7:00-7:40
Breakfast 4

UNIVERSAL RHINOGRAM

Abe Lapidot
Israel Medical Association, Hetrzlia, Israel

As an audiogram is crucial towards recording of auditory function, a Rhinogram is proposed for universal use. The anatomic and physiologic characteristics of each nasal chamber will be graphically illustrated after nasal shrinkage.
The chart will meaningfully indicate the highlights of nasal pathology, which can be explained visually to the consumer in an informed consent manner and as a permanent record.
It represents a six-point survey:
External Nose:
Deformity (clinical)
Tension Nose (“00” Test)
Internal Nose:
Presence of Allergic Membranes
Nasal Valve Incompetence
- 100% of free marg
- in not free- chart
- synechiae/scarring
- thickness undue

Septal Deviation Obstruction Location
- Along length of septum areas 1,2,3,4,5
- In height: low, mid, or high regions chart

7:00-7:05
Breakfast 5

NOSE IN SPORTS

Sigurd Hellmich
St. Johannes Hospital, Dortmund, Germany

Intentional and unintentional, light to severe injuries of the nose, their infrastructures, skin and inner lining, as well as injuries of surrounding regions of the skull base, the orbita and the sinuses are common side effects of modern sports. Treatment of acute traumata and their complications, as well as secondary repair of old damages, and surgical mistakes which cause functional and cosmetic problems for the victim are a challenge for the ENT-surgeon. The main problems, diagnosis, and treatment of nose injuries in sports will be shown.

8:05-8:20
Plenary 2

CHRONIC RHINOSINUSITIS, POLYPOSIS, SINOBRONCHIAL SYNDROME

Heinz Stammberger, H. Braun, K. Freudenschuss, W. Buzina
University ENT Department, Graz, Austria

There are several pathophysiologic hypotheses for chronic rhinosinusitis.

Infection, allergy, and the contact areas in the ostiomeatal complex are causes for acute rhinosinusitis. In chronic rhinosinusitis however the viral/bacterial component are less significant since this disease cannot be cured by antibiotics. The mechanical aspect of contact areas led to the development of FESS, with good results in, many cases. However, not all diseases could be cured by surgery and/or medical therapy. Despite corticosteroids giving excellent results, allergy appears to play no significant role in chronic rhinosinusitis.

Recently, a new idea was put forward: the fungal immunologic background. Patients with CRS and nasal polyposis react with an ongoing immune response to inhaled fungal fragments. Fungi are attacked in the mucus by eosinophilias from the mucosa, which degranulate in the mucus, release major basic protein (MBP) and attack the fungi. Possibly, the signal to migrate to the mucus and degranulate there is transmitted Via IL5 from T-lymphocytes. The large quantities of MBP are toxic to the mucosa resulting in epithelial damage which lead to CRS and polyps. Fungi can be demonstrated in everyone's nasal and sinus mucus. It is unclear, why some people respond with massive immune reaction to (harmless) Fungi. If this mechanism proves to be a major cause for rhinosinusitis, it will have significant impact on future diagnosis and therapy. Preliminary findings indicate that there may be a related mechanism for the asthmatic component in cases of sinobronchial syndrome as well.

8:20-8:35
Plenary 2

CHRONIC RHINOSINUSITIS: AN IMMUNE RESPONSE TO FUNGI

J.U. Ponikau, D.A. Sherris, E.B.Kern
Mayo Clinic, Mayo Foundation, Rochester, MN, USA

Chronic rhinosinusitis (CRS) is a chronic inflammatory disease of the nasal and paranasal mucosa defined to persist and be symptomatic for longer than 3 months, with polypoid mucosal thickening and nasal polyps as an ultimate endstage of that chronic inflammation.

Our new findings indicate that chronic rhinosinusitis is due to an immune response to fungal organisms, which is mediated through the eosinophil. We have now documented the criteria for Allergic Fungal Sinusitis (AFS) in 93% of consecutive surgical patients with chronic rhinosinusitis/polyposis (n = 210).

We have developed a novel collection and culturing technique to grow the fungus from nasal secretions.
We have also demonstrated that the immune response to the fungi is mediated by the eosinophil as an effector cell and not by IgE antibodies. Therefore the term "allergy" is incorrect and the term Eosinophilic Fungal Rhinosinusitis (EFRS) was introduced. The eosinophils actually migrate through the epithelium to engage and destroy the fungi in the nasal mucous. The destruction occurs because of the release of toxic proteins from the eosinophils, which in turn also damage the nasal mucosa.

This damaging of the nasal mucosa by the toxic proteins of the eosinophil is fundamental to the pathophysiology because it allows secondary bacterial invasion and leads to the development of chronic rhinosinusitis/polyposis. These findings support our new thinking that chronic rhinosinusitis/polyposis is triggered by fungal organisms. As a consequence, new treatment protocols are now applied successfully for patients with chronic rhinosinusitis/polyposis at our institution.

8:35-8:50
Plenary 2

EOSINOPHILIC FUNGAL RHINOSINUSITIS (EFRS) -THE GRAZ EXPERIENCE

H. Braun, K. Freudenschuss, W. Buzina, H. Stammberger
ENT University Hospital, Graz, Styria, Austria

In September 1999 Ponikau et al. published their findings about the incidence of allergic fungal sinusitis (AFS). Their data showed positive fungal cultures of nasal secretions in 96 percent of patients suffering from chronic rhinosinusitis (CRS). Eosinophilic clusters in the mucin were found in 96 percent in surgical cases of CRS and in 81 percent fungal elements could be detected in histological specimens. Based on their findings they proposed a change in terminology from AFS to Eosinophilic RhinoSinusitis (EFRS).

We wanted to investigate, whether the same findings are present in our patients or whether this is only a phenomenon in North American patients. Applying the new Mayo Clinic techniques, we started a study investigating the mucus of our patients suffering from CRS with or without polyposis nasi. Up to now we evaluated more than 90 patients. Histological specimens of the patients operated upon were examined by light and in part by electron microscopy.

We were able to show positive fungal cultures in 92.1 percent of our patients suffering from chronic rhinosinusitis. A total of 283 positive cultures grew, with an average of 3.2 organisms per patient. A total of 59 different species of fungi were identified with a maximum of 9 different fungi per patient.

Fungal elements could be detected in more than 73 percent and eosinophilic clusters were presents in 94 percent of our patients.

We can therefore confirm the Mayo findings, that fungi are present in the mucus of over 90 percent of patients with CRS and polyps as well as the formation of eosinophil clusters around fungal elements in the mucus.

9:05-9:20
Plenary 2

FUNGAL CULTIVATION AND IDENTIFICATION TECHNIQUES IN EFRS PATIENTS

W. Buzina, H. Braun, K. Freudenschuss, H. Stammberger
Institute of Botany, ENT University Hospital, Karl-Franzens-University Graz, Austria

In the past, mycological examination of nasal mucus mostly showed little or no fungal growth. In this study we present a method to isolate and identify different species of fungi from nasal mucus.

We examined over 90 patients suffering from chronic sinusitis with or without polyposis nasi. Mucus was obtained by rinsing the nose with sterile NaCl solution and the collected material was treated with dithiothreitol to release fungal elements. These were incubated on diverse mycological growth media for up to six weeks. Thereafter the cultures were examined under the microscope. Isolates lacking clear morphologic characters for unambiguous identification were classified with molecular techniques. For this purpose nuclear DNA was extracted and the highly variable ITS (Internal Transcribed Spacer) region of the ribosomal DNA was amplified with PCR (Polymerase Chain Reaction) and sequenced. The data were compared via internet with sequences released by gene databanks to assess homology with known fungi.

Up to now 91.1% of mucus were fungus positive. The number of different species of fungi per patient varied from one to eight, with an average of 3.1. More than seventy distinct species representing different taxonomic groups of higher fungi were identified, many of them not described in context of chronic sinusitis so far.

9:20-9:35
Plenary 2

THE RESULTS OF AN OPEN TRIAL WITH ANTIFUNGAL MEDICATIONS

David A. Sherris
Mayo Clinic, Mayo Foundation, Rochester, MN, USA

The results of an open trial with antifungal medications delivered via direct mucoadministration is presented. The theoretical rationale behind this treatment approach, the results in a group of patients, and specific case presentations will be presented. In addition, suggestions for future research along these lines is suggested.

9:35-9:50
Plenary 2

PATHOGENIC FACTORS IN CHRONIC RHINOSINUSITIS

David W. Kennedy
University of Pennsylvania Medical Center, Philadelphia, PA, USA

Chronic rhinosinusitis has multifactorial etiology. Factors demonstrated to play a part in etiology of the disorder include general and local host factors, genetic predisposition and environmental factors. General host factors include ASA sensitivity, immune deficiency, ciliary dyskinesia and there is some evidence to suggest that stress may also play a part in this disorder. Local host factors include sinus obstruction, anatomic deformities, granulomatous disorders and foreign bodies. Genetic factors are certainly critical in terms of diseases such as cystic fibrosis and Young's syndrome but there is evidence to suggest that they may have more widespread and subtle predispositions towards the disorder. Environmental factors include viruses, pollution, smoking, allergy and, possibly, flying. A relative evaluation of the importance of each of these predisposing pathogenic factors awaits further study.

10:35-10:50
Plenary 3

EOSINOPHILIC MUCIN RHINOSINUSITIS WITHOUT FUNGUS: A DISTINCT CLINICO-PATHOLOGICAL ENTITY

Berrylin J. Ferguson MD
University of Pittsburgh Medical Center, Pittsburgh, PA, USA

Background: Allergic Fungal Sinusitis represents a specialized form of Eosinophilic Rhinosinusitis characterized by a hypersensitivity to fungi. A form of sinusitis histologically similar to AFS, except for the absence of fungal hyphae has also been noted. The designation “eosinophilic mucin rhinosinusitis” (EMRS) is proposed as an umbrella term for both AFS and rhinosinusitis characterized by eosinophilic mucin which lacks fungal hyphae or a hypersensitivity to the fungi. In particular EMRS without fungus represents various non AFS forms of EMRS.
AIM: To determine if clinical factors differentiate AFS from EMRS without fungus.
Design: Literature review and comparison of cases of AFS (n= 418) to EMRS without fungus (n=40) from the literature as well as the present series of AFS (n=13) and EMRS without fungus (n=29).
Results:. AFS patients are younger than patients with EMRS without fungus (30.7 years compared to 48.0 years, respectively, p<.001). Asthma is more common in patients with EMRS without fungus (93%) than in patients with AFS (41%) (p< .0001). Over half of EMRS without fungus patients are aspirin sensitive compared to 13% of patients with AFS (p<. 0001). All of EMRS without fungus patients have bilateral disease compared to 55% of AFS patients (p<.0001). Differences in IgG1 deficiency, incidence of allergic rhinitis and IgE levels are significantly different between the two groups. Similarities include presence of nasal polyps in both groups and similar male to female ratios, with a slight male predominance.
Conclusions: Significant clinical and immunologic differences differentiate AFS from EMRS without fungus. It is postulated that AFS is a localized allergic response to fungi within the nose and sinuses of predisposed individuals, while EMRS without fungus represents a systemic disregulation of immunologic controls. It is important to differentiate these two similar histopathologic entities in trials assessing therapeutic efficacy, because of the possible response differences.

10:50-11:05
Plenary 3

THE ROLE OF ALLERGY IN CHRONIC RHINOSINUSITIS

Robert M. Naclerio
University of Chicago, Chicago, IL, USA

It is generally not known why some individuals develop chronic sinusitis. A small number have cystic fibrosis. Some individuals have allergic disease, abnormalities of host defense, including antibody deficiencies and ciliary dysmotility.

It is hypothesized that certain individuals have a predisposition to develop chronic sinusitis. In these persons, environmental factors, such as allergens, viruses and air pollutants, trigger epithelial alterations that induce inflammation and subsequently decrease mucociliary transport. Stasis of mucus in the sinuses than leads to bacterial infections that further adversely influence the epithelium. If this cycle is not interrupted, the epithelium proliferates, developing a self-perpetuating cycle. This cycle manifests clinically as a chronic sinusitis and is no longer dependent upon the bacteria or the anatomy that initiated the process.

The role of allergy in chronic sinusitis will be evaluated with regard to epidemiologic evidence supporting an association, potential mechanisms by which allergy can affect sinusitis and finally how interventions to treat allergy effect sinusitis.

10:35-10:50
Symposium 13

SECONDARY CLEFT RHINOPLASTY

Tom D. Wang, M.D.
Oregon Health Science University, Portland, OR, USA

One of the most challenging problems in rhinoplasty surgery deals with the cleft nasal deformity. The fact that many different surgical procedures and approaches have been described for attempted correction of this problem highlights the difficult nature of this challenge. Analysis of the unilateral cleft nose deformity from a fresh perspective suggests deficiency with internal nasal lining, as well as structural support. We have developed a technique utilizing a laterally based chondrocutaneous flap in conjunction with structural cartilage grafting, which satisfactorily addresses the cleft nasal deformity. The laterally based sliding flap cheilo-rhinoplasty has proven to be an effective technique for correcting both the secondary nasal deformity and the lip scar associated with a unilateral cleft lip.

10:50-11:05
Symposium 13

CLEFT LIP RHINOPLASTY: THE REPAIR AND RESULTS

G. Rettinger
ENT-Univesity Department, Ulm, Germany

After unilateral cleft lip and alveolus repair usually a nasal deformity, primarily at the nasal base remains. The alar rim is flattend and distorted and the nasal vestibule is narrow. For secondary correction of this abnormality there are mainly three types of procedures:

Repositioning of displaced structures only, e.g. alar cartilage, soft tissues
Repositioning and resection of a surplus of tissue
Repositioning and additional tissue-transplantation

We compared the aesthetic and functional results of two patient groups:

Mobilization and repositioning of the displaced alar cartilage via an endonasal approach.
Advancement of the lateral crus with vestibular skin and grafting of the vestibule with an auricular composite graft.

The results where better in the second group pointing out the importance of reconstructing a deficiency of vestibular lining that may be the result of the former lip repair procedure.

10:35-10:50
Symposium 14

COMPLICATIONS OF NASAL SURGERY IN CHILDREN

Ranko Mladina
ORL Department, Univ. Hospital Salata, Zagreb, Croatia

There two relevant complications of nasal surgery in children: secondary deformation and midface and nose growth impairment. The term “secondary deformation” can be assessed as “just a good excuse” for inadequately performed surgery. Verwoerd’s have approved that mucoperichondrial elevation for septal surgery regularly causes intraperichondrial lesions which might lead to some new cartilage formation. They also proved that by outgrowth of the cut ends of the septal cartilage their overlap can occur, presenting end-to-end junction between two cartilaginous parts, leading to the formation of the septal spine or even septal deformity (“secondary deformity”) during further development. The best way to prevent secondary deformation after septal surgery in children would be the implantation of newly engineered autologous cartilage containing less differentiated chondrocytes, since it appeared to be capable of complete reunion with the original cartilage fragments, when neatly fixed to the host cartilage. With respect to midface and nose growth retardation, it is not clear what are we defending by a rigid, dogmatic statement of postponing the septal surgery until puberty or even adolescence, despite the severe deformity? Are we defending the undisturbed growth of the nasal structure, midface and the nose itself? If yes, firstly how can we than justify thejeopardizing normal nasal breathing and undisturbed oxigenation of the whole body? Secondly, how can we be sure that the nasal and midface growth will remain undisturbed if we do not operate? And thirdly, what is worse: slightly underdeveloped nasal pyramide and/or collumelar retraction in the adolescence or long lasting oral breathing?

10:50-11:05
Symposium 14

THE INFLUENCE OF PARTIAL RESECTION OF THE LATERAL NASAL WALL FOR MIDFACIAL DEVELOPMENT

H.L. Verwoerd-Verhoef, C.D.A. Verwoerd
Erasmus university Medical Center Rotterdam, the Netherlands

Introduction: Chronic sinusitis in children sometimes requires functional endoscopic sinus surgery (FESS in a growing child. Studies on the effects of FESS at a young age for later facial growth are not concurrent. The first data on deformation of the midface after a long-term follow-up have now been reported. Some experimental studies in various animals have produced controversial results. Developmental mechanics of nose and maxilla have been extensively analyzed by our group in a rabbit model.

Objectives: In this study the effects of partial resection of the lateral nasal wall, with or without resection of the anterior part of the ethmoid was investigated in young growing rabbits.

Methods: 30 young rabbits, 6weeks of age, were divided in 3 groups. The effects of partial resection of the left lateral nasal wall (series 1), partial resection of the lateral nasal wall with resection of the anterior part of the ethmoid (series 2) were studied. For control, in the third group (series 3) only a transverse osteotomy with elevation and replacement of the left nasal bone was performed.

Results: Resection of the lateral nasal wall (series 1) did not diminish the length of the snout nor disturb the ‘symmetrical’ outgrowth of nose and maxilla. In series 2, nose and maxilla showed a normal outgrowth after additional resection of the anterior part of the ethmoid. A slight deviation to the left, operated side was found in 2 skulls, whereas the snout was deviated to the right, non-operated side in 1 skull. All skulls demonstrated an increase of the left sinus window dimensions on the external side. The control group (series 3) demonstrated no negative effects on midfacial growth.

Conclusion: In all 20 animals, , sinus surgery with careful resection of the lateral nasal wall and anterior part of the ethmoid, preserving the upper lateral cartilage, can be performed at a young age without the consequence for later major midfacial maldevelopment. A-113

11:05-11:20
Symposium 13

CLEFT-LIP RHINOPLASTY

Gilbert J. Nolst-Trenité
Academic Medical Center University of Amsterdam, Amsterdam, The Netherlands

In the surgical repair of the cleft-lip nose there are several important factors to consider:

The lip closure technique to ensure symmetry of the tip and alae to prevent a more conspicuous deformity during growth.

Timing of the operation before the puberty growth spurt to prevent psychological problems and to stop further expression of the deformity induced by septal growth.

Systematic surgical approach, dividing the operative procedure into septal surgery, tip surgery, osseocartilaginous vault surgery, maxillary augmentation and alar base reallocation.

Special postoperative care with the use of vestibulum device to prevent deformation by scar tissue retraction.

With these considerations in mind the aim of the treatment should be a normal function of the nose with an acceptable aesthetic result in which the young adult cleft-lip patient had lost the specific cleft-lip stigma.

11:05-11:20
Symposium 14

MANAGEMENT OF THE MALFORMED OR INJURED NOSE IN CHILDREN

C.D.A. Verwoerd, H.L. Verwoerd-Verhoef
Erasmus University Medical Center Rotterdam, the Netherlands

Functional and aesthetic nasal problems in young patients are, in general, treated conservatively. Facial surgeons tend to refrain from surgical intervention of the nose in infants, unless there is a serious craniofacial maldevelopment. Since long, in early cleft palate surgery the nose was neglected as a specific structure, and the cartilaginous framework of the infant's nose was not recognized. Even nowadays, it is difficult for the facial plastic surgeon to respect the mostly underdeveloped and malformed parts of nasal cartilage, and to build up a symmetrically growing nose skeleton.

In a long-term study on rabbit and human noses, we have demonstrated that in the first years of life the nasal skeleton has its own characteristics. Most important is that at birth, the internal three-dimensional framework of the nose is completely cartilaginous, and dominates the development of the external bony parts during the early years of life, determining the final form and function of the midface.

Features like the thickness of the septum cartilage which is varying for specific areas, the relationship between septal cartilage and bone which is gradually changing through endochondral ossification, and the biomechanics of the T-bar construct of the nasal skeleton are of great significance for normal outgrowth of the nose. Disturbances like growth disorders, traumatic injury with or without cartilage fracturing, and eventual risks of various surgical techniques like osteotomy, mucoperichondrial elevation, septoplasty with or without open approach, can be better assessed in the light of maximal morphological and biomechanical knowledge of the growing midface.

The ultimate goal of nasal surgery in children has to be to restore function without deleteriously interfering with growth.

11:20-11:35
Symposium 14

SEPTORHINOPLASTY IN CHILDREN: LONG-TERM RESULTS

Wolfgang Pirsig
University-HNO-Klinik, Ulm, Germany

Several genetic and epigenetic factors influence the outcome of septorhinoplasty in children such as the age of the previous damage to the nasomaxillary complex, the involvement of infection, and especially the amount and site of pathology of the septolateral cartilage with its T-bar-shaped structure and its specific three-dimensional architecture of thicker and thinner areas. Due to the incomplete wound healing of the damaged growing nasal cartilages, septorhinoplasty in children may often result in growth inhibition and/or unpredictable changes of some nasomaxillary structures after puberty, independent from the surgical approach (endonasal or external). While osteotomies seem to have no adverse influence on the growing nose, surgery of the non-acutely injured septolateral cartilage may result in recurrence of structural deviations depending on the site of cartilaginous pathology and the surgical techniques. As evidence based trials are lacking representative cases of long-term results will be discussed including the promising long-term results following primary rhinoplasty in infancy. There are good arguments to postpone septorhinoplasty necessary in cases of the non-acutely injured septolateral cartilage to the second decade except for a few special cases.

11:35-11:50
Symposium 14

DIAGNOSIS AND REPAIR OF CHOANAL ATRESIA

Richard L. Voegels
University of São Paulo Medical School, São Paulo, Brazil

Congenital choanal atresia is a defect in the development of communication between the nasal fossae and the nasal portion of the pharynx which occurs at an incidence of 1:5000 to 1:8000 births. Being more common as a unilateral condition ans in female patients. The condition may be present as an isolated malformation or may be part of a group of malformations in 20 to 50% of cases, including the so-called CHARGE association.

Three major theories have been proposed: 1) persistence of the buccopharyngeal membrane of the anterior intestine, 2) mesodermal adhesion resulting in the formation of an atresia plate and 3) local factors possibly leading to changes in the mesenchymal flow, preventing the canalization of the atresia plate.

The first description of congenital choanal atresia was published in 1755 by Roederer. Since then, several surgical procedures have been proposed for the correction of this condition, such as transnasal dilatation, drilling of the atresia plate, curettage, use of Laser, and transpalatine, trannslabial and transnasal approaches with an endoscope.

The differentiated diagnosis includes affections that cause unilateral or bilateral nasal obstruction such as atresia or stenosis of the nostrils, nasal valve and nasal fossae, meningocele, meningoencephalocele, nasal tumors such as nasal gliomas and obstruction secondary to local inflammation. A typical history is present in cases of bilateral atresia, with respiratory discomfort ans cyclic cyanosis; in unilateral cases, only secretion may be present on the one side involved. Physical examination includes an attempt to pass a tube through the nasal fossae, an examination routinely performed in neonates which also permits the diagnosis of unilateral atresia, and endoscopy in patients older than 5 years when possible. Imaging examinations (contrast radiology and computerized tomography) are used to confirm the diagnosis, to exclude other diseases or associated malformations and to characterize the type of atresia present.

10:50-11:05
Symposium 15

OUTCOMES MANAGEMENT (RHINOLOGY)

Richard E. Gliklich
Massachusetts Eye and Ear Infirmary and Harvard Medical School, Boston, MA, USA

Outcomes management is a technology of patient experience. That experience begins with a series of starting points and progresses to a series of endpoints or outcomes. Appropriate staging and measurement allows useful information to be collected from real-world clinical experience. A series of investigations will be presented which have focused on the measurement of outcomes in patients undergoing rhinologic therapies including sinusitis, allergic rhinitis and septoplasty. At this time, the outcomes of rhinologic therapies can be quantified and treatments as well as treatment patterns can be compares in a statistically meaningful way. For example, patients with chronic sinusitis undergoing endoscopic sinus surgery have a greater than 80% probability of improving their symptoms or usage of medications by 50% or more. Patients undergoing immunotherapy for allergic rhinitis demonstrate measurable changes in patient reported outcomes as early as three months after initiation of therapy. Patients undergoing septoplasty demonstrate significant improvement in the symptom of nasal congestion. Outcomes management employs feedback of measurement data to clinicians in a manner that can change treatment patterns. This has been demonstrated in patients undergoing sinus surgery by multiple surgeons in a large teaching institution. Finally outcomes management allows estimation of cost information that includes the aggregate patient costs illness. Cost information has implications for both patient and surgeon decision-making.

11:05-11:20
Symposium 15

SUBJECTIVE AND OBJECTIVE OUTCOMES IN ENDOSCOPIC SINUS SURGERY

David W. Kennedy
University of Pennsylvania Medical Center, Philadelphia, PA, USA

The literature clearly demonstrates that subjective improvement or resolution of disease does correlate well with disease resolution. In some instances this poor correlation may result from difficulty in identifying symptoms related to chronic sinus disease. However, in part it also relates to the fact that persistent low grade disease may remain asymptomatic or minimally symptomatic over long periods of time, before presenting with the need for further surgical intervention, or with a complication. We have demonstrated that avoidance of revision surgery over time does not correlate well with the degree of symptom resolution at 1 1/2 years post surgery. However, avoidance of the need for further surgery does correlate with endoscopic evidence of disease resolution. Since persistent sinus disease is may take many years to become clinically manifest, a strong case can be made for the use of objective endoscopic evidence of disease resolution as a critical marker of surgical success in the short to intermediate time period following surgery. Accordingly therefore, as with diseases such as hypertension, symptom resolution should not be utilized as the sole or primary indicator of treatment success and the importance objective endoscopic evaluation should be considered.

12:30-12:35
Luncheon 4

THE NEWER ANTIBIOTICS: ARE THEY BETTER?

David R. Edelstein
Manhattan Eye, Ear and Throat Hospital, New York , NY, USA

With the increasing prevalence of sinusitis and rhinologic complaints, the need for better antibiotics increases yearly. The development of multiply resistant bacterial organisms and the wide prescription of antibiotics by physicians accentuate this need. A potentially confusing array of antibiotics is available for the clinician. Therefore, our understanding of these uses of antibiotics, the factors in their selection and problems with their uses makes the introduction of new groups or types of antibiotics more challenging.

In this presentation, er review the history of the development of antibiotics and their usage. Newer antibiotics are reviewed based on their structure, bacterial coverage, tissue and serum penetration, side effects, drug interactions and cost-compliance factors. Their pharmacodynamics and pharmacokinetics are outlined. How these new antibiotics fir into our treatment paradigms and protocols is carefully discussed and critically reviewed. Specific attention is drawn to the treatment of sinusitis and the development of the new quinolones. The role of the new antibiotics in developing strategies to treat new resistance patterns is discussed. A profile of an ideal antibacterial agent for respiratory tract infections Is postulated. The use and misuse of antibiotics in the treatment of sinusitis is put into perspective.

13:00-13:25
Luncheon 4

THE NEWER ANTIBIOTICS: ARE THEY BETTER?

James A. Hadley
University of Rochester Medical Center, Mayo Clinic, Mayo Foundation, Rochester, MN, USA

Guidelines for the treatment of acute bacterial rhinosinusitis were published in June, 2000. All of the current available oral antibiotics were evaluated in view of their efficacy in regard to the severity of the disease. Some of the “new” antibiotics include the fluoroquinolones which have been synthesized for the improved potency for the bacteria causing these infections. New synthetic derivatives such as the oxazolidinones and ketolides have been recently introduced. Appropriate management of this disorder relies on judicious diagnosis of the bacterial nature of the infection and knowledge of community bacterial resistance rates for choices of antibiotics regimens.

14:05-14:20
Symposium 16

FESS: FACTS AND FANCY

Salah D. Salman
Massachusetts Eye and Ear Infirmary, Boston, MA, USA

It is timely to revisit the premises on which FESS is based on the early teachings of its enthusiasts. Evidence to support recommendations for some revisions will be presented.

14:20-14:35
Symposium 16

ANATOMICAL BASIS TO AVOID COMPLICATIONS IN ENDOSCOPIC SINUS SURGERY

Heinz Stammberger
University ENT Department, Graz, Austria

The key to avoidance of surgical complications during sinus procedures is intimate knowledge of anatomy and its variations. The surgeon not only must be able to read CT scans but translate this is to the intraoperative situation during the entire surgical procedure. At any given moment the surgeon must know, which structure lays before his eyes and /or instruments. There are 4 key areas for complications in the sinus region.

The roof of the anterior ethmoid/olfactory ridge.
The medial wall of the orbit.
The transition from posterior ethmoid or sphenoid.
The frontal recess

The standard anatomical features of each region are described in detail and examples of variations are given. Stress is put on how to recognize potential dangerous areas and configurations on CT-scans and MRI and how to avoid these. Examples of typical iatrogenic complications are demonstrated for each region. Surgeons without anatomical knowledge are like moles: They work in the dark and produce – mounds of earth.

14:35-14:50
Symposium 16

BASIC TECHNIQUES FOR THE ETHMOID SINUSES

P. CASTELNUOVO
Pavia, Italy

Functional endoscopic sinus surgery allows a selective approach to the ethmoid sinuses in order to remove inflammatory diseases sparing the nasal mucosa of close areas.

The surgical approach is planned in relation to the extension of the disease and individual sinonasal anatomy: the ostio-meatal complex is the anatomical key of the anterior ethmoid, and the spheno-ethmoidal recess is the critical area for the posterior one.

The core of such a surgical philosophy is an individual surgical tailoring of the ethmoidal pre-chambers in order to assure a physiological ventilation and drainage to the maxillary, frontal and sphenoidal sinuses. A variety of surgical procedures can be accomplished to attain such goals: partial uncinectomy, total uncinectomy, opening of the frontal recess with intact bulla, anterior ethmoidotomy, posterior ethmoidotomy and total ethmoidotomy. Septal spurs, concha bullosa or paradoxically bent middle turbinate are corrected when necessary.

Indications, surgical techniques, and practical hints will be thoroughly discussed, and long-term results showed.

14:35-14:50
Symposium 16

RESULTS USING HIGH RESOLUTION RHINOMANOMETRY

Klaus Vogt
Private ENT-practice, Rendsburg, Germany

Purpose: The aim of functional septorhinoplasty is to achieve improvement of nasal breathing. The deformability of the nasal entrance can be visualized by High Resolution Rhinomanometry (HRR), which separates the accelerating from the decelerating parts of the breathing cycle. It shows the deformation of the nasal channel during the measurement procedure by generating double-loops instead of straight lines.

For more than 20 years we use rhinomanometry – now performed as HRR – as an essential diagnostical tool before any endonasal surgery. We never perform septoplasty , if HHR cannot show either a skeletal obstruction , a remarkable side difference or a clearly visible valve phenomenon . This principle reduces remarkably the number of unsatisfied patients, which do not feel any improvement of nasal breathing after surgery.

Methods: 125 patients suffering from nasal obstruction have been operated by the same surgeon. HRR was performed pre- and minimal 6 weeks postoperatively by a non-commercial HRR-research program (Hasse, Vogt &Hoffrichter 1999). The methods of surgery followed the principles of COTTLE. In some cases additional FESS was carried out.

Results: In patients with obstruction as measured preoperatively by HRR in average good results have been achieved. The number of observed valve problems was reduced after surgery of the septum without touching the upper lateral cartilage.

Conclusions: HRR is a reliable method for selection of patients for functional nasal surgery. It is possible to detect the role of instability of the nasal valve and its influence on the total functional obstruction.

14:50-15:05
Symposium 17

IMPACT OF VERTICAL DOME DIVISION ON NASAL AIRFLOW

Jerry S. Chapnik, Krzystof Conrad, Phillip Solomon
Mount Sinai Hospital (Toronto), University of Toronto, Toronto, Ontario, Canada

Purpose
Vertical dome division is an effective manoeuvre in nasal tip surgery to reduce or increase tip projection, increase tip rotation, narrow the tip and correct asymmetry of the lobule. Some surgeons avoid this technique fearing tip deformity and possibly impaired nasal airflow.

Method & Results
We made nasal airflow measurements in patients before and after septorhinoplasty with vertical dome division. In 25% the nasal airflow improved. It was negatively affected in 37.5%.

Conclusions
Despite objective findings of diminished nasal airflow in some patients following vertical dome division, no subjective correlation was identified. Furthermore, during the postoperative testing, alar retraction on all of these patients failed to normalize airflow results, indicating that alar collapse was not contributing to the airflow impairment in those cases. All of the patients were found clinically asymptomatic after surgery.

14:01-14:08
Free Paper
Session 17

JUVENILE ANGIOFIBROMA (NASOPHARYNGEAL) EXPERIENCE IN PAKISTAN

Azhar Hameed
King Edward Medical College/Mayo Hospital, Lahore, Punjab, Pakistan

Purpose: Juvenile nasopharyngeal angiofibroma (JNA) is an unusual destructive but essentially benign tumor almost exclusively seen in the nasopharynx of adolescent males. This study tries to describe clinicopathologic features, availability of investigative procedures, proper tumor staging, and management decisions.

Methods: The study includes 25 cases diagnosed as JNA between 1984 and 1999. A detailed diagnostic work-up and staging were done before the decision making.

Results: Average age at presentation was 17 y; 56% of patients presented in stage I, whereas only 4% were seen in stage IIIb. Twenty-two of 25 tumors were addressed surgically and 3 were treated with radiotherapy. Three patients had recurrent disease.

Conclusion: Painstakingly performed history and physical examination coupled with radiologic evidence and staging correlated well with the findings at exploration. Surgery remains the mainstay of management.

14:08-14:16
Free Paper
Session 17

ENDOSCOPIC SURGERY IN NASOPHARYNGEAL ANGIOFIBROMA

Reda Kamel, Ashraf Khaled, Tarek Kandil
Cairo University, Cairo, Egypt

Purpose: Juvenile nasopharyngeal angiofibroma is a highly vascular and locally invasive tumor with a high incidence of persistence and recurrence.

Method: This work comprised 6 patients who had limited juvenile nasopharyngeal angiofibroma operated on transnasally under endoscopic control. All these lesions were localized to the posterior nasal cavity, nasopharynx, sphenoid sinus, or pterygopalatine fossa. The tumors were completely excised without complications. A wide middle meatal antrostomy and removal of the anterior wall of the pterygopalatine fossa and the anterior edge of the sphenopalatine foramen were basic steps of the procedure.

Results: Endoscopic follow-up for periods ranging between 1 and 8 y and contrast-enhanced computed tomography excluded any residual or recurrence.

Conclusions: In limited lesions of angiofibroma, experienced endoscopic surgeons could cautiously consider the option of a transnasal endoscopic approach. The transnasal endoscopic approach is the most direct and avoids any external, palatal, or sublabial incisions. However, it is feasible only in limited lesions and the surgeon should be ready for an open approach in case of inability to achieve good exposure or complete removal.

14:20-14:28
Free Paper
Session 17

LE FORTE I APPROACH TO THE ADVANCED ANGIOFIBROMA: REPORT OF A CASE WITH INTRACRANIAL EXTENSION

Mohsen Naraghi, M. T. Khorsandi, M. Bayat, Sh. Yahyavi
Tehran University of Medicine, Tehran, Iran

Purpose: Reconsideration of this method as a useful measure in the treatment of advanced nasopharyngeal angiofibroma with large intracranial extension.

Methods: A 16-y-old male with a 6-mo history of nasal obstruction and intermittent bleeding presented with right orbital apex syndrome and proptosis. Imaging data revealed right sinonasal mass with large intracranial and infratemporal extension. The tumor was resected by a Le Forte I osteotomy approach. Osteotomy was done just above the level of the nasal floor. After separation of the maxilla from pterygoid plate with a curved osteotome, down fracture of the maxilla allowed excellent exposure of the tumor, which involved maxillary sinus, nasopharynx, and infratemporal fossa, extending superior to the cavernous sinus. The completion of resection was checked endoscopically.

Result: Postoperative follow-up showed marked improvement in proptosis and ophthalmic symptoms. Postoperative visual acuity was 2 meters finger count compared to light perception preoperatively.

Conclusion: This approach could be considered strongly as a treatment of advanced angiofibroma with large intracranial extension.

14:28-14:36
Free Paper
Session 17

REMOVING THE JUVENILE ANGIOFIBROMA WITHOUT EXTERNAL INCISION

Wang Dongxi, Wang Xiaohui, Lin Benliang, Li Ruiyu
Fujian Provincial Hospital, Fushou, Fujian, China

Purpose: Sixty-four cases of juvenile nasopharyngeal angiofibroma were operated on by combined transoral and nasal approaches without any external incisions, which produced better results.

Method: This operation is performed under general anesthesia with controlled hypotension and tracheal intubation. While the blood pressure is down to 100-80 mm Hg, the operator puts his fore and middle fingers through the patient's mouth into nasopharynx to hold the tumor and his right hand holds a tonsil elevator, inserting through patient's nasal cavity and reaching the upper border of the tumor. Then he dissects the tumor downward and toward both sides, closely contacting the bone wall. When most of tumor has been freed, he pushes and blocks it at left posterior nostril. He uses a hard forceps or tonsil snare to grasp and to twist it up, the rest being completely freed, and to draw it out from the nose. Finally, the nasopharynx and both nasal cavities are tightly packed with petroleum jelly gauze. After 2 to 4 days, the nasal packing is pulled away first, and the nasopharyngeal packing is taken out the next day.

Results: In the series, 3 cases needed reoperation and 3 cases failed. In the latter, the tumor remained after 1 to 2 operations.

Conclusions: This method is suited to the tumor localizing in the nasopharynx. But sometimes (in 2 cases) the tumor invading into pterygomaxillary fossa can also be drawn out by twisting. Compared with other routes by severe external incisions, this method has quite a few merits: greatly reducing bleeding, distinctly lightening patient's pain, shortening admitted period, and having no unpleasant sequelae.

14:40-14:48
Free Paper
Session 17

EVOLUTION OF EXPERIENCE WITH DACRYOCYSTORHINOSTOMY FROM EXTERNAL APPROACH TO AN ENDOSCOPIC ONE: AN ANATOMIC AND CLINICAL STUDY

Hisham Abd Al-Fattah, Sami M. Elwany, Ahmed Z. Ewiess, Hisham Farouk
University of Alexandria, Alexandria, Egypt

Purpose: Fifty dry skulls and 50 sagittally bisected adult human cadavers were studied for the anatomy of the lacrimal sac. The shortest distances between the posterior margin of the lacrimal bone and the anterior margins of the uncinate process and bulla ethmoidalis were 0.637 ± 0.14 cm and 1.2 ± 0.127 cm, respectively. The dimensions of the fossa were estimated. Guided by the anatomic results, a prospective study of 35 patients with chronic saccal and postsaccal lacrimal obstruction was carried out.

Methods: The patients were randomly assigned to undergo endoscopic dacryocystorhinostomy (DCR) either with stent (Group A) or without stent (Group B). Each patient was observed weekly for a month and monthly for at least 6 mo. Subjective improvement of symptoms, fluorescein dye test (at 1 and 6 mo), and endoscopic appearance of the DCR were used to assess patients.

Results: Two patients were lost to follow-up and were excluded. Group A (18 patients) statistically matched Group B (15 patients) in every respect ($P > 0.1$). After 1 mo postoperatively, crusting was significantly less in Group A and granulations were significantly less in Group B ($P < 0.05$); the incidence of adhesions was similar ($P > 0.05$). Five patients from Group A (27.75%) and 1 patient from Group B (6.66%) were not cured after 6 mo and had persistent epiphora ($P < 0.05$). Groups A and B were retrospectively compared with 65 patients who had external DCR in the preceding 10 y. Only 2 patients (3.08%) from the external DCR group were not cured.

Conclusion: External DCR has the greatest cure rate and nonstented endoscopic DCR has the second greatest cure rate, but the difference is not significant ($P > 0.05$).

15:08-15:16
Free Paper
Session 17

ENDOSCOPIC RESECTION OF NASOPHARYNGEAL ANGIOFIBROMA

Mohsen Naraghi
Tehran University of Medicine, Tehran, Iran

Purpose: To determine the role of endoscopic surgery in decreasing morbidity and recurrence of angiofibroma.

Methods: Seven patients who had nasopharyngeal angiofibromas were selected for endoscopic resection. The extent of tumors was from a localized tumor with involvement of pterygopalatine fossa extending only to nasopharynx, up to a massive tumor with extensive involvement of sphenoid, infratemporal, and maxillary sinus. All of the patients had preoperative embolization 24 to 72 h before surgery. The tumor was approached through the nasal and oral cavities with 0-, 30-, and 70-degree 4-mm telescopes without any incision.

Result: The patients were followed both endoscopically and by imaging for a mean of 1 y. There was a dramatic decrease of bleeding intraoperatively and less morbidity postoperatively. There were no recurrences.

Conclusion: Minimum bleeding, less morbidity, and lower chance of residual tumor are the main reasons that we are persuaded to use endoscopic removal of angiofibroma.

15:20-15:28
Free Paper
Session 17

ANALYSIS OF THE ADULT CHRONIC RHINOSINUSITIS WORKING DEFINITION

Richard R. Orlandi and Jeffrey E. Terrell
University of Michigan, Ann Arbor, MI, USA

Purpose: In 1997, the Task Force on Rhinosinusitis produced a working definition for adult chronic rhinosinusitis. The diagnostic criteria grew out of consensus opinion and were “intended to serve as a unifying starting point for further research.” Their validity has not yet been tested. We summarize our experience with these criteria.

Methods: All patients presenting for evaluation of rhinosinusitis were routinely questioned as to the presence of sinonasal symptoms contained within the Task Force’s working definition. The presence or absence of nasal purulence on anterior nasal examination was also noted. Patients who subsequently had surgery for chronic rhinosinusitis comprised the study population. All patients included in the study had symptoms for greater than 12 wk, computed tomographic evidence of rhinosinusitis, and inflammation found on analysis of pathology specimens. These patients’ symptom questionnaires and nasal examinations were reviewed.

Results: Fifty-seven patients met the criteria for inclusion in the study. Nasal obstruction/blockage and facial congestion/fullness were the most common symptoms. The average numbers of major and minor symptoms were 3.2 and 2.8, respectively. Patients with polyps and with previous nasal or sinus surgery differed little from the overall population. Of the 57 patients in the study, 50 met the diagnostic criteria set forth by the Task Force, yielding a sensitivity of 87.7%.

Conclusions: Diagnosing chronic rhinosinusitis without radiologic imaging or nasal endoscopy is difficult. The criteria set forth by the Task Force provide a relatively sensitive working definition of chronic rhinosinusitis. Further work is under way to assess the specificity and predictive value of these criteria.

15:00-15:08
Free Paper
Session 17

TREATMENT OF INVERTED PAPILLOMA OF THE NOSE AND PARANASAL SINUSES

J. Betka, J. Klozar, M. Taudy, V. Salac
Charles University, Prague, Czech Republic

Purpose: To evaluate the group of patients treated for inverted papilloma (IP); detect typical features of IP in patient history, radiologic, and local findings; correlate the recurrence rate to the surgical method used and to the morphology of the tumor; and assign indications for endoscopic surgery and external approaches.

Methods: Retrospective study. All patients were operated and followed up in our institution. Chi-square was used to test for correlation.

Results: From 1980 to 2000, 71 patients with IP of the nose and paranasal sinuses were treated by surgery. There were 65 lateral nasal wall and 6 septal tumors in the series. Histologic examination showed IP in all cases. IP associated with carcinoma was originally described in 8 tumors. After reexamination, 5 cases were excluded; thus the incidence of carcinoma was 4% in the whole group. External approaches (lateral rhinotomy) were used in 40 cases, sublabial approaches in 10 cases, and endonasal procedures in 21 cases. Until 1995 the recurrence rate was 16% for lateral rhinotomy, 25% for sublabial approaches, and 38% for endonasal procedures. The results of endoscopic treatment have considerably improved in recent years because of careful selection of cases on the basis of computed tomography and progress in endoscopic surgery. The recurrence rate for tumors treated by endoscopy since 1995 is 14% with 1-to 5-y follow-up.

Conclusions: Histologic diagnosis of IP associated with carcinoma is difficult. In our retrospective study, the best treatment results were obtained by lateral rhinotomy. In selected cases, endoscopic procedures can obtain a similarly low recurrence rate.

14:01-14:08
Free Paper
Session 18

NASAL CHALLENGE TEST IN ACOUSTIC RHINOMETRY

B. Samolinski, A. Grzanka, M. Arcimowicz
The Medical University of Warsaw, Warsaw, Poland

Purpose: To determine which of the acoustic rhinometry (AR) curves and points of those curves should be used in the quantification of nasal mucosal changes in response to nasal provocation challenge (PR) with allergen: before the challenge (BS), after intranasal application of a control solution (CN), and after mucosal decongestion (MD).

Methods: Thirty patients with house dust mite (HDM) allergy and 20 patients with grass pollen (GP) allergy. The following values were examined: reactivity curves reflecting the percentage changes in each of the 40 points on the AR curve cross-sectional areas (CA) in points I (CA-I) and C (CA-C) and mean cross-sectional areas calculated for the 3-cm distance from point C (CA-C3).

Results: Analysis should include the cavity with a greater reduction in the CA on AR after PR. The use of the new CA-C3 parameter and its comparison with CA-C and CA-I values confirmed low reactivity of AR measurements at the CA-I and their virtual uselessness for PR evaluation. The comparison of the mean PR values between sides demonstrated a significant difference between the more reactive and other sides ($P < 0.001$): 35.4% reduction of CA at point C and 44% at point CA-C3. The corresponding values for the left and right side and the mean value for both sides ranged from 20.3% to 23.1% at point C and from 27.0% to 29.3% for CA-C3.

Conclusions: Measurements after PR should be compared to the preceding CN measurements rather than the BS or MD. The results of nasal PR with GP allergen were similar to those of HDM.

14:08-14:16
Free Paper
Session 18

MONITORING OF IMMUNOTHERAPY BY ACOUSTIC RHINOMETRY

B. Samolinski, A. Grzanka, M. Arcimowicz, M. Rzepkowska
The Medical University of Warsaw, Warsaw, Poland

Purpose: To use acoustic rhinometry (AR) for comparison of the effects of specific immunotherapy (IT) with standardized and nonstandardized house dust mite (HDM) extracts.

Methods: The study was a randomized, single-blind trial in 25 patients hypersensitive to HDM. In 12 patients a nonstandardized extract was used (NS group) and in 13 patients a standardized extract (S group). Their participation in the study ranged from 82 to 164 wk. The effects of immunotherapy were evaluated by 6-mo nasal provocation challenge (PR) with Der p. and Der f 1:1 clinically evaluated on the visual-analog scale and by AR. AR results were calculated as mean cross-sectional areas of the 3-cm distance from point C (CA-C3).

Results: In both groups, on visit 1 there was a significant difference ($P < 0.001$) in the mucosal status before and after PR demonstrated by AR. The reaction diminished on subsequent visits to nonsignificant values within the S group and low, though significant values ($P < 0.05$) within the NS group. There were no significant differences between the groups. Also on visit 1, there was a highly significant difference ($P < 0.001$) in clinical evaluation before and after PR. In the course of IT the differences gradually resolved, to a greater degree in the S group ($P < 0.05$) than in the NS group ($P < 0.005$). On visit 2, patients in the S group generally felt better than patients in the NS group ($P = 0.009$). On visit 4, the mean post-PR VAS score evaluating general health was 21.2 in the S group and 46.3 in the NS group ($P < 0.05$). The comparison between the groups was insignificant.

Conclusions: AR measurements and clinical evaluation after PR indicate a better therapeutic effect of a standardized HDM extract than a nonstandardized extract. AR may be used in monitoring of IT effectiveness.

14:20-14:28
Free Paper
Session 18

OBJECTIVE MEASUREMENTS OF NASAL PATENCY GIVE BETTER QUALITY AND PATIENT SUBJECTIVE SATISFACTION IN NASAL SURGERY

J. Sipilä, L. Haavisto, J. Suonpää
Turku University Central Hospital, Turku, Finland

Purpose: This is a review of prospective studies made in our department to achieve better quality and results in nasal surgery.

Methods and Results: The first study was on 102 consecutive patients referred to septoplasty between March 1987 and August 1989. Rhinomanometry was done before and 6 mo after septoplasty, but did not influence the decision to operate. Those patients who had high nasal resistance preoperatively lowered to normal with operation were significantly more satisfied with the result compared with patients who had normal or low resistance before operation. The patients were reevaluated 3 to 5 y after the surgery. The patients who had high preoperative nasal resistance normalized by the operation were still most pleased. We did another prospective study from 1993 to 1996. There was a waiting list for septoplasty. All the patients were reexamined: standard questionnaire of the symptoms, careful rhinologic examination, and rhinomanometry. The patients were divided into 3 groups: those with high resistance, those with normal postdecongestion resistance but other clinical indications to operate, and patients with normal resistance. The first 2 groups were operated on; the last group was offered another form of treatment. Altogether, 716 patients referred for septoplasty were examined, of whom 423 were operated on. During the waiting time, 10% of the patients who had been waiting for 3 to 4 y became symptom free. The initial decision had been done without evaluation of nasal breathing patency. Six months after operation, 85% were very satisfied or satisfied in the first group and 69% in the second group.

Conclusions: These studies confirm the need for some kind of objective assessment of nasal patency in addition to clinical examination before septoplasty.

14:28-14:36
Free Paper
Session 18

NORMATIVE NASAL AIRWAY RESISTANCE AND CROSS-SECTIONAL AREAS FOR CHILDREN, ADOLESCENTS, AND ADULTS USING COMPONENT RHINOMANOMETRY

Bonnie Smith, Thomas Guyette, Yash Patil, Mimis Cohen
University of Illinois at Chicago, Chicago, IL, USA

Purpose: The purpose of this presentation is to present normative nasal airway resistance and cross-sectional area values obtained by component rhinomanometry for children, adolescents, and adults. The clinical utility of this unique rhinomanometric approach will also be highlighted.

Method: Seventy-four subjects, male and female, aged 5 to 18 y as well as young adults, were included. None had upper respiratory tract infection or allergies at the time of testing or any history of nasal obstruction or trauma. Nasal airway resistance and cross-sectional area values were obtained for the right nasal cavity, left nasal cavity, total nasal cavity (TNC), velopharyngeal region (VR), and total nasal airway (TNA). TNC values were derived using anterior rhinomanometry and VP values from the approach described by Warren and DuBois in 1964. TNA values were obtained by adding TNC and VP at the same flow rate. Results were obtained during inhalation and exhalation.

Results: Results showed age, sex, and inhalatory-exhalatory effects similar to previous data, with nasal cavity results comparable to previous anterior rhinomanometry values and total nasal airway results like those obtained using a posterior rhinomanometric approach. VP resistances were negligible for all age groups. Case studies will be presented showing the advantage of using component rhinomanometry for patient testing.

Conclusion: Component rhinomanometry provides objective data for the different regions of the nasal airway. Such information can be used to guide surgical correction of nasal obstruction as well as to assist in monitoring the patient for signs of recurrence of obstruction.

14:40-14:48
Free Paper
Session 18

A PORTABLE SPIROMETER FOR STUDIES ON THE NASAL CYCLE

J. Hanif, S. S. M. Jawad, R. Eccles
Common Cold Centre Cardiff University, Cardiff, United Kingdom

Purpose: Studies on the nasal cycle are difficult because multiple measurements of nasal patency need to be made over many hours. There is a great need for a simple portable instrument that can be used away from the clinical laboratory for studies on the nasal cycle. Our aim was to investigate the usefulness of a small portable spirometer in studying the nasal cycle.

Methods: The Mir Spirobank spirometer was fitted with a nasal adapter to measure nasal airflow. The spirometer was used to measure the slow vital capacity volume of air expired from each nasal passage in turn. Hourly measurements were made over a 6-h period in 6 healthy volunteers. The spirometry measurements of the volume of air expired from each nasal passage were compared with the nasal conductance of each nasal passage (airflow at 75 Pa) obtained by anterior rhinomanometry.

Results: The spirometer was found to be easy to use by both the investigator and patient. Simple regression analysis of the spirometer and rhinomanometer measures of airflow partitioning found a correlation coefficient of $R = 0.826$ ($P < 0.0001$, $n = 42$).

Conclusion: The partitioning of nasal airflow as measured by spirometry is directly comparable to results obtained with rhinomanometry. Spirometry has considerable advantages over rhinomanometry for studies on the nasal cycle because of portability and ease of use of equipment.

14:48-14:56
Free Paper
Session 18

THE USE OF ANTIBIOTICS IN ENDONASAL ENDOSCOPIC SURGERY FOR CHRONIC SINUSITIS

S. Albu, E. Tomescu, C. Sarafoleanu
University of Cluj, Cluj, Romania

Purpose: To compare the effectiveness of an antibiotic (amoxicillin) and a placebo in the postoperative care of adult patients who had operations for chronic sinusitis.

Methods: A total of 170 adult patients who had chronic sinusitis refractory to multiple adequate trials of medical therapy were enrolled in a randomized, double-blind, placebo-controlled trial. Endoscopic endonasal procedures were performed with the Messerklinger technique. Main outcome measures were postoperative subjective improvement (headache, rhinorrhea, and nasal obstruction) after 10 days of treatment, difference in postoperative endoscopic appearance on day 10, and recurring episodes of sinusitis during the 12-mo follow-up.

Results: No statistically significant differences in symptomatic relief existed between the 2 treatment groups; although the antibiotic group displayed a better mean postoperative endoscopic score (0.85) compared with the placebo group (1.30), the difference was not statistically significant. The number of recurring episodes of sinusitis did not differ between the 2 groups.

Conclusion: This study demonstrated no benefit from routine use of antibiotics in the postoperative care of patients who had operations for chronic sinusitis.

15:00-15:08
Free Paper
Session 18

INCIDENCE OF CHRONIC HYPEROSTOTIC RHINOSINUSITIS IN PATIENTS UNDERGOING PRIMARY SINUS SURGERY COMPARED TO REVISION SURGERY

Vijay Anand and Ashutosh Kacker
New York Presbyterian Hospital, New York, NY, USA

Purpose: The incidence of chronic hyperostotic rhinosinusitis has been underreported due to poor recognition of the disease process. The surgical management of chronic hyperostotic rhinosinusitis without prolonged preoperative and postoperative antibiotic therapy can worsen the clinical course of the disease. We conducted a retrospective review of computed tomography (CT) scans of sinuses done at 5 teaching tertiary care institutions.

Methods: CT scans of 20 patients (10 undergoing primary sinus surgery and 10 undergoing revision sinus surgery) were randomly selected from each institution and reviewed by the same radiologist for evidence of osteitis and compared to the original readings of the CT scans.

Results: The finding of sinus osteitis was infrequently reported by the radiologist, who focused primarily on the mucosal disease.

Conclusions: Sinus osteitis is not an uncommon finding in chronic refractory sinusitis, which is underreported radiologically. Long-term intravenous antibiotic therapy in conjunction with surgery may provide symptom relief. This study will help formulate treatment protocols for patients with chronic hyperostotic rhinosinusitis.

15:08-15:16
Free Paper
Session 18

NASAL NITRIC OXIDE LEVELS PREDICT COMPUTED TOMOGRAPHIC FINDINGS IN PATIENTS WITH SYMPTOMS OF SINUSITIS

Craig M. Benoit, James Duncavage, S. Bobo Tanner, John Murray
Vanderbilt University Medical Center, Nashville, TN, USA

Purpose: This study examines the correlation between nasal nitric oxide (NO) levels and findings on computed tomography (CT) scans of the paranasal sinuses in patients with symptoms of active sinusitis.

Methods: Forty-nine symptomatic patients underwent a sinus CT scan, which was scored for extent of sinus disease and evaluated for active sinusitis by the presence of an air-fluid level. Patients also underwent steady-state nasal NO measurement using the Sievers NO Analyzer.

Results: Ten patients had normal CT scans; 22 had either mucoperiosteal thickening or partial opacification of > 1 paranasal sinus, but no air-fluid level, 17 had ≥ 1 paranasal sinus with an air-fluid level. The mean ± SEM NO concentration in patients with a normal CT scan was 211 ± 16 parts per billion (ppb). Patients with either mucoperiosteal thickening or partial opacification, but without an air-fluid level on CT scan, had a mean NO concentration of 244 ± 16 ppb. In the 17 patients with an air-fluid level in ≥ 1 of the paranasal sinuses on CT scan, the mean NO concentration was 103 ± 11 ppb. Compared to the other groups, the decreased nasal NO concentration in patients with an air-fluid level was highly significant ($P < 0.0001$). There was also a significant correlation between the nasal NO concentration and the degree of sinus disease radiographically ($r = -0.46$, $P < 0.001$).

Conclusion: Using presence of an air-fluid level on CT scan as the standard for active sinusitis, a nasal NO concentration < 150 ppb has a sensitivity of 88%, a specificity of 97%, and a positive predictive value of 94% for active sinusitis. This study shows that nasal NO measurements may be done quickly and inexpensively to detect active sinusitis, thus helping assess the need for CT scans and responsiveness to medical therapy.

14:01-14:08
Free Paper
Session 19

IMPAIRED NEUROIMMUNOMODULATION AS POSSIBLE CAUSE OF NASAL POLYPOSIS

Damir Milicic, Davorin Danic, Irena Pirkl, Alen Sekelj
General Hospital Andrije Stampara 42 Slavonski Brod, Croatia

Purpose: From our experience, cauterization of posterior nasal nerves reduces significantly the endoscopic recurrence of nasal polyposis ($P = 0.026$). We tried to shed some light on this by using the published experience and theories from other authors, known immunology events, and clinical experience.

Method: We reviewed more than 200 articles published in the last 15 y regarding immunology, structure, cell and metabolic products of nasal polyps, physiology and pathophysiology of immunocompetent cells, nerve injury and repair, and neurotransmitters and their influence on immunologic events and cells.

Results: Cascade of immunologic events in findings published by authors worldwide.

Conclusion: Constitutional or acquired impairment of production of different neurotransmitters in the nerve endings induces impaired immunologic function of different immunocompetent cells, resulting in polyp formation after inflammation with both bacteria and fungi and allergic sensitization. Remodeling and reinnervation can normalize the neurotransmitter content and restore normal immunologic function. Experimental and clinical trials should be done to elucidate and confirm our theory.

14:08-14:16
Free Paper
Session 19

NEW THEORY ON POLLINOSIS FROM AIRBORNE POLLEN OF GRASS

Tomio Nakano
Capital Medical University and Hyogo College of Medicine, Beijing, China, and Hyogo, Japan

Purpose: We reported with regard to the new theory of pollinosis in airborne tree pollens. There remains the question: how about grass pollens?

Methods: Based on a study using electron microscopy (EM), we postulate that pollinosis is caused by the morphologic characteristics of grass grains.

Results: The projections from the outer wall of pollen grains can be characterized as biting-pierce, saw, sharp-needle, long-needle, and club-cudgel types. Such types are likely to invade the nasal soft mucosa and cause allergy, especially, ambrosia and artemisia so famous clinically. Accordingly, their grains were measured to analyze the significance in the airborne pollens.

Conclusions: Thus, from the EM analysis of morphologic characteristics of pollen grains, the authors have proposed a new theory of grass pollinosis.

14:08-14:16
Free Paper
Session 19

NEW THEORY ON POLLINOSIS FROM AIRBORNE TREE POLLENS

Tomio Nakano
Capital Medical University and Hyogo College of Medicine, Nishinomiya, Hyogo, Japan

Purpose: Over a period of 1 year in Beijing, we investigated all airborne tree pollens.

Method: The study used electron microscopy (EM).

Results: The projections from the pollen bodies could be classified as granular, crest, biting, long-needle, sharp-needle, villous or hooked types or club or cudgel. Pollen grains with a needle form (long superficial and solid, thick or columnar interiors) seem to be more likely to invade the nasal mucous membrane. The disadvantage to nasal mucous membrane fall sick nasal symptoms such as allergy, sneezing, nasal obstruction. For these reasons, we postulate that pollinosis is caused by morphologic characteristics of pollen grains. Furthermore, we measured nitric oxide (NO) in the nasal cavity of Cedar allergen experimental model rats. Accordingly, we made a study on the significance of NO as air pollution and Cedar pollinosis.

Conclusion: From the EM analysis of pollen grains and NO study, the authors have proposed a new theory of grass pollinosis.

14:20-14:28
Free Paper
Session 19

AN ETIOPATHOLOGIC APPROACH IN TREATMENT OF POLYPOUS SINUSITIS WITH INTERFERON INDUCER CYCLOFERON

I. P. Vassilenko and S. S. Grigoryan
The Research Institute of Ear, Throat & Nose, Moscow, Russia

Purpose: The purpose of our study was to develop new diagnostic criteria in polypous sinusitis in view of the interferon system state and justify the tactics of postoperative therapy with interferon inducer.

Methods: There were 64 patients with chronic polypous sinusitis divided into 2 groups: 30 patients with primary polyposis (46.8%) and 34 patients with relapsing process (54.7%). In 24 cases there was a unilateral localization (37.5%) and in 40 cases, bilateral (62.5%). General clinical observation, computed tomography, and nasal endoscopy were done. The quantity of T- and B-lymphocyte subpopulations in peripheral blood (CD3, CD4, CD8, CD16, CD19, CD4/CD8) and serum IgA, IgM, IgG, IgE, and circulated immune complexes were studied. The levels of serum and spontaneous interferon (IFN) in blood ex vivo and a- and g-IFN in appropriate leukocyte induction in vitro were measured.

Results: Deficiency of a- and g-IFN production was obtained. Changes in IFN status were more sensitive than immune ones. After surgery all patients had cycloferon therapy by intramucosal injections at the points of ostiomeatal complex. Early postoperatively, reduction of reactive mucous membrane appearance and improvement of wound healing were revealed. After cycloferon management, up to normal restoration of leukocytes a- and g-IFN producing ability in patients of group I was obtained. In group II, increased remissions and level of a- and g-IFN producing capacity of leukocytes with the precisely expressed tendency to its normalization were found.

Conclusion: The correction of a- and g-IFN producing deficiency by cycloferon is an etiopathologic approach.

14:28-14:36
Free Paper
Session 19

VARIOUS CC CHEMOKINES IN NASAL POLYPS AND THE EFFECT ON THE EXPRESSION OF CC CHEMOKINE OF ANTIBIOTIC THERAPY

Seung Geun Yeo, Joong Saeng Cho, Chang Il Cha
Eulji Medical School, TaeJon, South Korea

Purpose: Fundamental pathologic changes in the nasal polyp are accumulation of eosinophils, edematous change, presentation of mast cells on lamina propria, and infiltration of inflammatory cells. Allergy can be involved in the pathogenesis of the nasal polyp. We designed this study to investigate whether specific chemokines are associated with different forms of nasal polyps and their change according to antibiotic treatment.

Methods: Nasal polyps from patients with atopy (AP group, n = 11) and without atopy (NP group, n = 18) were sampled. Expression of RANTES, eotaxin, MCP-2, MCP-3, MIP-1α, and MIP-1β was studied immunohistochemically. Specimens of nonallergic nasal turbinates from 11 patients who were operated on for nasal blockage were used as a control group. All patients were randomized into 2 groups. One group used antibiotics for 10 days before operation. The other was not treated by any medication.

Results: The rate of stained cells per infiltrating cell was higher in AP and NP groups than in the control group. Immunostaining of anti-chemokine monoclonal antibodies in AP group was more than in NP. Neutrophils were the predominant cells in NP group, and histiocytes and plasma cells were also identified. Eosinophils were predominant in the AP group. Antibiotic treatment had no effect.

Conclusion: Different kinds of chemokines were expressed in each group of nasal polyps. It suggests that chemokines play an important role in development of nasal polyps, and different kinds of chemokines can be involved according to the cause of nasal polyps. CC chemokines are not affected by antibiotic therapy.

14:40-14:48
Free Paper
Session 19

ASSOCIATION OF OPHTHALMIC CRANIAL NEUROPATHY AND ACUTE SPHENOID SINUSITIS

Erica Thaler and David Kennedy
University of Pennsylvania, Philadelphia, PA, USA

Purpose: The purpose of this paper is to demonstrate the association of ophthalmic cranial neuropathy and acute sphenoid sinusitis.

Methods: A review of 2 case histories of patients who presented with acute onset of ophthalmic cranial neuropathy and were found to have acute sphenoid sinusitis.

Results: In both cases, prolonged and aggressive medical management did not resolve the sinusitis, and operative intervention including sphenoidotomy was required to correct the neuropathy. In both cases, complete resolution of the ophthalmic cranial neuropathy occurred after sphenoidotomy.

Conclusions: Ophthalmic cranial neuropathy may result from acute sphenoid sinusitis and must be considered in the differential diagnosis of patients who present with diplopia. If sphenoid sinusitis is identified, surgical drainage of the sphenoid sinus must be strongly considered in management.

14:48-14:56
Free Paper
Session 19

POSSIBILITIES AND LIMITATIONS OF ENDOSCOPIC SINUS SURGERY FOR JUVENILE NASOPHARYNGEAL ANGIOFIBROMA

M. Jorissen
ENT Department, Leuven, Belgium

Purpose: To critically evaluate the possiblities and limitations of endoscopic sinus surgery (ESS) in the treatment of juvenile nasopharyngeal angiofibroma (JNA). Since 1993 all JNAs have been treated endoscopically.

Methods: Nine consecutive JNAs endoscopically operated on during the last 7 y were reevaluated for extent of the disease and recurrence.

Results: All patients were male: 7 were adolescents (13 to 17 y) and 2 were adults (24 to 29 y). Of the 9 JNAs, 5 extended into the infratemporal fossa (classification IIIA or IIIB according to Andrews). All patients underwent preoperative embolization. Surgery was always done under general anesthesia with controlled hypotension. In 1 patient with extension to the cavernous sinus, surgery was stopped because of preoperative cavernous sinus bleeding. All procedures were uneventful. Two patients needed transfusion because of postoperative internal maxillary artery bleeding. Most patients were dismissed at the second postoperative day. Mean follow-up was 37 mo (5 to 72 mo). There were 2 recurrences; both were recognized within the first 6 mo after surgery. The first patient had initial cavernous sinus involvment. The disease stabilized after internal carotid artery embolization, now more than 4 y ago. The second extended into the infratemporal fossa and was, although asymptomatic, successfully reoperated on endoscopically.

Conclusions: After embolization ESS is possible for JNA, even those extending into the infratemporal fossa. The results are not different from those reported in the literature for classic external approaches.

15:00-15:08
Free Paper
Session 19

PREVALENCE OF PERENNIAL ALLERGIC RHINITIS AMONG JUVENILES OF JIANGSU PROVINCE, CHINA

Lei Cheng, Min Yin, Akira Miyoshi, Taro Shirakawa
Nanjing Medical University, Nanjing, China

Purpose: The epidemiologic study of allergic rhinitis is quite rare in China. To study the prevalence of perennial allergic rhinitis among juveniles, an epidemiologic survey has been performed among the students (aged 6-24 y) of elementary, high school, and university from 1995 to 1998 in Jiangsu Province.

Method: Uniform methods, including questionnaire investigation, nasal inspection, and allergen extracts (house dust and D farinae) skin scratch test, were used in the survey.

Result: The positive rates of house dust and *D farinae* were 22.9% and 28.8%, respectively, while 19.1% of students were sensitive to both allergens, and 32.6% to at least 1 allergen. The sensitization to allergens increased with age ($P < 0.001$). The prevalence of allergic rhinitis was 1.8%. No difference was found in the sex ratio.

Conclusion: Although the prevalence of perennial allergic rhinitis among juveniles in China is lower than that in the developed countries, more attention should be paid to it. Environmental prevention is the key method in reduction of the incidence.

15:08-15:16
Free Paper
Session 19

ENDONASAL AND EXTERNAL APPROACH IN FRONTOETHMOIDAL OSTEOMA SURGERY

C. Steigerwald, F. Hilterhaus, R. Keerl, W. Draf
ENT Clinic, Fulda, Germany

Purpose: Frontoethmoidal osteomas are the most frequent benign tumors in the paranasal sinuses. If resection is indicated, an appropriate surgical approach is demanded. While external approaches have been the treatment of choice, recently the endonasal approach has been considered in the literature.

Methods: Retrospective evaluation of 34 resected frontoethmoidal osteomas (11 ethmoidal and 23 frontal) to analyze the crucial factors for endonasal and external procedures with the aim to illustrate current concepts in osteoma surgery.

Results: Twenty-three endonasal and 11 external approaches (osteoplastic procedure by coronal incision) had been used to resect 34 osteomas. In 3 cases complete osteoma removal required a partial resection of the anterior frontal sinus wall. Reconstruction of the forehead region was accomplished in these cases with parietal outer table grafts.

Conclusions: Osteomas limited to the ethmoid can usually be resected via an endonasal route. The endonasal approach can enable the resection of frontal osteomas, if the tumor is located medial to a virtual sagittal plane through the lamina papyracea, a sufficient frontal sinus access can be achieved endonasally in regard to the anterior-posterior diameter of the frontal sinus floor, and the osteoma's origin is found at the inferior-posterior region of the frontal sinus. Our current concept for frontoethmoidal osteoma resection consists of endonasal and osteoplastic procedures, including outer table grafts harvested from the parietal region to reconstruct the forehead in case of extended osteomas with involvement of the anterior frontal sinus wall.

15:20-15:28
Free Paper
Session 19

AN EVOLUTION IN THE MANAGEMENT OF SINONASAL INVERTING PAPILLOMA

Timothy L. Smith, Joseph K. Han, Todd Loehrl, Robert J. Toohill
Medical College of Wisconsin, Milwaukee, WI, USA

Purpose: We review the management of sinonasal inverting papilloma (IP) at our institution over the past 15 y, examining trends in diagnosis and treatment. A new staging system is proposed to compare various surgical approaches for tumors of similar stage.

Methods: Between 1986 and 1999, 37 patients with IP were treated. Demographic data, clinical presentations, radiographic evaluations, intraoperative and pathologic findings, surgical approaches and procedures, and recurrence rates were collected by reviewing medical records. Each lesion was staged on the basis of computed tomography findings and endoscopic examination.

Results: Complete information existed for 31 patients; 19 were treated endoscopically (average follow-up, 50 mo); 9 were in stage Ia, 5 in Ib, 5 in II, and 0 in III. The total recurrence rate for this group was 10%. Twelve patients had lateral rhinotomy or a sublabial degloving approach (average follow-up, 58 mo); 5 patients were in stage Ia, 3 in Ib, 1 in II, and 3 in III. The total recurrence rate for this group was 8%. Recurrence rates for patients who were treated primarily and secondarily were 0% and 17%, respectively.

Conclusions: Technological advancements have led to a trend of earlier diagnosis of sinonasal inverting papilloma. Comparable recurrence rates are observed with endoscopic management compared with the usual lateral rhinotomy or sublabial degloving approaches. Recurrence rates are lower for primary procedures than for secondary procedures, regardless of surgical approach.

16:00-16:05
Free Paper
Session 19

BALANCE INTEGRATION OF STEREOTACTIC NAVIGATION INTO AN EXPERIENCED FESS PRACTICE

Paul H. Toffel
University of Southern California, Los Angeles, CA, USA

Purpose: The efficacy of functional endoscopic sinus surgery for the treatment of refractory chronic obstructive rhinosinusitis is well established. Stereotactic computer navigation has recently added an additional level of precision and security for selected cases, especially revision and extensive polypoid primary disease. The initial application of stereo-tac procedures among a cadre of 333 consecutive FESS surgeries performed personally by an experienced clinical professor demonstrates useful and balanced application protocols for logical integration of this technology.

Methods: A retrograde review of 333 consecutive FESS cases performed personally by the experienced author, was segregated according to application of stereotactic computer navigation technique. The cases were not teaching cases, and allowed the author to select most appropriate modality freely as applicable.

Results: 149 of 333 cases were benefited by stereotatic navigation. These included all revision cases and difficult primary cases. The remainder were primary cases safely managed without navigation by balanced multimodal FESS technique. IN this cadre, no cases, whether stereo of standard FESS, had serious complications.

Conclusions: The data demonstrates that stereotactic navigation is useful for difficult sinus cases, but not required for safety in, most primary cases.

14:01-14:08
Free Paper
Session 20

CONTOUR COMPRESSION IN RHINOPLASTY

M. A. Sulamanidze and G. M. Sulamanidze
RAS Central Clinical Hospital, Moscow, Russia

Purpose: To improve the outcomes of rhinoplasty, the author has proposed methods of both external and internal contour compression of the nose.

Methods: Before operation, a mold of the patient's face is taken, to be used for casting a plaster copy, which is then shaped to the desired form. Thereafter, this model is used to prepare a plaster-gauze bandage, which is applied to the operated nose and kept there for 2 weeks.

Results: From permanent compression, the disintegrated osseous and cartilaginous fragments of the nose are set in the desired position. Altering the nose's shape on the model and creating new bandages allow additional amendment of the nose's shape in the desired direction. Hence, the bandage performs an active function, whereas commonly used bandages only passively fix the nose's shape obtained during rhinoplasty. The effect of rhinoplasty can be improved by using intranasal balloon-catheters. They provide easy nasal tamponade, reliable hemostasis, measured and uniform compression of internal surface of nasal cavity, and easy removal of the device.

Conclusions: The experience of 452 operations showed that this technique makes it possible to predict the patient's would-be complexion before rhinoplasty and, in the majority of cases, to form the nose to the desired individual shape.

14:08-14:16
Free Paper
Session 20

FUNCTIONAL AND AESTHETIC CORRECTION OF CLEFT NASAL DEFORMITIES

Mimis Cohen, Bonnie Smith, Thomas Guyette
University of Illinois at Chicago, Chicago, IL, USA

Purpose: Secondary correction of cleft nasal deformity is recommended for functional and aesthetic purposes. Little objective information is available on the preoperative status of the nasal airway as well as on the long-term functional effects of reconstructive surgery. Yet, it is widely accepted that nasal obstruction might have serious implications for the patient's well-being.

Methods: Methods for extensive clinical evaluation and analysis of the nasal deformity as well as functional evaluation with measurements of nasal airway resistance will be presented in detail. Planning of surgical procedures based on the clinical and rhinomanometric studies will be demonstrated.

Results: The first 25 consecutive patients treated with our protocol are reported. Follow-up ranged from 3 to 6 years and included clinical and rhinomanometric evaluations. Eighty-five percent (n = 20) of our patients had significant functional and aesthetic improvement; 12% (n = 3) had significant aesthetic improvement, but a modest functional improvement, while 8% (n = 2) required additional procedures to improve appearance and had no functional improvement. These patients had undergone several previous procedures that resulted in significant intranasal scarring.

Conclusions: The issue of airway obstruction must be addressed at the time of correction of secondary cleft nasal deformities. Rhinomanometric testing assists in better understanding of the nasal obstruction and selection of the most optimal procedure. Postoperative testing provides an objective evaluation of results.

14:20-14:28
Free Paper
Session 20

EXTERNAL SEPTORHINOPLASTY IN CHILDREN: UPDATE ON OBJECTIVE GROWTH MEASUREMENTS AND TECHNICAL ASPECTS

William S. Crysdale and Hamdy El Hakim
Hospital for Sick Children, Toronto, Canada

Purpose: Nasal surgery in children is controversial. The first author reported previously that postoperative anthropometric measurements demonstrated retarded nasal growth in 2 of 12 patients. The question, at that time, was whether this growth retardation represented a preexisting condition or was a consequence of the nasal surgery completed.

Methods: During the past 8 y, we have completed anthropometric measurements preoperatively in 29 boys and 12 girls aged from 6 to 17 who subsequently had surgery.

Results: Comparison of the nasal dorsum measurements and indices indicates no difference between the preoperative and postoperative means ($P > 0.05$), suggesting that the growth of the nose has not been impeded by the surgery.

Conclusions: The authors outline the rationale for this format of surgical management (autogenous septal cartilage free grafts) with respect to anterior nasal septal pathology affecting nasal valve function adversely, detail key surgical steps, and discuss the findings outlined above.

14:40-14:48
Free Paper
Session 20

RHINOSURGERY AS A DAY SURGERY PROCEDURE

Marián Kovác̆
Denná ORL Klinika, Banská Bystrica, Slovakia

Purpose: There is increasing pressure for more day surgery, even in rich countries. In some transition countries, there still remains “strong hospital thinking” despite low health budgets. We present a study of 855 patients undergoing rhinosurgery procedures from April 1997 to April 2000.

Methods: All cases were done in a day-care ear, nose, and throat clinic, the only one in our country. The same surgeon operated on all patients. The most common type of surgery was septoplasty, rhinoplasty, and endoscopic sinus surgery.

Results: Eight hundred twenty-four (96.3%) operations were performed under general anesthesia. Because of the large region (more than 200 km), most of the patients stay overnight, but no more than 24 hours. The most common complication is postoperative hemorrhagia: 6 patients (0.7%). Reoperation was necessary in 3 of them (0.35%, 1 septoplasty, 2 functional endoscopic sinus surgery [FESS]). No transfusion was necessary. Other complications: liquorrhea 1 patient (0.33% of FESS), septal hematoma 2 patients (0.52%), and postoperative asthmatic attack 1 patient (0.11%). Only 3 patients required transfer to the hospital (0.35%). It is difficult to make financial comparisons between a hospital and a day surgery, but day surgery is approximately 60% of hospital costs.

Conclusion: Rhinosurgery is a suitable type of surgery for day care. The complication rate is low, it is not necessary to select only easy cases and patients, and the region can be large.

14:48-14:56
Free Paper
Session 20

A MORPHOLOGIC STUDY OF HUMAN QUADRILATERAL CARTILAGE, IMPLICATIONS FOR CHILD SURGERY

P. S. G. Pereira, J. K. Kajiwara, M. Grellet
Faculdade de Medicina, Ribeirão Preto, USP, São Paulo, Brazil

Purpose: This is a morphologic study of human quadrilateral cartilage, including subjects 0 to 66 years old.

Methods: The quadrilateral cartilage was removed en bloc, with the other nose cartilages. The open rhinoplasty was the approach used to remove the cartilage from deceased patients autopsied at Serviço de Patologia do Hospital das Clínicas da Faculdade de Medicina de Ribeirão Preto - USP and Serviço de Verificação de Óbitos do interior, at Ribeirão Preto. The anatomic parts were cut into 3 pieces, each corresponding to the anterior (position 1), mid (position 2), and posterior (position 3) thirds. After fixing and embedding, the samples were cut in 7-mm slices and stained by hematoxylin and eosin and alcian blue. Each position was divided in 3 locales: superior (local 1), mid (local 2), and inferior (local 3) thirds studied in optical microscopy by photometric, histologic, and morphometric methods.

Result: The main result was that quadrilateral cartilaginous tissue has a high growth rate until age 5 y.

Conclusion: After age 8 y, there is a decrease in this rate. Nasoseptal surgeries can be done after age 5 y, and the best age to do these surgeries is 8 y.

15:01-15:08
Free Paper
Session 20

FUNCTIONAL SURGERY OF NASAL SEPTUM AND ITS INFLUENCE ON NOSE SHAPE

M. Popovska, F. Jakimovska, G. Kopaceva, B. Popovska
University of Skopje, Skopje, Macedonia

The importance of the nasal septum in nasal surgery cannot be overemphasized. It plays a major role in both the form and function of the nose. The functional role of the septum in regard to support of the external nose, regulation of airflow, and support of the nasal mucosa dictates that management of the nasal septum be judicious.

In the surgical management of septal deformities, the quadrangular cartilage must be considered as a fibroelastic plate that is deformed by the action of intrinsic or existing forces or both.

The complicated deformities need an additional intervention on the upper and lower lateral cartilages. A successful rhinoplasty surgeon must be able to deal with the entire range of septal problems to ensure successful surgery.

15:08-15:16
Free Paper
Session 20

PROBLEM-ORIENTED SEPTORHINOPLASTY (FLEXIBLE SEPTORHINOPLASTY)

N. B. Prahlada and Abdul Latheef
Basaveshwara School of Medicine, Kelagote, Chitradurga, Karnataka State, India

Purpose: To define and classify various septal deviations and deformities. To develop an individualized technique for each type of septal deformity, which is easy to perform and is associated with minimum complications and provides maximum results.

Methods: In this prospective study, 634 patients underwent septal surgery. The hospital records were analyzed for age, sex, indications for surgery, type of septal deformity, surgical technique used, complications, and outcome. A new classification for septal deformity was designed depending on the site and type of the deviation, dislocation, and presence of spurs. A conservative and flexible surgical technique evolved for each type of deformity. Emphasis was on preventing tear of mucoperiosteum/perichondrial flaps, preserving quadrangular cartilage, and avoiding complications such as septal perforation.

Results: The majority of patients (96.7%) expressed significant improvement in airway and other rhinologic symptoms. Associated allergy was a major limiting factor for improvement in a few patients. Seven patients had septal perforation and of these, only 2 patients required an additional surgical procedure to correct the perforation. Four patients required revision septal surgery for various reasons.

Conclusions: We propose a new classification for septal deformities and suggest surgical techniques tailored to each type of septal deformity.

15:20-15:28
Free Paper
Session 20

FUNGAL INFECTION OF THE PARANASAL SINUSES

Ajay I. Shah
N. H. L. Mun Medical College and V. S. Mun General Hospital, Ahmedabad, Gujarat, India

Purpose: This presentation deals with how to diagnose and to manage fungal infection of the paranasal sinuses. Fungal infection is commonly found along with allergic nasal polyposis, but at times we may find invasive fungal infection with polyposis, which may invade the orbit and intracranial cavity.

Methods: Of 52 patients, 3 patients had intracranial fungal invasion. Two had anterior as well as middle cranial fossa invasion of the nearby parasellar region. We have treated both patients by endoscopic sinus surgery without the help of a neurosurgeon.

Results: Close follow-up for about 1 year was uneventful.

Conclusions: We firmly believe that even intracranial fungal invasion can be treated solely by endoscopic procedures. Fungal sinusitis is also a fairly common occurrence and is managed by endoscopic sinus surgery.

14:01-14:08
Free Paper
Session 21

FUNCTIONAL ANGIOGRAPHY FOR THE MANAGEMENT OF NASAL VASCULAR TUMORS

Naoyuki Kanoh, Toru Minatogawa, Yukio Maeda, Yoshihiko Nishimura
Hyogo College of Medicine, Hyogo, Japan

Purpose: The treatment of head and neck vascular tumors is troublesome and challenging, and it presents the difficult problem of disfigurement as well as significant morbidity from bleeding, ulceration, and infection. We evaluated 5 recent patients with vascular tumors treated with our functional angiography and selective embolization protocol.

Methods: Pathologic diagnosis was hematocele in 2 patients, arteriovenous malformation in 1, angiofibroma in 1, and hemangiopericytomalike tumor in 1. Functional angiography was performed, and selective embolization was performed with Gelform (Acor Orthopaedic, Inc, Cleveland, OH, USA), aviten, or both within 4 (but usually 2) days before the total extirpation surgery.

Results: The blood supply to the nasal vascular tumor was evaluated with functional angiography and embolized effectively without complications. Blood loss was decreased to less than 250 mL, and the extirpation surgery was achieved in all cases.

Conclusions: Functional angiography and selective embolization before surgery is a highly successful and useful technique in the treatment of nasal vascular tumors.

14:08-14:16
Free Paper
Session 21

DETECTION OF FUNGI IN EOSINOPHILIC FUNGAL RHINOSINUSITIS USING CONFOCAL LASER MICROSCOPY

Darren McDonald, Jens Ponikau, David Sherris, Eugene Kern, Jim Tarara
Mayo Clinic and Mayo Foundation, Rochester, MN, USA

Purpose: More attention is paid to a possible fungal cause in chronic rhinosinusitis (CRS). Inadequate methods to detect fungus in CRS patients have limited the ability to link the chronic inflammation to the presence of fungal organisms. In the search for more sensitive methods, we evaluated the use of a confocal laser microscope to detect fungal elements in the mucin of CRS patients.

Methods: Six randomly selected patients with CRS were evaluated. In 3 patients, the reflection of the fungi in Gomori methenamine silver (GMS) stain was used to highlight them against the background by using an excitation wavelength of 488 nm. In another 3 patients, a chitin-specific immunofluorescence stain was used in the emission mode at 530 (± 15 mn) to specifically detect chitinous fungi in the mucin.

Results: Fungal elements were detected in all cases by using both the reflection and the chitin-labeling method. Fungi in cross section were not visible with the reflection method but were easily detectable by chitin labeling. Fungal elements with altered morphology, which were not detectable by GMS light microscopy, were confirmed by reflection and by specific chitinase. Controls were negative for both methods.

Conclusion: These novel methods specifically in combination with a fungus-specific marker show promising results in enhancing the ability to detect fungal elements in CRS patients.

14:20-14:28
Free Paper
Session 21

DEVELOPMENT OF BRUSH CYTOLOGY WITH NASAL ENDOSCOPY FOR DETECTION OF VARIOUS INFLAMMATORY, PRECANCEROUS, AND CANCEROUS LESIONS OF NOSE AND PARANASAL SINUSES

Yashwant Maru
M.Y. Hospital and M.G.M. Medical College, Indore, India

Purpose: Nasal cytology is a simple, easy, bloodless, and quite reliable investigation and, with the help of the nasal endoscope, samples for cytology can be collected more accurately. This can be used as a screening test for detection of various inflammatory, precancerous, and cancerous lesions in symptomless patients. It can also be used as a diagnostic test of high accuracy to give a definitive diagnosis of nasal pathology. Here an attempt is made to assess its efficacy for diagnosis of the above-mentioned lesions of nose and paranasal sinuses in 150 patients.

Method: Simultaneously, the results of this nasal endoscopic brush cytology are compared with histopathologic examination of the same cases.

Results: In the present study of 150 cases, the accuracy was 91% and incidence of false-negative results was 9%. This technique provides for rapid diagnosis on an outpatient basis in today's world of increasing cost of medical practice and time shortage for both patient and physician.

Conclusion: This method of brush cytology with the help of nasal endoscopy can be used as an adjuvant to clinical and histopathologic diagnosis as an outpatient department procedure. As in this study, it was found to be a simple, reliable, and timesaving procedure for further management.

14:28-14:36
Free Paper
Session 21

ENDOSCOPIC SURGERY OF SINONASAL TUMORS

Reddy M. Mohan
Nova ENT Hospital, Hyderabad, Andra Pradesh, India

Purpose: Our experience in the field of nasal endoscopy in the past 10 y encouraged us to adopt the endoscopy technique in sinonasal tumor surgery. The utility of such techniques and observations are highlighted.

Methods: Sixteen patients with nose and sinus tumors have been operated on during the last 30 mo. The cases included nasopharyngeal angiofibromas, inverted papillomas, nasoseptal osteomas, nasal dermoid, nasal glioma, infraorbital neuroma, and malignant tumors. Investigations like diagnostic nasal endoscopy, computed tomographic scan, magnetic resonance imaging, and angiography are helpful in designing the surgery. Most of the tumors are operated on by endoscopy approach alone. Surgical modifications like endoscopic medial maxillotomy, modified orbitotomy, and transseptal resections are designed to gain wide access within the narrow confines of nasal cavity. Endoscopic technique is combined with external approaches in angiofibromas with wide lateral extensions and in malignant tumors to facilitate dissection near dura and other deep areas. Intraoperative bleeding is effectively tackled by adopting electrosurgical resection technique with modified instrumentation.

Results: The results with respect to tumor resection are equally good or even better compared with external approaches. No major complications are encountered. Bleeding and reduced access are the major deterrents. Postoperative recovery is fast, morbidity is less, and hospitalization is minimized.

Conclusions: Newer surgical techniques and approaches are formulated to suit endoscopic excision of sinonasal tumors. This approach has major advantages with respect to deeper dissection, compared with conventional approaches, and can be combined to get the benefit of both techniques.

14:40-14:48
Free Paper
Session 21

PUSH-DOWN TECHNIQUE: YES OR NO FROM OUR EXPERIENCE

R. Zivkovic, M. Stankovic, S. Zivaljevic, D. Milisavljevic
The University Clinic of Ear, Nose and Throat, Nis, Serbia, Yugoslavia

Purpose: The aim of our study was to show our experience with the push-down technique and to point out its disadvantages and advantages over the classic osteotomy.

Method: We operated on 86 patients with the push-down technique in the period from 1985 to 1999 at the University Clinic of Ear, Nose and Throat in Nis, Serbia, Yugoslavia. We compared results using this technique with the results of the classic osteotomy.

Results: The push-down technique described in the literature is unsatisfactory in clinical practice. The main problem is collapse in the I, II area of the nose and in the osseous level where partial intervention is not possible.

Conclusion: We consider that the push-down technique is only theoretically possible and does not give proper results. Because of collapse in the cartilage level of the nose, it is better to perform the classic rhinoplastic procedure.

14:48-14:56
Free Paper
Session 21

SEQUENCE ANALYSIS OF EPSTEIN-BARR VIRUS GENES IN NASAL NK/T-CELL LYMPHOMA

Masayoshi Nagamine, Nobuyuki Bandoh, Miki Takahara, Yasuaki Harabuchi
Asahikawa Medical College, Asahikawa, Japan

Purpose: The authors previously demonstrated the presence of Epstein-Barr virus (EBV) genomes and their products in nasal NK/T-cell lymphomas. Sequence analysis is available to examine whether a certain EBV strain is associated with the disease and its lymphomagenesis. In the current study, we analyzed the sequence of latent EBV genes for latent membrane protein (LMP)-1 and -2A, whose products are related to the cytotoxic T-cell (CTL) epitopes, in nasal NK/T-cell lymphoma.

Methods: Seven Japanese patients with nasal NK/T-cell lymphoma were studied. Total DNA was extracted from frozen biopsy specimens using a QIAamp DNA mini kit. The total region of LMP-1 and exon 6 of the LMP-2A coding sequence were amplified by polymerase chain reaction. The sequences of the amplified products were resolved on an ABI Prism 310 Genetic Analyzer and were compared with the prototype B95-8 strain.

Results: A 30-bp deletion in the 3' C-terminal region of the LMP-1 gene, which corresponds to a deletion of 10 amino acids 346-355 of the B95-8 strain, was detected in all 7 samples. In the LMP-1 genes, 43 similar nucleotide changes, which corresponds to 22 amino acid changes, were detected in all 7 patients and 11 sequence variations were found among 7 patients. With regard to the sequence of exon 6 of the LMP-2A gene, a similar nucleotide change (AGC to ACC, serine to threonine) at codon 348 was found in all 7 patients.

Conclusion: Nasal NK/T-cell lymphomas have certain nucleotide and amino acid changes of LMP-1 and -2A that may confer on escaping to target for the CTL.

15:08-15:16
Free Paper
Session 21

METASTATIC ADENOCARCINOMA TO THE NASAL CAVITY

Ron Swain, Jr., and Seth Yellin
Emory University School of Medicine, Atlanta, GA, USA

Purpose: Review of an atypical case of adenocarcinoma arising in the parotid gland and metastasizing to the nasal cavity.

Methods: Retrospective case review.

Results: A 70-year-old man had adenocarcinoma of the right parotid gland. In 1990, he initially presented with bilateral parotid masses. Fine-needle aspiration was consistent with monomorphic adenoma on the right and pleomorphic adenoma on the left side. Right and left parotidectomies were performed 2 wk apart without complication. The final pathology revealed adenocarcinoma of the right parotid gland and pleomorphic adenoma of the left parotid gland. Within 2 y, the patient developed pulmonary metastases. Nine y after his initial diagnosis, the patient presented to our clinic with a large fungating mass involving the entire nasal cavity, with complaints of nasal obstruction and foul smell. Subtotal rhinectomy was performed, resecting mucosa, cartilage, septum, and skin, with primary closure of the defect, mobilizing mucosa, cartilage, dorsal skin, and nasal alae. Approximately 18 mo later, the patient has not had a recurrence in the nasal cavity. Resection of this metastatic lesion has provided adequate local control and prevented this patient from being ostracized.

Conclusion: Metastatic parotid adenocarcinoma to the nasal cavity is extremely rare and provided an unusual clinical dilemma. Although there was no chance of curing this patient, resection of this unsightly mass without requiring a prosthesis or free tissue transfer provided him with local control of his disease, a bilateral functioning nasal airway, and a significantly improved appearance.

15:20-15:28
Free Paper
Session 21

OUTCOME OF TREATMENT OF ALLERGIC FUNGAL SINUSITIS AND NASAL POLYPS WITH ENDOSCOPIC SINUS SURGERY, STEROIDS, & ANTIHISTAMINE

M. Yousef Mian, M. Mubarak, K. Chaudhry
The Aga Khan University Hospital, Karachi, Sindh, Pakistan

Purpose: To design a protocol for the treatment of allergic fungal sinusitis with functional endoscopic sinus surgery, systemic steroids, topical steroids, and antihistamine and to evaluate the efficacy of this treatment.

Methods: A prospective study was done from March 1997 to June 1999 of 15 patients with the diagnosis of allergic fungal sinusitis. All the patients underwent functional endoscopic sinus surgery; 2 had additional trephining of the frontal sinus for access to the frontal sinus and better viewing. At surgery, all the sinuses were washed with 2 to 3 L of normal saline to get rid of all the fungus in different corners of the sinuses. Postoperatively, all the patients were treated with systemic steroids, 1 mg/kg per d for 1 wk, then 0.5 mg/kg per d for 3 wk, followed by 0.1 mg/kg per d for another 3 mo. Topical steroids began 1 mo after surgery. Concomitant nonsedative systemic antihistamine therapy was started immediately after surgery. Follow-up was at regular intervals and was monitored with nasal endoscopies and computed tomographic scanning, if indicated.

Results: The follow-up was 9 mo to 3 y. All patients are in remission except 3 who have had recurrence. They were re-treated with the above regimen of systemic steroid and went into remission. One of them had further recurrence and needed further surgery to eradicate the disease. Immunotherapy for these particular patients is being considered. All the recurrences were due to noncompliance of the patients with the protocol.

Conclusion: The recurrence rate has been drastically reduced with the above protocol. Response to steroids and antihistamine is further evidence that allergic fungal sinusitis and nasal polyps are an immunologic-mediated hypersensitivity.

14:05-14:45
Mini-Course 25

THE TRANSVESTIBULAR APPROACH (A NEWER APPROACH TO TIP SURGERY)

Nabil Fuleihan
American University of Beruit Medical Center, New York, NY, USA

The limited exposure of the lower cartilage using the transcartilaginous approach may result in significant asymmetries in the nasal tip especially in the region of the nasal domes and intermediate or middle crura. The author presents a new technique for exposing the lower lateral cartilage. Through a marginal incision, the whole endonasal surface of the lower lateral cartilage can be exposed allowing performing different reduction and rearrangement techniques to the lateral medial crura. Permanent interdomal sutures can be applied resulting in narrowing of the distance between the two tip defining points. The author discusses results of his experience using this new approach emphasizing the surgical steps, advantages and disadvantages. The transvestibular approach has proven to be reliable approach that improves the predictability of endonasal rhinoplasty.

14:45-15:25
Mini-Course 25

A NEWER APPROACH TO TIP SURGERY WITH RESULTS.

Pietro Palma
Milano, Italy

Educational Objectives
(1) Identify pertinent functional and aesthetic anatomy of the nasal tip. (2) Conduct detailed aesthetic analysis. (3) Form a foundation for approaching aesthetic tip surgery in a functional fashion. (4) Choose the appropriate surgical techniques to achieve positive results with fewer complications.

Course Description
Nasal tip surgery is especially complicated since any modification for aesthetic goals has the potential to induce functional derangements. The risks of obstructive complications following tip surgery are very real since incisions and excisions in this area can easily alter alar sidewall compliance, produce valve derangements and cicatricial stenosis of the anterior segment of the nose.
The main thrust of the course will be to present the many options in surgical approaches to the nasal tip that afford maintaining or reconstituting the balance between functional integrity and aesthetics.
Operative techniques will be discussed. Detailed illustrations and intraoperative photographs will be used to highlight the techniques in order to provide the course participants with a practical approach. The course will emphasize the closed endonasal approach to tip surgery. If necessary, the “insider” rhinoplastic surgeon will convert all closed rhinoplasty procedures into an open procedure by simply connecting the two infracartilaginous incisions with the transcolumellar incision.
Long-term follow-up of each technique will be presented, and areas of controversy will also be discussed.

14:50-15:15
Mini-Course 26

INSTRUCTIONAL MINI-COURSE: A NEUROSURGICAL OVERVIEW OF TRANSNASAL PITUITARY SURGERY WITH NEUROSURGICAL COMPLICATIONS ANS HOW TO TREAT

John L. D. Atkinson
Mayo Clinic, Mayo Foundation, Rochester, MN, USA

This didactic format will cover an overview of pituitary surgery from a historical perspective through evolving endoscopic transnasal variations of present day surgery. Neurosurgical complications will be discussed from pre-operative decision making and perioperative complications with treatment options.

14:50-15:15
Mini-Course 27

ADVANCED CANCER OF THE SKULL BASE: WHEN AND HOW TO RESECT FOR BEST RESULTS

Paul J. Donald
University of California, Sacramento, CA, USA

Skull base surgery has revolutionized the surgical treatment of advanced cancer of the paranasal sinuses. Tumor penetrating the anterior and middle cranial fossa floors and even invading brain and dura can be completely resected with a reasonable expectation of cure. A plethora of approaches have evolved, but the commonest used are the transfacial-anterior fossa and the infratemporal fossa-middle fossa approaches. The team approach comprised of a neurosurgeon and a head and neck surgeon is essential of these complex procedures. Two-year tumor-free survival rates of 33% can be anticipated.

14:05-14:25
Mini-Course 29

RHINOPLASTY IN THE ASIAN NOSE

Tae Young Jang
Inha University Hospital, Inchon, Korea

Anatomical structure and preferred of the appearance of the external nose in oriental people is quite different from that of Caucasians. Results of our survey regarding the appearance of the external nose preferred by Koreans and their anatomical characteristics through cadaver dissection will be presented.

In general, external nose of oriental people can be characterized by a flat dorsum, thick skin, very thin weak upper and lower lateral cartilage. However, strategy and applied surgical techniques involved are dependent on each individual case. In a case where severe deformed nose exits or there is a need for strong support and projection of tip of the nose, external approach is preferred. Minor tip refinement and mild to moderate tip projection can be obtained through endonasal approach. For dorsal implant autologous cartilage is commonly used. Due to weak lower lateral cartilage, external valve collapse is one of the common findings which can be managed by various kinds of external valvoplasty.

14:25-14:50
Mini-Course 29

RHINOPLASTY IN THE MEXICAN NOSE

Fausto López Infante
Cirugia Reconstructiva Funcional de la Nariz, Mexico

This paper demonstrates the average Mexican nose with thick cartilage and thick skin. Approximately 90% have associated pathology, such as deviated nasal pyramid, deviated septum, high palate and narrowed nasal cavities, ptotic nasal tip (almost always posttraumatic at birth or after birth). Trauma in childhood, which may not be remembered, inhibit or stimulate the development of the nose.
More than hump resection, reconstruction into a normal position is required of all the elements of the nose including the pyramid, septum and turbinate. Grafts can help to rotate and project the lobule.

16:05-16:20
Symposium 19

ENDOSCOPIC SINUS SURGERY FOR INVERTED PAPILLOMA

David W. Kennedy
University of Pennsylvania Medical Center, Philadelphia, PA, USA

The role of endoscopy in the visualization, biopsy, and postoperative follow up of benign tumors has long been undisputed. Endoscopic surgery is also becoming increasingly established as the treatment of choice for inverted papilloma with limited sites of attachment in an accessible region or in patients with skull base or sphenoid. involvement. The key to successful for endoscopic surgery for inverted papilloma is meticulous identification of the site or sites of tumor attachment during the surgical procedure and either removal or burring of the underlying bone at these sites. Endoscopic surgery for inverted papilloma is more controversial in patients with extensive CT opacification of the maxillary and frontal sinuses. However, our experience demonstrates that, although MR provides valuable information with regard to the relative degree of tumor vs. retained secretions within an opacified sinus, it frequently does not demonstrate whether the tumor is has attachments within the sinus cavity, the critical piece of information in determining the most appropriate approach. Accordingly therefore, we now recommend an initial endoscopic approach in almost all patients with inverted papilloma. However, permission is obtained pre-operatively to change to the appropriate external approach if sites of attachment are found within the maxillary or frontal sinuses and the underlying bone cannot be either drilled or removed from these areas endoscopically. Utilizing this technique we have reported a recurrence rate of 6% for primary procedures and 25% for procedures referred following recurrence after an earlier surgical procedure.

16:20-16:35
Symposium 18

NASAL STEROIDS: MECHANISM OF ACTION IN CHRONIC RHINOSINUSITIS

J.U. Ponikau
Mayo Clinic, Mayo Foundation, Rochester, MN, USA

The common denominator in chronic rhinosinusitis (CRS), with or without nasal polyposis, is the intense eosinophilic infiltration into the nasal mucosa, which is the histologic hallmark of this disease and present independently from atopy. This sometimes very intense eosinophilic inflammation is in contrast to its near absence in healthy controls. The eosinophils mechanism of action is likely through the release of their cytotoxic granule proteins, especially eosinophil major basic protein (MBP), which is known to cause the epithelial damage seen in CRS. A role as an effector cell for the eosinophil leukocyte in the pathophysiology of CRS could also explain the positive effect of corticosteroids, which has been observed in patients. Beside the known decreasing effect of corticosteroids on the amount of circulating blood eosinophils, they are also thought to indirectly inhibit
the adhesion to endothelium and migration of eosinophils through the wall of the vessel into the tissue.
prolonged survival of eosinophils
eosinophil production in the bone marrow
chemokines, such as RANTES, who are eosinophil attractants
Thus, corticosteroids, and especially for safety reasons the intranasal corticosteroids, can be used to decrease the eosinophilic inflammation in patients suffering from chronic rhinosinusitis.

16:50-17:05
Symposium 19

ENDOSCOPIC REPAIR OF CSF-LEAKS

Heinz Stammberger
University ENT Department, Graz, Austria

For more than twenty-five years, intrathecal 5% sodium fluorescein had been routinely used at Graz during surgical closures of CSF-leaks. With endoscopic approaches, this technique has helped in identifying dural defects. From 1990 – July 2000, 130 patients with CSF-rhinorrhea were operated. In the 72 patients until 1995 only 41 were operated strictly endoscopically and 22 still had an external an 9 a combined approach, in the last 5 years over 96% of the patients with CSF leaks and meningoencephaloceles were operated strictly endoscopically. Only defects in the posterior table of the frontal sinus, especially when located laterally, were approached externally.

Direct coronal CT in the paranasal sinuses proves to be significantly better in detecting lesions compared to axial CT-images 82% vs. 53%). In all cases, intrathecal fluorescein allowed for a precise intraoperative localization of the defect(s). There were no fluorescein related complications in this series. The surgical techniques included the well known standards: underlay, overlay, combined techniques, fibrin-glue helped in most cases to stabilize the crafts; fascia latal being our favorite substrate. For the first series of 72 CSF-leaks until 1995 the overall success rate was 94.5% after primary closure. For the second half of our series, results appear to be even better.

16:01-16:08
Free Paper
Session 22

PRIVATE ENT PRACTICE IN WARSAW, POLAND

Marek J. Krajewski
Krajmed - Otorhinolaryngology, Plastic and Reconstructive Nasal Surgery, Warsaw, Poland

Purpose: The most common pattern of doctor's employment in Poland is full-time state employment often associated with part-time private practice. The decision on entering full-time private practice is always associated with fears. Will I have enough work? Will I make it?

Method: I have run a full-time private ENT practice since March 1994.

Results: The basic statistics are as follows: number of new patients, 4,485; Children up to 10 y, 1,659; total visits, 12,405; and number of operations, 1,264.

The most common complaints among children are blocked nose, recurrent upper respiratory tract infection, and otitis media and among adults, blocked nose, postnasal drip, and headaches. The most common surgical procedures on children are adenoidectomy, tonsillectomy, and tube insertion and on adults, functional endoscopic sinus surgery and septoplasty.

Conclusions: In the last few years, the practice has shifted into more rhinologic procedures. The practice seems to be stable; the number of rhinologic operations increases. In my experience, the biggest improvement in surgical techniques has been achieved by routine use of an endoscope during adenotomies.

16:08-16:16
Free Paper
Session 22

ANGLED CURETTES FOR ENDOSCOPIC ADENOIDECTOMY

P. F. Morgado, L. R. Neves, E. Y. C. Viertler, O. Cervantes
Universidade Federal de São Paulo, São Paulo, Brazil

Purpose: The purpose of this study was to evaluate a set of angled curettes for operations on patients with adenoid hypertrophy under videoendoscopic guidance.

Methods: Three biangled curettes were designed according to the anatomic and radiographic profiles of 20 children aged 4 to 8 y. The curettes were applied intraorally with the patient in a normal supine position without cervical hyperextension. All procedures were monitored from images taken with a 2.4-mm rigid endoscope introduced into the inferior or middle meatus of the nose. Special emphasis was given to peritubal hypertrophy for which conventional techniques usually fail to remove tissue satisfactorily. This technique may be used in patients who cannot undergo cervical hyperextension, such as those with Down syndrome.

Results: During an 8-mo period, 10 patients with the complaints of nose obstruction, sleep snoring, and mouth breathing underwent this technique with satisfactory results. Removal of the peritubal adenoid was carefully observed during the procedure with no hypertrophic tissue left behind. On 6-mo follow-up, improvement of obstructive symptoms and no regrowth of adenoid tissue were observed with nasopharyngoscopy.

Conclusion: We have developed a new set of curettes to perform videoendoscopic adenoidal surgery. Special attention was given to the peritubal areas where removal is usually not satisfactory with conventional curettes. We had no recurrences of adenoid tissue at 6-mo follow-up.

16:20-16:28
Free Paper
Session 22

ATROPHIC RHINITIS, COMPARATIVE SURGICAL TREATMENT: FUNCTIONAL ENDOSCOPIC SINUS SURGERY WITH AND WITHOUT OSTEOPERIOSTEAL FLAP IMPLANT

Damayanti Soetjipto and Sona John Lala
University of Indonesia, Jakarta, Indonesia

Purpose: Infection has a high incidence in atrophic rhinitis and may have an important role in atrophic rhinitis. We compared the results of treating atrophic rhinitis with functional endoscopic sinus surgery (FESS) and those of treating it with FESS together with osteoperiosteal flap implant.

Method: From January 1998 to December 1999, 20 patients were included in this study from the ENT Department Cipto Mangungkusumo Hospital who had clinically and pathologically confirmed atrophic rhinitis. Ten patients had FESS only and another 10 had FESS and osteoperiosteal flap implant. All patients had atrophic rhinitis grade I or II; no patient had grade III.

Results: All the patients from both surgical treatments had good results. No statistically significant differences existed between using FESS with and without osteoperiosteal flap implant in patients with atrophic rhinitis.

Conclusion: Surgical treatment of atrophic rhinitis using FESS alone produces good results similar to those using FESS together with osteoperiosteal flap implant. Surgical treatment of sinus infection is valuable in the treatment of atrophic rhinitis.

16:28-16:36
Free Paper
Session 22

CLINICAL PROFILE OF ANGIOFIBROMAS: A 10-YEAR RETROSPECTIVE STUDY

A. K. Agarwal, Devyani Lal, Ramanuj Bansal
Maulana Azad Medical College and Lok Nayak Hospital, New Delhi, India

Purpose: To study the clinical presentation and management of angiofibroma presenting over 10 y.

Methods: A 10-y retrospective review of records of 267 men (age, 8-23 y) with angiofibroma treated at our institution from April 1990 to the present.

Results: The commonest presenting complaints were epistaxis (100%), nasal obstruction (92%), and, in late-presenting cases, facial deformity (22%), with frequent involvement of nasopharynx, nasal cavity, or ipsilateral maxillary sinus, and extension beyond these sites in 40%. Intracranial involvement occurred in 18%, extradural in all but 3 cases. Computed tomography (CT) was introduced in 1997, increasing the pickup rate of angiofibromas by 23%; 34% were recurrences, which had extensive spread, aggressive clinical behavior, and were recalcitrant to treatment. CT scanning was most useful for diagnosis and planning of various surgical approaches; midfacial degloving and lateral rhinotomy were increasingly preferred. Average blood loss during surgery was 1,600 mL, decreasing over the years. One patient with extension into the middle cranial fossa died of hemorrhage. Disease recurred in 15% of all cases; 22% of cases with intracranial involvement received radiotherapy for residual or recurrent disease.

Conclusions: Juvenile nasopharyngeal angiofibromas still pose a clinical challenge because of bleeding during surgery, extensive spread into inaccessible areas, and recurrence. Despite lack of scanning and endoscopic facilities in peripheral health centers, and inadequate or unplanned resections, improvement in diagnostic, surgical, and anesthetic techniques has decreased morbidity and mortality.

16:48-16:56
Free Paper
Session 22

BELIEVE IT OR NOT! THEY ARE NASOPHARYNGEAL ANGIOFIBROMA

P. G. Datta, K. H. Tarafder, A. S. A. Amin
Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Purpose: The most frequent presentation of patients who have nasopharyngeal angiofibroma is recurrent and massive epistaxis. In most cases, despite this alarming symptom, presentation is too late. None of the accepted surgical approaches satisfies the surgeon for complete removal of the mass.

Methods: Here, I will present a series of 85 cases.

Results: Eight patients had recurrences and 2 died.

Conclusions: Because embolization is not developed in our country, preoperative massive bleeding confirms the belief that the tumor acquires a new blood supply from the site of extensions such as nasal cavities, sinuses, pterygopalatine fossa, orbit, and even the cranial cavity. Believe it or not, even ligation of 1 of the external carotid arteries fails to reduce bleeding to a minimum extent.

17:00-17:08
Free Paper
Session 22

SURGICAL MANAGEMENT OF EXTENSIVE NASOPHARYNGEAL ANGIOFIBROMAS WITH COMBINED TRANSFACIAL AND TRANSPALATAL APPROACHES

Magid El-Shennawy
Faculty of Medicine, Cairo University, Cairo, Egypt

Purpose: Large juvenile nasopharyngeal angiofibromas (JNA) are a therapeutic challenge because of their relationship to major vessels and cranial nerves at the base of the skull in addition to their tendency for recurrence. This report describes the results obtained in the last 10 years with the surgical removal of large (class III & IV) nasopharyngeal angiofibromas through a combined transfacial and transpalatal approach. Before the use of high-resolution computed tomographic scans and magnetic resonance imaging, unrecognized extensions of JNA resulted in a high incidence of incomplete resection. Likewise, the incidence of intracranial extension of disease has only recently been appreciated as 20% to 30% of cases.

Method: The treatment of choice for angiofibromas is surgical excision.

Results: Primary irradiation in our series failed to control the disease, in addition to the potential dangers of irradiation in a group of young patients such as those of JNA.

Conclusions: We used the combined frontotemporal and transfacial approach for type 3b angiofibroma in one case. This technique has been reported previously and provides excellent visualization of both the intradural and extradural aspects of the disease.

17:08-17:16
Free Paper
Session 22

NASOPHARYNGEAL ANGIOFIBROMA: ENDOSCOPIC APPROACH

Agnaldo Graciano, Plinio Morgado, Onivaldo Cervantes, Marcio Abrahão
Federal University of São Paulo, São Paulo, Brazil

Purpose: To investigate the safety and effectiveness of an endoscopic approach to nasopharyngeal angiofibroma. Nasopharyngeal angiofibroma is a benign, highly vascular, locally invasive tumor that occurs in young male patients. Its incidence is 0.5% of all head and neck tumors, and it usually originates on the posterolateral wall of the nose at the sphenopalatine foramen. Surgical excision is the standard treatment for these lesions. Other forms of therapies are considered adjunct treatment for extensively intracranial lesions or unresectable recurrences. Many surgical approaches are used to provide total excision of the tumor with minimal morbidity. Every case is judged on its particular characteristics, and the selected approach depends on preoperative diagnostic assessment to determine tumor extension and intracranial invasion. Some authors have suggested the use of endoscopic techniques to access stage I and stage II lesions.

Methods: We reviewed 7 cases of nasopharyngeal angiofibroma treated at the Federal University of São Paulo from January 1997 to March 2000. Blood loss, tumor size, length of surgery, and duration of hospital stay were analyzed.

Results: Six patients were primarily treated through an endoscopic approach. This technique was also used to remove a stage III lesion recurrence previously treated through a Webber-Fergunson access.

Conclusions: An endoscopic approach is safe and offers a low-morbidity access to the excision of stage I and stage II nasopharyngeal angiofibroma. It could also be used to control total excision of stage III and stage IV lesions accessed through other approaches.

17:20-17:28
Free Paper
Session 22

OUR EXPERIENCES WITH MYCOSES OF PARANASAL SINUSES

S. B. S. Mann, Naresh Panda, Ashok Gupta, Vikas Nehru , A. Chakrabarti
Postgraduate Institute of Medical Education & Research, Chandigarh, India

Purpose: To categorize paranasal sinus (PNS) mycoses by clinical, radiologic, and mycologic findings and to evalute the results of treatment.

Methods: Two hundred twenty-eight patients (7-60 y) with PNS mycoses (136 males) were managed. One hundred fifty-five patients were rural elite. Common symptoms were rhinorrhea (53.07%), nasal obstruction (33.77%), and headache (12.28%) followed by cheek swelling, proptosis, and diminished vision.

Results: PNS mycosis was categorized as allergic (11.84%), noninvasive (35.96%), invasive (45.6%), and fulminant (5.70%). Maxillary and ethmoid sinuses were commonly involved (57.01%).

Aspergillus flavus was the commonest pathogen (77.19%). Allergic group was treated by surgical excision followed by topical steroids, noninvasive type by extirpation of disease from all sinuses and close follow-up, invasive group by surgery followed by chemotherapy (itraconazole), and the fulminant type by early radical surgical debridement along with amphotericin B. Twenty-three showed recurrence or residual disease, and 12 died of disease.

Conclusions: Computed tomographic scan is mandatory to monitor recurrence or residual disease. Early management with surgery and chemotherapy is the treatment of choice.

FRIDAY

16:08-16:16
Free Paper
Session 23

CONCENTRATION OF EOSINOPHIL GRANULAR PROTEINS IN THE MUCIN OF PATIENTS WITH CHRONIC RHINOSINUSITIS

D. Congdon, J. Ponikau, D. Sherris, E. Kern, G. Gleich, H. Kita
Mayo Clinic and Mayo Foundation, Rochester, MN, USA

Purpose: Chronic rhinosinusitis (CRS) is an inflammatory disease of the nasal and paranasal mucosa. There is epithelial damage and a coexistent eosinophilic infiltration of the nasal tissues in patients with CRS. Major basic protein (MBP) is the main constituent of the eosinophil granule and is known to be toxic to tissue. Applying various concentrations of MBP has induced epithelial changes similar to those seen in CRS. Our goal was to determine quantitatively the exact MBP concentration to cause the tissue damage seen in CRS.

Methods: We collected samples of mucin from 20 patients with CRS undergoing endoscopic surgery. Mucus was obtained from normal controls by direct suctioning for comparison. The exact concentration of MBP was measured by radioimmunoassay with sensitivity of 2 pg/mL.

Results: The levels of MBP found in patients with CRS ranged from 2 to 12 mg/mL. The levels in the control group (n = 10) were undetectable in all but 1 patient. The MBP was significantly higher in concentration ($P < 0.0002$) compared with controls. The levels of MBP detected were higher than the minimum concentrations needed to induce tissue damage in vitro.

Conclusion: MBP is present in sufficient concentration to cause the tissue destruction seen in CRS.

16:20-16:28
Free Paper
Session 23

CHRONIC AND RECURRENT ACUTE RHINOSINUSITIS: OUTCOMES OF MEDICAL MANAGEMENT

James A. Duncavage
Vanderbilt University Medical Center, Nashville, TN, USA

Purpose: Recurrent acute and chronic sinus disease can be a therapeutic dilemma when initial medical therapy has failed. The purposes of our study were 1) to confirm the morbidity of sinusitis and compare it with that of other debilitating illnesses, 2) to propose a logical treatment system for these patients, and 3) to compare the outcome of medical management of recurrent acute with that of chronic sinusitis.

Methods: Patients were classified into diagnostic categories on the basis of accepted definitions of rhinosinusitis and treated according to established protocols. The Short Form 36 (SF-36) Health Inventory Survey was administered to 163 subjects with both recurrent acute and chronic disease, and scores in 8 domains were calculated.

Results: Patients had lower scores in vitality and social functioning compared with other serious illnesses before treatment ($P < 0.05$). Both groups scored significantly lower than the general population in all domains before treatment ($P < 0.05$). However, both patient groups improved with medical therapy ($P < 0.01$). After treatment, patients with recurrent acute disease showed an improvement in their SF-36 scores to the level of the general population, whereas patients with chronic disease scored lower than the general population ($P < 0.01$).

Conclusions: Recurrent acute and chronic sinusitis cause significant morbidity. The patient with chronic sinusitis has a chronic disease that, when intensively managed in a disease management program, may not be cured. The patient with recurrent acute sinusitis has a relative resolution of symptoms.

16:28-16:36
Free Paper
Session 23

MANAGEMENT OF CHRONIC INFECTIOUS RHINOSINUSITIS IN CYSTIC FIBROSIS PATIENTS AFTER LUNG TRANSPLANTATION

D. Holzmann and D. Simmen
University Hospital, Zurich, Switzerland

Purpose: For more than 8 y lung transplantation (LTPL) had been performed in Zürich. Patients with cystic fibrosis (CF) are a growing group among LTPL candidates. Since all CF patients have chronic infectious rhinosinusitis and colonization with Pseudomonas aeruginosa, the transplanted lungs are at increased risk to get infected secondarily by the paranasal sinuses. Hence, a treatment concept is necessary to control the infection in the nasal and paranasal cavities.

Methods: Between 1994 and March 2000, 26 CF patients underwent LTPL. They were followed 0.1 to 5.4 y (mean, 2.1 y). All patients underwent endoscopic sinus surgery after LTPL, during which every single pneumatized air cell was widely opened (technique described). Nasal secretions were sampled on every follow-up visit, and depending on clinical and microbiologic findings, the local or systemic therapy was adjusted. Acceptable infection control was defined as less than 2 acute rhinosinusitis episodes requiring systemic antibiotic treatment.

Results: In 23 of 26 patients, local infection control was achieved by means of only local treatment. In 3 patients revision surgery became necessary because 2 were less aggressively operated on and retention of tenacious secretion led to clinically significant rhinosinusitis. One developed synechiae, making local irrigation almost impossible.

Conclusions: Our treatment concept of chronic rhinosinusitis in CF patients after LTPL allows nasal and paranasal infection control with only local measures in a high percentage. The extensive surgical procedure using a diamond burr to remove osteitic bone to achieve widely open cavities requires an experienced surgeon.

16:40-16:48
Free Paper
Session 23

CLINICAL AND EPIDEMIOLOGIC RELATIONSHIPS BETWEEN AIRWAY ALLERGY AND CHRONIC RHINOSINUSITIS

Jan-Henning Lemke, Michael Damm, Christof Wolf, Hans Eckel
University of Cologne, Cologne, Germany

Purpose: Epidemiologic series have reported increased and decreased rates of prevalence of type 1 allergy in chronic rhinosinusits (CRS) compared with the general population. However, the relationship between CRS and allergy remains a subject of great controversy. The aim of this study was to evaluate and to compare the prevalence of type 1 allergy in patients with CRS and in patients suffering from septal deviation without sinusitis.

Methods: Subjects of this prospective study were 165 patients with CRS (group 1) diagnosed by computed tomography and 59 patients with septal deviation and radiologic exclusion of sinusitis (group 2). Allergy history, skin tests, and specific IgE measurements were performed to distinguish allergic from nonallergic patients.

Results: Male patients predominated in both groups (group 1: 59.8% vs. group 2: 69.5%). Patients with CRS (46.1 y) were 12 y older than patients suffering from septal deviation (33.6 y). Overall, 37.5% of patients showed positive skin tests or evidence of specific IgE: group 1, 46.1% and group 2, 52.5%. Most common sensitizations were positive reactions to perennial allergens, particularly house dust mites (group 1: 30.9%; group 2: 40.7%). Statistical analyses revealed no significant differences between both groups (Mann-Whitney U test).

Conclusions: We found no increased number of airway allergies in patients with CRS compared with patients with septal deviation. However, the rate of type 1 allergy seems to be increased in both groups compared with the general population in Germany, particularly the high percentage of perennial sensitization.

16:48-16:56
Free Paper
Session 23

MAXILLARY SINUSITIS OF DENTAL ORIGIN: IS EXTERNAL SURGICAL APPROACH MANDATORY?

Andrey S. Lopatin, Svyatoslav P. Sysolyatin, Pavel G. Sysolyatin, Mikhail N. Melnikov
Central Hospital of Presidential Medical Center, Moscow,
and State Medical Academy, Novosibirsk, Russia

Purpose: This study evaluated a less invasive endoscopic approach for treatment of chronic maxillary sinusitis of dental origin (MSDO).

Methods: Seventy patients (aged 16 to 62 y) were operated by means of the endoscopic technique. Thirty-nine presented with oroantral fistulas of different locations, the most common being third molar fistula in 26 cases. Foreign bodies were found in 21 sinuses, among them tooth root, 11; dental fillings, 7; packs, 3. Fungal ball was revealed in 6 sinuses. Seven patients from this series had a previous Caldwell-Luc operation. The endoscopic technique started with retrograde resection of the uncinate process and identification of the natural maxillary ostium. In 25 cases the ostium was blocked and anatomic abnormalities (concha bullosa, deviated uncinate process, large ethmoidal bulla) presented. The natural ostium was enlarged posteriorly and walls of ethmoidal bulla were removed. Removal of polyps and diseased mucosa from the medial part of the sinus and zygomatic recess was by double-spoon forceps and a microdebrider. Foreign bodies were removed via the middle antrostomy window. Puncture through the fossa canina or approach via the oroantral fistula facilitated additional access to the alveolar recess. The fistula was closed in 2 layers.

Results: Good results were obtained in all but 4 patients up to 3 y. Three of the patients presented with recurrent oroantral fistula which needed revision surgery, and 1, with recurrence of chronic maxillary sinusitis.

Conclusion: The endoscopic approach to MSDO is a reliable method associated with less morbidity and lower incidence of complications.

17:00-17:08
Free Paper
Session 23

SYMPTOMS AND CLINICAL AND RADIOLOGICAL SIGNS PREDICTING THE PRESENCE OF PATHOGENIC BACTERIA IN ACUTE SINUSITIS

J. S. Lacroix, A. Ricchetti, A. Morabia, L. Kaiser
University Hospital, Geneva, Switzerland

Purpose: A minority of patients with common cold and upper respiratory tract infections have a bacterial infection and may benefit from antibiotherapy. The present analysis was performed to determine whether there are clinical symptoms or signs that could help the clinician to identify a subset of patients with acute sinusitis who are infected with pathogenic bacteria.

Methods: Detailed clinical history and medical examination were obtained from 265 patients (mean age, 35 y, 138 females and 127 males) presenting clinical evidence of acute sinusitis but no fever above 38°C. Presence of 3 pathogenic bacteria (S pneumoniae, *H influenzae*, or *M catarrhalis*) was determined in all patients by culture of nasopharyngeal secretions.

Results: Pathogenic bacteria were found in only 77 patients (29%). Aggravating factors for severity of sinusitis such as severe nasal obstruction, inferior or middle turbinate hypertrophy, edema of the middle meatus mucosa, and septal defects were not associated with the presence of bacteria. The clinical signs and symptoms significantly associated in a multivariate model with the presence of bacteria included colored nasal discharge ($P < 0.003$), facial pain ($P < 0.032$), and radiologic maxillary sinusitis (complete opacity, air-fluid level or mucosal thickening greater than 10 mm) ($P < 0.001$). This best predictive model had a sensitivity of 69% and a specificity of 64% and therefore could not be used either as a screening tool or as diagnostic criteria for bacterial sinusitis.

Conclusion: Signs and symptoms of acute sinusitis in patients with mild to moderate clinical presentation are poor predictors of the presence of bacteria.

17:08-17:16
Free Paper
Session 23

FUNCTIONAL DIAGNOSIS OF THE NASAL VALVE

Klaus Vogt
Private Practice, Rendsburg, Germany

Classic rhinomanometric procedures do not sufficiently describe the elastic behavior of the nose. High-resolution rhinomanometry separates the accelerating parts of the breathing cycle from the decelerating parts. “Valve phenomena” are generated by acceleration of the nasal airflow, which induces narrowing of the elastic compartments: the nose changes its geometric form at the entrance during the rhinomanometric measurement. The phase shifting between pressure and flow generates “hysteresis” which was formerly seen as a technical failure of the rhinomanometric equipment. After eliminating these errors it contains important information about the elasticity of the nose. Besides the optical information (“the first view”), elasticity can be described numerically by the elasticity performance area or better by the nasal elasticity index, which also considers the maximum flow rate.

17:20-17:28
Free Paper
Session 23

ENCEPHALOCELES WITHIN THE LATERAL SPHENOID RECESS

Stephan Y. Lai, Stephanie Joe, David W. Kennedy, William E. Bolger
University of Pennsylvania Medical Center, Philadelphia, PA, USA

Encephaloceles are rare and challenging clinical entities to diagnose and treat. They may occur spontaneously or result from surgery or trauma. Most encephaloceles involve herniation of frontal lobe tissue through an anterior cranial fossa defect into the ethmoid sinus or nasal cavity. Less frequently, encephaloceles occur in the sphenoid sinus through a middle fossa defect. The temporal lobe is often involved in these cases. Intrasphenoid encephaloceles usually occur in the central portion of the sinus; however, when the sinus pneumatizes extensively and laterally into the pterygoid recess, the encephalocele and corresponding skull base defect can be laterally positioned. In these cases surgical access is difficult and presents the surgeon with a unique challenge. Temporal lobe encephaloceles in a lateral sphenoid sinus have been reported rarely in the literature, and only recently has a novel endoscopic transpterygoid approach to the lateral sphenoid sinus been described. We report our experience with sphenoid encephaloceles, emphasizing 6 patients with temporal lobe encephaloceles of the lateral sphenoid recess. Special diagnostic, pathophysiologic, and therapeutic considerations are addressed, based on our experience with this challenging clinical problem.

16:01-16:08
Free Paper
Session 24

ALLERGIC RHINITIS IN BANGALORE, THE FASTEST GROWING CITY IN ASIA

Pendakur Anand
Allergy-Immunology Clinic, Bangalore, Karnataka, India

Bangalore has 6 million inhabitants with about 1.3 million automobiles. Levels of SPM, nitrogen dioxide, and sulfur dioxide have increased demonstrably. Carbon monoxide is found to be high at high-density, low-velocity traffic areas. Pollen aerobiology is considerable and perennial due to rich and diverse vegetation. House dust mites are perennial but increase during humid and cool seasons.

In addition to symptoms of allergic rhinitis in 270 patients (120 native and 150 immigrants), 154 have asthma, 11 urticaria, 10 deflected nasal septum, 2 sinusitis, 7 ethmoidal polyp, and 3 patients antrochoanal polyp. Sixteen patients have seasonal symptoms, 27 did not know, and 227 have perennial symptoms (130 patients have increased symptoms in cooler months of June to January).

Skin prick test was done on 83 patients. Significant positive response was observed with antigens of *D pteronyssinus* in 48 and *D farinae* in 44 patients. Similar positive response was obtained with antigens of grasses like Cynodon-26, Imperata-9, and Pennisetum-6; weeds like Partheenium-21, Amaranthus-16, Xanthium-12, Ageratum-10, Gynandropsis-10, and Artemesia-9; and trees like Cassia-15, Prosopis-15, and Ricinus-7. Twenty-eight patients are on immunotherapy with aqueous vaccine for pollen. One patient did not tolerate it, 4 have no benefit, 3 have moderate benefit, and twenty have good to excellent benefit. Twelve patients are on immunotherapy with alum adsorbate vaccine for mites. One patient did not tolerate it, 1 has no benefit, and 10 have good to excellent benefit.

16:08-16:16
Free Paper
Session 24

ALLERGIC RHINITIS: AN OBSERVATION

K. M. Cheema, M. A. Khan, M. Ashraf, A. Hameed, A. Adnan
Mayo Hospital/King Edward Medical College, Lahore, Pakistan

Purpose: About 3% of all medical office visits are for and 10% of the world population is believed to have symptoms of allergic rhinitis. Its management has long been a challenge to rhinologists.

Methods: Fifty patients were studied in detail. Therapeutic agents like chlorpheniramine, loratadine, cetirizine, azelastine, and triamcinolone were given to them. Patients were followed up for 3 mo to 1 y.

Results: Patients had runny nose (88%), sneezing bouts (76%), nasal blockage (82%), headache (36%), bronchial asthma (38%), and urticaria (20%). Other family members were affected by this disorder (14%). Absolute eosinophilic count was raised (more than 470/mL) in 80%.

Conclusion: Dust (52%) and cold atmosphere (28%) were among the provocative factors. Patients given triamcinolone and cetirizine responded well.

16:20-16:28
Free Paper
Session 24

ROLE OF ARACHIDONIC METABOLITES IN NASAL ALLERGY

Akiyoshi Konno, Tsutomu Numata, Nobuhisa Terada, Hiroshi Nagata
Chiba University, School of Medicine, Chiba, Japan

Purpose: After single antigen challenge in subjects with pollinosis during nonpollen season, thromboxane B_2 (TXB_2), metabolite of TXA_2, increased significantly in the immediate phase and lymphotoxins (LTs) increased in the immediate and the late phase. This study evaluated the role of arachidonic acid metabolites, especially LTs and TXA_2, in the pathophysiology of nasal mucosal swelling in nasal allergy.

Methods and Results: Both LTs (ONO 1078) and TXA_2 (BAYu 3405) receptor antagonists significantly inhibited nasal mucosal swelling induced by antigen challenge, and they also significantly inhibited nasal hyperresponsiveness to histamine in subjects with nasal allergy. Topical application of leukotriene D_4 (LTD_4) significantly increased nasal mucosal swelling, and LTD4 was most potent in causing vascular smooth muscle relaxation of the strip of nasal mucosa evaluated by bioassay. Topical application of serially diluted U46619, TXA_2 analog, did not cause nasal mucosal swelling and caused mucosal shrinkage in high doses. It also did not cause relaxation of nasal vascular smooth muscle in bioassay and caused contraction in high doses. However, topical application of U46619 caused significant increase of eosinophils and eosinophil cationic protein (ECP) in the nasal lavages. TXA_2 receptor antagonist significantly inhibited an increase in concentration of albumin and ECP and number of eosinophils in the nasal lavages consecutively obtained after a single antigen challenge.

Conclusion: LTs induce nasal mucosal swelling by causing dilatation of capacitance vessels via direct action on LT receptors distributed on the nasal vasculature besides their effects on the postcapillary venule. Although TXA_2 may cause nasal mucosal swelling partially by its direct effect on postcapillary venules, the role of TXA_2 in pathophysiology of nasal mucosal swelling remains undetermined.

16:28-16:36
Free Paper
Session 24

WHEN IS THE OPTIMAL TIME OF SURGERY IN THE COURSE OF IMMUNOTHERAPY FOR ALLERGIC RHINITIS? EVALUATION OF EFFECT OF PLANNED SURGERY FOLLOWED BY IMMUNOTHERAPY

Joong Saeng Cho and Young Wan Jin
Kyung Hee University Hospital 1, Seoul, South Korea

Purpose: The clinical efficacy of specific immunotherapy (SIT) in allergic rhinitis (AR) was demonstrated in several controlled clinical trials. Moreover, immunologic changes induced by successful SIT interfere with pathologic mechanisms responsible for mediator-released and subsequent inflammatory changes in allergic disease. AR is frequently associated with some surgical condition in the nasal cavity, such as septal deviation, irreversible turbinate hypertrophy, paranasal sinusitis, or nasal polyposis. There have been controversies about the optimal time to perform the operation. In the course of SIT, the first 6 mo are considered to be the most troublesome.

Methods: We evaluated the efficacy of a treatment modality of planned surgery followed by SIT in patients with AR. Two hundred thirty-five patients who received combined therapy were analyzed. Six hundred thirty-one patients were enrolled into this study and they are receiving or received SIT for more than 3 y.

Results: The global evaluation rating of the combined group was significantly higher than that of the SIT group up to treatment at 2 1/2 y. Summed symptoms severity rating of the combined group showed lower scores than that of the SIT group until treatment at 3 y, when this was equalized in both groups.

Conclusion: From this study we conclude that the combined therapy with surgery followed by SIT can be recommended for treatment of patients with irreversible pathologic changes in nose and paranasal sinuses.

16:36-16:40
Free Paper
Session 24

REPAIR OF COMPLETE STENOSES OF NASAL PASSAGES AFTER UNSUCCESSFUL UNILATERAL CHEILOPLASTY AND CORRECTIVE CHEILOPLASTY

Igor A. Kozin
Clinic of Aesthetic Surgery Medlaz, Hospital N51, Moscow, Russia

Purpose: Description of contemporary methods of reconstructing the upper lip and nasal secondary defects and deformities after unilateral clefts, with simultaneous repair of the nasal passage stenoses up to its complete obstruction.

Methods: Reconstructive cheiloplasty is performed according to a modified Millard method, implying the excision of the skin-cicatricial flap on the pedicle at the limen of the affected nostril. Rhinoseptoplasty is performed through semicircular or circular incision along the perimeter of the flat nostril and through the endonasal transcartilaginous incision on the healthy wing of the nose. The base of the skin-cicatricial flap taken from the lip partially fills in the concealed defect of the membranous part of the septum, whereas the tip of this flap can be used to make up for the defect of the fundus texture of the nose vestibule provided the stenosis of the affected nostril is moderate. After reconstruction of the upper lip, skin and mucosal defects on the inner side of the nostril and in the nasal cavity were covered with pedicle flaps from the upper lip, slope of the nose, and cheek.

Results: The author has examined and operated on 218 patients with various rate of nasal passage stenoses after primary and corrective cheilorhinoplasty. In most cases optimal aesthetic and functional results are obtained.

Conclusion: While repairing the nasal passage stenoses the defects of the mucosa should be made up by skin flaps on pedicles excised around the defected tissues. I have also elaborated a radical method of cheiloseptorhinoplasty with repair of the nasal passage stenoses of various degree and depth of lesion.

16:40-16:48
Free Paper
Session 24

YAMIK CATHETER AS DRAG DELIVERY SYSTEM FOR PARANASAL SINUSES IN PATIENTS WITH NASAL POLYPOSIS

V. Kozlov, G. Markov, A. Shilenkov
Yaroslavl Medical Academy, Yaroslavl Regional Hospital, Yaroslavl, Russia

Purpose: A new concept from the Mayo Clinic of fungal origination of nasal polyposis creates an idea to treat sinusitis by local administration of antifungal medicine. Nasal lavage and spray do not allow introduction of medicine in the paranasal sinuses (PNS). In 1926, A. Proetz developed a method of displacement irrigation of PNS. The main disadvantage of this method is uncontrolled pressure in the nasal and paranasal cavities. We have developed several models of devices named sinus catheter (SC) YAMIK. SC YAMIK allows us to create controlled negative and positive pressure in the nasal and PNS cavities. By means of controlled pressure it is possible to evacuate secretion from PNS and fill PNS with medicine via natural ostia of the PNS. The goal of this study was to prove filling of PNS with medicine by SC YAMIK in patients with nasal polyposis.

Method: Twenty-five patients with nasal polyposis aged 21 to 56 y underwent contrast radiographic examination. Fifteen of them were not operated on before, and in 10 FESS was done from 1 to 3 y before. In all patients polyps were found in the middle meatus. Contrast medium (Urografin 60%) was introduced into the PNS by SC YAMIK. Immediately after this, radiographs were taken in lateral and frontal projections.

Results: Examination of radiographs showed that in 9 patients contrast medium was found in all sinuses. In 12 patients contrast medium was found in ethmoid, maxillary, and sphenoid sinuses, and in 4 patients, in ethmoid and maxillary sinuses. SC YAMIK allows us to introduce medicine into the PNS via sinus ostia. We did not find a big difference between operated and not operated patients.

Conclusion: SC YAMIK can be used as drag delivery system for PNS in patients with nasal polyposis.

17:00-17:08
Free Paper
Session 24

A STUDY OF SOME IMMUNOREGULATORY ABNORMALITIES IN CHILDREN WITH ALLERGIC RHINITIS

Hazem Dewedar, Iman K. Eyada, Tarek F. Hassan, Ahmed O. Khaddah, Jeanette A. Botros, Mona A. Ibrahim
Cairo University, Cairo, Egypt

Purpose: Allergic rhinitis (AR) is a problematic disorder that is rather common. The majority of its overt clinical symptoms are shared with other diseases. Accumulating data now point to a large network of interacting cytokines that regulate mucosal allergic inflammation. Interleukin-13 (IL-13) is a novel T-cell-derived cytokine that has been demonstrated to be capable of inducing IgE synthesis.

Method and Results: Twenty-six children with the clinical diagnosis of AR were enrolled in this study as well as 20 healthy controls. Serum IL-13 level; measured by enzyme-linked immunosorbent assay technique, was found to be significantly lower among AR patients (9.9 ± 3.2 pg/dL) than the control group (32.8 ± 1.8 pg/dL) (P = 0.0001). Total serum IgE level was significantly higher among AR patients (202.4 ± 24.2 IU/mL) than among the control group (56.1 ± 21.1 IU/mL) (P = 0.008). Nasal eosinophilia was present in 19.2% (5/26) while peripheral eosinophilia was demonstrated in 61.5% (16/26) of patients. Neither IL-13 nor IgE levels correlated with any of the clinical or laboratory parameters of the disease. A strong negative correlation between mean level of total IgE and mean level of serum IL-13 among AR patients was observed.

Conclusion: The low level of IL-13 in the peripheral blood of AR patients suggests that IL-13 may play an important role in the pathogenesis of AR within the nasal mucosa. Accordingly, local nasal anti IL-13 may be of therapeutic value in the near future.

17:08-17:16
Free Paper
Session 24

THE INTERACTION BETWEEN UPPER AND LOWER AIRWAYS IN ALLERGIC RHINITIS

Wytske Fokkens, Gert-Jan Braunstahl, Alex KleinJan, Jan-Bas Prins
Erasmus Medical Centre, Rotterdam, Netherlands

Purpose: The pathophysiologic connections between allergic rhinitis and asthma are still not entirely understood. The 2 studies described here were undertaken to compare allergic inflammation and clinical findings in the upper and lower airways after segmental bronchial provocation in nonasthmatic allergic rhinitis patients.

Methods and Results: In the first study, we performed a segmental bronchial allergen provocation in seasonal allergic rhinitis subjects without asthma out of the grass pollen season. A generalized inflammatory response which was not restricted to the bronchial mucosa only but also involved the blood and nasal mucosa was found. The inflammatory infiltrate, characterized by an increase in eosinophils and interleukin-5 expression, in the upper and lower airways was accompanied by increased symptoms of the upper and lower airways and a decline in bronchial and nasal function. In the second study, we investigated the effect of nasal allergen provocation on lower airways in allergic rhinitis patients. Again, an increase in blood and bronchial eosinophils was found, correlating with the local expression of the adhesion molecules intercellular adhesion molecule 1, vascular cell adhesion molecule 1, and endothelial leukocyte adhesion molecule and with the pulmonary symptom score. Nasal allergen provocation, however, had no significant effect on pulmonary function assessed by peak expiratory flow and forced expiratory volume in 1 second.

Conclusions: Allergic rhinitis is not a local disease; it also influences the bronchial mucosa. Most likely, systemic induction of inflammatory mediators leads to a more generalized inflammatory response. This may explain why in allergic rhinitis patients with asthma, local treatment of the nose with anti-inflammatory drugs is also beneficial for the lower airways.

16:20-16:28
Free Paper
Session 25

ACELLULAR HUMAN DERMAL ALLOGRAFT IN SEPTAL PERFORATION REPAIR THROUGH EXTERNAL RHINOPLASTY APPROACH

Ahmed M. Youssef
Minia University, Minia University Hospital, Minia, Egypt

Purpose: Patients seek medical attention for perforation of the nasal septum when symptoms arise. Most symptomatic perforations are large and involve the anterior cartilaginous portion of the septum. We studied the use of an acellular human dermal allograft (Alloderm) as a connective tissue interpositional graft in septal perforation.

Methods: Ten patients with septal perforation due to previous nasal surgery or previous nasal cautery were operated on for septal perforation repair through the external open approach that used external rhinoplasty in combination with acellular human dermal allograft as as interpositional graft.

Results: Seventy percent (7 of 10 patients) success rate was achieved with complete closure of the perforation. The other 3 patients showed reduction of the perforation size from 25 to 5 mm in 2 of them and from 30 to 10 mm in the third. No rejection or infection was noted in the 10 patients.

Conclusions: Acellular human dermal graft can be used as connective tissue interpositional graft in the repair of septal perforation with a success rate similar to the use of temporalis fascia or mastoid periosteum. The dermal graft eliminates the need for autogenous donor tissue and thereby eliminates the pain and morbidity associated with the harvest of autogenous tissue.

16:28-16:36
Free Paper
Session 25

FIBROUS DYSPLASIA AND CYSTIC DEGENERATION: A CASE REPORT

Francini Padua, Fabricio Romano, Marcus Lessa, Richard L. Voegels
University of São Paulo Medical School, São Paulo, Brazil

Purpose: Fibrous dysplasia (FD) is a rare and benign disease, characterized by replacement of the medullary bone by abnormal fibroconnective tissue, being classified in poliostotic and monostotic forms. The purpose of this study is to present a rare case of FD with cystic degeneration.

Case: A 16-year-old male had nasal enlargement for the past 5 y, with nasal obstruction, recurrent and mild epistaxis, and lateral deviation of both orbits. Patient was referred after previous surgery with recurrence. Endoscopic examination revealed a reddish lesion occupying the entire right nostril and causing septal deviation to the left. Tumor resection by degloving approach was performed; the tumor presented encapsulated and cystic with bone trabeculae. After surgical procedure, the sphenoid and ethmoid sinuses were exposed, and both nostrils were enlarged and communicated in a single cavity. Only the anterior cartilaginous portion of the septum remained. Histologic study of the tumor revealed FD with cystic degeneration. At 3-y follow-up, endoscopic examination and CT scan showed no signs of recurrence and excellent aesthetic and functional results.

Conclusions: Cystic formations in FD are rare and must be differentiated from cystic degeneration of other diseases or aneurysmal osseous cysts associated with FD. The treatment is basically surgical, aiming for favorable aesthetic and functional results, and avoiding injury to vital structures. As recurrences are common, the patient should be followed carefully for a long period.

16:40-16:48
Free Paper
Session 25

MINIMALLY INVASIVE ENDOSCOPIC MANAGEMENT OF MALIGNANT SINONASAL TUMORS

J. Daele, Y. Goffart, M. Jorissen, V. Vander Poorten,
J. Born, J-M. Deneufbourg, J-M. Remacle
CHR Citadelle, Liège, Belgium

Purpose: A large retrospective study is presented from 2 Belgian institutions of 78 patients who underwent minimally invasive endoscopic management for malignant sinonasal tumors from 1992 to 1999. We attempted to assess the results of this less invasive approach.

Methods: The spectrum of disease included adenocarcinoma, squamous cell carcinoma, olfactory neuroblastoma, and other malignant tumors. All patients were treated primarily for cure. Sixty-six patients were operated on by a purely endoscopic technique, 9 patients had a simultaneous neurosurgical and endoscopic approach, and 3 had a limited orbital approach. Sixteen patients (20.5%) presented with local recurrence, 6 (7.7%) sustained distant metastases, and 7 (9%) presented simultaneous local recurrence and distant metastases.

Results: The 2-y and 5-y survival rates of the whole group were 73.1% and 52.3%, respectively, while the adenocarcinoma group exhibited a significantly better prognosis than other histologic types with 2-y and 5-y survival rates of 89.8% and 63.8%. Patients who could be treated purely endoscopically had a significantly better survival than patients treated by an external and endoscopic approach. Morbidity was minimal and the local control rate as well as survival rates were comparable to literature data.

Conclusions: Endoscopic resection was adequate, providing clear margins and en bloc removal in most cases. Our results encourage us to use this minimally invasive approach in selected cases as a reliable alternative to the systematic use of an exclusively external approach.

16:48-16:56
Free Paper
Session 25

CAPILLARY HEMANGIOMA OF THE NASAL CAVITY AND MAXILLARY SINUS

F. Mottaghian Dini, M. Nejadkazem, R. Seyah Melli, S. Mottaghian Dini
Tabriz University, Tabriz, E. Azarbayjan, Iran

Purpose: We present a case of capillary hemangioma of the nasal cavity and maxillary sinus that demonstrates an aggressive behavior and with initial diagnosis of malignancy.

Method: A 65-year-old woman presented with a 5-month history of epistaxis, left-sided nasal obstruction, and left facial pain. A mass of necrotic appearance filled the entire nasal fossa, with a blue lobular mass in left side of choana. There was no evidence of mass on neck palpation. Computed tomographic (CT) scan confirmed a mass that filled the nasal cavity and maxillary sinus entirely, with destruction of ethmoidal complex and extension toward nasopharynx. The first biopsy of the tumor was reported as an inflammatory pseudopolyp with necrotic and infected zones. A serious hemorrhage was experienced in the procedure. However, a preoperative arteriography was not performed because a vascular lesion was not suspected. Indeed, clinical, radiologic, and histologic findings suggested a diagnosis of malignancy.

Results: Complete removal of the tumor was done through endoscopic surgery. During the surgical procedure the mass bled freely, but after complete removal of the tumor there was not exceptional bleeding. The final diagnosis of capillary hemangioma was only achieved after postoperative histology. Three days after operation the patient was discharged from hospital. Three months later the patient remained healthy.

Conclusion: Capillary hemangioma is an uncommon neoplasm that can arise in the nasal cavity; it may be confused with more aggressive lesions of the nose and paranasal sinuses because even biopsy can lead to a sudden loss of large quantities of blood.

17:00-17:08
Free Paper
Session 25

PRIMARY MUCOSA-ASSOCIATED LYMPHOID TISSUE LYMPHOMA OF THE NASOPHARYNX: PART I

Omar A. El-Banhawy, Mohammed Fawzy, Ahmed A. El-Hanfy
El-Menoufyia University, El-Mansoura, El-Dakahlia, Egypt

Purpose: Malignant tumors of the nasopharynx are always a challenging problem, both from the diagnostic and therapeutic standpoint. Most extranodal lymphomas arise in the gastrointestinal tract, but the other mucosal organs may also be involved, especially the upper aerodigestive tract. Nasopharyngeal lymphomas are rare among lymphoma of the upper aerodigestive tract.

Methods: Twenty-two patients with primary lymphoma arising in mucosa-associated lymphoid tissue (MALT) of the nasopharynx have been studied with reference to age, sex, clinical symptoms, radiologic finding, histologic subtype, and immunohistochemistry.

Results: All patients were diagnosed histologically as having low-grade lymphoma of MALT type. By immunohistochemical staining, the tumor cells typically exhibit the following immunophenotypes: CD20+ and CD45.

Conclusion: ENT surgeons and pathologists should be aware of this type of lymphoma to avoid misinterpretation and to set up a protocol for its management.

17:08-17:16
Free Paper
Session 25

TEACHING AND LEARNING LACRIMAL DRAINAGE SYSTEM SURGERY: A MULTIMEDIA APPROACH

R. Keerl, F. Hilterhaus, R. Weber, W. Draf
ENT Clinic, Fulda, Germany

Purpose: Learning and teaching surgical techniques consist of different steps: a) acquiring a theoretical basis using books, b) videos/instructional courses, and c) personal manual experience. Videos are difficult to handle and courses are expensive.

Methods: MPEG-encoded videos (bougienage, stenting, endonasal or external dacryocystorhinostomy, repairing severed canaliculi, implantation of Jones tubes, conjunctivorhinostomy), text, graphics, and sound were put together with an authoring tool using HTML and CD-ROM technology.

Results: A complete overview of all kinds of surgical approaches to lacrimal drainage problems from the ENT and ophthalmologic point of view as well as theoretical knowledge is given on a CD-ROM-based teaching software.

Conclusions: The multimedia approach combines basics and video/courses in an easy to use, interactive, and inexpensive way.

17:20-17:28
Free Paper
Session 25

FUNGAL SINUSITIS

P. Thulasi Das and Harini T. Da
Chennai Kaliappa Hospital 43, Chennai, Tamilnadu, India

Purpose: Fungal infections of the nose and sinuses have been a neglected area until recently, with the introduction of endoscopes and imaging techniques. Although more cases are detected, fungal sinusitis remains a complex and challenging entity. A clinical classification of fungal sinusitis acceptable to all concerned is yet to be proposed. In the recent past, allergic fungal sinusitis (AFS) was described as a new entity because of the presence of eosinophil-containing allergic mucin and Charcot-Leyden crystals. Authors are vying with each other to add fresh cases to those already reported. In India, fungal infections are extremely common, especially in the central and northern parts.

Method: We describe our experience with 450 cases of noninvasive fungal sinusitis and 12 cases of invasive fungal sinusitis in the last 10 y.

Results: We believe AFS is not a new entity. Aspergilloma and AFS are the same thing, probably 2 ends of the same spectrum. Illustrative case examples are shown where allergic mucin and fungal balls are seen in the same sinus.

Conclusion: Until one finds the answers to all the unanswered questions, it would not be a bad idea to classify fungal infections as invasive and noninvasive on the basis of tissue invasion.

16:01-16:08
Free Paper
Session 26

EOSINOPHILIC FUNGAL RHINOSINUSITIS IN HUNGARIAN PATIENTS

Etelka Molnar-Gabor, Erika Dosa, Janos Varga, Laszlo Mojzes
Outpatient Clinic for Health Insurance Service, Szeged, Hungary

Purpose: Inspired by the fungal revolution taking place in otorhinolaryngology, we studied chronic rhinosinusitis (CRS) patients (with or without nasal polyposis) and the frequency of the occurrence of fungi in their nasal mucus. We also followed the response of these patients to antifungal therapy.

Method: Fifty-two CRS patients were examined. In 30 cases, mucus was collected noninvasively and in 22 cases, during operation. Fungi colonizing in the mucus were detected by culture. Following the operations, histologic examinations were performed and pathogenic organisms were identified as well. Finally, we determined the total IgE levels. Our control group consisted of 20 healthy volunteers.

Results: Of 52 CRS patients, nasal secretion fungi could be detected in 43 (83%). Surgical treatment was performed in 28 cases (54%). In operated patients, fungal culture was positive in 26 (93%), and eosinophilia was found in 27 (96%). IgE-mediated hypersensitivity to fungal allergens could not be proved in our patients. In verified eosinophilic fungal rhinosinusitis cases, we started fluconazole therapy. A significant improvement could be seen in the patients' status.

Conclusion: With an appropriate culture procedure, fungal infection can be verified in the majority of CRS cases. At the removal of nasal polyps, a high percentage of histologic specimens contained fungal elements and degenerated eosinophils. Elevation of IgE level is not characteristic for fungi. Antifungal treatment leads to a significant improvement in the status of CRS patients.

16:08-16:16
Free Paper
Session 26

A CLINICAL REPORT OF SEROLOGIC MARKERS IN A GROUP OF PATIENTS WITH ALLERGIC FUNGAL RHINOSINUSITIS

Ravi Nadarajah, Usama Gabr, Mona M. Zahir, Jacquelynn P. Corey
University of Chicago, Chicago, IL, USA

Purpose: The diagnosis of allergic fungal rhinosinusitis (AFRS) can be difficult. The immunopathophysiology of this disease has not been fully elucidated. This has made the various serologic markers used in its diagnosis difficult to interpret. We attempted to investigate the relationship between serologic profiles of patients with AFRS and their clinical diagnostic criteria.

Methods: Fourteen patients who presented to the allergy clinic at the University of Chicago hospital were diagnosed with suggested AFRS by using the Bent and Kuhn classification. Each patient was tested using a "fungal panel" consisting of *Candida, Aspergillus, Alternaria, Helminthosporium, Cladosporium*, and *Curvularia* to determine the presence of fungal-specific IgG and IgE, precipitating antibodies, and the ratio of fungal-specific IgE to IgG.

Results: Elevated IgE to at least 1 fungal antigen was found in 8 patients, while fungal-specific IgG was elevated in only 4 patients; 13 of 14 patients (93%) who had 2 or more diagnostic criteria had IgE/IgG ratio greater than 2 for at least 1 of the tested fungi. Precipitating antibodies were identified in 28.6% of patients with at least 2 diagnostic criteria. The most frequent positive antigen was *Candida* (50%).

Conclusions: A continuum of immune responses may exist between chronic polypoid hyperplastic rhinosinusitis with fungal colonization (with minimal immune response) and AFRS. The clinical significance of these serologic markers remains unclear. However, our findings suggest that these tests may be useful in confirming the diagnosis of AFRS when used in conjunction with clinical diagnostic criteria.

16:20-16:28
Free Paper
Session 26

INVASION OF ALLERGIC FUNGAL SINUSITIS-ASSOCIATED SINONASAL POLYP TO THE INTRACRANIAL SPACE AND ORBIT

Shahriar Nazari, Vafa Rahimi Movaghar, Seyed Abolhassan Jazayeri
Zahedan University of Medical Sciences, Zahedan, Sistan, and Balutchestan, Iran

Purpose: Allergic fungal sinusitis (AFS) is diagnosed by the presence of nasal polyp, noninvasive fungus in smear or culture, and allergic mucin. It invades into intracranial space and orbit occasionally, but concomitant intracranial and intraorbital invasion of AFS and polyp has not been reported.

Methods: A 20-y-old man presented with nasal obstruction, purulent nasal discharge, and a tumoral lesion that extended to anterior intracranial fossa and orbit bilaterally. He had 2 operations within the last 3 y. The pathologic examination revealed nasal polyp. By diagnosing AFS, polypectomy and total removal of purulent material of nose, bilateral maxillary, frontal, ethmoidal, and sphenoid sinuses were performed. The polyp had destroyed the base of the skull, expanded and destroyed frontal sinus, and compressed the brain, optic nerves, chiasm, and cavernous sinuses by the bulging thin bone. The lesion was all extradural. Smear and culture of green tissue obtained from frontal sinus and epidural space confirmed aspergillus.

Results: Since radical surgery, systemic and intranasal corticosteroid therapy have been prescribed. Follow-up at 14 mo showed good results.

Conclusion: We think some reported cases of invasive polyp into orbital and intracranial fossa may be due to AFS as a predisposing factor. Thus, staining and culture of fungus are necessary for similar cases.

16:28-16:36
Free Paper
Session 26

INVASIVE FUNGAL SINUSITIS

C. Shekhar Singh
Owaisi Hospital and Research Centre, Hyderabad, India

Purpose: Invasive fungal sinusitis (IFS) is an uncommon condition. However, it is gaining prominence in view of its relation to diseases like diabetes, human immunodeficiency virus, and immunosuppression (due to radiotherapy, chemotherapy, malignancy, organ transplantation, etc). IFS occurs in 2 clinical entities—acute fulminant and chronic indolent. *Aspergillus* is a common cause in both types. The disease is often fatal. Diagnosis of IFS is often difficult because of varied presentations. The disease is not contagious. Source of infection is usually endogenous. We present 3 cases of IFS.

Methods: Diagnosis was confirmed by computed axial tomography, microscopic examination, and culture and sensitivity testing.

Results: In 2 cases, the disease had extended into brain parenchyma, and in 1 case, the fungus involved the orbit. The causative fungus was Aspergillus. To date, only 1 patient has survived.

Conclusions: This report extends our knowledge of invasive mold sinusitis. A high level of awareness, clinical findings, and course of disease can lead one to diagnose the fungal syndromes early so that treatment may be started immediately.

16:40-16:48
Free Paper
Session 26

LASER TISSUE VOLUME REDUCTION FOR TURBINATE HYPERTROPHY TREATMENT

Andrew A. Shakhov
Russian Medical Academy of Postgraduate Education, Moscow, Russia

Purpose: Methods of laser tissue volume reduction (LTVR) by utilizing especially designed surgical lasers were investigated in 56 consecutively treated patients to analyze efficacy and safety of LTVR for the treatment of nasal obstruction secondary to turbinate hypertrophy.

Method: We used LTVR as an alternative to standard volume-decreasing surgical procedures (eg, mechanical or superficial laser surgery for inferior turbinate hypertrophy). Fifty-six consecutively treated patients with nasal obstruction and associated turbinate hypertrophy refractory to medical therapy were evaluated for LTVR. Fifty-two of our patients suffered from different degrees of sleep-disordered breathing. For LTVR we used holmium, Nd: YAG, and diode surgical lasers equipped with intratissue laser light delivery device. LTVR is safely performed under local anesthesia in the office, and it provides progressive enlargement of the nasal cavity airspace. LTVR can also reduce nasal obstruction that may occur in patients with obstructive sleep apnea syndrome.

Result: Successive LTVR of the nasal turbinates provided a 74% success result. Patients reported nasal breathing improving with a decrease of the severity and frequency of the nasal obstruction.

Conclusions: LTVR with specially designed surgical lasers is a reliable and effective procedure for the treatment of nasal obstruction due to turbinate hypertrophy. The procedure can be performed in the office. Major advantages of this method are its simplicity, safety, and absence of bleeding, crusting, and dryness.

16:48-16:56
Free Paper
Session 26

SILVER NITRATE-ASSISTED OUTPATIENT INFERIOR MUCOCONCHOPLASTY

Bader M. S. Wild Ali
Amman, Jordan

Purpose: Failure of medical treatment to relieve nasal obstruction due to bilateral mucosal hypertrophy of the inferior turbinate, as result of noninfective chronic hypertrophic rhinitis, represents an indication for reduction of the mucosal size of the inferior turbinate. “Inferior mucoconchoplasty” is a term suggested for remodeling of the inferior turbinate to relieve such obstruction with preservation of adequate turbinate tissue to achieve proper nasal function.

Methods: With subjective and objective criteria, this study evaluates a new simple practice: using the silver nitrate applicators with the patient under local anesthesia to reduce the mucosal size of the inferior turbinate. Only patients who had nasal obstruction, rhinorrhea, and sneezing as presenting symptoms were selected.

Results: Successful relief was obtained in 95.8%. No complication was seen among the patients during treatment and follow-up, and no silver poisoning was detected.

Conclusions: It appears to be a safe, lower cost, quick, and predictable office procedure on the anterior, middle, or posterior part of the inferior turbinate.

17:00-17:08
Free Paper
Session 26

LIMITED SUBMUCOUS RESECTION WITH PARTIAL TURBINECTOMY IS BEST FOR CHRONIC OBSTRUCTION IN RURAL INDIA

J. P. Bhattacharjee
Bangalore, Karnataka, India

Methods: Of 1,057 patients complaining of nose block, 664 underwent limited submucous resection with partial turbinectomy between 1980 and 2000.

Results: Ninety percent of them were relieved of nose block. Eight percent had partial or minimal relief. Two percent developed atrophic rhinitis. These patients have poor follow-up. They do not come to the city or a major hospital. This combined surgery helps them to avoid repeated visits, provides a short stay at the hospital, and lessens the financial burden (Mediclaim insurance scheme has just started in the cities). Most important is that the patients are relieved of the nose block and the associated symptoms like headache, excessive sneezes, malaise, and heavy head.

Conclusion: Functional endoscopic sinus surgery (FESS) has helped reduce hospital stay and consumption of operating time. With the advent of FESS, uncinectomy has become mandatory.

17:08-17:16
Free Paper
Session 26

ENDOSCOPICALLY GUIDED LASER TURBINECTOMY

Samy Elwany
Alexandria Medical School, Alexandria, Egypt

Purpose: The study describes and evaluates a new technique for laser turbinectomy using the Flexilase nasal fibers and compares its results against radiofrequency turbinectomy (RFT) on subjective and objective criteria.

Methods: One hundred forty-eight patients who were candidates for inferior turbinate resection were randomized into 2 groups. All patients underwent formal rhinologic examination and were given a specially designed patient questionnaire as well as full acoustic rhinometric examination.

Results: Subjective impression of improved nasal airway was achieved in 91% who had endoscopically guided laser turbinectomy (EGLT) and 76% (RFT). Acoustic rhinometric data (minimal cross-sectional area and decongestive effect) demonstrated improved nasal patency in 89% (EGLT) and 61% (RFT). The difference was statistically significant.

Conclusion: EGLT allowed more thorough reduction of the inferior turbinates and its results were superior to RFT.

16:05-16:25
Mini-Course 31

ANATOMY AND BASIC RADIOLOGIC VIEW

Seung Kyu Chung
Dept. of ORL-HNS, Sungkyunkwan University, Samsung Medical Center, Seoul, Korea

The anatomy of the nose and paranasal sinuses is variable depending on the degree of the development of the normal structures. The shapes of both lateral walls of the nasal cavity show harmony with the nasal septum. In the era of endoscopic examination and surgery, the relationship with each structure is more important than the absolute size or location of them.
The important anatomic points in the ethmoid sinus include 1) the relationship between the uncinate process, the ethmoid bulla and the natural ostium of the maxillary sinus, 2) the shape of the ethmoid bulla and basal lamella of the middle turbinate, 3) the supraorbital cell, the frontal sinus and the frontal recess, and 4) the upper part of the uncinate process and the bullar lamella.
In the posterior ethmoid area, the location of the anterior sphenoid wall which separates the posterior ethmoid sinus from the sphenoid sinus should be confirmed.
The basic radiologic view consists of four views: lateral view, Caldwell view, Waters view, and the base view. These views were the modality of choice to examine the paranasal sinuses. These views only have a limited role in showing the air and fluid level. Now the basic view in rhinology is the coronal CT, in spite of its limitations.

16:25-16:50
Mini-Course 31

CT, MR AND CONTRAST STUDIES IN RHINOLOGY

John I. Lane
Mayo Clinic, Mayo Foundation, Rochester, MN, USA

This discussion will focus on the clinical utility of these modalities in the evaluation of pathologic conditions effecting the nasal cavities. The choice of imaging technique should be based on the particular question posed by the referring clinician. Since CT is superior in demonstrating the integrity of cortical bone and the bony landmarks of the major paranasal sinus ostia, patency of these drainage pathways are best evaluated with CT. Workstation technology now allows the head and neck radiologist to present this anatomy in a 3 dimensional format, producing images similar to those obtained by the endoscopist. If the clinician is compelled to exclude skull base or orbital extension of nasal pathology, the superior soft tissue detail provided by MR makes it the imaging modality of choice for this indication. CT and MR angiographic techniques can also provide additional anatomic information, which can be helpful in the preoperative evaluation of extensive neoplastic processes. Often CT and MR will play complimentary roles in the evaluation of complex pathologic processes involving the sinonasal cavities, facial bones, and skull base. Interventional techniques, useful in the treatment of nosebleeds recalcitrant to conservative management and in the pre-operative embolization of highly vascular tumors, are briefly discussed.

16:05-16:25
Mini-Course 33

THE PROBLEM OF HEADACHES & FACIAL PAIN

Salah D. Salman
Massachusetts Eye and Ear Infirmary, Boston, MA, USA

Patients with facial or sinus pressure pains are commonly diagnosed as sufferers from sinusitis and therefore treated accordingly. A group of such patients fail to respond to the usual medical and surgical treatments of sinusitis. It is becoming clearer that conditions other than sinusitis can present with facial pressures. A multidisciplinary approach is recommended for an etiologic diagnosis before management strategy is developed. Otolaryngologists should be aware of the existence of these conditions.

16:25-16:50
Mini-Course 33

NON-RHINOGENIC HEADACHES: DIFFERENTIAL DIAGNOSIS

Bahram Mokri
Mayo Clinic, Mayo Foundation, Rochester, MN, USA

The headache is a very common complaint. In general, rhinogenic headaches represent only a small fraction of this vastly prevalent symptom that can result from many different etiologic factors.

In this presentation, some of the most commonly encountered non-rhinogenic headaches that primarily involve frontal areas of the head and upper face will be discussed along with the various fractures that help in the differential diagnosis.

16:50-17:15
Mini-Course 33

NON-RHINOGENIC HEADACHES: TREATMENT AND RESULTS

J.E. Hammack
Mayo Clinic, Mayo Foundation, Rochester, MN, USA

The management of migraine and other headache types has advanced considerably through new understanding of the pathophysiology of pain and the introduction of new pharmacologic agents. Conventional and new therapies for episodic migraine and cluster headache will be discussed, including the use and mechanism of action of the tripton class of medications. This talk will also cover abortive and prophylactic treatment strategies for chronic daily headache, transformed migraine, tension headache and indomethacin-responsive headache syndromes. An approach to the management of "headache emergencies" will be described.

16:00-16:40
Mini-Course 34

RHINOPLASTY: PERSONAL TECHNIQUES THAT WORK

T. R. Bull, I. MacKay
London, England

Our personal techniques used over the past 2-3 decades for rhinoplasty will be presented with various changes and modifications along with techniques that we have discarded will be presented. Problems, nuances and simplification of the tip techniques will be emphasized.

A series of cases will be then presented for analysis and technique selection.