti-fibroblastic agent that has been shown to reduce clinical scarring. This is a preliminary report of a double-blind randomized placebo-controlled trial using MMC to determine it's effectiveness in keeping frontal sinusotomies (FS) patent. Methods All patients with chronic rhinosinusitis undergoing primary or revision bilateral image-guided endoscopic sinus surgery were enrolled. Patients requiring frontal sinus stents and those with allergic fungal sinusitis were excluded. After completion of the FS, dimensions of the FS were measured using curved Frazer suction diameters. Neuropatties soaked in 0.5mg/ml of MMC were then placed into one frontal recess for 4 minutes in a randomized manner. A saline control was used for the other side. The primary surgeon was blinded to the sides intraoperatively and throughout the follow-up period. Measurements of the FS were repeated at 1, 3 and 6 months. Results At present, fourteen patients have been followed-up for at least three months. In the control group, the FS had decreased by 46.7% compared to 24.9% in the MMC group. There was a strong trend indicating that the anterior-posterior diameters, transverse diameters and cross-sectional areas of the frontal sinusotomies decreased less on the MMC side than the control side. The differences, however, do not reach statistical significance. There was also no statistical difference between primary and revision cases. Conclusion Our early data seems to suggest that topical MMC may be effective in reducing post-operative frontal sinus scarring. Introduction Post-operative scarring in the frontal recess is the commonest cause of iatrogenic frontal sinusitis. Topical Mitomycin-C (MMC) is an anti-fibroblastic agent that has been shown to reduce clinical scarring. This is a preliminary report of a double-blind randomized placebo-controlled trial using MMC to determine it's effectiveness in keeping frontal sinusotomies (FS) patent. Methods All patients with chronic rhinosinusitis undergoing primary or revision bilateral image-guided endoscopic sinus surgery were enrolled. Patients requiring frontal sinus stents and those with allergic fungal sinusitis were excluded. After completion of the FS, dimensions of the FS were measured using curved Frazer suction diameters. Neuropatties soaked in 0.5mg/ml of MMC were then placed into one frontal recess for 4 minutes in a randomized manner. A saline control was used for the other side. The primary surgeon was blinded to the sides intraoperatively and throughout the follow-up period. Measurements of the FS were repeated at 1, 3 and 6 months. Results At present, fourteen patients have been followed-up for at least three months. In the control group, the FS had decreased by 46.7% compared to 24.9% in the MMC group. There was a strong trend indicating that the anterior-posterior diameters, transverse diameters and cross-sectional areas of the frontal sinusotomies decreased less on the MMC side than the control side. The differences, however, do not reach statistical significance. There was also no statistical difference between primary and revision cases. Conclusion Our early data seems to suggest that topical MMC may be effective in reducing post-operative frontal sinus scarring.

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Endoscopic Management Of Malignant Sinonasal Tumours

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Conflict of Interest/Disclosure: None Disclosed

Introduction Surgically resectable malignant sinonasal tumours have traditionally been managed with a combination of radical open surgery and radiotherapy. The role of endoscopic resection remains uncertain and controversial. We review our initial experience with endoscopic resection of malignant sinonasal tumours. Methods A retrospective chart review of malignant sinonasal tumours resected utilizing an endoscopic approach at a tertiary centre over a three-year period. Results We present three cases of uncommon sinonasal tumours that were primarily dealt with utilizing an endoscopic approach. The first was a 54-year old female with a chondrosarcoma of the septum. She underwent an endoscopic septectomy, resection of the tumour and bilateral complete frontosphenoethmoidectomy. The second patient was a 50-year old man with adenoid cystic carcinoma of the left inferior turbinate. He underwent an endoscopic medial maxillectomy and complete excision of the tumour. Neither one of these cases received adjuvant therapy. The third patient was a 61-year old man with a Kadish stage B esthesioneuroblastoma. He underwent an endoscopic resection followed by adjuvant radiotherapy. All patients were discharged within 4 days post operatively. All three patients have been disease-free for greater than 36 months. No complications were encountered in any of the cases. Conclusion An endoscopic approach is not recommended for all cases of malignant sinonasal tumours, but in experienced hands, well selected cases of malignant sinonasal tumours can be safely and completely resected with minimal morbidity and excellent outcomes. Introduction Surgically resectable malignant sinonasal tumours have traditionally been managed with a combination of radical open surgery and radiotherapy. The role of endoscopic resection remains uncertain and controversial. We review our initial experience with endoscopic resection of malignant sinonasal tumours. Methods A retrospective chart review of malignant sinonasal tumours resected utilizing an endoscopic approach at a tertiary centre over a three-year period. Results We present three cases of uncommon sinonasal tumours that were primarily dealt with utilizing an endoscopic approach. The first was a 54-year old female with a chondrosarcoma of the septum. She underwent an endoscopic septectomy, resection of the tumour and bilateral complete frontosphenoethmoidectomy. The second patient was a 50-year old man with adenoid cystic carcinoma of the left inferior turbinate. He underwent an endoscopic medial maxillectomy and complete excision of the tumour. Neither one of these cases received adjuvant therapy. The third patient was a 61-year old man with a Kadish stage B esthesioneuroblastoma. He underwent an endoscopic resection followed by adjuvant radiotherapy. All patients were discharged within 4 days post operatively. All three patients have been disease-free for greater than 36 months. No complications were encountered in any of the cases. Conclusion An endoscopic approach is not recommended for all cases of malignant sinonasal tumours, but in experienced hands, well selected cases of malignant sinonasal tumours can be safely and completely resected with minimal morbidity and excellent outcomes.

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A Development Of Rhinovirus Infection Model Using Organ Culture Of Turbinate Mucosa

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Conflict of Interest/Disclosure: None Disclosed

Introduction: To date, study on the pathophysiology of rhinovirus (RV) infection has been performed by in vivo challenge study on the volunteers or primary culture of tracheal and bronchial epithelial cell line. However, the former incurs an ethical problem and the latter is not capable of reflecting the in vivo epithelial and subepithelial interaction. Objective: To develop a new study model using the organ culture of turbinate mucosa Methods: The inferior turbinate mucosal tissues were cultured in air-liquid interface methods, placed on the support of gelfoam soaked in the culture media. Human rhinovirus-16 was applied in the top of the mucosal surface for 4 hours. Virus infected mucosal tissues were then transferred to another virus-free culture condition and incubated for additional 48 hours. The success of RV infection was determined by semi-nested RT-PCR of the mucosal surface fluid. Intracelluar RV was visualized by in situ hybridization. Elaboration of cytokine IL-6 and IL-8 was quantitated using ELISA method. Results: PCR product of 292 bp on semi-nested RT-PCR, representing successful RV infection, was detected in 5 tissues out of 10 mucosal tissues. In the in situ hybridization method, positively stained cells in scattered fashion, 11.8± 4.5 cells on the average, were found in epithelial layer. In the analysis of cytokine production, IL-6 and IL-8 secretions in the infected mucosa were significantly greater than in the control mucosa. Conclusion: The organ culture of turbinate mucosa could serves as an acceptable in vitro model for studying pathophysiology of RV infection.Introduction: To date, study on the pathophysiology of rhinovirus (RV) infection has been performed by in vivo challenge study on the volunteers or primary culture of tracheal and bronchial epithelial cell line. However, the former incurs an ethical problem and the latter is not capable of reflecting the in vivo epithelial and subepithelial interaction. Objective: To develop a new study model using the organ culture of turbinate mucosa Methods: The inferior turbinate mucosal tissues were cultured in air-liquid interface methods, placed on the support of gelfoam soaked in the culture media. Human rhinovirus-16 was applied in the top of the mucosal surface for 4 hours. Virus infected mucosal tissues were then transferred to another virus-free culture condition and incubated for additional 48 hours. The success of RV infection was determined by semi-nested RT-PCR of the mucosal surface fluid. Intracelluar RV was visualized by in situ hybridization. Elaboration of cytokine IL-6 and IL-8 was quantitated using ELISA method. Results: PCR product of 292 bp on semi-nested RT-PCR, representing successful RV infection, was detected in 5 tissues out of 10 mucosal tissues. In the in situ hybridization method, positively stained cells in scattered fashion, 11.8± 4.5 cells on the average, were found in epithelial layer. In the analysis of cytokine production, IL-6 and IL-8 secretions in the infected mucosa were significantly greater than in the control mucosa. Conclusion: The organ culture of turbinate mucosa could serves as an acceptable in vitro model for studying pathophysiology of RV infection.

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Catheter And Antibiotic Related Complications Of Ambulatory Intravenous Antibiotics For Chronic Refractory Rhinosinusitis

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Conflict of Interest/Disclosure: Medical consultant, Sinucare

Background: To evaluate complications related to catheter and antibiotics used in treating patients with chronic refractory sinusitis. Study Design: A retrospective study of 180 patients who underwent ambulatory intravenous antibiotics for chronic rhinosinusitis. Complications related to the peripherally inserted central catheter (PICC) line and antibiotics were reviewed. Results: Complication related to the PICC line (4/180, 2.3%) included line thrombosis in three patients and line related septicemia in one. The lines were replaced in the three patients and were able to complete the antibiotic course. Four patients (2.3%) had transient decrease in WBC count and one patient (0.5%) increased liver function tests, which did not require change in antibiotics. Out of the four patients with low WBC counts only one patient required change of antibiotics. 25 patients (13.9%) had minor complications which included rash, diarrhea, itch and flushed feeling out of which nine (5%) patients required change of antibiotics. Vancomycin was most often related with complications. There were no permanent complications or death in this group. Conclusion: Ambulatory intravenous antibiotics are well-tolerated in treatment of chronic refractory rhinosinusitis. Catheter and Antibiotics related catheter complications are uncommon. The treating physician should be aware of possible complications, close surveillance and follow-up of patients is recommended. Background: To evaluate complications related to catheter and antibiotics used in treating patients with chronic refractory sinusitis. Study Design: A retrospective study of 180 patients who underwent ambulatory intravenous antibiotics for chronic rhinosinusitis. Complications related to the peripherally inserted central catheter (PICC) line and antibiotics were reviewed. Results: Complication related to the PICC line (4/180, 2.3%) included line thrombosis in three patients and line related septicemia in one. The lines were replaced in the three patients and were able to complete the antibiotic course. Four patients (2.3%) had transient decrease in WBC count and one patient (0.5%) increased liver function tests, which did not require change in antibiotics. Out of the four patients with low WBC counts only one patient required change of antibiotics. 25 patients (13.9%) had minor complications which included rash, diarrhea, itch and flushed feeling out of which nine (5%) patients required change of antibiotics. Vancomycin was most often related with complications. There were no permanent complications or death in this group. Conclusion: Ambulatory intravenous antibiotics are well-tolerated in treatment of chronic refractory rhinosinusitis. Catheter and Antibiotics related catheter complications are uncommon. The treating physician should be aware of possible complications, close surveillance and follow-up of patients is recommended.

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Patterns of innervation of the anterior maxilla: A cadaver study with relevance to canine fossa puncture

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Conflict of Interest/Disclosure: None Disclosed

Introduction During endoscopic sinus surgery access to the maxillary sinus can be attained through a canine fossa puncture. A recent study at our institution has demonstrated a number of complications, primarily due to damage to the anterior superior alveolar nerve (ASAN), following canine fossa puncture. The aim of this study was to elucidate the pattern of ASAN within the maxillary bone, and to secondly determine suitable surgical landmarks to aid in accurately localizing the canine fossa, while preventing damage to the ASAN. Methods Anatomical study utilizing 40 maxilla from 20 cadaver heads. Results Four differing patterns of ASAN were identified. A single ASAN trunk without branching was identified in 12, a single ASAN trunk with multiple branches in 10, a single ASAN trunk with one branch in 8 and a double ASAN trunk in 10. A dehiscence of the ASAN occurred in 5, most commonly when the ASAN arose medial to the Infraorbital foramen (IOF). A diffuse plexus of ASAN branches overlying the canine fossa was identified in 14 cases, 10 from a single ASAN trunk and 4 from a double trunk. A vertical line drawn through the IOF, bisected by a horizontal line through the floor of the pyriform aperture, accurately predicted the canine fossa in all cases. There was no disruption to any main trunk of the ASAN, and in only 5 of the 40 specimens was there any disruption to small branches of the ASAN. Conclusions There is remarkable variation to the distribution of the ASAN on the anterior face of the maxilla. Canine fossa puncture, utilizing our landmarks, accurately located the canine fossa, and failed to damage any ASAN trunks in all cases Introduction During endoscopic sinus surgery access to the maxillary sinus can be attained through a canine fossa puncture. A recent study at our institution has demonstrated a number of complications, primarily due to damage to the anterior superior alveolar nerve (ASAN), following canine fossa puncture. The aim of this study was to elucidate the pattern of ASAN within the maxillary bone, and to secondly determine suitable surgical landmarks to aid in accurately localizing the canine fossa, while preventing damage to the ASAN. Methods Anatomical study utilizing 40 maxilla from 20 cadaver heads. Results Four differing patterns of ASAN were identified. A single ASAN trunk without branching was identified in 12, a single ASAN trunk with multiple branches in 10, a single ASAN trunk with one branch in 8 and a double ASAN trunk in 10. A dehiscence of the ASAN occurred in 5, most commonly when the ASAN arose medial to the Infraorbital foramen (IOF). A diffuse plexus of ASAN branches overlying the canine fossa was identified in 14 cases, 10 from a single ASAN trunk and 4 from a double trunk. A vertical line drawn through the IOF, bisected by a horizontal line through the floor of the pyriform aperture, accurately predicted the canine fossa in all cases. There was no disruption to any main trunk of the ASAN, and in only 5 of the 40 specimens was there any disruption to small branches of the ASAN. Conclusions There is remarkable variation to the distribution of the ASAN on the anterior face of the maxilla. Canine fossa puncture, utilizing our landmarks, accurately located the canine fossa, and failed to damage any ASAN trunks in all cases

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Presentation and Management of Extensive Fronto-Orbital-Ethmoid Mucoceles

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Conflict of Interest/Disclosure: None Disclosed

Abstract: Presentation and Management of Extensive Fronto-Orbital-Ethmoid Mucoceles Objectives: To report the presentation and management of extensive fronto-orbital-ethmoid mucoceles. Methods: A retrospective chart review of 13 consecutive patients requiring surgical intervention for extensive fronto-orbital-ethmoid mucoceles. Patients were treated over the period from 1998-2003. Variables examined include chief complaint, risk factors, location of erosion, management, and complications. Follow-up ranged from 12-36 months. Results: Most common chief complaint was eye proptosis, followed by forehead swelling and orbital cellulitis. Four patients had previous FESS and another 4 patients had history of prior trauma and frontal sinus obliteration. Eleven patients had skull base erosion and 12 had orbital wall erosion. Four patients were managed endoscopically. Of these, one had previously undergone FESS while the other 3 had no risk factors. All patients with prior trauma/obliteration were treated with bicoronal flap and frontal sinus obliteration. One patient who had undergone 2 previous FESS was successfully treated with bicoronal flap without obliteration. One patient treated with an osteoplastic flap had CSF leak that was identified and repaired intraoperatively with a pericranial flap. Conclusion: Extensive fronto-orbital-ethmoid mucoceles can be successfully and safely treated by endoscopic and non-endoscopic methods. The choice of surgical approach mainly depends on the anatomy of the frontal recess. Prior trauma and FESS are associated with requiring bicoronal flap and frontal sinus obliteration.Abstract: Presentation and Management of Extensive Fronto-Orbital-Ethmoid Mucoceles Objectives: To report the presentation and management of extensive fronto-orbital-ethmoid mucoceles. Methods: A retrospective chart review of 13 consecutive patients requiring surgical intervention for extensive fronto-orbital-ethmoid mucoceles. Patients were treated over the period from 1998-2003. Variables examined include chief complaint, risk factors, location of erosion, management, and complications. Follow-up ranged from 12-36 months. Results: Most common chief complaint was eye proptosis, followed by forehead swelling and orbital cellulitis. Four patients had previous FESS and another 4 patients had history of prior trauma and frontal sinus obliteration. Eleven patients had skull base erosion and 12 had orbital wall erosion. Four patients were managed endoscopically. Of these, one had previously undergone FESS while the other 3 had no risk factors. All patients with prior trauma/obliteration were treated with bicoronal flap and frontal sinus obliteration. One patient who had undergone 2 previous FESS was successfully treated with bicoronal flap without obliteration. One patient treated with an osteoplastic flap had CSF leak that was identified and repaired intraoperatively with a pericranial flap. Conclusion: Extensive fronto-orbital-ethmoid mucoceles can be successfully and safely treated by endoscopic and non-endoscopic methods. The choice of surgical approach mainly depends on the anatomy of the frontal recess. Prior trauma and FESS are associated with requiring bicoronal flap and frontal sinus obliteration.

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Sinonasal-Type Hemangiopericytoma of the Sphenoid Sinus

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Hemangiopericytoma (HPC) is a rare vascular tumor arising from Zimmerman's pericytes. It most commonly occurs in the retroperitoneum and lower extremities with malignant biological behavior. Compared with the conventional soft tissue HPC, sinonasal-type HPC characteristically has clinical and histopathological features and good prognosis. In this study, we present a middle-aged woman with a large sinonasal-type HPC of the sphenoid sinus and being successfully treated by surgery. Methods: Case report and literature review. Results: A 50-year-old woman had progressive left nasal obstruction and intermittent epistaxis for one year. Rhinoscopy revealed a dark red, soft mass that bled easily with minimal manipulation. It occupied the left nasal cavity and extended to the nasopharynx and right choana. The CT scan and MRI showed a hypervascular lesion over the left sinonasal cavity. Preoperative angiography and embolization were carried out. Under the assistance of nasoendoscope, we identified the origin of the tumor, in the anterior table of the left sphenoid sinus, and completely removed a 6-cm sinonasal mass using a lateral rhinotomy approach. Pathology showed a vascular lesion, confirmed by immunohistochemistry staining, consistent with sinonasal-type HPC. The postoperative course was uneventful, and there has been no evidence of recurrence for 3 years. Conclusions: In previous reports, sinonasal-type HPCs were reported to have a mean size of 3 cm and most commonly originated from the ethmoid sinus. A sinonasal-type HPC rarely originates from the sphenoid sinus and reaches up to 6 cm in size. Preoperative angiography with embolization and surgical therapy is the recommended treatment. Introduction: Hemangiopericytoma (HPC) is a rare vascular tumor arising from Zimmerman's pericytes. It most commonly occurs in the retroperitoneum and lower extremities with malignant biological behavior. Compared with the conventional soft tissue HPC, sinonasal-type HPC characteristically has clinical and histopathological features and good prognosis. In this study, we present a middle-aged woman with a large sinonasal-type HPC of the sphenoid sinus and being successfully treated by surgery. Methods: Case report and literature review. Results: A 50-year-old woman had progressive left nasal obstruction and intermittent epistaxis for one year. Rhinoscopy revealed a dark red, soft mass that bled easily with minimal manipulation. It occupied the left nasal cavity and extended to the nasopharynx and right choana. The CT scan and MRI showed a hypervascular lesion over the left sinonasal cavity. Preoperative angiography and embolization were carried out. Under the assistance of nasoendoscope, we identified the origin of the tumor, in the anterior table of the left sphenoid sinus, and completely removed a 6-cm sinonasal mass using a lateral rhinotomy approach. Pathology showed a vascular lesion, confirmed by immunohistochemistry staining, consistent with sinonasal-type HPC. The postoperative course was uneventful, and there has been no evidence of recurrence for 3 years. Conclusions: In previous reports, sinonasal-type HPCs were reported to have a mean size of 3 cm and most commonly originated from the ethmoid sinus. A sinonasal-type HPC rarely originates from the sphenoid sinus and reaches up to 6 cm in size. Preoperative angiography with embolization and surgical therapy is the recommended treatment.

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A new protocol for the treatment of Allergic Fungal Sinusitis

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Conflict of Interest/Disclosure: None Disclosed

Background: The current most accepted protocol for the management of AFS (Allergic Fungal Sinusitis) includes ESS (Endoscopic Sinus Surgery) first and than a prolonged course of steroid treatment. Objective: To evaluate a new protocol for the treatment of AFS, that includes pre-operative high-dose steroids and a following preoperative CT scan. Subjects and methods: During 2001–2004 eight patients were suspected to have AFS based on the following findings: IgE hypersensitivity, nasal polyposis, characteristic CT findings and unilateral predominance. The treatment protocol included: 1. preoperative prednisone - 1mg/Kg/day for 10 days. 2. CT scan one day before surgery. 3. ESS – targeted to fungal foci remnants. 4. Prednisone tapering for 6-9 days. Using the Lund – MacKay radiologic staging system, the pre-steroid CT scans were compared to the post-steroid scans. The Kupferberg\'s mucosal staging system was used to evaluate the postoperative endoscopic appearance. Results: Mean Follow-up was 23.3 months. All patients had the required criteria for the diagnosis of AFS. The mean radiologic unilateral score was 11 before steroids and 3.5 after steroids. Endoscopic examination on their last follow-up visit showed stage 0 (no edema) in 6 patients, stage 1 (edema) in one patient, stage 2 (polypoid edema) in one patient. Conclusions: 1. Treatment of AFS with high-dose prednisone has a major effect on the extent of the disease. 2. Treatment of AFS with high-dose prednisone pre-operatively significantly improves the surgical control of the disease. 3. CT scan post high-dose treatment with prednisone and before surgery helps the surgeon to perform a more precise and targeted operation. 4. The dramatic response to high-dose prednisone may be added as major criteria for the diagnosis of AFS. Background: The current most accepted protocol for the management of AFS (Allergic Fungal Sinusitis) includes ESS (Endoscopic Sinus Surgery) first and than a prolonged course of steroid treatment. Objective: To evaluate a new protocol for the treatment of AFS, that includes pre-operative high-dose steroids and a following preoperative CT scan. Subjects and methods: During 2001–2004 eight patients were suspected to have AFS based on the following findings: IgE hypersensitivity, nasal polyposis, characteristic CT findings and unilateral predominance. The treatment protocol included: 1. preoperative prednisone - 1mg/Kg/day for 10 days. 2. CT scan one day before surgery. 3. ESS – targeted to fungal foci remnants. 4. Prednisone tapering for 6-9 days. Using the Lund – MacKay radiologic staging system, the pre-steroid CT scans were compared to the post-steroid scans. The Kupferberg\'s mucosal staging system was used to evaluate the postoperative endoscopic appearance. Results: Mean Follow-up was 23.3 months. All patients had the required criteria for the diagnosis of AFS. The mean radiologic unilateral score was 11 before steroids and 3.5 after steroids. Endoscopic examination on their last follow-up visit showed stage 0 (no edema) in 6 patients, stage 1 (edema) in one patient, stage 2 (polypoid edema) in one patient. Conclusions: 1. Treatment of AFS with high-dose prednisone has a major effect on the extent of the disease. 2. Treatment of AFS with high-dose prednisone pre-operatively significantly improves the surgical control of the disease. 3. CT scan post high-dose treatment with prednisone and before surgery helps the surgeon to perform a more precise and targeted operation. 4. The dramatic response to high-dose prednisone may be added as major criteria for the diagnosis of AFS.

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Bacteriology Of Chronic Rhinosinusitis In Relation To Middle Meatal Secretion

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Conflict of Interest/Disclosure: None Disclosed

Objectives: This work is to study the relationship of the bacteriology of chronic rhinosinusitis with middle meatal secretion. Methods: Chronic rhinosinusitis patients who were going to undergo functional endoscopic sinus surgery were enrolled in this study. After sterilizing the nasal vestibule and anterior nasal cavity, a cotton stick was used to collect specimen from the middle meatus under the endoscope. When the ethmoid bulla was removed, another cotton stick was passed to collect specimen from the anterior ethmoid cavity. The specimens were sent to the laboratory for aerobic and anaerobic cultures. All patients were divided into 2 groups according to the presence of secretion in the middle meatus. Results: Two hundred and ten patients were collected in this study. The culture rate of middle meatal specimens was 70.7% (58/82) for patients with secretion present in the middle meatus. In contrast, the culture rate was 53.1% (68/128) for patients without secretion in the middle meatus. The difference in culture rates was statistically significant (p=0.011). On the other hand, the culture rate of anterior ethmoid specimens was 51.2% (42/82) for patients with secretion present in the middle meatus. In contrast, the culture rate was 44.5% (57/128) for patients without secretion in the middle meatus. The difference in culture rates was not significant (p=0.344). Conclusions: If the secretion was present in the middle meatus, bacteria were more frequently recovered from middle meatal specimens. However, the bacteriology of anterior ethmoid cavity was not related to the presence of secretion in the middle meatus. Objectives: This work is to study the relationship of the bacteriology of chronic rhinosinusitis with middle meatal secretion. Methods: Chronic rhinosinusitis patients who were going to undergo functional endoscopic sinus surgery were enrolled in this study. After sterilizing the nasal vestibule and anterior nasal cavity, a cotton stick was used to collect specimen from the middle meatus under the endoscope. When the ethmoid bulla was removed, another cotton stick was passed to collect specimen from the anterior ethmoid cavity. The specimens were sent to the laboratory for aerobic and anaerobic cultures. All patients were divided into 2 groups according to the presence of secretion in the middle meatus. Results: Two hundred and ten patients were collected in this study. The culture rate of middle meatal specimens was 70.7% (58/82) for patients with secretion present in the middle meatus. In contrast, the culture rate was 53.1% (68/128) for patients without secretion in the middle meatus. The difference in culture rates was statistically significant (p=0.011). On the other hand, the culture rate of anterior ethmoid specimens was 51.2% (42/82) for patients with secretion present in the middle meatus. In contrast, the culture rate was 44.5% (57/128) for patients without secretion in the middle meatus. The difference in culture rates was not significant (p=0.344). Conclusions: If the secretion was present in the middle meatus, bacteria were more frequently recovered from middle meatal specimens. However, the bacteriology of anterior ethmoid cavity was not related to the presence of secretion in the middle meatus.

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Toxic Shock Syndrome Associated with Absorbable Nasal Packing

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Conflict of Interest/Disclosure: None Disclosed

Objective: Although relatively uncommon, toxic shock syndrome (TSS) associated with nasal surgery requires early recognition and prompt intervention. TSS has an estimated incidence of 16/100,000. The large majority of reported cases involveded non-absorbable packing. We present a case of TSS in a pediatric patient who underwent endoscopic sinus surgery in which absorbable Merogel packing was used. Methods: Case report of a five year old girl who underwent bilateral middle meatal antrostomies along with bilateral anterior ethmoidectomies for chronic sinusitis. Merogel packing was placed for purposes of hemostasis and prevention of synechia. Patient was discharged four hours post-operatively and given prescriptions for Amoxacillin and Tylenol #3. Patient returned to emergency department on post-operative day #1. Mother reports that after returning home patient seemed lethargic with decreased mental status. She developed a rash throughout her body later that night. Upon arrival in the ED, patient was hypotensive and had a fever of 39.0 degrees C. Further questioning of the mother revealed that the patient had not taken any antibiotics since being discharged the day before. Results: Patient received fluid resuscitation and the possibility of TSS was considered. She was taken to the operating room where all Merogel packing which remained in the nose was removed. Patient was placed on Unasyn post-operatively. Within two hours of awaking from surgery, patient\'s mental status had returned to baseline. She was no longer hypotensive and her fever had resolved. Her rash resolved on post-operative day #1 at which time she was discharged home. Conclusion: TSS is a potentially life-threatening condition which must be considered in any patient who has undergone nasal surgery and presents post-operatively with sudden onset of high fever, erythroderma, hypotension, or mental status changes. This case report emphasizes that TSS is not limited to those patients in whom non-absorbable packs were used. It also stresses the importance of post-operative antibiotics that cover Staphylococcus aureus.Objective: Although relatively uncommon, toxic shock syndrome (TSS) associated with nasal surgery requires early recognition and prompt intervention. TSS has an estimated incidence of 16/100,000. The large majority of reported cases involveded non-absorbable packing. We present a case of TSS in a pediatric patient who underwent endoscopic sinus surgery in which absorbable Merogel packing was used. Methods: Case report of a five year old girl who underwent bilateral middle meatal antrostomies along with bilateral anterior ethmoidectomies for chronic sinusitis. Merogel packing was placed for purposes of hemostasis and prevention of synechia. Patient was discharged four hours post-operatively and given prescriptions for Amoxacillin and Tylenol #3. Patient returned to emergency department on post-operative day #1. Mother reports that after returning home patient seemed lethargic with decreased mental status. She developed a rash throughout her body later that night. Upon arrival in the ED, patient was hypotensive and had a fever of 39.0 degrees C. Further questioning of the mother revealed that the patient had not taken any antibiotics since being discharged the day before. Results: Patient received fluid resuscitation and the possibility of TSS was considered. She was taken to the operating room where all Merogel packing which remained in the nose was removed. Patient was placed on Unasyn post-operatively. Within two hours of awaking from surgery, patient\'s mental status had returned to baseline. She was no longer hypotensive and her fever had resolved. Her rash resolved on post-operative day #1 at which time she was discharged home. Conclusion: TSS is a potentially life-threatening condition which must be considered in any patient who has undergone nasal surgery and presents post-operatively with sudden onset of high fever, erythroderma, hypotension, or mental status changes. This case report emphasizes that TSS is not limited to those patients in whom non-absorbable packs were used. It also stresses the importance of post-operative antibiotics that cover Staphylococcus aureus.

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Navigation Systems in Residency Training Program

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Conflict of Interest/Disclosure: None Disclosed

Objective Compare complication rates in patients having Endoscopic Sinus surgery with navigation system vs those with out navigation system in the same time period in a residency training program. Materials & Methods Four hundred and ninty one patients had ESS between Jan 1999 and Dec 2003. All procedures were performed by senior residents under supervision of senior author. Four hundred and thirteen (84%) patients were done with out the aid of navigation system. Seventy-eight (16%) had ESS with the aid of the navigation system. Results Twelve patients (2.9%) in the non navigation system group had major complications compared to one (1.3%) in the navigation group ($p>0.05$). Eight patients had orbital entry, 2 had csf leak and 2 had hemorrhage. In the navigation group we had only one patient who had exceessive bleeding intraoperatively. Conclusion Navigation systems have been advocated for use in difficult or revision cases to prevent complications. In our group, with adequate supervision residents were able to perform the procedure as safely with out the use of a navigation system. Navigation systems however are excellent tools for teaching as well as in cases with anatomically distorted landmarksObjective Compare complication rates in patients having Endoscopic Sinus surgery with navigation system vs those with out navigation system in the same time period in a residency training program. Materials & Methods Four hundred and ninty one patients had ESS between Jan 1999 and Dec 2003. All procedures were performed by senior residents under supervision of senior author. Four hundred and thirteen (84%) patients were done with out the aid of navigation system. Seventy-eight (16%) had ESS with the aid of the navigation system. Results Twelve patients (2.9%) in the non navigation system group had major complications compared to one (1.3%) in the navigation group ($p>0.05$). Eight patients had orbital entry, 2 had csf leak and 2 had hemorrhage. In the navigation group we had only one patient who had exceessive bleeding intraoperatively. Conclusion Navigation systems have been advocated for use in difficult or revision cases to prevent complications. In our group, with adequate supervision residents were able to perform the procedure as safely with out the use of a navigation system. Navigation systems however are excellent tools for teaching as well as in cases with anatomically distorted landmarks

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Association of a Calcium Sulfate Concretion to Biofilms

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Maxillary sinus concretion histopathology has not been fully determined. The world literature supports its association to Aspergillosis and Calcium Phosphate as the most common chemical composition. Although non-Aspergillosis concretions are reported, their chemical and environmental make-up is not clear. We present a multi-qualitative study of a concretion, and the corresponding sinus mucosa, from a patient without Aspergillosis. Patient and Methods: A forty-year-old male presented with progressively worsening left nasal obstruction and purulent discharge. On physical examination, a left middle meatus polyp and purulence were noted. After maximal medical therapy, Computed Tomography (figure-1) showed a small antral calcification in an opacified left maxillary sinus. During Endoscopic Sinus Surgery a concretion was retrieved. With prior consent, the concretion and mucosal samples from the left maxillary sinus and bulla were collected. All specimens were cultured, dehydrated, and fixed in Osmium-tetroxide. Mucosa was prepared for Scanning Electron Microscopy (SEM). The concretion was divided for SEM and Energy Dispersive Analysis (EDA). A normal mucosal sample was utilized as a control for EDA and SEM. Results: SEM of the concretion, and maxillary sinus mucosa, shows three different biofilm morphologies (figure-2) . The concretion's biofilms were the most dense. EDA revealed peaks for Calcium and Sulfur (figure-3). The control was negative for these chemicals and for biofilms (figure-4). Cultures showed Staphylococcus Aureus, and no fungus. Conclusion: We report a patient without Aspergillosis, and a concretion containing Calcium and Sulfur. Significant biofilms are seen on the concretion and corresponding maxillary sinus mucosa. Introduction: Maxillary sinus concretion histopathology has not been fully determined. The world literature supports its association to Aspergillosis and Calcium Phosphate as the most common chemical composition. Although non-Aspergillosis concretions are reported, their chemical and environmental make-up is not clear. We present a multi-qualitative study of a concretion, and the corresponding sinus mucosa, from a patient without Aspergillosis. Patient and Methods: A forty-year-old male presented with progressively worsening left nasal obstruction and purulent discharge. On physical examination, a left middle meatus polyp and purulence were noted. After maximal medical therapy, Computed Tomography (figure-1) showed a small antral calcification in an opacified left maxillary sinus. During Endoscopic Sinus Surgery a concretion was retrieved. With prior consent, the concretion and mucosal samples from the left maxillary sinus and bulla were collected. All specimens were cultured, dehydrated, and fixed in Osmium-tetroxide. Mucosa was prepared for Scanning Electron Microscopy (SEM). The concretion was divided for SEM and Energy Dispersive Analysis (EDA). A normal mucosal sample was utilized as a control for EDA and SEM. Results: SEM of the concretion, and maxillary sinus mucosa, shows three different biofilm morphologies (figure-2) . The concretion's biofilms were the most dense. EDA revealed peaks for Calcium and Sulfur (figure-3). The control was negative for these chemicals and for biofilms (figure-4). Cultures showed Staphylococcus Aureus, and no fungus. Conclusion: We report a patient without Aspergillosis, and a concretion containing Calcium and Sulfur. Significant biofilms are seen on the concretion and corresponding maxillary sinus mucosa.

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Expression of 12- and 15-Lipoxygenase in Murine and Human Nasal Mucosa

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Conflict of Interest/Disclosure: None Disclosed

Objectives-To determine the localization of leukocyte-type 12-lipoxygenase (L-12-LO) in murine nasal mucosa and 15-lipoxygenase-1 (15-LO-1) in human nasal mucosa and to investigate the expression of L-12-LO according to the development of murine nasal mucosa. Material and Methods-Immunohistochemical staining was done on human nasal mucosa and on the nasal mucosa of gestational day 16, 17, 18 mice, postnatal day 1, 3, 7, 14 mice, and adult mice. Alcian blue (pH 2.5)-periodic acid Schiff staining on murine nasal mucosa was performed. Results-In murine nasal mucosa, the expression of L-12-LO was noted in ciliated epithelial cells, basal cells, serous acini, and secretory ducts, but it was not found in the goblet cells. In human nasal mucosa, the expression pattern is almost the same, except there was no immunoreactivity in both the serous and mucous acini. The expression in murine nasal mucosa according to the development was strongly noticed from gestational day 16 through postnatal day 7. The expression in postnatal day 14 and adult mice was weaker than in the previous time point. Conclusion-As a result of this study, we found the exact localization of L-12-LO and 15-LO-1 in murine and human nasal mucosa, and we also found the possible involvement of L-12-LO in the development of murine nasal mucosa. Based on the close relationship of L-12-LO and 15-LO-1, we can suggest that 15-LO-1 is involved in the development of human nasal mucosa.Objectives-To determine the localization of leukocyte-type 12-lipoxygenase (L-12-LO) in murine nasal mucosa and 15-lipoxygenase-1 (15-LO-1) in human nasal mucosa and to investigate the expression of L-12-LO according to the development of murine nasal mucosa. Material and Methods-Immunohistochemical staining was done on human nasal mucosa and on the nasal mucosa of gestational day 16, 17, 18 mice, postnatal day 1, 3, 7, 14 mice, and adult mice. Alcian blue (pH 2.5)-periodic acid Schiff staining on murine nasal mucosa was performed. Results-In murine nasal mucosa, the expression of L-12-LO was noted in ciliated epithelial cells, basal cells, serous acini, and secretory ducts, but it was not found in the goblet cells. In human nasal mucosa, the expression pattern is almost the same, except there was no immunoreactivity in both the serous and mucous acini. The expression in murine nasal mucosa according to the development was strongly noticed from gestational day 16 through postnatal day 7. The expression in postnatal day 14 and adult mice was weaker than in the previous time point. Conclusion-As a result of this study, we found the exact localization of L-12-LO and 15-LO-1 in murine and human nasal mucosa, and we also found the possible involvement of L-12-LO in the development of murine nasal mucosa. Based on the close relationship of L-12-LO and 15-LO-1, we can suggest that 15-LO-1 is involved in the development of human nasal mucosa.

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"Vertex-to-Floor" Position Delivers Topical Nasal Drops to Olfactory Cleft after FESS

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Olfactory deficits are encountered in approximately 55 – 60% of patients with chronic rhinosinusitis. Topical nasal steroid drops are frequently prescribed postoperatively in patients with refractory smell/taste disturbances. The optimal head position for delivery of topical drops to the olfactory cleft remains unclear to date. In this study, the efficacy of the vertex to floor (VF) position was evaluated in FESS patients. Methods: Three trials were performed: two trials in which patients maintained the VF position for one and five minutes, respectively, after drop administration were compared to a third trial utilizing an atomizer spray in the upright position. Two independent observers rated the distribution of fluorescein-dyed dexamethasone drops at five sinonasal subsites: maxillary sinus (MS), ethmoid cavity (EC), frontal recess (FR), sphenoid sinus (SS), and olfactory cleft (OC). Results: VF position consistently delivered nasal drops to four of five subsites (MS, EC, SS, and OC). The atomizer distributed drops to the MS, ES, SS and FR. The greatest difference was noted with the nasal drops in the olfactory cleft in the VF position; statistical significance was achieved using ANOVA test ($p = 0.012$), with greater distribution at five minutes compared with one minute and spray (paired t-test, $p = 0.05$ and 0.003). Conclusions: The VF position was effective in delivery of the dexamethasone drops to the paranasal sinuses, especially to the olfactory cleft. This head position has significant implications for management of patients suffering from persistent hyposmia or anosmia with recalcitrant chronic rhinosinusitis and/or sinonasal polyposis.Introduction: Olfactory deficits are encountered in approximately 55 – 60% of patients with chronic rhinosinusitis. Topical nasal steroid drops are frequently prescribed postoperatively in patients with refractory smell/taste disturbances. The optimal head position for delivery of topical drops to the olfactory cleft remains unclear to date. In this study, the efficacy of the vertex to floor (VF) position was evaluated in FESS patients. Methods: Three trials were performed: two trials in which patients maintained the VF position for one and five minutes, respectively, after drop administration were compared to a third trial utilizing an atomizer spray in the upright position. Two independent observers rated the distribution of fluorescein-dyed dexamethasone drops at five sinonasal subsites: maxillary sinus (MS), ethmoid cavity (EC), frontal recess (FR), sphenoid sinus (SS), and olfactory cleft (OC). Results: VF position consistently delivered nasal drops to four of five subsites (MS, EC, SS, and OC). The atomizer distributed drops to the MS, ES, SS and FR. The greatest difference was noted with the nasal drops in the olfactory cleft in the VF position; statistical significance was achieved using ANOVA test ($p = 0.012$), with greater distribution at five minutes compared with one minute and spray (paired t-test, $p = 0.05$ and 0.003). Conclusions: The VF position was effective in delivery of the dexamethasone drops to the paranasal sinuses, especially to the olfactory cleft. This head position has significant implications for management of patients suffering from persistent hyposmia or anosmia with recalcitrant chronic rhinosinusitis and/or sinonasal polyposis.

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A New Procedure For The Short Screening Of Olfactory Function Using Five Items From The "Sniffin`Sticks" Identification Test Kit

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Conflict of Interest/Disclosure: None Disclosed

Introduction: "Sniffin` Sticks" is a validated test for olfactory function which includes subtests of odor threshold, discrimination and identification. The aim of the present study was to create a new protocol, based on the odor identification test, which is suitable for the short screening of smell function. Methods: 106 norm- and dysosmics (43 male,63 female; mean age 43.6 years, range 15-84 years) were involved in the investigation. In a first session five odorants (orange, leather, peppermint, rose, fish) were presented together with a list of 20 descriptors (five odorants together with 15 distractors). Additional choices were "no odor" and "undefinable". Secondly the established Sniffin`Sticks identification test was carried out to assess olfactory function. In a further session the new short screening procedure was repeated with 21 subjects after five days to check the test-retest-reliability. Results: The new test procedure could separate two groups of subjects (score of zero and scores 4 or 5). These groups showed no overlapping scores in the established odor identification test. Repeated measurements of the short test showed a correlation coefficient of $r21=0.77$ ($p<0.01$). Conclusions: The present data indicate the usefulness of the short screening test as it is able to exclude the presence of anosmia. In case of one mistake at the most, normosmia or mild hyposmia can be assumed. The discussed procedure is highly practical as it can be carried in a pocket and takes only three minutes for testing.Introduction: "Sniffin` Sticks" is a validated test for olfactory function which includes subtests of odor threshold, discrimination and identification. The aim of the present study was to create a new protocol, based on the odor identification test, which is suitable for the short screening of smell function. Methods: 106 norm- and dysosmics (43 male,63 female; mean age 43.6 years, range 15-84 years) were involved in the investigation. In a first session five odorants (orange, leather, peppermint, rose, fish) were presented together with a list of 20 descriptors (five odorants together with 15 distractors). Additional choices were "no odor" and "undefinable". Secondly the established Sniffin`Sticks identification test was carried out to assess olfactory function. In a further session the new short screening procedure was repeated with 21 subjects after five days to check the test-retest-reliability. Results: The new test procedure could separate two groups of subjects (score of zero and scores 4 or 5). These groups showed no overlapping scores in the established odor identification test. Repeated measurements of the short test showed a correlation coefficient of $r21=0.77$ ($p<0.01$). Conclusions: The present data indicate the usefulness of the short screening test as it is able to exclude the presence of anosmia. In case of one mistake at the most, normosmia or mild hyposmia can be assumed. The discussed procedure is highly practical as it can be carried in a pocket and takes only three minutes for testing.

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Migraine and Intranasal Contact Point

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Conflict of Interest/Disclosure: None Disclosed

Introduction: It has been suggested that intranasal contact point can trigger headache in individuals with migraine without aura (MWOA). The objective of this study is to assess the outcomes of surgical sinonasal treatment in patients with contact points and refractory headache. Method: We conducted a retrospective chart review of patients treated with endoscopic sinus surgery from October 1998 to August 2003. Eligible subjects had (1) A diagnosis of refractory migraine or transformed migraine. (2) Contact point demonstrated by CT scan. (3) Reported significant improvement after insertion of cottonoid soaked with pantocaine and decongestant in contact area during a headache attack. Information was obtained at baseline and follow-up (6-63 months) using standardized questionnaire. Surgical procedure consists of SMR middle turbinectomy and ethmoidectomy and removal of medial wall of ethmoid sinus in contact area. Result: We assessed 21 subjects (72% female). Mean headache frequency was reduced from 17.7 to 7.7 days per month ($p<0.01$). Mean headache severity was reduced from 7.8% (10 point scale) to 3.6% ($p< 0.0001$). Headache related disability was reduced from 5.6 (10 point scale) to 1.8 ($p<0.0001$). Nine (43%) subjects were completely headache free, and seven (33%) subjects had symptom reduction of more than 50%, at the last follow-up. Five (24%) subjects had less than 50% reduction in there symptoms; 2 of them are headache free after second surgery for release of adhesions at the area of surgery. Conclusion: In individuals with contact points and refractory migraine or transformed migraine with radiographic contact points and a positive response to local anesthesia, surgical sinonasal treatment was associated with marked headache improvement. We hypothesize that in some individual with MWOA with intranasal contact area, contact points contributes to trigeminal sensitization and creating a vicious cycle. By separating the contacting mucosa, contact point surgery may break this cycle. Prospective blinded studies are warranted to further assess our findings. Introduction: It has been suggested that intranasal contact point can trigger headache in individuals with migraine without aura (MWOA). The objective of this study is to assess the outcomes of surgical sinonasal treatment in patients with contact points and refractory headache. Method: We conducted a retrospective chart review of patients treated with endoscopic sinus surgery from October 1998 to August 2003. Eligible subjects had (1) A diagnosis of refractory migraine or transformed migraine. (2) Contact point demonstrated by CT scan. (3) Reported significant improvement after insertion of cottonoid soaked with pantocaine and decongestant in contact area during a headache attack. Information was obtained at baseline and follow-up (6-63 months) using standardized questionnaire. Surgical procedure consists of SMR middle turbinectomy and ethmoidectomy and removal of medial wall of ethmoid sinus in contact area. Result: We assessed 21 subjects (72% female). Mean headache frequency was reduced from 17.7 to 7.7 days per month ($p<0.01$). Mean headache severity was reduced from 7.8% (10 point scale) to 3.6% ($p< 0.0001$). Headache related disability was reduced from 5.6 (10 point scale) to 1.8 ($p<0.0001$). Nine (43%) subjects were completely headache free, and seven (33%) subjects had symptom reduction of more than 50%, at the last follow-up. Five (24%) subjects had less than 50% reduction in there symptoms; 2 of them are headache free after second surgery for release of adhesions at the area of surgery. Conclusion: In individuals with contact points and refractory migraine or transformed migraine with radiographic contact points and a positive response to local anesthesia, surgical sinonasal treatment was associated with marked headache improvement. We hypothesize that in some individual with MWOA with intranasal contact area, contact points contributes to trigeminal sensitization and creating a vicious cycle. By separating the contacting mucosa, contact point surgery may break this cycle. Prospective blinded studies are warranted to further assess our findings.

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Bilateral Blindness Caused by Angiofibroma: A Clinical Catastrophe and Result of the Surgery

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Presenting an advanced case of angiofibroma causing blindness of both eyes, surgical approach and the results. Materials and Methods: A 28-year-old Afghan male patient was referred for headache, bloody nasal discharge, and visual loss. On examination, widening of nasal bridge, large red-purple mass with high vascularity in the nose eroding septum and severe proptosis were found. Cranial nerves examination revealed no light perception in both eyes, bilateral VIth cranial nerve palsy and anosmia. CT scan a huge destructive mass eroding skull base and extending bilaterally into the anterior and middle cranial fossae, displacing frontal lobes. The patient underwent combined transnasal and transoral transpalatal resection of tumor. Result: Proptosis was relieved and general condition of the patient was improved Postoperatively. There was no improvement for I, II, and VIth cranial nerves abnormalities. Conclusion: Untreated angiofibroma has potential for bilateral blindness, which is a clinical catastrophe. Extracranial surgical approach is an acceptable modality even for massive intracranial extension of angiofibroma. Introduction: Presenting an advanced case of angiofibroma causing blindness of both eyes, surgical approach and the results. Materials and Methods: A 28-year-old Afghan male patient was referred for headache, bloody nasal discharge, and visual loss. On examination, widening of nasal bridge, large red-purple mass with high vascularity in the nose eroding septum and severe proptosis were found. Cranial nerves examination revealed no light perception in both eyes, bilateral VIth cranial nerve palsy and anosmia. CT scan a huge destructive mass eroding skull base and extending bilaterally into the anterior and middle cranial fossae, displacing frontal lobes. The patient underwent combined transnasal and transoral transpalatal resection of tumor. Result: Proptosis was relieved and general condition of the patient was improved Postoperatively. There was no improvement for I, II, and VIth cranial nerves abnormalities. Conclusion: Untreated angiofibroma has potential for bilateral blindness, which is a clinical catastrophe. Extracranial surgical approach is an acceptable modality even for massive intracranial extension of angiofibroma.

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Elevated Nitric Oxide Metabolite Leves In Human Chronic Sinusitis

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Conflict of Interest/Disclosure: None Disclosed

INTRODUCTION: Nitric oxide (NO) is produced mainly in the paranasal sinuses and the nasal mucosa. Nasal NO has been suggested to be a marker of nasal inflammation and also a mucociliary transport stimulant. Decreased exhaled NO is found in chronic sinusitis. NO metabolites was shown to be significantly higher in infected sinuses in a rabit model of chronic sinustis. Elevated NO metabolites is due to increased presence of neutrophils in the inflammatory state. METHODS: We lavaged maxillary sinuses during functional endoscopic sinus surgery (FESS) in the control group (patients who underwent FESS with any reason except chronic sinusitis) and patients with chronic sinusitis. NO metabolites (nitrate and nitrite) were measured in sinus lavages of both groups. RESULTS: NO metabolites levels (mean ± SEM) were 8.085±1.43 micromole/L in the control group and 16.30±2.67 micromole/L in Chronic sinusitis. Chronic sinusitis had elevated levels of NO metabolites that were statistically significant (P value= 0.036). CONCLUSIONS: NO metabolites were significantly higher in maxillary sinuses of patients with chronic sinusitis. Decreased levels of exhaled NO in the presence of increased NO metabolites in chronic sinusitis may be due to the indirect negative effect of inducable NO Synthase (iNOS) on the constitutive NO Synthase (cNOS) by decreasing the ciliated epithelium of sinuses which is the main source of NO in human sinus. INTRODUCTION: Nitric oxide (NO) is produced mainly in the paranasal sinuses and the nasal mucosa. Nasal NO has been suggested to be a marker of nasal inflammation and also a mucociliary transport stimulant. Decreased exhaled NO is found in chronic sinusitis. NO metabolites was shown to be significantly higher in infected sinuses in a rabit model of chronic sinustis. Elevated NO metabolites is due to increased presence of neutrophils in the inflammatory state. METHODS: We lavaged maxillary sinuses during functional endoscopic sinus surgery (FESS) in the control group (patients who underwent FESS with any reason except chronic sinusitis) and patients with chronic sinusitis. NO metabolites (nitrate and nitrite) were measured in sinus lavages of both groups. RESULTS: NO metabolites levels (mean ± SEM) were 8.085±1.43 micromole/L in the control group and 16.30±2.67 micromole/L in Chronic sinusitis. Chronic sinusitis had elevated levels of NO metabolites that were statistically significant (P value= 0.036). CONCLUSIONS: NO metabolites were significantly higher in maxillary sinuses of patients with chronic sinusitis. Decreased levels of exhaled NO in the presence of increased NO metabolites in chronic sinusitis may be due to the indirect negative effect of inducable NO Synthase (iNOS) on the constitutive NO Synthase (cNOS) by decreasing the ciliated epithelium of sinuses which is the main source of NO in human sinus.

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Dynamic Rhinoplasty: The Spring Concept for Correction

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Permanent correction of the drooping nose has been the subject of constant challenge in nasal plastic surgery. Other than an aged and unfavorable appearance which is accentuated on animation, Nasal tip ptosis adversely affects nasal airway. The lip-nose angle depends on many static and dynamic factors. The result of action of evator labii superioris alaque nasi and depressor septi nasi during smile causes caudal rotation of tip alongside the elevation of the columellar base resulting the drooping nose which is a matter of concern in dynamic rhinoplasty. We emphasized the role of augmentation as an important factor other than conventional muscular techniques. Methods: From 1994 onward, 492 cases of dynamic rhinoplasty underwent the ancillary augmentation technique using the spring concept. Nasal augmentation was achieved by cartilage graft inserting during tip surgery. The pocket was so prepared to allow a spring action of graft, combating dynamic forces. Results: Multiple aesthetic parameters including the lip-nose angle in static and dynamic states were assessed before and after surgery. There was significant improvement in dynamic and static states postoperatively. Results were more pronounced in severe cases. Conclusion: To correct the drooping nose, a method of correction utilizing the spring concept could abate dynamic mechanisms responsible for tip ptosis during animation more effective than the sole muscular techniques. This method works even in highly dynamic states. I will present my experience, demonstrating the operative technique. Introduction: Permanent correction of the drooping nose has been the subject of constant challenge in nasal plastic surgery. Other than an aged and unfavorable appearance which is accentuated on animation, Nasal tip ptosis adversely affects nasal airway. The lip-nose angle depends on many static and dynamic factors. The result of action of evator labii superioris alaque nasi and depressor septi nasi during smile causes caudal rotation of tip alongside the elevation of the columellar base resulting the drooping nose which is a matter of concern in dynamic rhinoplasty. We emphasized the role of augmentation as an important factor other than conventional muscular techniques. Methods: From 1994 onward, 492 cases of dynamic rhinoplasty underwent the ancillary augmentation technique using the spring concept. Nasal augmentation was achieved by cartilage graft inserting during tip surgery. The pocket was so prepared to allow a spring action of graft, combating dynamic forces. Results: Multiple aesthetic parameters including the lip-nose angle in static and dynamic states were assessed before and after surgery. There was significant improvement in dynamic and static states postoperatively. Results were more pronounced in severe cases. Conclusion: To correct the drooping nose, a method of correction utilizing the spring concept could abate dynamic mechanisms responsible for tip ptosis during animation more effective than the sole muscular techniques. This method works even in highly dynamic states. I will present my experience, demonstrating the operative technique.

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Presence Of Surfactant Lamellar Bodies In Normal And Diseased Sinus Mucosa

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Conflict of Interest/Disclosure: Dr. Schlosser is consultant for BrainLab and Aventis pharmaceuticals

Introduction: The primary component of surfactant in the pulmonary alveolus, phospholipid lamellar bodies, is secreted from Type II epithelial cells. In the lower airway, they optimize surface tension and oxygen exchange, decrease mucus viscosity and aid in mechanical elimination of inhaled pathogens. In addition to the lung, lamellar bodies have been identified in many other cell types throughout the human body. We performed ultrastructural studies to determine their existence in sinus mucosa. Materials/Methods: Sinus mucosa was examined in five different diagnoses, including allergic fungal sinusitis (AFS), eosinophilic mucin rhinosinusitis (EMRS), cystic fibrosis (CF), frontal sinus mucocele, and cerebrospinal fluid leak (control). Mouse lung was used as a positive control. Specimens were prepared using a novel technique with a combination of ferrocyanide reduced osmium tetroxide and thiocarbohydrazide for fixation (R-OTO method) to avoid elimination of cellular phospholipids during dehydration. Sections were viewed using transmission electron microscopy. Results: We identified phospholipid lamellar bodies in the sinus mucosa of all patients. Additionally, preservation of mouse lung lamellar bodies confirms the R-OTO method is a valid technique to examine these phospholipid structures. Conclusion: Lamellar bodies are present in a variety of normal and diseased human sinus mucosa, including AFS, EMRS, CF, mucocele, and normal control mucosa. We describe a simpler, faster technique for identification of cellular phospholipid components than those used previously. Definitive identification of these lamellar bodies within ciliated pseudostratified epithelium of the upper airway indicates that surfactant may have a role in normal sinus function and pathology. Introduction: The primary component of surfactant in the pulmonary alveolus, phospholipid lamellar bodies, is secreted from Type II epithelial cells. In the lower airway, they optimize surface tension and oxygen exchange, decrease mucus viscosity and aid in mechanical elimination of inhaled pathogens. In addition to the lung, lamellar bodies have been identified in many other cell types throughout the human body. We performed ultrastructural studies to determine their existence in sinus mucosa. Materials/Methods: Sinus mucosa was examined in five different diagnoses, including allergic fungal sinusitis (AFS), eosinophilic mucin rhinosinusitis (EMRS), cystic fibrosis (CF), frontal sinus mucocele, and cerebrospinal fluid leak (control). Mouse lung was used as a positive control. Specimens were prepared using a novel technique with a combination of ferrocyanide reduced osmium tetroxide and thiocarbohydrazide for fixation (R-OTO method) to avoid elimination of cellular phospholipids during dehydration. Sections were viewed using transmission electron microscopy. Results: We identified phospholipid lamellar bodies in the sinus mucosa of all patients. Additionally, preservation of mouse lung lamellar bodies confirms the R-OTO method is a valid technique to examine these phospholipid structures. Conclusion: Lamellar bodies are present in a variety of normal and diseased human sinus mucosa, including AFS, EMRS, CF, mucocele, and normal control mucosa. We describe a simpler, faster technique for identification of cellular phospholipid components than those used previously. Definitive identification of these lamellar bodies within ciliated pseudostratified epithelium of the upper airway indicates that surfactant may have a role in normal sinus function and pathology.

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Combined Extended Midface Degloving and Endoscopic Approach for Resection of Sinonasal Lesions

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Conflict of Interest/Disclosure: None Disclosed

Introduction: The midface degloving approach has been used extensively for the resection of sinonasal lesions. This approach provides adequate exposure to many regions of the sinonasal tract, but provides limited access to the frontoethmoid area. An extended midface degloving approach has been described previously to improve access to these areas. Even better access and visualization can be achieved by combining this approach with an endoscopic approach. Methods: The extended midface degloving technique includes osteotomies of the nasal bones and septum, allowing elevation of the entire nasal framework from the midface. After en bloc resection of the lesion, endoscopy can be used to evaluate and manage extension of disease into areas that are otherwise difficult to visualize. Results: The technique was used in a patient with cylindrical cell papilloma originating in the maxillary sinus and extending to the frontoethmoid region. Because involvement of the frontal sinus was uncertain on pre-operative evaluation, endoscopy was used to better visualize this area after en bloc resection of the lesion. Follow up shows no recurrence and an excellent cosmetic outcome. Conclusions: The extended midface degloving approach in conjunction with an endoscopic approach provides superior exposure when compared to either approach alone. The open approach allows for en bloc resection, while the endoscopic approach provides excellent visualization of areas that are otherwise difficult to assess. The combined approach allows for exposure of the entire nasal cavity without external incisions or violation of the frontal sinus. These advantages allow for complete resection of sinonasal lesions without cosmetic deformity. Introduction: The midface degloving approach has been used extensively for the resection of sinonasal lesions. This approach provides adequate exposure to many regions of the sinonasal tract, but provides limited access to the frontoethmoid area. An extended midface degloving approach has been described previously to improve access to these areas. Even better access and visualization can be achieved by combining this approach with an endoscopic approach. Methods: The extended midface degloving technique includes osteotomies of the nasal bones and septum, allowing elevation of the entire nasal framework from the midface. After en bloc resection of the lesion, endoscopy can be used to evaluate and manage extension of disease into areas that are otherwise difficult to visualize. Results: The technique was used in a patient with cylindrical cell papilloma originating in the maxillary sinus and extending to the frontoethmoid region. Because involvement of the frontal sinus was uncertain on pre-operative evaluation, endoscopy was used to better visualize this area after en bloc resection of the lesion. Follow up shows no recurrence and an excellent cosmetic outcome. Conclusions: The extended midface degloving approach in conjunction with an endoscopic approach provides superior exposure when compared to either approach alone. The open approach allows for en bloc resection, while the endoscopic approach provides excellent visualization of areas that are otherwise difficult to assess. The combined approach allows for exposure of the entire nasal cavity without external incisions or violation of the frontal sinus. These advantages allow for complete resection of sinonasal lesions without cosmetic deformity.

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Ethmoiditis In A Diabetic As A Cause Of Superior Orbital Fissure Syndrome – A Silent And Potent Threat To Vision

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Conflict of Interest/Disclosure: None Disclosed

Title: Ethmoiditis in a diabetic as a cause of superior orbital fissure syndrome – A silent and potent threat to vision. Objective: To present a case of superior orbital fissure syndrome secondary to "asymptomatic" ethmoid sinusitis in a diabetic patient. Design: Case report. Setting: Tertiary hospital. Patients: One patient. Results: A case of a diabetic patient initially presenting with signs and symptoms of superior orbital fissure syndrome on the right (ptosis, ophthalmoplegia, decreased pupillary and corneal reflexes) but with no sinonasal signs and symptoms. Computed tomography (CT) scan revealed right posterior ethmoiditis. Patient was managed with broad spectrum antibiotics, steroids, and control of diabetes. Repeat CT scan after one week revealed partial resolution. Neurologic deficits resolved after two months. Conclusion: It is important that we recognize that "asymptomatic" ethmoid sinus infection has the potential to produce intracranial complication – like in our patient whose neurologic deficits comprise a superior orbital fissure syndrome – in poorly controlled diabetics. Thus, when a patient consults with superior orbital fissure syndrome, the otolaryngologist should be aggressive in the management of possible sinus infection in high risk groups to prevent permanent disability of the eye and possible blindness.Title: Ethmoiditis in a diabetic as a cause of superior orbital fissure syndrome – A silent and potent threat to vision. Objective: To present a case of superior orbital fissure syndrome secondary to "asymptomatic" ethmoid sinusitis in a diabetic patient. Design: Case report. Setting: Tertiary hospital. Patients: One patient. Results: A case of a diabetic patient initially presenting with signs and symptoms of superior orbital fissure syndrome on the right (ptosis, ophthalmoplegia, decreased pupillary and corneal reflexes) but with no sinonasal signs and symptoms. Computed tomography (CT) scan revealed right posterior ethmoiditis. Patient was managed with broad spectrum antibiotics, steroids, and control of diabetes. Repeat CT scan after one week revealed partial resolution. Neurologic deficits resolved after two months. Conclusion: It is important that we recognize that "asymptomatic" ethmoid sinus infection has the potential to produce intracranial complication – like in our patient whose neurologic deficits comprise a superior orbital fissure syndrome – in poorly controlled diabetics. Thus, when a patient consults with superior orbital fissure syndrome, the otolaryngologist should be aggressive in the management of possible sinus infection in high risk groups to prevent permanent disability of the eye and possible blindness.

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Biomechanical Properties of Nasal Septal Cartilage. Part I: Tension

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Conflict of Interest/Disclosure: None Disclosed

Introduction Craniofacial defects are reconstructed using various implants including autografts, allografts, and synthetic biocompatible materials. Nasal septum is the most frequently used cartilage. However, recently there have been great advances in tissue engineering of cartilage constructs that may one day provide the ideal tissue for craniofacial reconstruction. To date the biomechanical properties of nasal septal cartilage have not been fully defined and therefore limit comparisons to tissue engineered constructs and other implant materials used for reconstruction within the head and neck Methods Human septal cartilage obtained from patients undergoing septoplasty or septorhinoplasty underwent tensile testing along the vertical axis, the anterior-posterior (AP) axis above the maxillary crest, and the AP axis within the maxillary crest to evaluate isotropic properties. At the conclusion of biomechanical testing, specimens were evaluated for glycosaminoglycan and collagen content. Results Fifty-five tensile tests (19 maxillary crest, 20 vertical, 16 anterior-posterior) were run on cartilage specimens obtained from 28 patients; average age 39 years (+/- 11.5 years); 12 females (43%), 16 males (57%). The average values for peak stress, failure strain, equilibrium modulus and ramp modulus were determined and compared to other load-bearing and non-load bearing cartilage. These results were not found to be significantly different ($p > 0.05$) with respect to axis, age group, or gender. Discussion As tissue engineered neocartilage approaches clinical applicability, it is critical to define its mechanical properties in relation to commonly used, or "gold standard", reconstructive materials such as the nasal septum. Additionally, because nasal septum is often the source of chondrocytes for tissue engineering, we strive to create neocartilage with similar biomechanical properties as the native tissue. This is the first description of the tensile properties of human septal cartilage and will provide a reference that various craniofacial reconstructive materials should be compared. Introduction Craniofacial defects are reconstructed using various implants including autografts, allografts, and synthetic biocompatible materials. Nasal septum is the most frequently used cartilage. However, recently there have been great advances in tissue engineering of cartilage constructs that may one day provide the ideal tissue for craniofacial reconstruction. To date the biomechanical properties of nasal septal cartilage have not been fully defined and therefore limit comparisons to tissue engineered constructs and other implant materials used for reconstruction within the head and neck Methods Human septal cartilage obtained from patients undergoing septoplasty or septorhinoplasty underwent tensile testing along the vertical axis, the anterior-posterior (AP) axis above the maxillary crest, and the AP axis within the maxillary crest to evaluate isotropic properties. At the conclusion of biomechanical testing, specimens were evaluated for glycosaminoglycan and collagen content. Results Fifty-five tensile tests (19 maxillary crest, 20 vertical, 16 anterior-posterior) were run on cartilage specimens obtained from 28 patients; average age 39 years (+/- 11.5 years); 12 females (43%), 16 males (57%). The average values for peak stress, failure strain, equilibrium modulus and ramp modulus were determined and compared to other load-bearing and non-load bearing cartilage. These results were not found to be significantly different ($p > 0.05$) with respect to axis, age group, or gender. Discussion As tissue engineered neocartilage approaches clinical applicability, it is critical to define its mechanical properties in relation to commonly used, or "gold standard", reconstructive materials such as the nasal septum. Additionally, because nasal septum is often the source of chondrocytes for tissue engineering, we strive to create neocartilage with similar biomechanical properties as the native tissue. This is the first description of the tensile properties of human septal cartilage and will provide a reference that various craniofacial reconstructive materials should be compared.

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An Evidence-Based Review Of The Medical Treatment Of Chronic Rhinosinusitis In Adults

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Conflict of Interest/Disclosure: None Disclosed

The medical treatment of chronic rhinosinusitis in adults remains controversial. To analyze this topic, an evidence-based review for the following questions was performed: Are regimens of oral or topical antibiotics beneficial? Are systemic or topical steroids beneficial? Are decongestants, leukotriene receptor antagonists, or antihistamines beneficial? A Medline search encompassing 1966-2003 yielded 25 articles using MeSH search terms "sinusitis/drug therapy". Modeled on evidence-based grading criteria by Sackett et al., articles were categorized based on research methodology. The evidence was then graded from A (consistent support) – D (inconsistent support) based on the ability to predict efficacy of the therapy. Fourteen of the 25 studies are case series, most of which involved antibiotics. There was high-grade (grade A) support for the use of oral antibiotics in the treatment of chronic sinusitis. The majority of randomized, controlled studies involved topical nasal steroids; however, there is inconsistent support (grade D) for use in chronic sinusitis. Notably, only 2 studies included oral steroids in treatment regimens with poorly designed studies supporting their use. There was less consistent support (grade C) for topical decongestants in 3 articles and grade C support for leukotriene receptor antagonists in 1 article. There was also grade C evidence refuting topical antibiotics. No articles addressed antihistamines. Based on this review, many of the medical therapies historically used in the treatment of chronic rhinosinusitis are not supported by the literature; therefore, further studies are required to determine the optimal medical therapy options in the management of chronic rhinosinusitis. The medical treatment of chronic rhinosinusitis in adults remains controversial. To analyze this topic, an evidence-based review for the following questions was performed: Are regimens of oral or topical antibiotics beneficial? Are systemic or topical steroids beneficial? Are decongestants, leukotriene receptor antagonists, or antihistamines beneficial? A Medline search encompassing 1966-2003 yielded 25 articles using MeSH search terms "sinusitis/drug therapy". Modeled on evidence-based grading criteria by Sackett et al., articles were categorized based on research methodology. The evidence was then graded from A (consistent support) – D (inconsistent support) based on the ability to predict efficacy of the therapy. Fourteen of the 25 studies are case series, most of which involved antibiotics. There was high-grade (grade A) support for the use of oral antibiotics in the treatment of chronic sinusitis. The majority of randomized, controlled studies involved topical nasal steroids; however, there is inconsistent support (grade D) for use in chronic sinusitis. Notably, only 2 studies included oral steroids in treatment regimens with poorly designed studies supporting their use. There was less consistent support (grade C) for topical decongestants in 3 articles and grade C support for leukotriene receptor antagonists in 1 article. There was also grade C evidence refuting topical antibiotics. No articles addressed antihistamines. Based on this review, many of the medical therapies historically used in the treatment of chronic rhinosinusitis are not supported by the literature; therefore, further studies are required to determine the optimal medical therapy options in the management of chronic rhinosinusitis.

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Rhinocerebral Mucormycosis and Hyperbaric Oxygen Therapy: A 20-Year Experience

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Conflict of Interest/Disclosure: None Disclosed

Rhinocerebral mucormycosis is an uncommon, but highly morbid fungal infection. It occurs almost exclusively in the immunosuppressed patient, with a high predilection for diabetic patients in ketoacidosis. The growth of these fungal elements leads to vascular invasion and ischemia, which propagates its advancement. Standard therapy includes aggressive surgical debridement of all nonviable tissue and intravenous antifungals. The use of hyperbaric oxygen as an adjunct to treatment is attractive because it reduces ischemia and acidosis and is a relatively benign therapeutic option. However, no controlled studies have proven its efficacy. Overall survival has been linked with control of the underlying cause of immunosuppression as well as prompt diagnosis. Survival has improved over time, and is generally reported to be 50 to 80%. We review our institution's experience with rhinocerebral mucormycosis and hyperbaric oxygen therapy as an adjunct to aggressive surgical debridement and intravenous antifungal medications. Twenty-three patients were treated with this combination of therapy between 1983 and 2003 with an overall survival of 74%.Rhinocerebral mucormycosis is an uncommon, but highly morbid fungal infection. It occurs almost exclusively in the immunosuppressed patient, with a high predilection for diabetic patients in ketoacidosis. The growth of these fungal elements leads to vascular invasion and ischemia, which propagates its advancement. Standard therapy includes aggressive surgical debridement of all nonviable tissue and intravenous antifungals. The use of hyperbaric oxygen as an adjunct to treatment is attractive because it reduces ischemia and acidosis and is a relatively benign therapeutic option. However, no controlled studies have proven its efficacy. Overall survival has been linked with control of the underlying cause of immunosuppression as well as prompt diagnosis. Survival has improved over time, and is generally reported to be 50 to 80%. We review our institution's experience with rhinocerebral mucormycosis and hyperbaric oxygen therapy as an adjunct to aggressive surgical debridement and intravenous antifungal medications. Twenty-three patients were treated with this combination of therapy between 1983 and 2003 with an overall survival of 74%.

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Endoscopic Management of Orbital Blow-out Fracture

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Conflict of Interest/Disclosure: None Disclosed

Orbital blow-out fractures are caused by direct trauma to the globe, usually by a blunt object. As the fluid in the globe is not compressible, the force of impact is transmitted to the weakest part of the orbit (i.e. the floor and the lamina papyracea). As a result, the orbital contents herniate into the maxillary sinus, with or without entrapment. The conventional method to reduce the fracture is by exploration of the floor of the orbit, and/or a Caldwell-Luc approach through the maxillary sinus. Although these approaches are satisfactory, the morbidity may be reduced considerably by an endoscopic-assisted approach through the maxillary antrum. Technique: The fracture site is approached through an osteoplastic maxillary antrostomy, the fracture is assessed, and the sinus cavity is cleaned. The reduction is accomplished by reversing the same dynamics that created the blow-out fracture –that is by positioning an appropriate sized foley catheter under the fracture site and gradually inflating it until the fracture is reduced in place. Fixation is achieved by application of fibrin glue to the fracture site. This method may be useful in selected cases, considerably reducing the operating time and complications. Endoscopic-assisted approach for reduction of orbital blow-out fracture is presented as an alternate approach to the conventional treatment. This approach is minimally invasive, provides excellent visualization to assess the defect, and is virtually atraumatic. Additionally, osteoplastic maxillary antrostomy avoids the complications associated with the Caldwell-Luc approach. Illustrative case, photos, and graphics are presented. Orbital blow-out fractures are caused by direct trauma to the globe, usually by a blunt object. As the fluid in the globe is not compressible, the force of impact is transmitted to the weakest part of the orbit (i.e. the floor and the lamina papyracea). As a result, the orbital contents herniate into the maxillary sinus, with or without entrapment. The conventional method to reduce the fracture is by exploration of the floor of the orbit, and/or a Caldwell-Luc approach through the maxillary sinus. Although these approaches are satisfactory, the morbidity may be reduced considerably by an endoscopic-assisted approach through the maxillary antrum. Technique: The fracture site is approached through an osteoplastic maxillary antrostomy, the fracture is assessed, and the sinus cavity is cleaned. The reduction is accomplished by reversing the same dynamics that created the blow-out fracture –that is by positioning an appropriate sized foley catheter under the fracture site and gradually inflating it until the fracture is reduced in place. Fixation is achieved by application of fibrin glue to the fracture site. This method may be useful in selected cases, considerably reducing the operating time and complications. Endoscopic-assisted approach for reduction of orbital blow-out fracture is presented as an alternate approach to the conventional treatment. This approach is minimally invasive, provides excellent visualization to assess the defect, and is virtually atraumatic. Additionally, osteoplastic maxillary antrostomy avoids the complications associated with the Caldwell-Luc approach. Illustrative case, photos, and graphics are presented.

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Surgical Management of Frontal Sinus Osteomas

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Osteomas are the most common benign neoplasm of the paranasal sinuses. Frontal sinus osteomas can be asymptomatic or cause frontal pain, headache, and outflow tract obstruction. Several surgical approaches are at the disposal of the sinus surgeon for addressing these tumors including open, combined, and endoscopic techniques. A variety of patient and tumor characteristics play a key role in surgical planning for successful treatment of these tumors. Methods: A retrospective chart review was performed of patients referred for evaluation and treatment of frontal sinus osteomas. Patient characteristics including age, sex, location of osteoma, and symptoms were recorded. Treatment course was reviewed with emphasis on surgical planning, surgical approach selection, intraoperative findings, complications, and long term results including recurrence and frontal ostium patency. Results are compared with other reported series and cases in the literature. Results: 11 patients were included in the study; six men and five women. Age ranged from seventeen to fifty-nine years. Common presenting symptoms were ranked. Two patients underwent an open approach, one patient underwent a combined approach, and eight patients underwent a completely endoscopic approach. Complication rates were low. Follow up ranged from one week to six years with an average follow up of twelve months. Conclusion: Resection of symptomatic frontal sinus osteomas can be a challenging surgical task. Choosing the appropriate surgical approach based on individual patient characteristics allows for complete tumor resection with low complication rates and excellent long-term results. Introduction: Osteomas are the most common benign neoplasm of the paranasal sinuses. Frontal sinus osteomas can be asymptomatic or cause frontal pain, headache, and outflow tract obstruction. Several surgical approaches are at the disposal of the sinus surgeon for addressing these tumors including open, combined, and endoscopic techniques. A variety of patient and tumor characteristics play a key role in surgical planning for successful treatment of these tumors. Methods: A retrospective chart review was performed of patients referred for evaluation and treatment of frontal sinus osteomas. Patient characteristics including age, sex, location of osteoma, and symptoms were recorded. Treatment course was reviewed with emphasis on surgical planning, surgical approach selection, intraoperative findings, complications, and long term results including recurrence and frontal ostium patency. Results are compared with other reported series and cases in the literature. Results: 11 patients were included in the study; six men and five women. Age ranged from seventeen to fifty-nine years. Common presenting symptoms were ranked. Two patients underwent an open approach, one patient underwent a combined approach, and eight patients underwent a completely endoscopic approach. Complication rates were low. Follow up ranged from one week to six years with an average follow up of twelve months. Conclusion: Resection of symptomatic frontal sinus osteomas can be a challenging surgical task. Choosing the appropriate surgical approach based on individual patient characteristics allows for complete tumor resection with low complication rates and excellent long-term results.

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Image-Guided Sinus Surgery Opinions & Trends: A National Survey

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Conflict of Interest/Disclosure: Winston Vaughan, Scientific Advisory Panel, SinusPharmacy

Introduction: Since its introduction in the mid 1990's for functional endoscopic sinus surgery (FESS), image-guided surgery (IGS) has become increasingly popular. However, despite its increased use, there is no consensus regarding its exact role. A nationwide survey was conducted to examine trends, opinions, and reimbursement patterns. Methods: A detailed, anonymous survey was mailed to otolaryngologists in 2004. Results: 73% of respondents use IGS. Of the respondents who do not use IGS, the most common reasons cited were equipment costs and the impression that it did not aid their surgery (27% and 26%). 30% of respondents felt that IGS should be the "standard of care" for certain cases such as revision, frontal, and advanced endoscopic procedures. 78% felt that IGS allows for safer surgery, and 86% felt that IGS allows for more complete surgery. Regarding reimbursement, 40% stated they receive reimbursement less than 50% of the time they charge for IGS. 25% of respondents report they do not charge at all for surgical navigation. Conclusions: A majority of otolaryngologists practicing FESS appear to incorporate IGS into their practice at some level. Most of these felt that IGS allows for safer and more complete surgery. However, the majority of respondents do not consider IGS the "standard of care". Reimbursement appears to be often denied even in 2004. Introduction: Since its introduction in the mid 1990's for functional endoscopic sinus surgery (FESS), image-guided surgery (IGS) has become increasingly popular. However, despite its increased use, there is no consensus regarding its exact role. A nationwide survey was conducted to examine trends, opinions, and reimbursement patterns. Methods: A detailed, anonymous survey was mailed to otolaryngologists in 2004. Results: 73% of respondents use IGS. Of the respondents who do not use IGS, the most common reasons cited were equipment costs and the impression that it did not aid their surgery (27% and 26%). 30% of respondents felt that IGS should be the "standard of care" for certain cases such as revision, frontal, and advanced endoscopic procedures. 78% felt that IGS allows for safer surgery, and 86% felt that IGS allows for more complete surgery. Regarding reimbursement, 40% stated they receive reimbursement less than 50% of the time they charge for IGS. 25% of respondents report they do not charge at all for surgical navigation. Conclusions: A majority of otolaryngologists practicing FESS appear to incorporate IGS into their practice at some level. Most of these felt that IGS allows for safer and more complete surgery. However, the majority of respondents do not consider IGS the "standard of care". Reimbursement appears to be often denied even in 2004.

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The Effect Of Histamine On Rhinovirus-16 Infection In Airway Epithelial Cells

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Conflict of Interest/Disclosure: This study was supported by Grant (2004-354) form the Asan Institute for Life Sciences, Seoul, South Korea.

Introduction: There are few reports whether allergy promotes rhinovirus infection or aggravates symptoms of common cold due to rhinovirus. Histamine is one of the most important mediators inducing symptoms of allergic rhinitis and asthma. We aimed to investigate the effect of histamine on rhinovirus-16 infection in airway epithelial cells. Methods: Cultured A549 cells were divided into control group, histamine only group, rhinovirus-16 only group, histamine and rhinovirus group respectively. Histamine concentrations were 10-5, 10-4, 10-3 mole/liter. After 24 hours incubation, mean fluorescence intensity (MFI) of intercellular adhesion molecule-1 (ICAM-1) was estimated by flow cytometry in each group and concentrations of interleukin-8 (IL-8) and interleukin-6 (IL-6) were measured by enzyme-linked immunosorbent assay method. Viral titers of rhinovirus-16 were measured by tissue cytopathic effect of lung fibroblast after serial dilution. Results: Histamine and rhinovirus didn't show the synergistic effect in MFI of ICAM-1 or IL-6 release. However, IL-8 release was increased in histamine only group or rhinovirus only group than control group. ($p<0.05$) IL-8 release was more increased in histamine and rhinovirus group than histamine only group or rhinovirus only group. ($p<0.05$) Viral titer was increased in histamine and rhinovirus group than rhinovirus only group by dose dependent manner. ($p<0.01$) Conclusion: Histamine may potentiate the release of interleukin-8 after rhinovirus-16 infection and may promote the proliferation of rhinovirus-16 in airway epithelial cells by dose dependent manner. Introduction: There are few reports whether allergy promotes rhinovirus infection or aggravates symptoms of common cold due to rhinovirus. Histamine is one of the most important mediators inducing symptoms of allergic rhinitis and asthma. We aimed to investigate the effect of histamine on rhinovirus-16 infection in airway epithelial cells. Methods: Cultured A549 cells were divided into control group, histamine only group, rhinovirus-16 only group, histamine and rhinovirus group respectively. Histamine concentrations were 10-5, 10-4, 10-3 mole/liter. After 24 hours incubation, mean fluorescence intensity (MFI) of intercellular adhesion molecule-1 (ICAM-1) was estimated by flow cytometry in each group and concentrations of interleukin-8 (IL-8) and interleukin-6 (IL-6) were measured by enzyme-linked immunosorbent assay method. Viral titers of rhinovirus-16 were measured by tissue cytopathic effect of lung fibroblast after serial dilution. Results: Histamine and rhinovirus didn't show the synergistic effect in MFI of ICAM-1 or IL-6 release. However, IL-8 release was increased in histamine only group or rhinovirus only group than control group. ($p<0.05$) IL-8 release was more increased in histamine and rhinovirus group than histamine only group or rhinovirus only group. ($p<0.05$) Viral titer was increased in histamine and rhinovirus group than rhinovirus only group by dose dependent manner. ($p<0.01$) Conclusion: Histamine may potentiate the release of interleukin-8 after rhinovirus-16 infection and may promote the proliferation of rhinovirus-16 in airway epithelial cells by dose dependent manner.

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An Update in the Endoscopic Management of Benign Sinonasal Tumors

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Traditional surgical management of benign sinonasal tumors have been approached externally, however with advancements in endoscopic sinus surgery sinonasal tumors may be managed endoscopically. Materials and Methods: A retrospective chart review was performed on patients with sinonasal tumors between 1991 and 2004 at the University of Virginia. Patients who were treated endoscopically as well as externally were examined. Their demographic data, surgical management, complications, recurrence rate, and length of follow-up were gathered. Results: Of the 29 patients in the study, 27 patients were managed endoscopically and 2 were managed with externally (osteoplastic flap). Two patients were managed externally because frontal sinus disease. Tumors were osteomas, ossifying fibromas, fibrous dysplasia, cholesteral granuloma, meningioma, minor salivary gland tumors, recurrent pituitary adenoma, inflammatory pseudotumor, lobular capillary hemangioma. 3 patients had recurrence necessitating revision surgery (2 endoscopically, 1 osteoplastic flap)(2 ossifying fibroma, 1 osteoma). There was only one complication (3.7%), a CSF leak from a combined Osteoplastic flap and Modified Lothrop endoscopic resection of an osteoma from the frontal sinus. The range of follow-up was 0.5 to 11 years with a median of 4.0 years. Conclusion: Endoscopic excision of sinonasal tumors is a viable alternative to the traditional external management. However the variety of sinonasal tumors with their natural clinical course should dictate the managements of these tumors.
Introduction: Traditional surgical management of benign sinonasal tumors have been approached externally, however with advancements in endoscopic sinus surgery sinonasal tumors may be managed endoscopically. Materials and Methods: A retrospective chart review was performed on patients with sinonasal tumors between 1991 and 2004 at the University of Virginia. Patients who were treated endoscopically as well as externally were examined. Their demographic data, surgical management, complications, recurrence rate, and length of follow-up were gathered. Results: Of the 29 patients in the study, 27 patients were managed endoscopically and 2 were managed with externally (osteoplastic flap). Two patients were managed externally because frontal sinus disease. Tumors were osteomas, ossifying fibromas, fibrous dysplasia, cholesteral granuloma, meningioma, minor salivary gland tumors, recurrent pituitary adenoma, inflammatory pseudotumor, lobular capillary hemangioma. 3 patients had recurrence necessitating revision surgery (2 endoscopically, 1 osteoplastic flap)(2 ossifying fibroma, 1 osteoma). There was only one complication (3.7%), a CSF leak from a combined Osteoplastic flap and Modified Lothrop endoscopic resection of an osteoma from the frontal sinus. The range of follow-up was 0.5 to 11 years with a median of 4.0 years. Conclusion: Endoscopic excision of sinonasal tumors is a viable alternative to the traditional external management. However the variety of sinonasal tumors with their natural clinical course should dictate the managements of these tumors.

WITHDRAWN

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Clinical characteristics of maxillary sinus organized hematoma

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Organized hematoma can occur in the unaerated maxillary sinus. But there were few reports about organized hematoma of the maxillary sinus. Blood clot accumulation (ex. facial trauma, postoperative bleeding, vessel injury and idiopathic disease) and poor ventilation can cause organized hematoma by means of neovascularization and fibrosis. We aimed to present clinical characteristics, radiological findings, histopathologic findings and treatment results of organized hematoma of the maxillary sinus. Methods: We have reviewed 16 cases of organized hematoma of the maxillary sinus treated between April 1998 and December 2003 retrospectively. Results: The patients were ten men and six women (mean age 51 years). All of them had a history of frequent epistaxis. They also complained of nasal obstruction, hyposmia, headache, cheek pain and cheek swelling. At endoscopic nasal examination, a reddish easily bleeding mass was noted in nasal cavity. In six patients, bone destruction was observed on the computed tomogram (CT) scans and first impression before biopsy was malignancy. However, biopsy didn't prove malignancy in any one. If bone destruction was absent on the CT scans, the first impression was diverse. The treatment modalities were medial maxillectomy, Denker's operation, Caldwell-Luc's operation and endoscopic sinus surgery, and the outcomes were successful. Conclusions: Organized hematoma of maxillary sinus is not so rare disease and can mimic malignancy on the CT scans. Organized hematoma should be included in the differential diagnosis when patients show frequent epistaxis and an expansile mass in the maxillary sinus.Introduction: Organized hematoma can occur in the unaerated maxillary sinus. But there were few reports about organized hematoma of the maxillary sinus. Blood clot accumulation (ex. facial trauma, postoperative bleeding, vessel injury and idiopathic disease) and poor ventilation can cause organized hematoma by means of neovascularization and fibrosis. We aimed to present clinical characteristics, radiological findings, histopathologic findings and treatment results of organized hematoma of the maxillary sinus. Methods: We have reviewed 16 cases of organized hematoma of the maxillary sinus treated between April 1998 and December 2003 retrospectively. Results: The patients were ten men and six women (mean age 51 years). All of them had a history of frequent epistaxis. They also complained of nasal obstruction, hyposmia, headache, cheek pain and cheek swelling. At endoscopic nasal examination, a reddish easily bleeding mass was noted in nasal cavity. In six patients, bone destruction was observed on the computed tomogram (CT) scans and first impression before biopsy was malignancy. However, biopsy didn't prove malignancy in any one. If bone destruction was absent on the CT scans, the first impression was diverse. The treatment modalities were medial maxillectomy, Denker's operation, Caldwell-Luc's operation and endoscopic sinus surgery, and the outcomes were successful. Conclusions: Organized hematoma of maxillary sinus is not so rare disease and can mimic malignancy on the CT scans. Organized hematoma should be included in the differential diagnosis when patients show frequent epistaxis and an expansile mass in the maxillary sinus.

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The Histopathological Characteristics in Patients with Nasal Polyposis

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Conflict of Interest/Disclosure: None Disclosed

Introduction Nasal polyposis (NP) can be divided into inflammatory polyp and allergic polyp. It is already reported most of NP is allergic polyp in western countries. The purpose are to evaluate histopathological aspects of nasal polyposis in Korea and to differentiate histopathological characteristics between nasal polyps and other inflammed nasal mucosa Methods Nasal tissue were obtained respectively in uncinate process, maxillary sinus, and polyp in 16 patients with NP from Mar 2003 to Aug 2003. Allergy test was done in all patients. The study was performed by light-microscope at the level of lamina propria. Eosinophil, lymphocyte, PMN, plasma cell and mast cell were examined. Grouping was done by non-eosinophil dominant and eosinophil dominant. Results Non-eosinophil dominant and eosinophil dominant group were 9 and 6 cases respectively. Positive allergy test were observed in 1 patient in each group. No definite difference exists between the two groups in total inflammatory cell counts. There are increased eosinophils also in maxillary sinus and mast cells are more frequently observed in polyps than in uncinate process & maxillary sinus in eosinophil dominant group. In non - eosinophil dominant groups, plasma cells are more frequently observed in polyps than in uncinate process & maxillary sinus Conclusions Different histopathological aspects of nasal polyps exist in Korea comparing with those of western countries ; Non-eosinophil dominant group has the main portion of NP. Allergic role in pathogenesis of nasal polyposis is unclear. Further studies with regards to clinical outcomes are needed. Introduction Nasal polyposis (NP) can be divided into inflammatory polyp and allergic polyp. It is already reported most of NP is allergic polyp in western countries. The purpose are to evaluate histopathological aspects of nasal polyposis in Korea and to differentiate histopathological characteristics between nasal polyps and other inflammed nasal mucosa Methods Nasal tissue were obtained respectively in uncinate process, maxillary sinus, and polyp in 16 patients with NP from Mar 2003 to Aug 2003. Allergy test was done in all patients. The study was performed by light-microscope at the level of lamina propria. Eosinophil, lymphocyte, PMN, plasma cell and mast cell were examined. Grouping was done by non-eosinophil dominant and eosinophil dominant. Results Non-eosinophil dominant and eosinophil dominant group were 9 and 6 cases respectively. Positive allergy test were observed in 1 patient in each group. No definite difference exists between the two groups in total inflammatory cell counts. There are increased eosinophils also in maxillary sinus and mast cells are more frequently observed in polyps than in uncinate process & maxillary sinus in eosinophil dominant group. In non - eosinophil dominant groups, plasma cells are more frequently observed in polyps than in uncinate process & maxillary sinus Conclusions Different histopathological aspects of nasal polyps exist in Korea comparing with those of western countries ; Non-eosinophil dominant group has the main portion of NP. Allergic role in pathogenesis of nasal polyposis is unclear. Further studies with regards to clinical outcomes are needed.

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Evidence of turbinate atrophy with aging: Evaluation by Acoustic rhinometry and Rhinomanometry

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Conflict of Interest/Disclosure: None Disclosed

Background and Objectives: We usually hear that the nasal cavity becomes atrophic as we grow older. However, there is no exact data that prove senile atrophic change of nasal cavity. So we evaluated the effect of aging on the dimension and the resistance of nasal cavity. Materials and Methods: 112 healthy subjects free of nasal disease such as septal deviation and rhinitis, prior nasal operation, or systemic disease are included in this study. Acoustic rhinometry and rhinomanometry were performed before and after phenylephrine application. The subjects were classified into 4 age groups (1-14, 15-29, 30-49, 50-69 years) and data were analyzed among each group. Results: The average value of C-notch before and after congestion were on the increase with age, however, the difference of C-notch between pre-decongestion and post-decongestion did not change significantly with age. Rhinomanometry showed that nasal resistance was 0.86, 0.51, 0.49, 0.38 (Pa/cm3/sec) before congestion and 0.60, 0.30, 0.32, 0.27 (Pa/cm3/sec) after congestion with each age group, respectively. The nasal resistance showed decreasing tendency with age. We can deduce that senile nasal atrophy results from structural factor rather than mucosal factor. Conclusion: The dimension of nasal cavity increases and the nasal resistance decreases with age. The senile atrophy of nasal cavity seems to be attributed by structural change rather than mucosal change.Background and Objectives: We usually hear that the nasal cavity becomes atrophic as we grow older. However, there is no exact data that prove senile atrophic change of nasal cavity. So we evaluated the effect of aging on the dimension and the resistance of nasal cavity. Materials and Methods: 112 healthy subjects free of nasal disease such as septal deviation and rhinitis, prior nasal operation, or systemic disease are included in this study. Acoustic rhinometry and rhinomanometry were performed before and after phenylephrine application. The subjects were classified into 4 age groups (1-14, 15-29, 30-49, 50-69 years) and data were analyzed among each group. Results: The average value of C-notch before and after congestion were on the increase with age, however, the difference of C-notch between pre-decongestion and post-decongestion did not change significantly with age. Rhinomanometry showed that nasal resistance was 0.86, 0.51, 0.49, 0.38 (Pa/cm3/sec) before congestion and 0.60, 0.30, 0.32, 0.27 (Pa/cm3/sec) after congestion with each age group, respectively. The nasal resistance showed decreasing tendency with age. We can deduce that senile nasal atrophy results from structural factor rather than mucosal factor. Conclusion: The dimension of nasal cavity increases and the nasal resistance decreases with age. The senile atrophy of nasal cavity seems to be attributed by structural change rather than mucosal change.

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Proliferation, Angiogenesis And Hormonal Markersin Juvenile Nasopharyngeal Angiofibroma

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Conflict of Interest/Disclosure: None Disclosed

Objective: The aims of this study is to compare clinical and histological findings and to investigate the correlation between tumor stage and recurrence Type: Retrospective study of 26 cases of juvenile nasopharyngeal angiofibroma those operated at the Department of Otorhinolaryngology of Hacettepe University (Ankara, Turkey) between 1983-2002. Methodology: The medical records of 26 patients operated between 1983 and 2002 with JNA were reviewed and specimens were stained with estrogen receptor, progesterone receptor, Transforming growth factor beta 1 (TGF-B1) for stromal cell proliferation, Vascular endothelial growth factor (VEGF) for angiogenesis and policlonal nuclear antigen (PCNA) for proliferation. The percentages of cells staining positively were determined semiquantitatively by visual methods. Findings: The ages of the 26 patients were between 10 to 34 years. 23 patients underwent primary surgical treatment at our department and 3 patients were treated for recurrence following primary surgery elsewhere. Endoscopic approach was used for 9 patients, 2 patients were treated by Weber Ferguson approach, lateral rhinotomy approach was used for 3 patients, 10 patients were treated by transpalatal approach and combined lateral rhinotomi and transpalatal approach was used for 2 patients. Craniotomy combined to other approaches was required for 3 patients. Patients were followed up minimum 12 months, maximum 72 months. Recurrence was seen in 4 patients and these were treated surgically. Radiation was used for only 1 patient. Of 26 cases, 10 showed strong positive staining with TGF-B1 and there were no staining 11 patients. Eight cases showed strong positive staining and six cases showed no staining with VEGF. PCNA was positive in all specimens but in four cases ratio of stained cells were under %50. Estrogen receptors were detected in 2 cases and progesterone receptors were detected in 3 cases strongly. Result: There was no correlation between recurrence rates and all markers. Tumors infiltrated infratemporal fossa and orbit were stained strongly but no difference was found for intracranial extension. Aggressiveness of tumor should not be determined by any marker. Surgical approach should selected more carefully to avoid recurrence. Objective: The aims of this study is to compare clinical and histological findings and to investigate the correlation between tumor stage and recurrence Type: Retrospective study of 26 cases of juvenile nasopharyngeal angiofibroma those operated at the Department of Otorhinolaryngology of Hacettepe University (Ankara, Turkey) between 1983-2002. Methodology: The medical records of 26 patients operated between 1983 and 2002 with JNA were reviewed and specimens were stained with estrogen receptor, progesterone receptor, Transforming growth factor beta 1 (TGF-B1) for stromal cell proliferation, Vascular endothelial growth factor (VEGF) for angiogenesis and policlonal nuclear antigen (PCNA) for proliferation. The percentages of cells staining positively were determined semiquantitatively by visual methods. Findings: The ages of the 26 patients were between 10 to 34 years. 23 patients underwent primary surgical treatment at our department and 3 patients were treated for recurrence following primary surgery elsewhere. Endoscopic approach was used for 9 patients, 2 patients were treated by Weber Ferguson approach, lateral rhinotomy approach was used for 3 patients, 10 patients were treated by transpalatal approach and combined lateral rhinotomi and transpalatal approach was used for 2 patients. Craniotomy combined to other approaches was required for 3 patients. Patients were followed up minimum 12 months, maximum 72 months. Recurrence was seen in 4 patients and these were treated surgically. Radiation was used for only 1 patient. Of 26 cases, 10 showed strong positive staining with TGF-B1 and there were no staining 11 patients. Eight cases showed strong positive staining and six cases showed no staining with VEGF. PCNA was positive in all specimens but in four cases ratio of stained cells were under %50. Estrogen receptors were detected in 2 cases and progesterone receptors were detected in 3 cases strongly. Result: There was no correlation between recurrence rates and all markers. Tumors infiltrated infratemporal fossa and orbit were stained strongly but no difference was found for intracranial extension. Aggressiveness of tumor should not be determined by any marker. Surgical approach should selected more carefully to avoid recurrence.

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Modeling Pre- & Post-Operative Airflow And Odorant Delivery Pattern In The Nasal Cavity: A Quantitative Evaluation Of Surgical Intervention

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Conflict of Interest/Disclosure: None Disclosed

Mechanical obstruction of odorant flow to olfactory receptor sites may be a primary cause of olfactory loss in nasal-sinus disease patients. Accordingly, surgical intervention can effectively facilitate recovery of olfactory ability. Unfortunately, quantifying surgical results using standard rhinometric assays (e.g. rhinomanometry, acoustic rhinometry) is inadequate. Relatively small perturbations in the anatomy of the nasal cavity in specific regions can induce large changes in localized airflow and odorant mass transport rate without effecting the total nasal airflow rate. Using computational fluid dynamics (CFD) techniques, we can convert patient CT scans into anatomically accurate 3-D numerical nasal models that predict nasal airflow and odorant delivery patterns. These models can also be modified to reflect anatomical changes, e.g. following endoscopic surgery. Our goal is to correlate patient olfactory recovery with improvement of airflow and odorant delivery rate to receptor sites following treatment. In this preliminary study, we followed the treatment of a patient who had chronic rhinosinusitis with nasal polyposis and had lost most of her olfactory ability, but recovered it (as assessed psychophysically) following endoscopic sinus surgery. CFD modeling of this patient's nose before and after surgery showed significant improvement in ortho- and retronasal airflow and olfactory odorant delivery rate (> 1000 times), and suggested that remodeling the airway was a significant factor leading to the recovery of olfactory function. In the future, such modeling techniques may provide a quantitative evaluation of surgical procedures and an important pre-operative guide to the optimization of airflow and odorant delivery in the human nose. Mechanical obstruction of odorant flow to olfactory receptor sites may be a primary cause of olfactory loss in nasal-sinus disease patients. Accordingly, surgical intervention can effectively facilitate recovery of olfactory ability. Unfortunately, quantifying surgical results using standard rhinometric assays (e.g. rhinomanometry, acoustic rhinometry) is inadequate. Relatively small perturbations in the anatomy of the nasal cavity in specific regions can induce large changes in localized airflow and odorant mass transport rate without effecting the total nasal airflow rate. Using computational fluid dynamics (CFD) techniques, we can convert patient CT scans into anatomically accurate 3-D numerical nasal models that predict nasal airflow and odorant delivery patterns. These models can also be modified to reflect anatomical changes, e.g. following endoscopic surgery. Our goal is to correlate patient olfactory recovery with improvement of airflow and odorant delivery rate to receptor sites following treatment. In this preliminary study, we followed the treatment of a patient who had chronic rhinosinusitis with nasal polyposis and had lost most of her olfactory ability, but recovered it (as assessed psychophysically) following endoscopic sinus surgery. CFD modeling of this patient's nose before and after surgery showed significant improvement in ortho- and retronasal airflow and olfactory odorant delivery rate (> 1000 times), and suggested that remodeling the airway was a significant factor leading to the recovery of olfactory function. In the future, such modeling techniques may provide a quantitative evaluation of surgical procedures and an important pre-operative guide to the optimization of airflow and odorant delivery in the human nose.

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Use of Acupuncture in the Treatment of Sinonasal Symptoms: Results of a Practitioner Survey

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Conflict of Interest/Disclosure: None Disclosed

Introduction: The use of complementary medicine is becoming increasingly popular in the United States. In order to characterize the use of acupuncture in treating patients with chronic sinonasal symptoms we designed a survey of regional licensed acupuncturists to query the percentage of acupuncture patients who are treated for chronic sinonasal symptoms, the perceived efficacy of such treatments, and the specific acupuncture points used. Methods: A list or regional licensed acupuncturists was obtained from the state acupuncture board. Regional licensed acupuncturists (1,516) were mailed our acupuncture and sinonasal symptoms survey. Results: 331 surveys (22%) were returned. Ninety-nine percent of acupuncturists who returned surveys reported treating patients with chronic sinonasal symptoms. On average 19% of their patients reported sinonasal complaints and these symptoms were almost always treated with acupuncture. On a five point scale the mean perceived efficacy for the overall treatment of chronic sinonasal symptoms was 4.24. Nasal congestion, sinus headache, and facial pressure were the symptoms perceived to be most effectively treated with acupuncture ($p<.001$ when compared to overall efficacy) while post-nasal drainage and allergy were perceived to be less effectively treated with acupuncture ($p<.001$). The mean cost of an acupuncture treatment course for chronic sinonasal symptoms was calculated to be $750.00. Conclusions: Acupuncturists devote a significant portion of their practices to the treatment of patients with chronic sinonasal symptoms. These practitioners report good efficacy using acupuncture to treat such symptoms. Further study is required to objectively evaluate the efficacy of acupuncture in the treatment of sinonasal disorders.
Introduction: The use of complementary medicine is becoming increasingly popular in the United States. In order to characterize the use of acupuncture in treating patients with chronic sinonasal symptoms we designed a survey of regional licensed acupuncturists to query the percentage of acupuncture patients who are treated for chronic sinonasal symptoms, the perceived efficacy of such treatments, and the specific acupuncture points used. Methods: A list or regional licensed acupuncturists was obtained from the state acupuncture board. Regional licensed acupuncturists (1,516) were mailed our acupuncture and sinonasal symptoms survey. Results: 331 surveys (22%) were returned. Ninety-nine percent of acupuncturists who returned surveys reported treating patients with chronic sinonasal symptoms. On average 19% of their patients reported sinonasal complaints and these symptoms were almost always treated with acupuncture. On a five point scale the mean perceived efficacy for the overall treatment of chronic sinonasal symptoms was 4.24. Nasal congestion, sinus headache, and facial pressure were the symptoms perceived to be most effectively treated with acupuncture ($p<.001$ when compared to overall efficacy) while post-nasal drainage and allergy were perceived to be less effectively treated with acupuncture ($p<.001$). The mean cost of an acupuncture treatment course for chronic sinonasal symptoms was calculated to be $750.00. Conclusions: Acupuncturists devote a significant portion of their practices to the treatment of patients with chronic sinonasal symptoms. These practitioners report good efficacy using acupuncture to treat such symptoms. Further study is required to objectively evaluate the efficacy of acupuncture in the treatment of sinonasal disorders.

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Chronic Invasive Fungal Rhinosinusitis in Immunocompetent Patients

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Conflict of Interest/Disclosure: None Disclosed

Chronic Invasive Fungal Rhinosinusitis in Immunocompetent Patients Introduction: Chronic invasive fungal sinusitis in immunocompetent hosts remains a poorly understood disease entity with scant literature to support an optimal treatment strategy. This study reports two cases of histologically-confirmed invasive fungal sinusitis in immunocompetent patients . Methods: A retrospective data analysis was performed to delineate the clinico-pathologic features of these patients. The surgical and medical strategies were reviewed. Results: Two immunocompetent patients presented with history of chronic rhinosinusitis (both male, ages 46 and 55 years). Chief complaints included facial pain and nasal congestion. These complaints remained refractory to traditional medical management, and each patient was subsequently taken to the operating room for endoscopic sinus surgery. Histologic evaluation of the surgical specimens revealed fungal invasion in each patient. Aspergillus was confirmed by histologic criteria alone in one patient, and in the second patient, subsequent fungal cultures showed Fusarium species on multiple occasions. Systemic and topical anti-fungal medications such as intravenous amphotericin-B, oral voriconazole, and amphotericin-B and itraconazole irrigations led to improvement in each patient's symptoms. Serial nasal endoscopy confirmed symptomatic nasal improvement. Conclusion: Chronic invasive fungal rhinosinusitis occurs in selected patients without overt evidence of immunocompromise. A clear understanding of the disease process may result in timely diagnosis and appropriate medical and surgical therapy.
Chronic Invasive Fungal Rhinosinusitis in Immunocompetent Patients Introduction: Chronic invasive fungal sinusitis in immunocompetent hosts remains a poorly understood disease entity with scant literature to support an optimal treatment strategy. This study reports two cases of histologically-confirmed invasive fungal sinusitis in immunocompetent patients . Methods: A retrospective data analysis was performed to delineate the clinico-pathologic features of these patients. The surgical and medical strategies were reviewed. Results: Two immunocompetent patients presented with history of chronic rhinosinusitis (both male, ages 46 and 55 years). Chief complaints included facial pain and nasal congestion. These complaints remained refractory to traditional medical management, and each patient was subsequently taken to the operating room for endoscopic sinus surgery. Histologic evaluation of the surgical specimens revealed fungal invasion in each patient. Aspergillus was confirmed by histologic criteria alone in one patient, and in the second patient, subsequent fungal cultures showed Fusarium species on multiple occasions. Systemic and topical anti-fungal medications such as intravenous amphotericin-B, oral voriconazole, and amphotericin-B and itraconazole irrigations led to improvement in each patient's symptoms. Serial nasal endoscopy confirmed symptomatic nasal improvement. Conclusion: Chronic invasive fungal rhinosinusitis occurs in selected patients without overt evidence of immunocompromise. A clear understanding of the disease process may result in timely diagnosis and appropriate medical and surgical therapy.

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The Role of Biofilms in Chronic Rhinosinusitis

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Conflict of Interest/Disclosure: None Disclosed

The treatment of chronic and recurrent infectious diseases is focused on antibiotics designed to kill the causative agent. The formation of bacterial biofilm has been demonstrated in patients with chronic purulent otitis media, prostatitis, osteomyelitis, bacterial endocarditis, cystic fibrosis, pneumonia and habitual tonsillitis. Chronic and recurrent rhino-sinusitis (CRS) is a common disease poorly controlled by antibiotics. The aim of this study was to determine the presence of biofilms on the sinus mucosa. Biopsies of the sinus mucosa were taken during endoscopic sinus surgery. Specimens were preserved in liquid nitrogen and forwarded to the Biofilm laboratory at Northern Arizona University for FISH testing for Streptococcus pneumoniae, Staphylococcus aureus, Haemophilus influenza and Pseudomonas aeruginosa. The presence of biofilms was determined using Flourescent In-Situ Hybridization (FISH). Polymerase Chain Reaction (PCR) of the same mucosa was run for the same bacteria. The establishment of the presence of biofilms on the mucosa of chronic or recurrent rhino-sinusitis patients will suggest the cause of antimicrobial therapy failure. The presence of the biofilms would change the approach to treatment, redirecting it toward dissolution or inhibition of the matrix.The treatment of chronic and recurrent infectious diseases is focused on antibiotics designed to kill the causative agent. The formation of bacterial biofilm has been demonstrated in patients with chronic purulent otitis media, prostatitis, osteomyelitis, bacterial endocarditis, cystic fibrosis, pneumonia and habitual tonsillitis. Chronic and recurrent rhino-sinusitis (CRS) is a common disease poorly controlled by antibiotics. The aim of this study was to determine the presence of biofilms on the sinus mucosa. Biopsies of the sinus mucosa were taken during endoscopic sinus surgery. Specimens were preserved in liquid nitrogen and forwarded to the Biofilm laboratory at Northern Arizona University for FISH testing for Streptococcus pneumoniae, Staphylococcus aureus, Haemophilus influenza and Pseudomonas aeruginosa. The presence of biofilms was determined using Flourescent In-Situ Hybridization (FISH). Polymerase Chain Reaction (PCR) of the same mucosa was run for the same bacteria. The establishment of the presence of biofilms on the mucosa of chronic or recurrent rhino-sinusitis patients will suggest the cause of antimicrobial therapy failure. The presence of the biofilms would change the approach to treatment, redirecting it toward dissolution or inhibition of the matrix.

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A New Drug Protocol for the Treatment of Chronic Refractory Sinusitis

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Conflict of Interest/Disclosure: Peter J. Catalano, MD - Consultant,Stryker Corp.

Introduction: Chronic refractory sinusitis (CRFS) is considered, in many cases, to be secondary to a hypersensitivity reaction to inhaled fungi within the paranasal sinuses. Although different modes of therapy have been used to treat this disease, no studies have reported the ability to reverse or stabilize this process. The purpose of this study is to report on a novel drug protocol, which, when combined with endoscopic sinus surgery, has the ability to control, and potentially cure patients with this disease. Methods: In a prospective study, 102 patients were diagnosed with CRFS based on history, physical exam, and radiologic findings. Seventy-five patients were placed on a protocol comprised of oral itraconazole, a leukotriene inhibitor, and itraconazole nasal solution. The dose of itraconazole was weaned from 300mg daily over a minimum of 6 months. The remaining 27 patients, who were not candidates for this protocol, were designated as a control group. SNOT-20 outcome measurements were obtained before and after treatment for all study participants. Results: Of the 75 patients on protocol, 26 (34.7%) were successfully weaned off the medication and alleviated of recurrent symptoms. Thirty-eight (50.7%) additional patients had marked control of symptoms while on protocol; 11/75 (14.7%) patients were not responsive to the treatment. Patients responsive to treatment had significant improvement in SNOT-20 outcome compared to controls. Conclusions: Oral and aerosolized intraconazole, in conjunction with a leukotriene inhibitor and endoscopic sinus surgery, is an effective method of treatment for CRFS. Introduction: Chronic refractory sinusitis (CRFS) is considered, in many cases, to be secondary to a hypersensitivity reaction to inhaled fungi within the paranasal sinuses. Although different modes of therapy have been used to treat this disease, no studies have reported the ability to reverse or stabilize this process. The purpose of this study is to report on a novel drug protocol, which, when combined with endoscopic sinus surgery, has the ability to control, and potentially cure patients with this disease. Methods: In a prospective study, 102 patients were diagnosed with CRFS based on history, physical exam, and radiologic findings. Seventy-five patients were placed on a protocol comprised of oral itraconazole, a leukotriene inhibitor, and itraconazole nasal solution. The dose of itraconazole was weaned from 300mg daily over a minimum of 6 months. The remaining 27 patients, who were not candidates for this protocol, were designated as a control group. SNOT-20 outcome measurements were obtained before and after treatment for all study participants. Results: Of the 75 patients on protocol, 26 (34.7%) were successfully weaned off the medication and alleviated of recurrent symptoms. Thirty-eight (50.7%) additional patients had marked control of symptoms while on protocol; 11/75 (14.7%) patients were not responsive to the treatment. Patients responsive to treatment had significant improvement in SNOT-20 outcome compared to controls. Conclusions: Oral and aerosolized intraconazole, in conjunction with a leukotriene inhibitor and endoscopic sinus surgery, is an effective method of treatment for CRFS.

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Intracranial Mucocele: An Unusual Complication Of Endoscopic Repair Of Cerebrospinal Fluid Rhinorrhea

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Conflict of Interest/Disclosure: None Disclosed

Introduction CSF rhinorrhea following endoscopic sinus surgery is uncommon. It is often repaired endoscopically using nasal mucosa and cartilage. We describe an unusual occurrence of an intracranial mucocele resulting from this repair. Methods We present a 46-year-old woman who developed nasal obstructive symptoms and chronic sinusitis. A deviated septum and an incidental 7-mm pituitary adenoma were noted on MRI. The patient underwent FESS for bilateral maxillary antrostomies, total ethmoidectomies, sphenoidotomies, septoplasty, and cauterization of the left inferior turbinate. A CSF leak developed in the superior aspect of the sphenoid sinus as a result of suctioning blood and purulent material from the right sphenoid sinus. Mucosal and denuded bone grafts from the right middle turbinate were used to repair the leak. Results The patient did well postoperatively with no indication of continued CSF rhinorrhea. Serial MRIs were performed to evaluate further growth of the incidental pituitary adenoma. Two years postoperatively, no growth of the adenoma was seen, however a 13-mm mass was noted along the anterior cranial base at the junction of the cribriform plate and planum sphenoidale. This mass grew to 20-mm one year later with minimal enhancement with gadolinium and high signal intensity on T1-weighted images. Conclusions Due to routine follow up MRIs for the incidental pituitary adenoma, we were able to diagnose the asymptomatic mucocele. In this presentation, we will discuss the techniques of CSF rhinorrhea repair, the unique complication resulting in an intracranial mucocele, and proper orientation and placement of a mucosal graft in the repair. Introduction CSF rhinorrhea following endoscopic sinus surgery is uncommon. It is often repaired endoscopically using nasal mucosa and cartilage. We describe an unusual occurrence of an intracranial mucocele resulting from this repair. Methods We present a 46-year-old woman who developed nasal obstructive symptoms and chronic sinusitis. A deviated septum and an incidental 7-mm pituitary adenoma were noted on MRI. The patient underwent FESS for bilateral maxillary antrostomies, total ethmoidectomies, sphenoidotomies, septoplasty, and cauterization of the left inferior turbinate. A CSF leak developed in the superior aspect of the sphenoid sinus as a result of suctioning blood and purulent material from the right sphenoid sinus. Mucosal and denuded bone grafts from the right middle turbinate were used to repair the leak. Results The patient did well postoperatively with no indication of continued CSF rhinorrhea. Serial MRIs were performed to evaluate further growth of the incidental pituitary adenoma. Two years postoperatively, no growth of the adenoma was seen, however a 13-mm mass was noted along the anterior cranial base at the junction of the cribriform plate and planum sphenoidale. This mass grew to 20-mm one year later with minimal enhancement with gadolinium and high signal intensity on T1-weighted images. Conclusions Due to routine follow up MRIs for the incidental pituitary adenoma, we were able to diagnose the asymptomatic mucocele. In this presentation, we will discuss the techniques of CSF rhinorrhea repair, the unique complication resulting in an intracranial mucocele, and proper orientation and placement of a mucosal graft in the repair.

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Nasal Airflow During Respiratory Cycle

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Conflict of Interest/Disclosure: None Disclosed

Introduction: There have been several studies on the nasal airflow, using casts made from cadavers or cyber models reconstructed from CT or MRI data, but such studies only showed the patterns of the nasal airflow at steady state during respiration. Therefore, this study has attempted to observe the cycle of the nasal airflow during the respiration Methods: Three-dimensional virtual model of nasal cavity was reconstructed with medical image reconstruction software using 1.25 mm thickness CT data. A transparent nasal cavity model was made using a negative model of the reconstructed model made by rapid prototyping technique. Artificial respirator using pump and cam simulated the normal quiet respiration. The nasal airflow was observed with particle image velocimetry. Respiratory cycle was divided into 17 points and airflows were observed at each point. Results: During the inspiration, a maximal airflow was observed at the valve area and the main stream was noted around the middle meatus. During the expiration, larger flow was noted around the middle meatus comparing to the flow during the inspiration. Maximal turbulence was noted at the anterior to the middle turbinate during the inspiration. Vortexes were observed between the inspiration and the expiration. Conclusions: This result would widen our knowledge of the nasal airflow and this equipment would allow a more physiologic understanding of the nasal operations. Introduction: There have been several studies on the nasal airflow, using casts made from cadavers or cyber models reconstructed from CT or MRI data, but such studies only showed the patterns of the nasal airflow at steady state during respiration. Therefore, this study has attempted to observe the cycle of the nasal airflow during the respiration Methods: Three-dimensional virtual model of nasal cavity was reconstructed with medical image reconstruction software using 1.25 mm thickness CT data. A transparent nasal cavity model was made using a negative model of the reconstructed model made by rapid prototyping technique. Artificial respirator using pump and cam simulated the normal quiet respiration. The nasal airflow was observed with particle image velocimetry. Respiratory cycle was divided into 17 points and airflows were observed at each point. Results: During the inspiration, a maximal airflow was observed at the valve area and the main stream was noted around the middle meatus. During the expiration, larger flow was noted around the middle meatus comparing to the flow during the inspiration. Maximal turbulence was noted at the anterior to the middle turbinate during the inspiration. Vortexes were observed between the inspiration and the expiration. Conclusions: This result would widen our knowledge of the nasal airflow and this equipment would allow a more physiologic understanding of the nasal operations.

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Do Pulmonary Function Tests Improve in Patients with Cystic Fibrosis after Functional Endoscopic Sinus Surgery?

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Conflict of Interest/Disclosure: None Disclosed

Background – Studies investigating whether sinus surgery in patients with cystic fibrosis results in improved in pulmonary function have had mixed conclusions. Clinical findings of sinusitis are found in virtually all patients with cystic fibrosis and these findings do not directly correlate with the patient's functional status. Thus, clinicians are confronted with the dilemma of deciding which patients will benefit from surgery. Our bias was to select cystic fibrosis patients with worsening pulmonary status. We investigated our data and to see if the pulmonary function tests in our patients were declining preoperatively, and to see if these pulmonary function tests improved postoperatively. Methods – Records of patients with cystic fibrosis who underwent endoscopic sinus surgery were examined. Patients received preoperative and postoperative antibiotics and steroids. Patients met selection criteria if 1) an endoscopic maxillary antrostomy and anterior ethmoidectomy were performed and 2) pulmonary function tests were measured six and three months before and after surgery. Results: There was no statistical significance between pulmonary function tests between six and three months prior to surgery. Tests improved three months postoperatively when compared to three months preoperatively for FVC, FEV1, and FEF25-75 ($p<0.05$). This significance was maintained at six months postoperatively for only FVC. Conclusion - Patients treated with sinus surgery, had improvement in FVC, FEV1, and FEF25-75 at three months postoperatively. Significance was maintained at six months postoperatively for FVC. Background – Studies investigating whether sinus surgery in patients with cystic fibrosis results in improved in pulmonary function have had mixed conclusions. Clinical findings of sinusitis are found in virtually all patients with cystic fibrosis and these findings do not directly correlate with the patient's functional status. Thus, clinicians are confronted with the dilemma of deciding which patients will benefit from surgery. Our bias was to select cystic fibrosis patients with worsening pulmonary status. We investigated our data and to see if the pulmonary function tests in our patients were declining preoperatively, and to see if these pulmonary function tests improved postoperatively. Methods – Records of patients with cystic fibrosis who underwent endoscopic sinus surgery were examined. Patients received preoperative and postoperative antibiotics and steroids. Patients met selection criteria if 1) an endoscopic maxillary antrostomy and anterior ethmoidectomy were performed and 2) pulmonary function tests were measured six and three months before and after surgery. Results: There was no statistical significance between pulmonary function tests between six and three months prior to surgery. Tests improved three months postoperatively when compared to three months preoperatively for FVC, FEV1, and FEF25-75 ($p<0.05$). This significance was maintained at six months postoperatively for only FVC. Conclusion - Patients treated with sinus surgery, had improvement in FVC, FEV1, and FEF25-75 at three months postoperatively. Significance was maintained at six months postoperatively for FVC.

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The Role Of Hyperbaric Oxygen Therapy In The Management Of Invasive Fungal Sinusitis

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Conflict of Interest/Disclosure: None Disclosed

Aim: The role of hyperbaric oxygen therapy in the management of invasive fungal sinusitis Introduction: Invasive fungal sinusitis (rhinocerebral mucormycosis) is rapidly fatal and highly mutilating. Therapy is aimed at localizing the infection to the affected organ and preventing mortality from intracranial or systemic dissemination. Antifungal therapy, aggressive surgical debridement and supportive medical management have not improved the prognosis. The septated hyphae cause extensive tissue necrosis via vascular invasion, thrombosis, tissue hypoxia and acidosis. It is proposed that hyperbaric oxygen (HBO) therapy retards the necrosis by improving oxygenation distal to the thrombosed vessels, exerting its fungistatic and fungicidal properties by reversal of acidosis and generation of oxygen free radicals. Method: Retrospective review of all patients presenting to our department with invasive fungal sinusitis over the past 3 years. The survival outcome of those who received HBO therapy in addition to the usual treatment is compared to those who did not. Results: There were 6 patients with invasive fungal sinusitis. All were immunocompromised. All received aggressive antifungal therapy. All but one patient with systemic fungemia underwent extensive surgical debridement. 2 patients received additional hyperbaric oxygen therapy and they were both alive after one year. In one of them, the HBO therapy was effective in arresting the disease progression prior to optimization for surgery. Of the 4 without HBO therapy, only one survived for 14 weeks before succumbing to cerebral metastasis. The remaining 3 had a rapidly fatal outcome due to advanced fungal disease or intercurrent illness. Conclusion: The management of invasive fungal sinusitis can be optimized by targeting the underlying pathophysiology. The role of HBO therapy needs to be further examined. Aim: The role of hyperbaric oxygen therapy in the management of invasive fungal sinusitis Introduction: Invasive fungal sinusitis (rhinocerebral mucormycosis) is rapidly fatal and highly mutilating. Therapy is aimed at localizing the infection to the affected organ and preventing mortality from intracranial or systemic dissemination. Antifungal therapy, aggressive surgical debridement and supportive medical management have not improved the prognosis. The septated hyphae cause extensive tissue necrosis via vascular invasion, thrombosis, tissue hypoxia and acidosis. It is proposed that hyperbaric oxygen (HBO) therapy retards the necrosis by improving oxygenation distal to the thrombosed vessels, exerting its fungistatic and fungicidal properties by reversal of acidosis and generation of oxygen free radicals. Method: Retrospective review of all patients presenting to our department with invasive fungal sinusitis over the past 3 years. The survival outcome of those who received HBO therapy in addition to the usual treatment is compared to those who did not. Results: There were 6 patients with invasive fungal sinusitis. All were immunocompromised. All received aggressive antifungal therapy. All but one patient with systemic fungemia underwent extensive surgical debridement. 2 patients received additional hyperbaric oxygen therapy and they were both alive after one year. In one of them, the HBO therapy was effective in arresting the disease progression prior to optimization for surgery. Of the 4 without HBO therapy, only one survived for 14 weeks before succumbing to cerebral metastasis. The remaining 3 had a rapidly fatal outcome due to advanced fungal disease or intercurrent illness. Conclusion: The management of invasive fungal sinusitis can be optimized by targeting the underlying pathophysiology. The role of HBO therapy needs to be further examined.

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New Description Method And Classification System Of Septal Deviation

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Conflict of Interest/Disclosure: None Disclosed

Purpose: Using generic term "deviated septum" without proper classification is suboptimal for precise documentation and guiding the severity of septal deviation (SD). The purpose of this study is to present a systemic method to describe the various pathologies of SD and to introduce a new classification system which provides reproducible guidelines for the severity and correction of these deformities. Methods: 100 patients with (N=65) or without nasal obstruction (N=35) were included in the study. The pathology was analyzed according to the new description method based on the morphology, site, and degree of the SD and its influence on the external nose. The morphology was divided into 3 deformity groups: localized, convexity, and angulation. The site was divided according to the horizontal (anterior, central, posterior) and vertical axis (high, mid, basal). The degree of the SD was divided into mild, moderate, and severe. Classification of the SD was introduced according to the results of these observations. Result: In both groups, all the pathologies of the SD could be described with the new method. Based on these observations, 4 types of SD were noted: localized deformity (type I), convexity/angulation without type I (type II), convexity/angulation with type I (type III), and convexity/angulation with/without type I with external nasal deviation (type IV). In symptomatic group, convexity, anterior/mid, and moderate were most common in each description category. Type II was most common (65%) followed by type IV (20%), and type III (15%). In asymptomatic group, convexity, central/mid, and mild were most common. Type II was most common (77%) followed by type I (11%), and type III (6%). Type III and IV were significantly more in symptomatic group compared to the asymptomatic group. Conclusion: The new description method and classification system are useful for precise documentation and guiding the severity of septal deviation.Purpose: Using generic term "deviated septum" without proper classification is suboptimal for precise documentation and guiding the severity of septal deviation (SD). The purpose of this study is to present a systemic method to describe the various pathologies of SD and to introduce a new classification system which provides reproducible guidelines for the severity and correction of these deformities. Methods: 100 patients with (N=65) or without nasal obstruction (N=35) were included in the study. The pathology was analyzed according to the new description method based on the morphology, site, and degree of the SD and its influence on the external nose. The morphology was divided into 3 deformity groups: localized, convexity, and angulation. The site was divided according to the horizontal (anterior, central, posterior) and vertical axis (high, mid, basal). The degree of the SD was divided into mild, moderate, and severe. Classification of the SD was introduced according to the results of these observations. Result: In both groups, all the pathologies of the SD could be described with the new method. Based on these observations, 4 types of SD were noted: localized deformity (type I), convexity/angulation without type I (type II), convexity/angulation with type I (type III), and convexity/angulation with/without type I with external nasal deviation (type IV). In symptomatic group, convexity, anterior/mid, and moderate were most common in each description category. Type II was most common (65%) followed by type IV (20%), and type III (15%). In asymptomatic group, convexity, central/mid, and mild were most common. Type II was most common (77%) followed by type I (11%), and type III (6%). Type III and IV were significantly more in symptomatic group compared to the asymptomatic group. Conclusion: The new description method and classification system are useful for precise documentation and guiding the severity of septal deviation.

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Analysis Of Survival Rate According To Revised AJCC System In Sinonasal Squamous Cell Cancer

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Conflict of Interest/Disclosure: None Disclosed

Introduction : The American Joint Committee of Cancer (AJCC) revised staging system in 2002 and there has been some changes between 5th and 6th edition in sinonasal malignancy. This study was performed to evaluate the difference in survival rate between 5th and 6th editon of AJCC staging system in sinonasal squamous cell cancer. Materials and Method : Total 66 patients were diagnosed as sinonasal squamous cell cancer from September 1981 through August 2003 at Seoul National University Hospital. Medical records and radiological images were reviewed retrospectively, and data were analyzed using SPSS software (version 11.0). Results : The overall 5 year survival rate is 54% and 5-year survival rates (6th edition) of stage I, II, III, IVa, and IVb are 100%, 66%, 75%, 45%, and 0% respectively. The stages were changed in 21 cases. The group changed from stage III (5th) to IVa (6th) showed worse survival rate than unchanged stage III (6th) group, but statistically insignificant. The survival rate between stage IVa (6th) and IVb (6th) showed significant difference (p=0.01), but survival rate between other groups did not. The 5-year disease free survival rates of unchanged III group and re-staged III group are 58% and 34%, respectively (p=0.248). Local recurrences are more frequently observed in re-staged IVa (6th) group (stage III in 5th) and this might have caused worse survival rate. Conclusion : Although our studies showed no statistically significant result, new staging system seems to be better for predicting survival rate in advanced but surgically resectable group.Introduction : The American Joint Committee of Cancer (AJCC) revised staging system in 2002 and there has been some changes between 5th and 6th edition in sinonasal malignancy. This study was performed to evaluate the difference in survival rate between 5th and 6th editon of AJCC staging system in sinonasal squamous cell cancer. Materials and Method : Total 66 patients were diagnosed as sinonasal squamous cell cancer from September 1981 through August 2003 at Seoul National University Hospital. Medical records and radiological images were reviewed retrospectively, and data were analyzed using SPSS software (version 11.0). Results : The overall 5 year survival rate is 54% and 5-year survival rates (6th edition) of stage I, II, III, IVa, and IVb are 100%, 66%, 75%, 45%, and 0% respectively. The stages were changed in 21 cases. The group changed from stage III (5th) to IVa (6th) showed worse survival rate than unchanged stage III (6th) group, but statistically insignificant. The survival rate between stage IVa (6th) and IVb (6th) showed significant difference (p=0.01), but survival rate between other groups did not. The 5-year disease free survival rates of unchanged III group and re-staged III group are 58% and 34%, respectively (p=0.248). Local recurrences are more frequently observed in re-staged IVa (6th) group (stage III in 5th) and this might have caused worse survival rate. Conclusion : Although our studies showed no statistically significant result, new staging system seems to be better for predicting survival rate in advanced but surgically resectable group.

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Maxillary Osteomyelitis Caused By Mycobacerium Chelonae and Actinomyces Israelii

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Conflict of Interest/Disclosure: None Disclosed

WITHDRAWN

Mycobacterium chelonae is a fast-growing atypical mycobacteria that is ubiquitous in the environment and a common contaminant of laboratories and hospital equipment, but rarely causes human disease. Actinomyces israelii is a microaerophilic oral saprophyte with low pathogenicity that occasionally can cause disease in human hosts. Maxillary osteomyelitis can present as a bony destructive lesion mimicking a more common malignant or granulomatous disease process. Actinomyces israelii is an exceedingly rare cause of maxillary osteomyelitis and Mycobacterium chelonae has not been previously reported to cause maxillary osteomyelitis. We report two cases. A review of the literature revealed that Mycobacterium chelonae can cause disseminated skin and organ disease in the immunocompromised host, osteomyelitis in cases of penetrating injury, and an array of iatrogenic infections. Of interest to the otolaryngologist, rare cases of otitis media, mastoiditis, sinusitis, neck abscess, and thyroid abscess have been reported with Mycobacterium chelonae. Actinomyces israelii typically causes cervicofacial soft tissue infection and mandibular osteomyelitis, and is usually associated with dental trauma. The microbiological characteristics, epidemiology, diagnosis, treatment, and prognosis of Mycobacterium chelonae and Actinomyces israelii are discussed. When confronted with bony destructive lesions of the maxilla, the otolaryngologist must include these infectious etiologies in the differential. Mycobacterium chelonae is a fast-growing atypical mycobacteria that is ubiquitous in the environment and a common contaminant of laboratories and hospital equipment, but rarely causes human disease. Actinomyces israelii is a microaerophilic oral saprophyte with low pathogenicity that occasionally can cause disease in human hosts. Maxillary osteomyelitis can present as a bony destructive lesion mimicking a more common malignant or granulomatous disease process. Actinomyces israelii is an exceedingly rare cause of maxillary osteomyelitis and Mycobacterium chelonae has not been previously reported to cause maxillary osteomyelitis. We report two cases. A review of the literature revealed that Mycobacterium chelonae can cause disseminated skin and organ disease in the immunocompromised host, osteomyelitis in cases of penetrating injury, and an array of iatrogenic infections. Of interest to the otolaryngologist, rare cases of otitis media, mastoiditis, sinusitis, neck abscess, and thyroid abscess have been reported with Mycobacterium chelonae. Actinomyces israelii typically causes cervicofacial soft tissue infection and mandibular osteomyelitis, and is usually associated with dental trauma. The microbiological characteristics, epidemiology, diagnosis, treatment, and prognosis of Mycobacterium chelonae and Actinomyces israelii are discussed. When confronted with bony destructive lesions of the maxilla, the otolaryngologist must include these infectious etiologies in the differential.

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Antiviral Activity of Herbal Extracts Against Upper Respiratory Tract Viruses

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Conflict of Interest/Disclosure: None Disclosed

Introduction Upper respiratory tract viruses have a major impact on world health, causing recurrent epidemics and pandemics. Previous in vitro studies suggest that certain herbal extracts may inhibit resistant microorganisms. In this study, we evaluated various herbal extracts¡ı potential antiviral activities on RSV, Influenza A, B, and Parainfluenza viruses. Materials and Methods Eleven herbal extracts previously evaluated for antiviral activity against HSV were selected for this study. The appropriate host cells were grown to confluence in glass vials containing microscope slides. Extracts in 2 concentrations - 10 mg/ml and 100 mg/ml ¡V were added to the cells, incubated for 1 hour at 35„aC, followed by addition of the viruses and incubation at 35„aC for 3-5 days. Specific direct immunofluorescence tests were performed. The slides were scored under an epifluorescence microscope with comparison to the control slides. Result RSV infection decreased to 0-25% at 10 mg/ml and 0-10% at 100 mg/ml. Influenza A infection decreased to 50-75% at 10 mg/ml and 10-50% at 100 mg/ml. Influenza B infection decreased to 25-100% at 10 mg/ml and 0-75% at 100 mg/ml. Parainfluenza infection decreased to 75-100% at 10 mg/ml and 25-75% at 100 mg/ml. Conclusion The tested extracts show promising in vitro antiviral activity against these upper respiratory tract viruses. Future study will focus on identifying the inhibitory mechanisms and on transitioning to an in vivo model with eventual clinical trials of a topical therapy that may have a wide spectrum of antiviral activity, achieve sufficient concentration in nasal mucosa, and antagonize inflammatory mediators. Introduction Upper respiratory tract viruses have a major impact on world health, causing recurrent epidemics and pandemics. Previous in vitro studies suggest that certain herbal extracts may inhibit resistant microorganisms. In this study, we evaluated various herbal extracts¡ı potential antiviral activities on RSV, Influenza A, B, and Parainfluenza viruses. Materials and Methods Eleven herbal extracts previously evaluated for antiviral activity against HSV were selected for this study. The appropriate host cells were grown to confluence in glass vials containing microscope slides. Extracts in 2 concentrations - 10 mg/ml and 100 mg/ml ¡V were added to the cells, incubated for 1 hour at 35„aC, followed by addition of the viruses and incubation at 35„aC for 3-5 days. Specific direct immunofluorescence tests were performed. The slides were scored under an epifluorescence microscope with comparison to the control slides. Result RSV infection decreased to 0-25% at 10 mg/ml and 0-10% at 100 mg/ml. Influenza A infection decreased to 50-75% at 10 mg/ml and 10-50% at 100 mg/ml. Influenza B infection decreased to 25-100% at 10 mg/ml and 0-75% at 100 mg/ml. Parainfluenza infection decreased to 75-100% at 10 mg/ml and 25-75% at 100 mg/ml. Conclusion The tested extracts show promising in vitro antiviral activity against these upper respiratory tract viruses. Future study will focus on identifying the inhibitory mechanisms and on transitioning to an in vivo model with eventual clinical trials of a topical therapy that may have a wide spectrum of antiviral activity, achieve sufficient concentration in nasal mucosa, and antagonize inflammatory mediators.

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Surgical Management of Frontal Sinus Osteomas

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Osteomas are the most common benign neoplasm of the paranasal sinuses. Frontal sinus osteomas can cause frontal pain, headache, and outflow tract obstruction or be asymptomatic. Several surgical approaches are at the disposal of the sinus surgeon for addressing these tumors including open, combined, and endoscopic techniques. A variety of patient and tumor characteristics play a key role in surgical planning for successful treatment of these tumors. Methods: A retrospective chart review was performed of patients referred for evaluation and treatment of symptomatic frontal sinus osteomas. Patient characteristics including age, sex, location of osteoma, and symptoms were recorded. Treatment course was reviewed with emphasis on surgical planning, surgical approach selection, intraoperative findings, complications, and long term results including recurrence and frontal ostium patency. Results are compared with other reported series and cases in the literature. Results: 12 patients were included in the study; six men and six women. One asymptomatic patient has not been operated and is being followed with yearly serial CT scans. Age ranged from seventeen to seventy-five years. Mean age was forty three years. Most tumors were located in the frontal recess. Headache was the most common presenting symptom. Four patients underwent a combined approach (3- bicoronal osteoplastic flap/endoscopic, 1- endoscopic and trephine), and seven underwent a completely endoscopic approach. Complication rates were low. Follow up ranged from six days to six years with an average follow up of twelve months. Conclusion: Resection of symptomatic frontal sinus osteomas can be a challenging surgical task. Choosing the appropriate surgical approach based on individual patient characteristics allows for complete tumor resection with low complication rates and excellent long-term results.Introduction: Osteomas are the most common benign neoplasm of the paranasal sinuses. Frontal sinus osteomas can cause frontal pain, headache, and outflow tract obstruction or be asymptomatic. Several surgical approaches are at the disposal of the sinus surgeon for addressing these tumors including open, combined, and endoscopic techniques. A variety of patient and tumor characteristics play a key role in surgical planning for successful treatment of these tumors. Methods: A retrospective chart review was performed of patients referred for evaluation and treatment of symptomatic frontal sinus osteomas. Patient characteristics including age, sex, location of osteoma, and symptoms were recorded. Treatment course was reviewed with emphasis on surgical planning, surgical approach selection, intraoperative findings, complications, and long term results including recurrence and frontal ostium patency. Results are compared with other reported series and cases in the literature. Results: 12 patients were included in the study; six men and six women. One asymptomatic patient has not been operated and is being followed with yearly serial CT scans. Age ranged from seventeen to seventy-five years. Mean age was forty three years. Most tumors were located in the frontal recess. Headache was the most common presenting symptom. Four patients underwent a combined approach (3- bicoronal osteoplastic flap/endoscopic, 1- endoscopic and trephine), and seven underwent a completely endoscopic approach. Complication rates were low. Follow up ranged from six days to six years with an average follow up of twelve months. Conclusion: Resection of symptomatic frontal sinus osteomas can be a challenging surgical task. Choosing the appropriate surgical approach based on individual patient characteristics allows for complete tumor resection with low complication rates and excellent long-term results.

862
Cocaine-Induced Midline Nasal Necrosis Presenting With Proptosis And Acute Vision Changes.

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Conflict of Interest/Disclosure: None Disclosed

Objective: To report a case of extensive cocaine-induced midfacial necrosis that presented with the symptoms of orbital cellulitis and visual changes requiring urgent surgical debriedment. Methods: Analysis of computed tomography imaging, intraoperative imaging, nasal cultures, histopathologic examination of nasal tissue, and clinical course. Results: We describe a case of cocaine-induced midfacial necrosis that presented with proptosis, periorbital edema, acute vision changes, and severe limitations of extra-ocular movements. Initial workup included anterior rhinoscopy, computed tomography (CT), and nasal culture. CT scan demonstrated extensive bony destruction involving anterior septum, maxillary sinus, and left inferior and medial orbital walls. Nasal culture was positive for Pseudomonas aeruginosa. Endoscopic debriedment of necrotic tissue was performed to provide orbital decompression and prevent further vision deterioration. Other treatments included culture specific intravenous antibiotic therapy and nasal irrigation. Postoperative course was remarkable for rapid improvement in vision and gradual resolution of orbital cellulitis. Conclusion: Chronic cocaine use is well known to produce destruction of nasal septum. Cases of more extensive necrosis, involving nasal bony structures, hard palate, and orbital wall were described in the literature. Most authors advocate conservative treatment with antibiotic therapy, saline irrigation, and gentle debriedment. We describe a case of chronic cocaine-induced nasal necrosis that presented with symptoms of orbital cellulitis and acute vision changes as a result of bacterial superinfection of necrotic tissue. Surgical debriedment and aggressive antibiotic therapy provided adequate orbital decompression with complete reversal of vision changes and significant improvement of extra-ocular movements. Objective: To report a case of extensive cocaine-induced midfacial necrosis that presented with the symptoms of orbital cellulitis and visual changes requiring urgent surgical debriedment. Methods: Analysis of computed tomography imaging, intraoperative imaging, nasal cultures, histopathologic examination of nasal tissue, and clinical course. Results: We describe a case of cocaine-induced midfacial necrosis that presented with proptosis, periorbital edema, acute vision changes, and severe limitations of extra-ocular movements. Initial workup included anterior rhinoscopy, computed tomography (CT), and nasal culture. CT scan demonstrated extensive bony destruction involving anterior septum, maxillary sinus, and left inferior and medial orbital walls. Nasal culture was positive for Pseudomonas aeruginosa. Endoscopic debriedment of necrotic tissue was performed to provide orbital decompression and prevent further vision deterioration. Other treatments included culture specific intravenous antibiotic therapy and nasal irrigation. Postoperative course was remarkable for rapid improvement in vision and gradual resolution of orbital cellulitis. Conclusion: Chronic cocaine use is well known to produce destruction of nasal septum. Cases of more extensive necrosis, involving nasal bony structures, hard palate, and orbital wall were described in the literature. Most authors advocate conservative treatment with antibiotic therapy, saline irrigation, and gentle debriedment. We describe a case of chronic cocaine-induced nasal necrosis that presented with symptoms of orbital cellulitis and acute vision changes as a result of bacterial superinfection of necrotic tissue. Surgical debriedment and aggressive antibiotic therapy provided adequate orbital decompression with complete reversal of vision changes and significant improvement of extra-ocular movements.

863
Intrinsic Antimicrobial Properties Of Sinus Secretions

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Conflict of Interest/Disclosure: None Disclosed

Introduction: Airway secretions possess intrinsic antimicrobial properties that are believed to contribute to the innate host defense of the respiratory tract. Both nasal and broncholaveolar lavage fluid have been found to be capable of killing or inhibiting the growth of various microbes in vitro mediated by their antibacterial polypeptide constituents. The purpose of this study was to determine whether sinus secretions from normal subjects possess similar microbicidal properties and contribute to host defense. Methods: Maxillary sinus fluid was obtained from twelve subjects without a history of sinus disease via antral lavage through the canine fossa. All patients showed no radiographic evidence either on CT scan or MRI of sinus disease within one month prior to the procedure. Following specimen collection, microbicidal effects against Staphyloccal aureus and Escherichia coli of the samples were determined via radial diffusion assays. Specifically, sinus fluid specimens were incubated in wells placed within a microbe containing underlay and zones of clearance (no bacterial growth) subsequently measured. Results: The radial diffusion measurements for all 12 samples incubated with S. aureus was –30RDU, indicating no zones of clearance. Similarly, all 12 samples failed to demonstrate killing zones on radial diffusions assays for E. coli. Conclusions: Maxillary sinus secretions of patients without a history of sinus pathology do not appear to possess antimicrobial capabilities. Previous or active infection may be necessary to induce the production of antibacterial polypeptides from sinus mucosa that would confer microbicidal properties. Introduction: Airway secretions possess intrinsic antimicrobial properties that are believed to contribute to the innate host defense of the respiratory tract. Both nasal and broncholaveolar lavage fluid have been found to be capable of killing or inhibiting the growth of various microbes in vitro mediated by their antibacterial polypeptide constituents. The purpose of this study was to determine whether sinus secretions from normal subjects possess similar microbicidal properties and contribute to host defense. Methods: Maxillary sinus fluid was obtained from twelve subjects without a history of sinus disease via antral lavage through the canine fossa. All patients showed no radiographic evidence either on CT scan or MRI of sinus disease within one month prior to the procedure. Following specimen collection, microbicidal effects against Staphyloccal aureus and Escherichia coli of the samples were determined via radial diffusion assays. Specifically, sinus fluid specimens were incubated in wells placed within a microbe containing underlay and zones of clearance (no bacterial growth) subsequently measured. Results: The radial diffusion measurements for all 12 samples incubated with S. aureus was –30RDU, indicating no zones of clearance. Similarly, all 12 samples failed to demonstrate killing zones on radial diffusions assays for E. coli. Conclusions: Maxillary sinus secretions of patients without a history of sinus pathology do not appear to possess antimicrobial capabilities. Previous or active infection may be necessary to induce the production of antibacterial polypeptides from sinus mucosa that would confer microbicidal properties.

864
Radiofrequency Surgery Using 4.0 MHz Radiowave Technology in Rhinology

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Obejective: Radiosurgery is a new surgical technique employing low temperature energy source of 4.0 MHz radiowave known as Surgitron dual frequency, for ENT and other surgical procedures as it affords surgical precession, controlled penetration, depth and low temperature. As compared to laser surgery coblation, harmonic scalpel surgery, pure radiowave surgery is a better alternative because it is radio-plasma surgery. Unlike standard electrosurgical devices, there is no burining of tissue, therefore no extensive thermal injury or delay healing, Scar tissue is minimized and cosmetic result are superior. De-bulking is achieved without the removal of organs and with the maximal control of tissue removal.

Methods: All procedures will be performed by radiofrequency surgery under local or general anesthesia, include: turbinate debunking, nasal polypectomy, FESS, and septorhinoplasty.

Result: The efficiency of the technology required only one application; it was not necessary to have the patient return for additional procedures.

Conclusion: The best technique for the most ENT and head and neck surgery is 4.0 MHz radiofrequency surgery. The patented Surgitron dual frequency technology generates an electromagnetic wave that is impedance matched, frequency matched and power matched to initiate and sustain a harmonious cloud with the low atomic particle turbulence and chaos, that producing a micro-incision in target tissue.

865
A Modified Shaver-Concho-Suction Method For Inferior Turbinate Reduction: 8 Years Experience

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Introduction: Nasal obstructions caused by hypertrophic inferior turbinates are a very frequent syndrom in ORL. Shaver surgery of the turbinates unlike lasers, argon-plasma or electro-cauterisation entail a "cold" technique, avoiding the inevitable collateral thermal damage and postoperative healing problems. Here are our long term results of a submucosal suctioning procedure.

Materials and Methods: We use a special turbinate shaver, diameter 2.0 and 2.9.mm, for the strictly submucosal suctioning of the anterior, middle and posterior part of the inferior turbinate (1400 RPM). Under local anaesthesia a little incision in the anterior "head" part was done and the shaver tip was directed in the hypertrophic submucosal space. This tip features a sharp-edged elevator section designed for preparation. In the last 8 years, 1200 patients underwent this operation (age 14 – 68 years) suffering from inferior turbinate hypertrophy and persistent nasal obstruction , 15% are athletes, who asked for improving nasal breathing. The results pre- and post-op were controled by endoscopy, video documentation, rhinomanometry and a special nasal obstruction assessment questionaire (NOAQ).

Results and Conclusions: Shaver conchosuction is an intact mucosa procedure and as a cold technique it leads to a better healing and to less postoperative crusting. Nasal packing is mandatory with ventilated nasal dressing for 2 days.There was no severe bleeding or other complications. The degree of satisfaction (questionaire) is far greater than with other surgical methods.In the follow up of 8 years perfect long term improvement in nasal breathing was documented by endoscopy and rhinomanometry.

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