ABSTRACT NUMBER: 1545

PREVALENCE AND SEVERITY OF ANOSMIA IN WORKERS EXPOSED TO THE WORLD TRADE CENTER SITE

Shaun Desai, BA, Richard Doty, PhD, Robin Herbert, MD, Kenneth Altman, MD, PhD

BACKGROUND: Following the terrorist attacks at the World Trade Center (WTC) on September 11, 2001, greater than 40,000 people were exposed to a mix of toxic and hazardous chemicals in the massive recovery effort. While a large potion of subjects developed chronic upper and lower respiratory symptoms, it is not known whether olfactory function was compromised, particularly since such compromise can be eclipsed by more prominent respiratory symptoms.

OBJECTIVE: To assess the prevalence and severity of anosmia in WTC-exposed subjects, and to compare these findings with severity of upper respiratory symptoms.

METHODS: The University of Pennsylvania Smell Identification Test (UPSIT) and the Sino-Nasal Outcomes Test (SNOT-20) were prospectively administered to patients presenting to the WTC Medical Monitoring and Treatment Program from April to July 2008.

RESULTS: One-hundred research subjects were recruited, of which 99 completed both UPSIT and SNOT-20 [72 men & 27 women; mean (SD) age = 48.0 (0.7)]. Mean UPSIT scores were 30.05 in the WTC-exposed group, compared to 35.94 in the control group (out of maximum score of 40; $p = 0.01$). As expected from other studies, age was inversely related to the UPSIT scores ($p = 0.003$). No meaningful association existed between UPSIT and SNOT-20 scores ($r = 0.20$; $p = 0.11$).

CONCLUSION: Subjects exposed to noxious chemicals and airborne particulates at Ground Zero exhibited a statistically-significant decrement of olfactory function. Such smell loss may have significant consequences for the first-responder group of police and firefighters who frequently rely on a sense of smell to identify public safety hazards.

ABSTRACT NUMBER: 1546

RHEOLOGIC PROPERTIES OF SINONASAL MUCUS IN PATIENTS WITH CHRONIC RHINOSINUSITIS

David Saito, MD, Steven Pletcher, MD, Anh Innes, MD, John Fahy, MD

BACKGROUND & OBJECTIVE: Mucociliary clearance is a critical aspect of sinonasal physiology. While ciliary function has been evaluated in patients with chronic rhinosinusitis, little is known about the rheologic properties of sinonasal mucus. The goal of the current study is to describe the rheologic properties of sinonasal mucus in patients with chronic rhinosinusitis and correlate these properties with disease severity.

STUDY DESIGN: Cross-sectional study.

METHODS: Twenty-three adult subjects with chronic rhinosinusitis underwent collection of sinonasal secretions. Samples were analyzed using the AR2000 cone and plate rheometer to determine the dynamic viscosity and elasticity across a range of oscillatory frequncies. The mucus clearance index (MCI) and cough clearance index (CCI) was calculated from these values and compared to measures of disease severity.

RESULTS: Mean dynamic elasticity and viscosity was calculated at both 1 Hz (78.24 ± 103.4 Pa and 22.09 ± 29.62 Pa respectively) and 10Hz (118.9 ± 155.5 Pa and 32.36 ± 45.58 Pa respectively). A greater Lund-McKay score correlated with higher values for all measures of viscoelasticity and predicted a worse MCI ($p = .02$) and CCI ($p = .04$). Higher SNOT-20 scores predicted a statistically significant increase in mucus elasticity and viscosity. Mucus from patients with sinonasal polyps demonstrated a worse MCI (1.00 vs. 1.18, $p = .02$) and CCI (1.54 vs. 2.12, $p = .03$).

CONCLUSIONS: This study establishes the range of rheological properties of sinonasal mucus in patients with chronic rhinosinusitis and demonstrates an association between severity of sinus disease and rheologic properties of sinonasal secretions.

ABSTRACT NUMBER: 1549

RUBBER TUBE VERSUS SILICONE TUBE AT THE OSTEOTOMY SITE IN DACRYOSYSTORHINOSTOMY

Shawky Elmorsy, MD, Hytham Fayk, MD

PURPOSE: To compare the efficacy of using rubber versus silicone tubes at the osteotomy of Dacryocystorhinostomy.

METHOD: 46 patients diagnosed with primary acquired nasolacrimal duct obstruction were assigned randomly to rubber, silicone or control group. The surgical procedures in the three groups were the same except that in patients of rubber and silicone groups, rubber or silicone lubes were placed at osteotomy opening and removed after 3 months. Transnasal Endoscopic findings were, recorded at the completion of surgery and at 3 months, 6 months and 9 months after surgery for the 3 groups. A computer aided digitizer was used to calculate the surface area of the osteotomy site.

RESULTS: After removal of their tubes 3 patients in the rubber group had recurrent epiphora (78.0% success), one patient in silicone group (92.86% success) and 4 patients in control group (77.8% success). The average final surface area of the osteotomy opening of patients with rubber group at the end of follow up was (9.85 mm2) in the silicone group was (17.47mm2) whereas in the control group was (8.56mm2). Conclusion: Silicone tube more better than rubber one in maintaining effective larger osteotomy after Dacryocystorhinostomy. This can improve the long term success of the operation.

ABSTRACT NUMBER: 1550

TRANSNASAL ENDOSCOPIC RESECTION OF BENIGN TUMOURS EXTENDING TO PTERYGOPALATINE AND INFRATEMPORAL FOSSA

Shawky Elmorsy, MD, Yasser Khafagy, MD

INTRODUCTION: Endoscopic resection of nasal and sinus tumours extending beyond the limits of the nose and sinuses is one of the new frontiers of endoscopic sinus surgery.Tumour vascularity ,inability of the surgeon to manipulate the tumour and uncertinity about the endoscopic anatomy are the major limitations for endoscopic resection.These limitations have been largely overcome by improvement in interventional radiology and the development of the endoscopic two surgeons technique.

PATIENTS AND METHODS: We present our surgical technique for resection of angiofibroma extending to pterygopalatine and infratemporal fossa in 5 cases by using two surgeons technique (Wormald and Robinson approach)with slight modifications.

RESULTS: Better control with no recurrence for 2 years follow up.MRIwere performed 6 monthly postoperative.

CONCLUSION: the endoscopic two surgeons technique is not a conservative or less radical approach,but the principles of complete tumour resection should be applied.This technique also requires a high level of endoscopic skills,careful surgical planning and detailed knowledge of the anatomy.

ABSTRACT NUMBER: 1551

MANAGEMENT OF CSF RHINORRHEA; SEPTAL GRAFT AND MIDDLE TURBINATE ROTATIONAL FLAP TECHNIQUE.

Shawky Elmorsy, MD, Yasser Khafagy, MD

INTRODUCTION: Endoscopic management of CSF rhinorrhea has been reported as highly successful by several authors .Various techniques are used for site preparation ,graft selection and graft stabilization. Endoscopic approach is highly effective and safe with minimal invasiveness.

PATIENTS AND METHODS: We presented our experience on using transnasal endoscopy for the repair of CSF rhinorrhea. Between 2000 and 2007 we observed 20 patients with spontaneous CSF rhinorrhea. Endoscopy allowed the localization and repair of the defect.Septal graft was inserted with the underlay technique(cartilage or bone) and supported with middle turbinate rotational flap .Surgiceal and gelfoam packing are then applied.Anterior nasal packing for 5 days.

RESULTS: Endoscopy was successful in 90% of patients at the first attempt and in 95% at the second approach.No major complications were encountered.

CONCLUSIONS: Septal graft and middle turbinate flap are easy to harvest and easy to be applied to the site of the leak.The endoscopic approach is effective and safe with minimal morbidity.

ABSTRACT NUMBER: 1554

ALLERGIC FUNGAL SINUSITIS (AFS): DETECTION OF FUNGAL DNA IN SINUS ASPIRATE USING PCR

Shawky Elmorsy, MD, Yasser Khafagy, MD, Mohamed Elnagar

OBJECTIVE: Aimed to compare the detection of fungi in sinus aspirate by culture and PCR assay and relate the presence of fungi in nasal sinus and type of fungal allergen causing the disease.

METHODS: In our study, 68 cases of allergic fungal sinusitis (AFS) were selected, fungal culture and PCR assay for universal fungal, Aspergillus and Bipolaris DNA. Measurement of Aspergillus specific IgE in sinus aspirate and serum total IgE were done. A control group (10 cases) was included.

RESULTS: Among the total number of AFS (68), only 42 cases gives positive fungal growth with a percentage of 61.7 % while among 10 control cases, only 3 cases gives positive growth with a percentage of 30%. Dematiaceous family was the most common as it was isolated from 30 cases (71.4%). Bipolaris was the most common isolated species (18 cases) followed by Curvularia (11 cases) and Alternaria (1 case). The results of PCR assay assured the detection of fungal DNA in all cases of AFS group (68 cases) and in 4 cases of control group (40%). Ten patients were positive for Aspergillus fumigatus specific IgE (14.7 %) out of 68 patients and the mean value was 11.32 ±4.12 IU/ml which was significantly higher than the mean value of this specific IgE in our control group which was 0 IU/ml.

CONCLUSION: Detection of fungal DNA by PCR in nasal aspirate was superior to culture method. The presence of fungus is not essentially accompanied with allergic process.

ABSTRACT NUMBER: 1556

CHRONIC FUNGAL SINUSITIS: FUNGAL COLONIZATION OF PARANASAL SINUSES, EVALUATION OF ICAM-1 AND IL-8 AND STUDYING OF IMMUNOLOGICAL EFFECT OF LONG-TERM LOW-DOSE MACROLIDE THERAPY

Shawky Elmorsy, MD, Mohamed Elnagar

INTRODUCTION: Elevated concentrations of sICAM-1 in patients with chronic non allergic sinusitis pointed to its key role in the recruitment of neutrophils into the inflamed tissue. IL-8 transcripts were detected in 45% of chronic sinusitis RNAs by RT-PCR suggesting that IL-8 may contribute to neutrophil involvement in chronic sinusitis. Long-term low-dose macrolide therapy was first introduced for the treatment of diffuse panbronchiolitis in the 1980's. In the 1990's it was also shown to be an effective treatment for chronic sinusitis.

PATIENTS AND METHODS: In our study, one hundred and eight patients with chronic sinusitis who underwent sinus surgery were selected. Sinus aspirates were collected in sterile containers. A part of the aspirate was used for immunologic assay, the other part was cultured for mycologic growth. All patients were examined for the presence of characteristic fungal mucin of chronic allergic fungal sinusitis and this was confirmed later by measurement of total serum IgE. After culture, we have classified our cases into 3 groups: group I chronic non allergic fungal sinusitis (48), group II chronic allergic fungal sinusitis (14) and group III chronic sinusitis without fungal growth(46). A control group (11) was included.

RESULTS: The collection and culturing method results in culture positive for fungus in 62 (57.4%) of 108 patients. Chronic non allergic fungal sinusitis represented 48 cases (44.4%) with Aspergillus fumigatus (17) most prevalent followed by Bipolaris spp.(9), and Aspergillus niger (8). Chronic allergic fungal sinusitis was diagnosed in 14 cases (12.9%). The most prevalent was Aspergillus fumigatus (7) followed by Asprgillus niger (2), Bipolaris (2), and Cuvularia (2). In our study, we have found a statistically increased IgE levels in group II compared to group I, group III and control group IV and there were non statistically significant difference among the later 3 groups compared to each other. There were statistically increased ICAM-1 and IL-8 in groups I, II and III compared to control group IV. There were non statistically significant differences among the first 3 groups compared to each other.

CONCLUSION: These results assured the role of these molecules in all types of sinusitis. We selected Erythromycin from macrolides to study its effect in chronic fungal sinusitis and after finishing treatment, the mean value of IL-8 and ICAM-1 decreased with a statistically significant value indicating the efficacy of this drug to affect the immunologic part of this disease.

ABSTRACT NUMBER: 1558

TREATMENT OF RECALCITRANT CHRONIC RHINOSINUSITIS WITH LONG-TERM, LOW-DOSE MACROLIDE ANTIBIOTICS

Anders Cervin, MD, Ben Wallwork, MD, Prof. Alan Mackay-Sim, Prof. William Coman

A hands on approach to select and treat the right chronic rhinosinusitis patients with low-dose, long-term macrolide antibiotics will be presented. Treatment strategy is based on the randomised controlled trial presented below and on personal experience over a decade. A double-blind, randomized, placebo-controlled clinical trial on 64 patients with chronic rhinosinusitis was conducted. Subjects received either 150 mg roxithromycin daily for 3 months or placebo. Outcome measures included the Sinonasal Outcome Test-20 (SNOT-20), measurements of peak nasal inspiratory flow, saccharine transit time, olfactory function, nasal endoscopic scoring, and nasal lavage assays for ninterleukin-8, fucose, and alpha2-macroglobulin. There were statistically significant improvements in SNOT-20 score, nasal endoscopy, saccharine transit time, and IL-8 levels in lavage fluid (P<.05) in the macrolide group. A correlation was noted between improved outcome measures and low IgE levels.

ABSTRACT NUMBER: 1561

TRYPTASE DOES NOT ALTER PARACELLULAR PERMEABILITY IN HUMAN AIRWAY EPITHELIAL CELLS

Eugene Chang, MD, John Lee, MD, Joseph Zabner, MD

INTRODUCTION: The epithelial membrane functions as a barrier against bacteria, viruses, and antigens. The paracellular pathway involves the movement from apical to basolateral between cells by disruption of the cell-cell adhesion complex. In allergic and inflammatory diseases such as allergic rhinitis and asthma mast cell levels are increased. Degranulation of mast cells releases tryptase, a protease whose effects in airway epithelia can induce bronchospasm, mucus secretion, vasodilation, and edema.

HYPOTHESIS: We hypothesize that tryptase increases paracellular permeability in human airway epithelia (HAE).

METHODS: We applied recombinant human tryptase (rhtryptase) on the apical and basolateral surface to primary HAE and measured changes in paracellular permeability during short (every minute) and longer (over hours) time courses. We then immunostained the cell membranes for occludins and claudins to observe for changes in the structure of the tight junctions after tryptase application.

RESULTS: Rhtryptase does not alter airway conductance over hours. We tested a range of concentrations that replicated reported tryptase levels found in physiologic concentrations in the nose and as high as levels reached in systemic mastocytosis. HAE conductance was measured every fifteen minutes over 24 hours. Even under high concentrations, rhtryptase did not alter transepithelial conductance. Rhtryptase does not affect paracellular permeability transiently over minutes. In order to investigate if tryptase application had a transient effect we used cystic fibrosis (CF) HAE studied under short circuit conditions. Resistance was measured every 50 seconds for 60 minutes. The application of rhtryptase (6mu/ml) did not alter transepithelial conductance and thereby paracellular permeability. Rhtryptase does not affect the structure of the tight junction. HAE were stained for two proteins, occludin and claudin, that are specific to the tight junction of airway epithelial cells. After the application of rhtryptase (6mu/ml), HAE cells retained their normal architecture.

CONCLUSION: Our in vitro studies have conclusively shown that tryptase alone does not affect human airway epithelial permeability. One explanation could be that tryptase may not be the critical mediator in mast cell degranulation that alters the tight junction structure. Future tests of mast cell lysates in vitro and in vivo may answer this question.

ABSTRACT NUMBER: 1563

PROPHYLACTIC IV ANTIBIOTICS IN FESS: TRENDS AND ATTITUDES OF THE ARS MEMBERSHIP

Rakesh Chandra, MD, David Conley, MD, Robert Kern, MD

BACKGROUND: Use of antibiotic prophylaxis in otolaryngology-head and neck surgery is a practice that exhibits significant variation among practitioners, and trends vary by subspecialties within the field. The objective of the present study was to assess these habits among otolaryngologists with special interest or experience in FESS.

METHODS: Attendees of the 2008 Annual Meeting of the ARS were surveyed regarding practice patterns and attitudes concerning the use of prophylactic IV antibiotics in FESS.

RESULTS: Surveys were returned from 49 attendees, and within this sample, IV antibiotic prophylaxis was employed by 28 (57%) and was not in 21 (43%). Among those who utilized prophylaxis, only 2/28 (7%) did so because they felt there was strong evidence to support such a practice, while 26/28 (93%) used prophylactic antibiotics despite the opinion that there is no solid evidence in support of this. The most common antibiotic chosen empirically was a cephalosporin (25/28; 89%). There was no significant difference between those who did and did not employ prophylactic IV antibiotics with regard to number of years in practice or practice situation (full time academic, academic affiliated private, solo private, group private).

CONCLUSIONS: Opinion of the respondents suggests there is no solid evidence supporting the use of prophylactic IV antibiotics in FESS. Nonetheless, this practice is more common than not. Possible explanations for these observations are explored in the context of medicolegal factors and the present fiscal climate.

ABSTRACT NUMBER: 1564

POWERED ENDOSCOPIC DACRYOCYSTORHINOSTOMY WITH MUCOSAL FLAPS WITHOUT STENTING

Dr. Harvinder Singh, Dr. Rosalind Simon

OBJECTIVES: Dacrycystorhinostomy (DCR) is a procedure performed to drain the lacrimal sac in cases of nasolacrimal duct obstruction or in chronic dacryocystitis. It can be performed externally or endoscopically. The aim of this study is to describe powered endoscopic dacryocytorhinostomy with full sac exposure and primary mucosal anastomosis without stenting the lacrimal ostium and to report perioperative and follow-up results achieved with this procedure since April 2005.

STUDY DESIGN: Prospective, nonrandomized study.

METHODS: Thirty-four consecutive patients (27 Females and 7 Males; mean age 48.29y; range 18-74y) who presented to the DCR clinic with epiphora secondary to nasolacrimal duct obstruction and

recurrent infection were included in this study. All these patients underwent primary powered endoscopic DCR. A total of 39 procedures were performed using a standardized surgical technique. Post-operatively, symptom evaluation and endoscopic assessment of the newly created lacrimal ostium were done.

RESULTS: Thirty-three of the 39 DCR's were patent after a mean follow-up of 21.5 months, yielding a success rate of 84.6%. Patency was assessed by symptomatic evaluation and endoscopic visualization at each post-operative visit. Two patients had complications, one orbital fat exposure and the other secondary haemmorhage. All 6 failures were due to inadequate bone removal at the lacrimal ostium site with subsequent synechiae formation and stenosis.

CONCLUSION: Powered endoscopic DCR with mucosal flaps without stenting has a success rate comparable to that achieved with stents and external DCR.

ABSTRACT NUMBER: 1565

GUIDE-WIRE AUGMENTED ENDOSCOPIC FRONTAL SINUSOTOMY

Hamed Sajjadi, MD

Endoscopic Frontal sinus surgery remains the most difficult of all sinus operations. Mastering the endoscopic approach to the frontal recess remains a challenge and the margin of error is unforgiving. A new adjunctive method utilizing fiberoptic guide wire to safely find the nasofrontal recess and then performing the standard endoscopic nasofrontal sinusotomy has been used in 20 patients with excellent results. This method seems to augment the well know standard endoscopic frontal sinus surgery and provide an increased level of safety and efficiency while allowing the traditional approach to be completed with the guide wire in place.

ABSTRACT NUMBER: 1569

THE COMPARATIVE DISEASE BURDEN OF RHINOSINUSITIS

Neil Bhattacharyya, MD

OBJECTIVES: Determine the disease burden of sinusitis relative to other medical conditions.

METHODS: The National Health Interview Survey for the calendar years 1997-2006 adult sample was analyzed, extracting one-year prevalence data for the disease conditions: sinusitis, hayfever, peptic ulcer, acute asthma and chronic bronchitis. Disease burden data for emergency room visits, general and specialist visits, health-care spending and workdays lost were also extracted. The influence of each disease condition on disease burden variables was statistically determined. Comparisons among outcomes variables were conducted across disease conditions to determine their relative economic and healthcare impacts.

RESULTS: 313,982 adult patients were studied (mean age, 45.2 years). The one-year disease prevalences were: sinusitis (15.2%), hayfever (8.9%), ulcer (2.4%), acute asthma (3.8%) and chronic bronchitis (4.8%). Patients with sinusitis were significantly more likely to: visit the emergency room (33.3% versus 17.7%, $p<0.001$), spend greater than $500/year on healthcare (50.0% versus 39.0%, $p<0.001$) and see a medical specialist (33.6% versus 22.1%, $p<0.001$), than those without sinusitis. Patients with sinusitis missed an average of 5.93 workdays per 12 months versus 3.82 workdays for those without ($p<0.001$). The number of workdays lost with sinusitis was similar to that of acute asthma (6.10 workdays, $p>0.05$) and health-care spending with sinusitis was significantly greater than that of ulcer disease, acute asthma and hayfever ($p<0.004$).

CONCLUSIONS: Sinusitis imparts a significant disease burden both within and outside of the healthcare system that is comparable to or exceeds that of other conditions commonly thought to be more serious.

ABSTRACT NUMBER: 1571

CHANGED NASAL CAVITY AND PARANASAL SINUS AIRFLOW VELOCITY AND DISTRIBUTION AFTER TOTAL SINUECTOMY: A COMPUTATIONAL FLUID DYNAMICS STUDY

Xu Geng, MD, Xong Xia, MD

BACKGROUND: This study aimed to investigate the difference of airflow velocity, trace, distribution, and air pressure, as well as the airflow exchange between the nasal cavity and paranasal sinus in a numerical simulation of nasal cavity pre and post of total sinus opend according to the method of FESS.

METHODS: Computational Fluid Dynamics (CFD) techniques were applied to construct an anatomically and proportionally accurate three-dimensional nasal model based on a normal nasal CT scans. A virtual FESS intervention was performed numerically on the normal nasal model using Fluent software. Navier-Stokes and continuity equations were used to calculate and compare airflow, velocity, distribution and pressure in both the pre and post FESS models.

RESULTS: In the post-FESS model, there was an increase in airflow distribution in the area connecting the middle meatus and the surgically opened ethmoid, 19% increase during stable inhalation and 9% increase during stable Exhalation; flow velocity in the ostiomeatal complex was increased. The flow trace in the nasal vestibule, nasopharynx, common and inferior meatus were similar with the pre-FESS, the flow trace in the middle meatus were obviously changed, there were wide-ranging vortex in the maxillary, ethmoid and sphenoid sinuses following FESS. There was a gradual decrease in nasal resistance in the posterior ethmoid sinus region, the airflow exchange between the nasal cavity and paranasal were markedly increased following FESS, the maxillary sinus was at most.

CONCLUSION: The airflow velocity, trace, distribution, and air pressure were changed in the ostiomeatal complex following FESS, the airflow exchange between the nasal cavity and paranasal sinus were markedly increased, the maxillary sinus was at most.

ABSTRACT NUMBER: 1572

MASTOID BONE AS A NEW GRAFT MATERIAL IN RHINOPLASTY

Mahmoud Sadoughi, MD, Ali Kouhi, MD, Mehdi Bakhshaee, MD

INTRODUCTION: Management of some nasal deformity including saddle noses, low radix especially in the secondary rhinoplasty challenges the surgeon to provide both cosmetic and functional improvement. We describe a new technique for creation of a split mastoid bone to provide dorsal support while increasing tip projection in patients with substantial saddle nose deformities due to trauma or excessive surgical resection.

MATERIALS AND METHODS: In a Case series since 2004, sculptured lateral cortex of mastoid bone was used in 56 patients for dorsal nasal augmentation, smoothing dorsal nasal irregularities or augmentation of radix. Eighteen patients had been suffered overresection of ostecartilaginous nose structures during previous aesthetic nose surgeries while 38 cases were candidate of primary rhinoplasties (18 low radix and 20 saddle nose) due to structural deformity or trauma.

RESULTS: Fifty six consecutive patients (mean age: 25±6 year, female/male: 45/11) with postoperative follow-up from 6 to 49 months (mean: 23 months) met the study criteria. All cases resulted in an augmented, straightened nasal dorsum, increased tip projection and adjusted radix. The final results were satisfied throughout follow-up with no evidence of graft infection. Only in two cases the graft was displaced needing revision .The amount of graft absorption even 2 years after operation was acceptable.

CONCLUSIONS: This graft provides adequate autologous bone for large group of patients. Furthermore the donor site is in the field of an otolaryngologist task with low morbidity and camouflaged scar. We recommend overcorrection of the defect using additional bone graft considering some predictable future bone resorption.

ABSTRACT NUMBER: 1575

ENDOSCOPIC TRANSNASAL RESECTION OF MALIGNANT TUMOR IN THE PTERYGOPALATINE FOSSA

Dr. Satoru Kodama, Toshiaki Kawano, Masashi Suzuki

INTRODUCTION: Pterygopalatine fossa (PPF) is a difficult-to-access anatomic area and PPF tumors are uncommon entities. Structures contained within the PPF include the internal maxillary artery (IMA) and its branches, the maxillary division of the trigeminal nerve (V2), and the vidian nerve. Standard approaches to the PPF require open transmaxillary techniques that violate the anterior and posterior walls of the maxillary sinus. Here, we describe endoscopic transnasal resection of malignant tumor, ectopic esthesioneuroblastoma (ENB), in the PPF.

TECHNIQUES: Endoscopic medial maxillectomy was performed, and this allowed the transnasal approach to be performed up to the posterior wall of the maxillary sinus and the PPF with a wide working space under the 0o endoscope. The posterior wall of the maxillary sinus was drilled out with a diamond bur, and the tumor was identified in the PPF. The IMA supplying the tumor was clipped with a hemoclip and cut with the Harmonic Scarpel. The maxillary nerve (V2) was identified around the foramen rotundum and could be preserved. The vidian nerve and pterygopalatine ganglion were resected with the tumor. Moreover, the tumor in the PPF was successfully removed without complications.

SUMMARY AND CONCLUSION: Endoscopic transnasal approach could be successfully used for the complete removal of malignant tumors in the PPF. Although PPF is a difficult-to-access anatomic area, the endoscopic transnasal approach improves access and visualization, and potential to reduce complications compared with open approach. The endoscopic transnasal approach might become the treatment of choice for malignant tumors in the PPF.

ABSTRACT NUMBER: 1578

CORRELATION BETWEEN OUTCOMES OF ENDOSCOPIC MANAGEMENT OF SINUGENIC FACIAL PAIN OR HEADACHE AND PREOPERATIVE COMPUTED TOMOGRAPHY IN RHINOSINUSITISI

Mohamed Askar, MD

OBJECTIVES: The objective was to prospectively evaluate the relationship between the results of functional endoscopic sinus surgery (FESS) for management of sinugenic facial pain / headache due to chronic rhinosinusitis and the preoperative computed tomography (CT) scans.

STUDY DESIGN: The results were analyzed according to both pre- and postoperative degree of severity of pain according to visual analogue score from 0-10.

METHODS: This study was performed on 30 patients presented with facial pain/ headache as the main symptom of refractory chronic sinusitis. CT scans were graded according to Lund-Mackay score. All patients were subjected to FESS then followed up for 8 months. The degree of improvement was obtained by comparing the pre- and postoperative pain visual analogue scores.

RESULTS: The final postoperative subjective assessment showed that FESS had improved the pain to variable degrees in 93.4 % of patients. The visual analogue and Lund-Mackay scores were reviewed and analyzed using correlation coefficient and t-test. Both scores failed to significantly correlate($r = 0.12$, p.value > 0.05).

CONCLUSION: FESS is a worthwhile procedure for treatment of sinugenic facial pain/ headache secondary to chronic rhinosinusitis. However, patient-based responses of sinunasal pain symptoms fail to correlate with the extent of pathology seen in patient CT scan. The location of mucosal disease is frequently much more significant than the extent of the disease.

ABSTRACT NUMBER: 1580

PARANASAL SINUS DISEASE AND AIRWAY INFLAMMATION IN PREDNISONE-DEPENDENT ASTHMA

Dr. Bosco Lui, Dr. Doron Sommer, Dr. Parameswaran Nair

BACKGROUND: Asthma is commonly associated with chronic rhinosinusitis in Otolaryngology and Respirology practices. Although the exact mechanism remains unclear, some proposed theories include bacterial seeding of lungs, reflex bronchospasm, and enhanced â-adrenergic blockade. Computed tomography (CT) offers superior sensitivity in detecting sinus abnormalities and extent of disease, particularly in patients with difficult-to-treat asthma. There are few reports using sinus CT to assess the relationship between sinus abnormalities and asthma.

METHODS: A retrospective survey of 15 prednisone-dependent asthmatic patients with respect to measures of airway inflammation, airflow limitation, and CT sinus scans. The pathological changes in the CT scans were scored using the Lund-Mackay and JAMA staging systems; and several paranasal bony anatomical variations were recorded. These CT sinus measures were in turn correlated with quantitative analysis of

expectorated sputum for eosinophilia, prednisone dose requirement, and spirometry (FEV1).

RESULTS: With respect to prednisone requirement, both JAMA and Lund-Mackay staging systems showed that greater sphenoidal mucosal disease was associated with increased prednisone dose requirements (OR 1.7, p=0.05; OR 1.6, p=0.021). Generally, both staging systems showed that specific sinus site involvement correlated with higher levels of sputum eosinophils; these include sphenoid, maxillary, ethmoid sinuses, and the osteomeatal complex. Finally, there appeared to be a limited role for sinus anatomy as a predictive factor in prednisone dependent asthma.

CONCLUSIONS: Sinus anatomy does not seem to play an important role in prednisone-dependent asthma. However, sinomucosal thickening appears to be an important predictor of prednisone requirement and severity of eosinophilic bronchitis.

ABSTRACT NUMBER: 1583

HEMODYNAMIC EFFECTS OF TOPICAL ADRENALINE IN NASAL SURGERY

Suja Sreedharan, MS, Kishore Prasad, MS, Madhusudan Upadya, MD, Waheeda Cherukattil, MS

OBJECTIVES: Optimal mucosal decongestion in nasal surgery is achieved by adrenaline nasal packing. Adrenaline, a powerful vasoconstrictor can have significant hemodynamic effects on the circulation. This study evaluates the hemodynamic effects of topical adrenaline under both local and general anesthesia when used prior to adrenaline infiltration in nasal surgery.

METHODS: The study group comprised of 90 subjects undergoing nasal surgeries in whom topical adrenaline of 1:30,000 (Group 1), 1:6,000 (Group 2) or 1:4,000 (Group 3) was used followed by sub-mucosal adrenaline infiltration. Each of these 3 groups had 20 patients under general anesthesia(GA) and 10 patients under local anesthesia(LA). Controls (40 patients 20 GA and 20 LA) were subjects undergoing ENT or head and neck surgeries where only adrenaline infiltration was done without prior nasal packing. Serial intra-operative heart rate, blood pressure and ECG monitoring was done and relevant changes were recorded. The field during surgery was subjectively assessed by the surgeon. The ANOVA method was used for statistical analysis.

RESULTS: It was observed that there were no statistically significant changes in heart rate, systolic and diastolic BP between the control and study groups after adrenaline nasal packing under both LA and GA. Similarly after adrenaline infiltration these three groups did not show statistically significant alteration in the parameters when compared to the control group. But adrenaline infiltration did cause significant changes in the hemodynamic parameters in both the control and study groups when compared to their own baselines.

CONCLUSION: Topical Adrenaline does not significantly affect the hemodynamic parameters when used as a vasoconstrictor agent in nasal surgery.

ABSTRACT NUMBER: 1585

CONSTRUCTION AND EFFECTIVENESS OF ENDOSCOPIC SINO-NASAL SURGERY MODEL

Joao Nogueira, MD, Aldo Stamm, PhD, Shirley Pignatari, PhD

INTRODUCTION & OBJECTIVES: Functional endoscopic sinus surgery is the "gold standard" for the treatment of many diseases. Long periods of training are necessary for the adequate learning of professionals. This process has been impaired in some places. Virtual simulators have been used with positive results. However virtual images and impossibility to use real instruments are disadvantages. Our study aims to: show the development of an endoscopic nasal surgery model; discuss the effectiveness in anatomical knowledge gain and present major advantages and disadvantages.

METHODS: We developed models used by 32 Otolaryngologists divided into 3 groups according to levels of experience. Scores were requested for consistency tissue color and identification of anatomical structures. The results were compared and analyzed statistically.

RESULTS: The mean score assigned by participants for consistency was 32. For the color the overall average was 36. The mean score for identification of anatomical structures was 94.

CONCLUSIONS: We presented an endoscopic nasal surgery model showing the steps of development. 82% of participants reported improvement in anatomical knowledge. The advantages are: use of instruments similar to the real and no involved biological hazards. The disadvantage was the single dissection at the nasal lateral wall."

ABSTRACT NUMBER: 1588

SURGICAL STAGING OF ESTHESIONEUROBLASTOMA FOR ENDOSCOPIC-ASSISTED TRANSNASAL-CRANIECTOMY

Joao Nogueira, MD, Aldo Stamm, PhD, David, Kennedy, MD, Fernando Balieiro, MD

BACKGROUND: The goal of surgical treatment of patients with esthesioneuroblastomas (ENB) is total tumor removal including an adequate margin of normal surrounding tissue. The classical craniofacial approach has achieved time tested results despite significant morbidity. However, endoscopic technology, surgical techniques and concepts of endoscopic oncologic surgery have evolved in recent years. Endoscopic assisted transnasal-craniectomy (EATNC) allows resection of all cranial base structures that are related to the tumor with a margin of normal tissue (oncologic resection) and eliminates the need for frontal craniotomy and brain retraction, even in many cases with intracranial invasion.

OBJECTIVE: To re-evaluate the relevance of the Kadish staging system to endoscopic surgical approaches for ENB and discuss modifications appropriate for the endoscopic era in the light of experience with EATNC.

METHODS: Review of 10 cases of ENB treated endoscopically, including patients presenting with intradural extension.

RESULTS: According to the Kadish staging system, these would be classified as follows, two Stage A, four Stage B, four Stage C. All cases were treated exclusively with EATNC. Nine of the ten patients (90%) were free of disease 2 to 126 months after resection (average 55 months). The Kadish system did not provide guidance regarding appropriate surgical approach.

CONCLUSION: The limitations of the Kadish staging system of ENB have been recognized in prior publications. Those limitations are highlighted by the new surgical approaches now available. Based upon our experience we propose a surgical staging system which provides greater tumor stage precision and therapeutic guidance for surgeons performing EATNC.

ABSTRACT NUMBER: 1589

NOVEL "CROSS-OVER FLAP" TECHNIQUE FOR NASAL SEPTAL PERFORATIONS

Joao Nogueira, MD, Shirley Pignatari, PhD, Aldo Stamm, PhD

INTRODUCTION: A nasal septum perforation is a defect in any portion of the cartilaginous or bony septum with no overlying mucoperichondrium or mucoperiosteum on either side. In the perforation the mucosal edges epithelialize, preventing closure of the defect. Although some patients may be completely asymptomatic, symptoms arise from altered nasal laminar airflow, and they may be severely disturbing to the patient.

OBJECTIVE: The aim of this paper is to describe our surgical "cross-over" technique for the treatment of nasal septum perforations.

METHODS: We use nasal septum flaps that are crossed at the nasal septum perforation.

RESULTS: We used this novel technique in 5 patients. One patient presented an idiopatic anterior septum perforation and four had postoperative perforations. In four patients, the perforation was successfully closed with a follow-up of 6 months. One patient remained with the nasal septum perforation after the procedure.

CONCLUSION: We described this novel "cross-over" technique for the closure of nasal septum perforations. This technique is feasible and seems to be effective at the closure of nasal septum perforations. A larger series with a longer follow-up is being done in order to assure the technique efficacy.

ABSTRACT NUMBER: 1598

THE EFFECTS OF BIPOLAR RADIOFREQUENCY ABLATION ON SINONASAL MUCOSA IN A SHEEP MODEL

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OBJECTIVES: To determine the pattern of injury in the sinuses using a bipolar radiofrequency plasma process (BRFP) and evaluate healing.

METHODS: Based on prior experience using a rabbit model, three sheep underwent endoscopic sinus surgery. BRFP was applied to turbinate mucosa in three areas for 2, 4, or 6 seconds. After resection of the contralateral middle turbinate and ethmoidectomy, BRFP was applied to the lateral wall or lamina papyracea for 2 seconds. The ethmoid and turbinate specimens were resected en bloc during necropsy immediately for the first sheep and on post-operative day 14 for the second and third sheep.

RESULTS: BRFP resulted in immediate loss of surface respiratory epithelium and thermal-type injury to the underlying seromucinous glands. On post-operative day 14, the site demonstrated re-epithelialization with respiratory epithelium. The underlying seromucinous glands were replaced by mild fibrosis. There was a well-defined zone of injury, no larger than the device. Longer use did not result in a deeper injury. Rather, the depth of injury was dependent on the type of submucosal tissue. Cartilage acted as a barrier to injury. Underlying bone had reactive, regenerative change. There were no histologic changes in the orbit.

CONCLUSIONS: Sheep mucosa after BRFP shows a similar injury and healing pattern to rabbit mucosa. Sinus mucosa heals appropriately after BRFP. The depth of injury is well demarcated and dependent on the type of tissue injured. Based on this and the previous rabbit study, BRFP may be an additional surgical tool to consider in endoscopic sinus surgery.

ABSTRACT NUMBER: 1599

ENDOSCOPIC SEPTOPLASTY WITH POWERED INSTRUMENTS

Aderito De Sousa, MD, Aidmar Salas, MD, Minaret Sandrea, MD

INTRODUCTION: The septoplasty is an the procedures well known and perform in the ENT practice. The endoscopic approach to the nasal septum and the treatment of estructural pathology of this through powered instruments constitute a useful tool to treat back and attical deviations with more precision, besides conserving improve the septal cartilaginose phatology.

METHODS: A prospective study was conducted in 141 patients undergoing septoplasty with powered instruments since january to june 2007, all patients consent participate in this study. The variables evaluated prior and after surgery were: changes in the severity of rhinosinusitis syntoms and rigid endoscopic, likewise postoperative complications. The test t was applicated, a p value <0,05 was regarded as statistically significant.

RESULTS: The change in the severity of rhinosinusitis syntoms after surgery decrease from 6,12 (preoperative) to 2,01 (postoperative)=p <0,05. 100% of the patients to manifest was content with the surgery outcome. About complications postoperatives was present in a 4,96% and was represent subnasal hematoma (n=4), septal perfoaration, <0,5 cms (n=2) andd epistaxis (n=1).

CONCLUSIONS: The endoscopic septoplasty through powered insturments offer a better corrections to back and attical septal deviation, with confortable recover, minor complications and important decrease of syntoms in the patient with crhonic rhinosinusitis refractary to medical treatment.

ABSTRACT NUMBER: 1600

A NEW MODEL FOR ANALYZING THE FLOW EFFECTS ON ELECTRICAL BARRIER OF NASAL EPITHELIUM

Masato Miwa, MD, Kensuke Watanabe

INTRODUCTION: The barrier function of nasal epithelium is critical to the host defense. Hemodynamic shear stresses have important roles in both the normal and pathophysiological conditions of the vascular endothelium. Airway epithelial cells are exposed to luminal shear stress generated by airflow. Recent data have shown that phasic motion like respiration is a key feature of airway physiology including the regulation of epithelial barrier function. The short-circuit technique on epithelial cells delivers a measured amount of current. Short circuit current (SCC) is an index of net electrogenic ion transport across epithelium. The measurement of SCC had been proved to be an important method for assessing the efficiency of the airway epithelium as an electrical barrier. The aim of this study is to develop a new model to evaluate the effect of sheer stress on the electrical barrier function of nasal mucosal epithelium.

METHODS: To stimulate the hemodynamic environment of the circulation and to examine the effect of various fluid shear stresses, we have developed a flow apparatus to subject primary cultured nasal epithelial cells excised from guinea pig to well-characterized shear. Short circuit currents (SCC) measurements were made in those cells by using our system before and after applying sheer stress.

RESULTS: The low levels of shear stresses enhanced airway epithelial electrical barrier function. On the other hand, higher levels of shear stresses down regulated the electrical barrier function.

CONCLUSION: We have shown in this study that our original model might be very useful for analyzing the effect of shear stress on the nasal epithelium. The data obtained form this model would contribute to understand the pathogenesis and therapy of the upper airway diseases with the rupture of the barrier function by pathological shear stresses.

ABSTRACT NUMBER: 1601

MANUKA HONEY: THE NEW TREATMENT FOR RECALCITRANT CHRONIC SINUS DISEASE

Andrew Thamboo, BSc, Andrea Thamboo, BPh, Dr. Carl Philpott, Dr. Amin Javer

BACKGROUND: Some patients continue to suffer from symptoms of sinusitis after maximal medical and surgical treatment for chronic rhinosinusitis (CRS) or allergic fungal rhinosinusitis (AFRS). Manuka honey has well-documented anti-microbial and anti-fungal properties and is currently being used by physicians across the world for a wide variety of medical problems.

OBJECTIVE: To determine the effectiveness of MEDIHONEY™ Antimicrobial Active Manuka Honey in patients who continue to suffer from CRS or AFRS resistant to conventional medical treatment after bilateral FESS and post operative maximal medical management.

METHODS: A randomized, double-blind, placebo-controlled, prospective study at a tertiary centre. Thirty-one patients with CRS and thirty-one patients with AFRS had one side irrigated with saline and the other side irrigated with a 50/50 mixture of honey and saline once a week for four weeks. A one grade improvement in endoscopic grading was considered significant and patients filled a SNOT-22 questionnaire to assess subjective nasal symptoms.

RESULTS: The patients with CRS showed an absence of mucopus discharge in a significant number of cases on the treated side ($p=0.03$). In the AFRS patients there was also a significant number of cases in whom the staging improved on the treatment side ($p=0.01$). The symptom scores however did not show a significant difference although the mean score in both groups was slightly lower after treatment.

CONCLUSION: Manuka Honey is an effective topical anti-microbial agent post-operatively among patients who continue to suffer from CRS and AFRS.

ABSTRACT NUMBER: 1604

ALLERGIC FUNGAL SINUSITIS–A NEW STAGING SYSTEM

Dr. Carl Philpott, Dr. Amin Javer

BACKGROUND: In 1997, Kupferberg et al described the endoscopic staging system for allergic fungal sinusitis (AFS). This allows 4 stages, 0-3 which is further qualified with A or B to indicate the presence of allergic mucin. It has been noted however that patients may show visual improvement on endoscopic examination, in response to treatment, and yet remain at the same stage.

OBJECTIVE: To introduce a new system that allows greater sensitivity for demonstrating changes in mucosal oedema and polyposis.

METHODS: A series of 50 patients with AFS who attended the St Paul's Sinus Centre in Vancouver were endoscopically staged at the clinic appointment. Photos were recorded of all the sinus cavities bilaterally. These photos were then retrospectively staged using a new system: each sinus cavity (maxillary, ethmoid, frontal and sphenoid) has a scale of 0-9 with an extra point for the presence of allergic mucin. Thus each side of the nose has a maximum score of 40; a total of 80 for both sides. The staging is based on the old Kupferberg staging.

RESULTS: Restaging the patients showed a greater variety in the spectrum of mucosal disease than indicated by the old staging system and allowed for a more descriptive analysis of the current severity of their disease and its response or lack of to treatment.

CONCLUSION: Use of the new staging system provides greater information to the clinician seeing patients with allergic fungal sinusitis in determining their response to treatment and is also useful for research into new treatment regimes.

ABSTRACT NUMBER: 1605

ENDOSCOPIC MANAGEMENT OF SINO-NASAL TUMOURS: LONG-TERM RESULTS–THE ST PAUL'S EXPERIENCE

Dr. Carl Philpott, Dr. Amin Javer, Alia Dharamsi

OBJECTIVES: To demonstrate that computer-assisted endoscopic management of sino-nasal tumours yields excellent results in terms of preventing recurrence and minimizing significant morbidity and mortality.

METHODS: A retrospective chart review of patients who are being followed up for tumour recurrence or have undergone tumour removal between 2000 and 2008.

RESULTS: Inverted papillomas are the most numerous tumours managed endoscopically accounting for 40% of cases. Approximately 50% of these cases had undergone previous surgery in another centre where the tumour was either not recognized or the resection was incomplete. 30% of patients with inverted papillomas had a recurrence but only three required a revision procedure using an open approach; otherwise recurrences were successfully managed endoscopically. Other common benign tumours included osteomas (8%), haemangiomas (2%) and angiofibromas (2%). The most common malignancy was squamous cell carcinoma (7%) with all malignant tumours accounting for 17% of cases and, to date, none of the patients that were dealt with primarily at our centre have died of their sino-nasal tumour. Two patients that were initially managed elsewhere died of their disease.

CONCLUSIONS: Endoscopic management of sino-nasal tumours using computer navigation allows good control of the disease and avoids unnecessary morbidity associated with open procedures. Although there is a higher initial recurrence rate, these recurrences can be successfully managed endoscopically.

ABSTRACT NUMBER: 1606

THE EXPRESSION OF THE IMMUNOREGULATORY ENZYME INDOLEAMINE 2,3-DIOXYGENASE IN PATIENTS WITH NASAL POLYPS

Sanna Toppila-Salmi, MD,PhD, Mikko Lehtonen, MD

Indoleamine 2,3-dioxygenase (IDO), an enzyme involved in the catabolism of the essential amino acid tryptophan (trp), suppresses T cell activity and is up-regulated with various inflammatory stimuli. It is expressed broadly in cells, such as eosinophils, antigen presenting cells and epithelial cells. Although many hypotheses have been suggested, the pathogenesis of nasal polyps (NP) is still largely unknown. We sought to establish whether IDO expression is involved in the pathogenesis of NP. We analyzed immunohistochemically the expression of IDO in specimens of healthy nasal mucosa, NP, antrocoanal polyps (ACP), and maxillary sinus biopsies from healthy controls and patients with chronic rhinosinusitis (CRS) with or without NP diagnosis. IDO was expressed in sinonasal epithelial cells, leukocytes and intraepithelial glands. The epithelial expression of IDO was significantly lower in the nasal mucosa from healthy control subjects compared to patients with either eosinophilic NP, or with non-eosinophilic NP. The epithelial expression of IDO was significantly higher in maxillary sinus mucosa from patients with CRS without NP compared to patients with CRS with NP. Interestingly, the positivity of epithelial IDO 9 months after endoscopic sinus surgery (ESS) correlated with the apperarance of nasal polyps in 5 years after ESS. Before performing ESS, only 13 % of patients had nasal polyps. 5 years after ESS, 31 % of patients reported that they had gotten NP diagnosis. Our results suggest that the induction of epithelial IDO might play a role in the pathogenesis of both eosinophilic and non-eosinophilic nasal polyposis. By reducing locally the essential amino acid, trp, epithelial IDO might suppress either the activation of inflammatory cells, or inhibit bacterial growth ("suppression by starvation"). In maxillary sinus mucosa, the differences in the positivity of epithelial IDO in groups CRS NP+ and CRS NP- , might reflect a distinct property of the sinus mucosa. It remains open, whether the expression of epithelial IDO is beneficial or detrimental for sinus mucosa. When observing the sinus specimens taken 9 months after ESS, the correlation between the positivity of epithelial IDO and the growth of NPs in 5 years, might reflect to reduced postoperative epithelial trp and thus abnormal epithelial healing among patients who developed NPs.

ABSTRACT NUMBER: 1607

COMPUTED TOMOGRAPHY FINDINGS IN SINONASAL WEGENER'S GRANULONATOSIS

Pete Batra, MD, David Grindler, BA, Steven Cannady, MD

BACKGROUND: Wegener's granulomatosis (WG) is intimately associated with the sinonasal tract, with involvement reported in 85% of patients during the course of the disease process.

OBJECTIVES: The objective of the study was: (1) to describe Lund-Mackay (L-M) scores and patterns of neo-osteogenesis and bony erosion and (2) to analyze the impact of surgery on the CT findings of WG patients.

METHODS: Retrospective review was performed of 74 patients presenting with WG to a tertiary care referral center. CT analysis was performed and graded by two independent reviewers.

RESULTS: The mean age was 53 years with a male:female ratio of 0.6:1. The average Lund-Mackay score was 10.0. Neo-osteogenesis was evident in 78% of the patients with overall average neo-osteogenesis score of 4.2. Bony erosion was noted on imaging in 62% of patients with overall average score for bony erosion of 2.0. Patients having undergone previous surgical intervention compared to no surgery had statistically significant elevation of overall L-M, bony erosion, and neo-osteogenesis scores (p value = 0.024, 0.0009, and 0.0015, respectively). Prior surgical intervention was significantly associated with an increased bone erosion and osteoneogenesis scores as compared with surgically naïve patients (p value = 0.013).

CONCLUSIONS: CT imaging in WG patients commonly demonstrated elevated L-M scores and evidence of bony erosion and osteoneogenesis. Furthermore, surgical manipulation in WG patients may lead to increased bony abnormalities and greater elevations of LM scores, possibly due to worsening vasculitis and/or inflammation. The presence of concurrent neo-osteogenesis and bony destruction of the paranasal sinus wall should raise clinical suspicion of WG.

ABSTRACT NUMBER: 1608

THE CALCIUM SENSING RECEPTOR IN SINONASAL EPITHELIUM: A MODULATOR OF CILIARY BEAT FREQUENCY?

Dawn Sharp, MD, Shaoyan Zhang, PhD, John Kostrzewa, MD, Brad Woodworth, MD

INTRODUCTION: Modulation of ciliary beat frequency(CBF) is complex, but is, in part, regulated by fluxes in intracellular calcium[Ca2+]i. Zinc and ATP can increase [Ca2+]i and CBF in a low sodium(Na+), high extracellular calcium[Ca2+]e environment via activation of Ca2+-permeable, non-selective, P2X receptor channels. Our prior studies have also demonstrated an increase in CBF under low Na+, high [Ca2+]e conditions in the absence of zinc and ATP, although to a lesser extent. The calcium sensing receptor(CaSR) is a metabotropic receptor that responds to [Ca2+]e by increasing [Ca2+]i via inositol triphosphate(IP3) mediated release from intracellular stores. The present study investigates whether CaSR is present in sinonasal epithelium and whether CaSR is responsible for the [Ca2+]e-mediated CBF amplification in a low Na+ environment.

METHODS: CaSR was detected and localized in murine septal and human sinonasal cultures using RT-PCR and immunofluorescence. Cultures were bathed in graded concentrations of [Ca2+]e(up to 10 mM) in a physiologic(140 mM) NaCl solution. CBF was captured and analyzed using high-speed digital video imaging. [Ca2+]i levels were investigated using Fura-2 Ca2+ imaging.

RESULTS: CaSR was detected in murine and human cultures and localized to ciliated epithelial membranes. However, a graded increase in [Ca2+]e in a normal Na+ environment did not augment CBF. Furthermore, no increase in [Ca2+]i signal was detected in the presence of [Ca2+]e.

CONCLUSIONS: CaSR is present on ciliated sinonasal epithelial cells, but [Ca2+]e was unable to stimulate CBF via Ca2+ release from intracellular stores in a physiologic, normal Na+ environment. CaSR function in sinonasal epithelium deserves further investigation.

ABSTRACT NUMBER: 1609

RADIOFREQUENCY COBLATION DECREASES BLOOD LOSS DURING ENDOSCOPIC SINONASAL AND SKULL BASE TUMOR REMOVAL.

John Kostrzewa, MD, Jumin Sunde, MS-3, Kristen Riley, MD, Bradford Woodworth, MD

OBJECTIVES: Minimizing bleeding during transnasal resection of sinonasal tumors is imperative for optimizing visualization and decreasing complications. The purpose of the present study was to determine whether radiofrequency coblation decreases blood loss during endoscopic tumor removal.

METHODS: A review of all sinonasal and skull base tumors treated with transnasal endoscopic techniques in 2008 was performed. Data collected included demographics, histopathology, operative technique, duration of procedure, intraoperative complications, and estimated blood loss(EBL). Videoendoscopy was available in all cases and edited to include the use of a microdebrider or coblation during the approach and/or initial debulking portion of the procedure. All videos were reviewed by the authors and scored using the 11-point Wormald Surgical Field Grading Scale.

RESULTS: Twenty-one patients with sinonasal or skull base tumors treated with transnasal endoscopic resection were identified. Average age was 48.6 years(8-80). The coblation device was used during the initial approach and/or debulking portion of the procedure in 7 cases. Sinus and skull base tumors included were esthesioneuroblastoma(n=6), squamous cell carcinoma(n=2), adenocarcinoma(n=2), inverted papilloma(n=2), intracranial dermoid(n=2), melanoma(n=2), adenoid cystic carcinoma(n=1), juvenile nasopharyngeal angiofibroma(n=1), and fibromyxosarcoma(n=1). There were no intraoperative complications. Use of the coblation device was associated with a significant decrease in all blood loss categories, including EBL(386 vs. 979 ml, p=0.0012), EBL divided by operative time(58 vs 164 ml/hr, p=0.0001), and Wormald Grade(2.92 vs 6.07, p=0.0002).

CONCLUSION: Radiofrequency coblation can significantly decrease blood loss during endoscopic sinonasal and skull base tumor removal and is a useful tool in the armamentarium of the endoscopic skull surgeon.

ABSTRACT NUMBER: 1610

ULTRASTRUCTURAL CILIARY CHANGES OF MAXILLARY SINUS MUCOSA FOLLOWING FUNCTIONAL ENDOSCOPIC SINUS SURGERY: AN IMAGE ANALYSIS QUANTITATIVE STUDY

Ahmed Atef, MD

This was a study of the effect of functional endoscopic sinus surgery (FESS) on the ciliary regeneration of maxillary sinus mucosa in patients with chronic maxillary sinusitis, using objective quantitative methods. Twenty specimens from the mucosa of both the superolateral wall and the ostium of the maxillary sinus were sampled during FESS and then six to 12 months later. They were light examined first by light microscopy and then by scanning electron microscopy in combination with image analysis software in order to study the cilia under higher magnification and to calculate proportion of the field that was ciliated. Samples were taken and studied at Cairo University hospital. This study showed that the maxillary sinus mucosa in chronic sinusitis is capable of regeneration and could return towards normal with the improvement of ventilation and drainage of the maxillary sinus following FESS. There were no significant changes in the degree of glandular hyperplasia, goblet cells or pathological glands after surgery.

ABSTRACT NUMBER: 1611

COMPARISON OF LARYNGEAL MASK WITH ENDOTRACHEAL TUBE

Ahmed Atef, MD, Ahmed Fawaz

BACKGROUND: The purpose of this study was to compare surgical conditions, including the amount of intraoperative bleeding as well as\r\nintraoperative blood pressure, during functional endoscopic sinus surgery (FESS) using flexible reinforced laryngeal mask airway (FRLMA) versus endotracheal tube (ETT) in maintaining controlled hypotension anesthesia induced by propofol-remifentanil total i.v. anesthesia (TIVA).

METHODS: Sixty normotensive American Society of Anesthesiologists I–II adult patients undergoing FESS under controlled hypotension\r\nanesthesia caused by propofol-remifentanil-TIVA were randomly assigned into two groups: group I, FRLMA; group II, ETT. Hemorrhage was measured and the visibility of the operative field was evaluated according to a six-point scale.

RESULTS & CONCLUSION: In summary, our results indicate that airway management using FRLMA during controlled hypotension anesthesia provided better surgical conditions in terms of quality of operative field and blood loss and allowed for convenient induced hypotension with low doses of remifentanil during TIVA in patients undergoing FESS.

ABSTRACT NUMBER: 1612

BIOFILMS AND MUCOSAL HEALING IN POSTSURGICAL PATIENTS WITH CHRONIC RHINOSINUSITIS

Zi Zhang, MD, Demin Han, MD,PhD, Deyun Wang, MD

INTRODUCTION: There are considerable studies on biofilms in chronic rhinosinusitis. However, few studies have specifically looked at biofilm production in the sinus cavities after functional endoscopic sinus surgery. This study observed the presence of biofilms on postsurgical mucosa, scar tissue and adhesion.

METHODS: Patients were followed up for six months, after intraoperative mucosal samples were obtained for the confirmation of biofilm. According to endoscopic evaluation, the postsurgical edema, scar or adhesion of sinonasal mucosa were obtained. In order to evaluate the mucosal healing and biofilms simultaneously, samples were prepared for hematoxylin and eosin stains and standard scanning electron microscopy.

RESULTS: Twenty patients with biofilms were enrolled. Five patients showed no sign of infection in the postoperative study, so no samples were obtained. In the six patients who had adhesions in the nasal meatus, biofilms were identified in four of the scars and adhesions both under hematoxylin and eosin stains and standard scanning electron microscopy. In the nine patients with apparent mucosal edema, various degrees of ciliated columnar epithelial healing with lamina propria edema and dilated capillaries were observed, while no basement membrane thickness and mucous gland hyperplasia could be seen in the recovered mucosa. Moreover, five samples showed various configurations of biofilms. Scattered bacteria were also shown both under scanning electron microscopy and hematoxylin and eosin stains.

CONCLUSIONS: Biofilms could form on the postsurgical edema, scar and adhesion of sinonasal mucosa. Hematoxylin and eosin stain is an efficient way to identify apparent biofilms like plaque. Postsurgical mucosa has different structures.

ABSTRACT NUMBER: 1616

LONG TERM RESULTS OF SEPTAL-TURBINATE-SUTURE IN ENDOSCOPIC SINUS SURGERY

Mona Ashoor, MD, Gerhard Rettinger, MD, Kerstin Lindemann, MD, Joerg Lindemann, MD

INTRODUCTION: Synechia formation between the middle turbinate (MT) and the lateral nasal wall is a common postoperative complication in endoscopic sinus surgery (ESS) often leading to revision surgery. To keep the middle meatus open several procedures were described in order to medialize the MT. Long term results of these techniques are missing. Therefore, the purpose of the study was to evaluate the long term results of fixing the heads of the MT to the septum by means of a resorbable septal-turbinate-suture (STS) in ESS.

METHODS: 17 patients (10 males, 7 females) were included in the retrospective study. All patients underwent ESS with STS in addition with septoplasty because of chronic rhinosinusitis with (8) and without polyps (9). The median follow up was 81 months (range, 36 – 105 months). All the patients underwent nasal endoscopic examination. In a total 34 nasal cavities were examined. Additionally, rhinomanometry and olfaction test were performed.

RESULTS: According to the endoscopic findings, the MT was found in a central position in 10 nasal cavities (29%), medial in 24 (71%) and none lateral. Only 2 patients presented a synechia, one between MT and septum and one to lateral nasal wall. The middle meatus was bilaterally open in all patients. In 3 patients (18%) minimal recurrent polyps were found.

CONCLUSIONS: Synechia of the MT to the lateral nasal wall in ESS can be avoided by a resorbable suture between MT and septum. Our long term results showed that STS maintains the MT in a medial position with a free middle meatus without relevant synechia.

ABSTRACT NUMBER: 1619

MUCOCELE AND OSTEOMA OF FRONTAL SINUS: THE CLINIC AND HISTOPATHOLOGIC ANALYSIS OF COEXISTENCE

Prof. Mustafa Gerek

OBJECTIVES: The rhinologic and ophthalmologic signs and symptoms of mucocele and osteoma of the frontal sinus were investigated and histopathologic characteristics of the removed specimens were analyzed to find an answer of the etiology of their coexistence.

METHODS: Fifty-one patients diagnosed as having co-existing frontal sinus osteoma and mucocele. The patients were divided to three different groups according to their lesions and were underwent osteoplastic flap and/or endonasal endoscopic technique to remove the osteoma and mucocele from the frontal sinus. The specimens were evaluated with light microscopy and the symptoms and signs before and after the surgery were compared.

RESULTS: In our serious, the presenting symptom and its duration showed a discrepancy; however, the frontal headache was the most common one. The patients in the first and second group had usually a long history of recurrent sinusitis and 11 patients had undergone sinus surgery but their complaints persist after the surgery. The ophthalmologic symptoms and signs had wide range as lid swelling, periocular pain, ocular motility problem with diplopia. Bacterial growth from frontoetmoid sinus mucoceles cultures were investigated in 22 cases and only in one specimen had positive result for Klebsiella pneumonia. The histopathologic examination shows the osteoma with dense, mature, predominantly lameller bone covered with hyperplastic columnar epithelial cells of mucocele and some cases shows wide and haphazardly interconnecting bone trabeculae that are predominantly rimmed by osteoblasts.

CONCLUSION: The association of paranasal sinus osteoma and intracranial mucocele extension is a rare entity and paranasal sinus osteoma is the primary pathology. Although osteoma is the primary pathology, unexpected enlargement of the osteoma might have been due to calcification of the mucocele.

ABSTRACT NUMBER: 1620

ENDOSCOPIC VERSUS OPEN APPROACHES IN TREATING HUGE LOCALLY ADVANCED ANGIOFIBROMAS

Hossam El Bosraty, Ahmed Atef, Ehab Abou Zeid, Mossad Abdelaziz

HYPOTHESIS & BACKGROUND: Juvenile nasopharyngeal angiofibromas (JNA) is combined vascular and fibrous neoplasm arising in the nasoptarynx of prepubertal and addescent males. These tumors are usually managed surgically through open surgical approaches but in the recent year's interest endoscopic resection -particularly in small tumors –raised up but all the published data in the literatureare descriptive data discussing technique of endoscopic resection of JNA but no comparative studies between this technique and the more established open approaches exist.

MATERIAL & METHODS: Retrospective chart analysis study was done evaluating a total of 42 male patients grouped into two groups (1) open surgical approach (2q patients) and (2) endoscopic approaches 13 patients. Comparative study between two groups was done as regard A local control parameters 2 Morbidity parameters.

RESULTS & CONCLUSION: endoscopic approach offers patients with huge locally advanced angiofi vomas less morbidity with equal or even better local control.

ABSTRACT NUMBER: 1623

CAN CT SCORE PREDICT SUCCESS IN PEDIATRIC ENDOSCOPIC SINUS SURGERY?

Hassan Arshad, MD, Hassan Ramadan, MD

INTRODUCTION: The risk factors for endoscopic sinus surgery (ESS) failure in children have not been well characterized. The purpose of this study was to determine if the pre-operative Lund-MacKay CT score could predict ESS failure in children.

METHODS: Retrospective review of 172 patients age 2-15 (mean, 9.57 years), all of whom had sinus CT scans. All patients had follow-up for at least 1 year. Success was defined as improvement of symptoms or cure at 1 year post-ESS.

RESULTS: Overall success rate was 78%. Patients undergoing successful and unsuccessful ESS had an average pre-operative CT score of 9 and 10, respectively. This was not statistically significant (p=0.108).

CONCLUSIONS: Pre-operative CT score can not reliably predict a successful outcome in children undergoing ESS.

ABSTRACT NUMBER: 1625

ENDOSCOPIC SURGERY FOR JUVENILE ANGIOFIBROMA (JA): INDICATIONS AND LIMITS

Sylvie Nadeau, Piero Nicolai, Andrea Bolzoni Villaret

INTRODUCTION: At present, endoscopic surgery is considered a viable option in the management of selected sinonasal benign and malignant tumors. The authors critically review their 14-year experience in endoscopic management of JA to better define indications and limits.

METHODS: From January 1994 to November 2008, 46 patients were treated after angiography and vascular embolization (87%). All patients were followed by endoscopic and MR examinations.

RESULTS: Lesions were classified according to Andrews et al. (1989): type I, n=5; type II, n=24; type IIIa, n=14; stage IIIb, n=3. Unilateral blood supply was detected in 39 (85%) cases. Feeding vessels from the internal carotid (ICA) artery were reported in 14 (30%) patients. Intraoperative blood loss ranged from 250 to 1300 mL (mean, 580 mL), and blood transfusion was required in 5 (11%) cases. Follow-up ranged from 6 to 173 months (mean, 65). In 4 (8.7%) cases suspicious residual disease was detected by MR. In one patient, a 1-cm persistence was endoscopically removed. because of slight progression. The other 3 lesions, all located into the roots of the pterygoid plates, are stable in size and under MR follow-up.

CONCLUSIONS: Endoscopic surgery is a safe approach in stage I-II JA. The improvement of surgical instrumentation and the experience acquired have contributed to expanding the indications to stage IIIa-b lesions unless the ICA is encased. Switching to an external approach may be necessary when critical areas (ICA, cavernous sinus, optic nerve) are involved in recurrent lesions.

ABSTRACT NUMBER: 1626

ENDOSCOPIC TRANSNASAL CRANIECTOMY (ETC) IN THE MANAGEMENT OF SELECTED SINO-NASAL MALIGNANCIES: SURGICAL TECHNIQUE AND MORBIDITY

Andrea Bolzoni Villaret, Piero Nicolai, Andrea Bizzoni, Paolo Castelnuovo

INTRODUCTION: This study critically reviews endoscopic transnasal craniectomy (ETC) and in the management of selected sino-nasal malignancies.

METHODS: From April 1996 to October 2008, 182 patients affected by malignant tumors of the sino-nasal tract were treated by endoscopic resection at two referral University Hospitals. Starting from 2004, 60 patients underwent ETC, which extended antero-posteriorly from the frontal sinus to planum sphenoidale and latero-laterally from the nasal septum to the lamina papyracea (unilateral resection, N=27) or from papyracea to papyracea (bilateral resection, N=33). Whenever a lateral extension over the orbital roof, or involvement of the frontal sinus was detected, subfrontal or frontal craniotomy was performed. Duraplasty with a "3-layer" technique was carried out using fascia lata. All patients underwent a CT scan of the brain the day after surgery to rule out complications.

RESULTS: The most frequent histotypes were adenocarcinoma (57%) and olfactory neuroblastoma (22%). Thirty-one (77%) patients were previously untreated. The complication rate was 15% (cerebrospinal fluid leak in 8 cases and septic fever in 1). The mean hospitalization time was 11 days (range, 5-32). The dura was involved in 14 (23%) cases. Overall, 30 (50%) patients received adjuvant treatment. After a mean follow-up of 17.5 months (range,1-54), 58 (97%) patients had no evidence of disease.

CONCLUSIONS: ETC is a safe procedure with an acceptable complication rate, and allows wide resection of the dura, with a correct assessment of its involvement. The surgeon must be able to switch to an external approach whenever necessary.

ABSTRACT NUMBER: 1627

NASOPHARYNGEAL ENDOSCOPIC RESECTION (NER) IN THE MANAGEMENT OF SELECTED MALIGNANCIES: SURGICAL TECHNIQUE AND PRELIMINARY RESULTS

Andrea Bolzoni Villaret, Piero Nicolai, Andrea Bizzoni, Paolo Castelnuovo

INTRODUCTION: This study evaluated the efficacy of endoscopic surgery in the management of selected malignant nasopharyngeal tumors (NPT). Three different types of nasopharyngeal endoscopic resections (NER) are described.

METHODS: From January 1997 to October 2008, 17 consecutive patients affected by NPT were treated by endoscopic resection in two referral University Hospitals. Five patients were previously untreated (3 adenoidcystic carcinoma, 1 adenocarcinoma, 1 undifferentiated sarcoma). Recurrent or persistent lesions were 9 carcinomas, 2 adenocarcinomas, and 1 melanoma. The extent of NER was classified as follows: type 1: limited to the postero-superior NP wall; type 2: superiorly extended to the sphenoid sinus; type 3: with lateral extension including the cartilaginous portion of the Eustachian tube and parapharyngeal space.

RESULTS: Type 1 NER was performed in 4 cases, type 2 in 6, and type 3 in 7. In case of resection of the Eustachian tube, trans-tympanic drainage was always positioned. No complications were observed. Mean hospitalization stay was 4 days (range, 1-7). The lesions were staged as follows: stage I, 10 (63%); stage II, 2 (12%); stage III, 3 (13%) and stage IV, 2 (12%). Postoperative adjuvant treatment was performed in 5 (29%) cases. Mean follow-up was 33 months (range,1-129). Twelve (71%) patients are free of disease, 3 (17%) alive with disease, 2 (12%) dead of disease.

CONCLUSIONS: These preliminary results show that NER is a feasible surgical technique in the treatment of selected NPTs. Larger series of patients and a longer follow-up are needed.

ABSTRACT NUMBER: 1628

ALTERATIONS IN COMPLEMENT PATHWAY GENE AND PROTEIN EXPRESSION IN CHRONIC RHINOSINUSITIS

Rodney Schlosser, MD, Ryan Mulligan, Juan Varela, Carl Atkinson

INTRODUCTION: The complement cascade forms part of the initial innate response to pathogens in the airway. Complement activation is important in the maintenance of host homeostasis, but excessive and uncontrolled activation may lead to inflammation and disease. The role of the complement pathway in the innate response in chronic rhinosinusitis is poorly characterized.

METHODS: Sinus mucosa biopsies from the anterior ethmoid and middle meatus of patients with allergic fungal rhinosinusitis (AFRS), chronic rhinosinusitis without nasal polyps (CRSsNP) and controls was harvested and gene and protein expression of C3, factor B (fB), C5 and C7 complement proteins were analyzed using quantitative polymerase chain reaction and immunohistochemical techniques.

RESULTS: fB and C3 gene expression was increased 3-10 fold in both AFRS and CRSsNP compared to controls ($p<0.05$). C7 expression was increased in AFRS, but decreased in CRSsNP ($p<0.05$). C5 expression was not significantly different among groups. Immunohistochemistry studies demonstrated the presence of C3, fB and C5 on the mucosal surface and in sub-mucosa of both AFRS and CRSsNP, but not normal controls.

CONCLUSION: Both AFRS and CRSsNP display up regulation of the complement pathway, in particular the alternative pathway (Factor B) and common pathways (C3). Enhanced innate responses as demonstrated by alterations in complement components may play a pivotal role in the inflammatory response noted in CRS and provide potential therapeutic targets in the future.

ABSTRACT NUMBER: 1630

A PROSPECTIVE STUDY IDENTIFYING VARIATIONS IN PARANASAL SINUS ANATOMY & COMPLICATION RATES IN ENDOSCOPIC SINUS SURGERY

Kevin Welch, MD, Alexander Chiu, MD, Bert O'Malley, MD, James Palmer, MD

INTRODUCTION: Endoscopic Sinus Surgery (ESS) is a safe method of treating chronic rhinosinusits. Retrospective reviews of complications resulting from ESS have been widely published. There are no prospective studies examining high risk anatomy and the rates of complications. Therefore, we devised a prospective study to identify high risk anatomy preoperatively in an effort to reduce intraoperative complications.

METHODS: Preoperative triplanar CT scans of consecutive patients were prospectively analyzed in order to identify high risk anatomy known to be associated with complications during ESS. ESS was performed in all patients. Frequency of anatomic variations were noted and intraoperative complications were recorded.

RESULTS: 161 patients with 375 high risk structures (2.32/patient) were identified. Anatomic dehiscences were noted in the following structures: carotid artery (6.2%), lamina papyracea (18.0%), optic nerves (13.7%), ethmoid roof (9.9%), and sphenoid roof (3.1%). The anterior ethmoid artery was pedicled in 24.8% of cases. An Onodi cell was present in 27.3% of cases. The skull base was asymmetric in 13.7% of cases and was classified as Keros II and Keros III in 46.6% and 6.8% of cases, respectively. The maxillary-to-ethmoid ratio was >2:1 in 7.5% of cases. There were a total of 2 complications (1.2% of cases), and no complication was due to a previously identified high risk anatomic structure.

CONCLUSIONS: Variations in paranasal sinus anatomy are common and are frequently encountered. The rate of complications during ESS is low. Complications due to variations in sinus anatomy can be minimized by identifying high risk anatomic structures preoperatively.

ABSTRACT NUMBER: 1631

SINUS CULTURE DIRECTED MANAGEMENT OF SINUSITIS IN A TERTIARY RHINOLOGY CENTRE

Dr. Carl Philpott, Miss Krista Genoway, Dr. Amin Javer

BACKGROUND: With recent concerns over the increasing prevalence of coagulase negative Staphylococcus aureus (CNSA) and in consideration of recent guidelines for antibiotic treatment of chronic rhinosinusitis, the potential pathogens yielded from nasal cultures before any treatment is commenced is increasingly important in preventing unnecessary use of antibiotics and encouraging appropriate prescriptions.

OBJECTIVES: To examine the yield of pathogens in a tertiary rhinology centre from 320 patients with chronic rhinosinusitis with particular reference to the prevalence of CNSA and current antibiotic regimes.

METHODS: A retrospective review of the microbiological log in the St Paul's Sinus Centre looking at the different pathogens yielded, the frequency of these pathogens and the implications for future practice.

RESULTS: The most common bacterial pathogen was Staphylococcus aureus (SA), accounting for 33% of cultured samples. Fungi, moulds and yeast were cultured in 15% of cases. Only one case of MRSA was found in a patient with cystic fibrosis.

CONCLUSION: MRSA does not appear to pose a significant source of morbidity for patients with sinusitis. Antibiotic therapy directed at specific culture results will help to reduce resistant strains of bacteria.

ABSTRACT NUMBER: 1633

MUCOSAL EXPRESSION OF NERVE GROWTH FACTOR AND BRAIN-DERIVED NEUROTROPHIC FACTOR IN CHRONIC RHINOSINUSITIS

Charles Coffey, MD, Ryan Mulligan, MS, Rodney Schlosser, MD

INTRODUCTION: Allergic rhinitis is characterized in part by hyperresponsiveness to non-specific stimuli, a phenomenon which reflects the fundamental role of nasal neural pathways in chronic airway inflammation. Neurotrophins may serve pivotal roles in mediating hyperresponsiveness in allergic airway disease, though the role of such neurogenic mediators in chronic rhinosinusitis (CRS) is not well understood. We examined the expression of two potent neurotrophins, nerve growth factor (NGF) and brain-derived neurotrophic factor (BDNF), in CRS.

METHODS: Inferior turbinate and sinus mucosa was obtained from CRS patients with and without nasal polyps (NP) and from non-allergic controls. ELISA was used for quantitative determination of tissue concentrations of NGF and BDNF.

RESULTS: 94 tissue samples from 48 patients were included. Mean concentration of NGF in sinus mucosa was significantly higher in CRS than controls. CRS without NP was associated with a 60% increase in sinus NGF over controls ($p<0.05$), while CRS with NP was associated with a 140% increase ($p<0.05$). Mean sinus NGF concentration was significantly elevated in allergic subjects compared to controls ($p<0.01$). A similar trend was noted in subjects with non-allergic CRS, though this did not reach significance. Mean BDNF concentration was decreased

in CRS compared to controls, with the most significant decrease in patients with polyps ($p<0.05$). Mean turbinate concentration of both NGF and BDNF were similar in controls and CRS.

CONCLUSION: Increased expression of NGF may contribute to neural hyperresponsiveness in CRS sinus mucosa, particularly those patients with NP and/or allergies. BDNF expression is decreased in CRS sinus mucosa. Alterations in neurogenic inflammation may contribute to the pathophysiology of CRS and provide alternative therapeutic targets.

ABSTRACT NUMBER: 1639

THE USE OF BIORESORBABLE STAPLES FOR MUCOPERICHONDRIAL FLAP COAPTATION IN SEPTOPLASTY

Thomas Tami, MD, Ron Kuppersmith, MD, James Atkins, MD

INTRODUCTION: During septoplasty surgery, the formation of dead space between the mocosal flaps must be minimized to prevent septal hematoma and promote healing. Historically, this has been achieved by utilizing techniques such as nasal packing or the continuous septal quilting suture. This study presents the first clinical results using a septal stapling device that utilizes bioresorbable staples to achieve mucoperichondrial flap coaptation during septoplasty.

METHODS: The septal stapler was used in 15 patients undergoing septoplasty surgery. The primary outcome measure was whether septal coaptation was accomplished. The extent of tissue reaction at the site of staple placement was also evaluated.

RESULTS: Septal coaptation was accomplished in all subjects with no septal hematoma formation. At one week follow-up, there was either no or minimal tissue reaction at the site of staple placement.

CONCLUSION: The use of bioresorbable staples appears to be a safe, efficient, and effective alternative to other methods used in septoplasty for mucoperichondrial flap coaptation.

ABSTRACT NUMBER: 1640

DECREASED EXPRESSION OF CONNEXIN (CX)26 AND 43 IN ALLERGIC NASAL EPITHELIUM

Huabin Li, Geng Xu

The aim of the present study was to elucidate whether Dermatofagoides pteronissinus (Der p) 1 affects the expression of connexin (Cx) 26 and 43, which are tight junction proteins that constitute the airway epithelium barrier, as well as their possible mechanisms of action. Expression of Cx26 and Cx43 was examined in nasal mucosa of 14 Der p1–sensitized allergic rhinitis (AR) patients. Primarily cultured nasal epithelial cells (NECs) and BEAS-2B cells were stimulated by Der p1, then Cx26, 43 and protease-activated receptors (PARs) 1-4 were investigated. Effects of glucocorticoids and PAR2 siRNA on Cxs expression were also evaluated. Expression of Cx26 and Cx43 was down regulated in AR patients compared to normal controls. Der p1 was found to suppress Cx26 and Cx43 production in cultured epithelial cells via PAR2 activation. Glucocorticoids and PAR2 siRNA were able to prevent the reductions of Cx26 and Cx43.\r\nThe present results provide the first evidence that Cx26 and Cx43 are downregulated in Der p1-sensitized AR patients, and that airway epithelial cells utilize a PAR2-mediated signaling pathway to suppress gene expression of Cx26 and Cx43 in response to Der p1 challenge. Thus, targeting PAR2 or Cxs is capable of preventing allergic sensitization.

ABSTRACT NUMBER: 1641

ENDOSCOPIC TREATMENT OF INVERTED PAPILLOMA: A REPORT OF 109 CASES

Vittorio Sciaretta, MD, Giulia Tenti, MD, Paolo Farneti, MD, Ernesto Pasquini, MD

PURPOSE: In this study, the endoscopic management of an inverted papilloma (IP) of the nose and paranasal sinuses performed at our Institution is reviewed. Moreover, to help in the choice of the correct endoscopic procedure for the treatment of this lesion, a staging system with endoscopic surgical implications is reported.

METHODS: One hundred nine patients affected by an IP originating at the level of the lateral nasal wall or adjacent sinuses were surgically treated using an endoscopic technique at the ENT Department of Bologna University between January 1994 and July 2008.

RESULTS: The endoscopically treated patients had a mean follow-up of 55 months (12-112 months). Five cases of recurrence was observed in the patient treated endoscopically for his primary tumor (4.6%). In 5 cases (4,6%), the IP was associated with a malignancy.

CONCLUSIONS: In our study, the endoscopic approach showed itself to be a useful tool for the radical resection of an IP. This new surgical staging system may help the surgeon in choosing the correct endoscopic approach for treating an IP, owing to the wide variety of anatomical sites within the sinuses that could be involved by this neoplasm and the different surgical implications.

ABSTRACT NUMBER: 1642

CIGARETTE SMOKE EXTRACT STIMULATES INTERLEUKIN-8 PRODUCTION IN HUMAN SINUS EPITHELIUM VIA REACTIVE OXYGEN SPECIES

Rodney Schlosser, M.D., Richard Harvey, M.D., Ryan, Mulligan, M.S., Carl Atkinson, Ph.D.

BACKGROUND: Cigarette smoke exposure results in extensive inflammation in the upper airways. Free-radicals and reactive oxygen species (ROS) have been shown to be potent mediators of this inflammation. Superoxide dismutase (SOD) catalyzes ROS into less reactive metabolites.

METHODS: Human sinonasal epithelial cells (HSNECs) were isolated, maintained in culture and treated with varying concentrations of cigarette smoke extract (CSE) with or without SOD. Supernatants and cell lysates were examined for the pro-inflammatory cytokine interleukin-8 (IL-8). Sinus mucosal biopsies were also processed for immunohistochemical staining by 3,3′-diaminobenzidine (DAB) for the presence of reactive oxygen species (ROS).

RESULTS: CSE induces production of the pro-inflammatory cytokine IL-8 by HSNECs in a dose-dependent manner with 20% CSE resulting in a 2.5 fold increase in IL-8 both in cell lysates and secreted supernatant ($P<0.05$). This IL-8 up-regulation can be suppressed by free SOD (100 µg/ml, $P<0.05$). Modified DAB staining confirms the presence of ROS on the epithelial surface as well as in the sub-epithelial space of sinus mucosa.

CONCLUSION: Inflammation in the upper airway after cigarette smoke exposure is, in part, due to the presence of ROS. The ability to attenuate this inflammation with SOD could provide a therapeutic approach for individuals with cigarette smoke exposure or other inciting agents that lead to inflammation via free radical production.

ABSTRACT NUMBER: 1643

CLINICAL EXPERIENCE USING CANINE FOSSA ACCESS DURING TRANS-ANTRAL, ENDOSCOPICALLY GUIDED BALLOON DILATION OF THE OSTIOMEATAL COMPLEX (OMC)

Theodore Truitt, MD, James Atkins, MD, James Stankiewicz, MD, Thomas Tami, MD

INTRODUCTION: A new balloon dilatation device (FinESS™ Sinus Treatment; Entellus Medical, Inc.) is available to treat chronic rhinosinusitis (CRS) via a canine fossa (CF) puncture. Procedural outcomes are reported from a prospective study.

METHODS: Forty-three (43) subjects with CRS limited to the OMC were enrolled in a multi-center clinical study (BREATHE I). Each subject underwent unilateral or bilateral balloon dilation of the maxillary ostium and ethmoid infundibulum under trans-antral, endoscopic guidance via a CF access. Post-procedural outcome data was gathered at 1 week, 3 months, 6 months and 12 months.

RESULTS: Eighty (80) CF punctures were performed by 9 trained physician investigators. All subjects completed follow-up through 1 week. Follow-up evaluation at 3 months and 6 months has been completed by 39 and 30 subjects respectively. Seven subjects completed the end of study requirement of 12-month follow-up. No serious device or procedure-related adverse events have been reported. Facial numbness was reported as a mild adverse event in 1 subject and tooth numbness was reported in 2 subjects (3/80; 3.8%). One event was transient and spontaneously resolved without treatment. Two events remain ongoing. No other device-related complications have been reported. There were no mucosal wound infections related to the puncture site including oral antral fistula or abscess formation.

CONCLUSION: These results indicate that treatment of the OMC via canine fossa access and endoscopically-guided trans-antral balloon dilation can be safely performed.

ABSTRACT NUMBER: 1644

EARLY RESULTS FOR TRANS-ANTRAL BALLOON ANTROSTOMY UNDER LOCAL ANESTHESIA IN THE OFFICE

Theodore Truitt, MD, James Atkins, MD, James Stankiewicz, MD, Thomas Tami, MD

INTRODUCTION: Balloon dilatation of the maxillary sinus outflow tract is a promising treatment for chronic rhinosinusitis (CRS). Although most of these procedures are performed under general anesthesia, a new balloon-based technology (Entellus Medical, Inc.) is available to treat patients in an office setting under local anesthesia.

METHODS: Seven (7) subjects with CRS of the maxillary sinuses with or without anterior ethmoid disease were treated under local anesthesia without IV sedation in the office. Through a canine fossa access and using trans-antral endoscopic visualization, a balloon catheter was inserted into the ethmoid infundibulum and inflated to a maximum diameter of 5 millimeters. Subjects were monitored during the procedure, at discharge from the clinic, and at 1 week and 3-months post-procedure.

RESULTS: Four (4) unilateral and 3 bilateral procedures were successfully completed. Sino Nasal Outcome 20 (SNOT 20) scores were 2.79 +/- 0.78 at baseline and improved to 0.92 +/- 0.87 at 3-month follow-up. The Wong-Baker FACES Pain Scale scores were 1.4 during the procedure and 1.1 at discharge. Six (6) subjects reported a pain score of 0, (No Hurt) at discharge. No device-related, procedural, or serious adverse events were reported. Four (4) subjects were able to return to normal activity in less than 24 hours and all subjects were back to normal activities within 48 hours.

CONCLUSION: These results indicate that endoscopically-guided trans-antral balloon dilatation of the ostiomeatal complex can be safely performed under local anesthesia in an office setting with minimal pain and rapid recovery.

ABSTRACT NUMBER: 1647

THE EFFECT OF TOPICAL INTRANASAL BUDESONIDE SALINE IRRIGATIONS ON SERUM AND URINARY CORTISOL LEVELS IN PATIENTS WITH RECURRENT POLYPOSIS FOLLOWING ENDOSCOPIC SINUS SURGERY

Kevin Welch, MD, Erica Thaler, MD, James Palmer, MD, Alexander Chiu, MD

INTRODUCTION: The delivery of topical intranasal corticosteroid sprays has traditionally been the primary method of treating recurrent nasal polyposis. An emerging treatment for polyposis is budesonide nasal irrigations. Delivered at concentrations nearly 100 times greater than found in prescription nasal sprays, there have been little studies on the effects of budesonide irrigation on the adrenal axis. Therefore, we investigated whether irrigation with budesonide solution was associated with any increase in serum cortisol and 24-hour urinary cortisol levels.

METHODS: Patients who previously had undergone ESS and were not taking prednisone for 3 months were prospectively enrolled in this study. Patients irrigated twice daily with 0.5mg/2mL budesonide mixed with 240 mL saline solution. Serum cortisol and 24-hour urinary cortisol were collected prior to drug administration and 6 weeks after continuous use.

RESULTS: Ten patients were enrolled in this study. The average serum cortisol and 24-hour urinary cortisol prior to drug administration were 9.8±5.4 mcg/dL and 28.1±15.0 mcg/24h, respectively. After 6 week follow-up, the average serum cortisol and 24-hour urinary cortisol were 13.5±3.2 mcg/dL and 16.5+/-5.6 mcg/24h, respectively. Normal ranges for serum cortisol and 24-hour urinary cortisol are 5-25 mcg/dL and 4-50 mcg/24h.

CONCLUSIONS: Irrigation with budesonide 0.5mg/2mL in 250 mL of saline solution does not result in increases of serum cortisol and 24-hour urinary cortisol levels. Based on this, we feel irrigation with budesonide solution is safe to perform in patients as an alternative to traditional aerosolized steroid sprays or systemic corticosteroids.

ABSTRACT NUMBER: 1650

REGULATION OF PROTON (H+) SECRETION OF FRESHLY EXCISED NASAL TISSUES

Do-Yeon Cho, MD, Horst Fischer, PhD, Beate Illek, PhD, Peter Hwang, MD

INTRODUCTION: The airway surface epithelium is lined with a protective layer of fluid called the airway surface liquid (ASL). Acidic luminal pH has been shown to inhibit ciliary beating and to cause loosening of the epithelium and detachment from the basement membrane. The purpose of this study is to measure acid secretion by freshly excised human nasal tissues and investigate its regulation.

METHODS: Human nasal tissue was collected during sinus surgery and grouped by condition: i) normal, ii) chronic rhinosinusitis (CRS) without asthma, and iii) CRS with asthma. We determined mucosal equilibrium pH values and rate of proton (H+) secretion for each tissue using the pH-stat technique. The pH of the mucosal solution was maintained at pH 8.0 (to increase the driving force for H+ secretion) and 10μM ZnCl2 (blocks HVCN1 proton channel) was used to block H+ secretion.

RESULTS: CRS with asthma had an equilibrium pH 6.79±0.4 (n=3) above which tissues started to secrete H+ at a rate of 114±7.8 nmol•min-1•cm-2. This rate was significantly higher compared to normal (63.3±7.1, n=4) and CRS without asthma (63.2±22.6, n=5). Mucosal addition of ZnCl2 resulted in block of 51.8%, 42.5%, and 33.0%, respectively, of H+ secretion in the normal, CRS without asthma, and CRS with asthma, indicating a role of apical HVCN1 H+ channels in H+ secretion by these tissues.

CONCLUSION: Freshly excised human nasal epithelium secretes H+ into an alkaline ASL. Our data suggests that inflammatory processes in asthma activate H+ secretion by the nasal airway epithelium and acidify the ASL.

ABSTRACT NUMBER: 1652

WOUND HEALING MODEL OF NASAL MUCOSA IN A RAT

Roza Khalmuratova, Sea-Yuong Jeon, Dae Woo Kim

OBJECTIVES: Postoperative wound healing of nasal mucosa is a highly organized process. However, this process has not yet been fully understood. The study aimed to explore histomorphological changes in nasal mucosa of the rat after mechanical injury and establish wound healing model of nasal mucosa.

MATERIALS AND METHODS: Unilateral wound in nasal cavity was induced using the brushing technique in 4-week-old, Sprague-Dawley rats. Experimental rats were divided into 5 groups (n=7 for each group). Animals were sacrificed 1 hour, 2, 5, 14, and 28 days after injury. The histological sections were examined for inflammatory cell infiltration, goblet and ciliated cell formation in H&E staining. The subepithelial and epithelial thickness was measured and expressed as subepithelial thickness index (STI) and epithelial thickness index (ETI). Fibrosis was evaluated by subepithelial fibrosis index (SFI) in Masson's thrichrome stained sections.

RESULTS: Respiratory epithelial discontinuity and hemorrhage were observed 1 hour after injury. On day 2, edematous subepithelium and infiltration of neutrophils could be found on injured sites. Day 5 was characterized by the infiltration of monocytes and granulation tissue. SFI and ETI values increased significantly at day 14. Goblet cells and ciliated cells began to regenerate from day 14, and restored to near normal at day 28.

CONCLUSION: Using mechanical injury, wound healing model of nasal mucosa was established in a rat. The regeneration of respiratory mucosa was completed on day 28 after injury

ABSTRACT NUMBER: 1653

SINUS IRRIGATION BOTTLES: A POTENTIAL SOURCE OF INFECTION?

Dr. Eun Hae Estelle Chang, Dr. Kevin Wong, Dr. Carl Philpott, Dr. Amin Javer

INTRODUCTION: Normal saline irrigation is an important component of the treatment of sinusitis. Sinus irrigation bottles are commonly utilized to perform this task. It is not uncommon for the irrigation solution to backflow out of the nasal cavity into the tubing of the irrigation bottle itself, potentially contaminating it.

OBJECTIVE: To determine if organisms responsible for sinusitis can be cultured from the tubing and the sinus irrigation bottles.

METHODS: A prospective study was performed. Twenty patients were given sinus irrigation bottles for a period of four weeks for the treatment of their sinusitis. All patients had endoscopically guided swabs taken directly from the middle meatus on the first visit prior to the initiation of the sinus bottle use. The bottles were then returned and cultured. Microbiology data was collected.

RESULTS: All twenty irrigation bottle tubing had positive cultures. There was a significant correlation between initial nasal cavity cultures and\r\nthose from the sinus bottle tubing.

CONCLUSIONS: Sinus irrigation bottles are potential source of sinus re-infection. We recommend that patients change their irrigation bottles on a biweekly basis and clean them after each use. A sinus irrigation bottle without tubing and one that is not prone to nasal backwash may be an alternative option.

ABSTRACT NUMBER: 1655

EPIDEMIOLOGICAL FINDINGS OF CHRONIC RHINOSINUSITIS IN OUR POPULATION

Rafael Hijano, MD, Jordi Serra, MD, Francisco Crego, MD, Anabella Hernandez, MD

INTRODUCTION: Despite consensus documents which have established the definition of chronic rhinosinusitis (CRS) with and without polyps lately, the data regarding epidemiology remain short. The aim of this study is to identify individual and environmental risk factors by means of epidemiological data in order to increase the knowledge of the pathological process.

METHODS: A prospective data collection in an SPSS data base from April 2007-October 2008 was carried out. 124 patients were included according to the definition of CRS by the European Position Paper on Rhinosinusitis and Nasal Polyps (EP3OS). All patients were asked about their rhinological symptoms, as well as indicated on a visual analogic scale (VAS) how troublesome their symptoms of CRS were. An endoscopy, a CT scan and allergic tests were performed to all of them. It was taken into consideration whether they were suffering from asthma or aspirin intolerance.

RESULTS: 47 patients presented CRS without polyps and 77 were diagnosed from CRS with polyps (CRS-P). Those with CRS-P were older than those without polyps . Nasal obstruction was more associated with CRS-P, and it was more severe. Smell abnormalities were more frequent and worse in patients with CRS-P (p=0.00005). Furthermore, patients suffering from asthma had a more severe grade of smell abnormality (p=0.015).

CONCLUSIONS: The epidemiological knowledge of CRS will help us to establish accurately its actual incidence and to know the real natural history of the pathological process. Proper selection of population is fundamental when establishing clinical trials.

ABSTRACT NUMBER: 1658

RHINOTOPIC THERAPY FOR REFRACTORY CHRONIC RHINOSINUSITIS USING THE VIBRATING MESH NEBULIZER

Alan Shikani, MD, Karim Chahine, MD

INTRODUCTION: The vibrating mesh nebulizer (VMN) is a small portable device that is significantly faster and more efficient than conventional jet and ultrasonic nebulizers. It creates an aerosol mist by rapidly vibrating a mesh with hundreds of 4 to 8 microns holes, and allows a fast and uniform delivery of tiny aerosolized medication particles inside the sinuses. This study evaluates the effectiveness of VMN-nebulized antibiotics and corticosteroids, coupled with weekly nasal toilet (a method that we call: "rhinotopic therapy"), in patients with rhinosinusitis that is refractory to endoscopic sinus surgery.

METHODS: This is a prospective open-crossover clinical trial that included forty patients. Inclusion criteria were (1) previous endoscopic sinus surgery, (2) recurrent sinusitis symptoms despite patent sinus ostia (3) failure of oral antimicrobial treatment. All patients were treated with topically aerosolized corticosteroids, along with aerosolized antibiotics selected on the basis of culture-specific sensitivity. Treatment lasted 4 to6 weeks and was self-administered, using a VMN, twice daily by the patients. In addition, weekly endoscopic sinus cleansing and biofilm removal was performed by the treating rhinologist, followed with direct installation of the topical antibiotic and corticosteroids preparations inside the sinus cavities.

RESULTS: The great majority of the patients showed significant improvement in sinusitis symptoms, endoscopic sinus appearance, and bacterial eradication. Less than 5% had persistent symptoms and/or required revision sinus surgery.

CONCLUSION: Rhinotopic therapy using the VMN is a well-tolerated and effective method for managing refractory chronic rhinosinusitis.

ABSTRACT NUMBER: 1663

CEREBROSPINAL FLUID RHINORRHOEA: NEW CLASSIFICATION AND GUIDELINES FOR ENDOSCOPIC MANAGEMENT

Prof. Reda Kamel, Prof. Algohary Algohary, Tarek Kandil, Consu Khaled Anbar, Ass P

BACKGROUND: Cerebrospinal fluid (CSF) rhinorrhoea is uncommon. It may be traumatic, developmental, pathological, or spontaneous. A lot of modalities were suggested to define the site of the leak prior to surgery. Different routes were suggested to approach the defect and many techniques were introduced for repair. Satisfactory results entail precise identification of the defective site, enough exposure of all the margins and proper repair.

PROSPECTIVE DESCRIPTIVE STUDY/AIM OF WORK: To present a new classification of cerebrospinal fluid rhinorrhoea based on the detailed site of the skull base defect and demonstrate how to utilize it in determining the best approach followed for repair.

PATIENTS AND METHODS: Fifty two cases of CSF leak having 58 skull base defects with or without meningocele or meningo-enchephalocele were classified according to their sites. The approach followed to repair the defect was designed according to the exact site of the leak. These approaches included the endoscopic direct transnasal, transethmoid, axillary flap technique, transnasal transsphenoid, transpterygopalatine and external osteoplastic flap.

RESULTS: The transnasal endoscopic approach was useful to approach all sites except the lateral frontal sinus defects, where the external osteoplastic flap was mandatory. Direct transnasal approach was effective in anterior and posterior cribriform plate defects. Transnasal transethmoid approach was useful in anterior and posterior ethmoids leaks. The axillary flap technique was sufficient in medial frontal sinus and frontal recess lesions. Transnasal transsphenoid was efficient in central sphenoid sinus defects and transpterygopalatine fossa in lateral recess leaks. These different approaches offered enough exposure of the defect for repair and handling of any associated meningo-enchephalocele and/or pathology. Primary closure of the defect was achieved in 92.7%.

CONCLUSION: Classification of cerebrospinal fluid rhinorrhoea according to the site of skull base defect helps select the most direct and least invasive approach with effective repair.

ABSTRACT NUMBER: 1664

EUSTACHIAN TUBE ENDOSCOPY: VALIDITY AND LIMITS

Stefano Millarelli, M.D., Claudio Maria Pianura, M.D., Gianluca Bellocchi, M.D

In the last 2 years we have performed Eustachian tube endoscopy in 440 patients who subsequently underwent ear surgery. We used this method to evaluate the Eustachian pathology that could cause problems for the subsequent ear surgery. We used a 2.7 mm flexible fiberoptic tube which allowed us to evaluate the morphology, the motility during swallowing, the presence of secretions and the presence of perieustachian pathology. In almost 80 patients we reached the tubaric istmus but the size of the optic tube prevented further vision. In the cases of an absence of pathology we treated the ear otherwise we solved the nasal pathology before doing the ear surgery. The endoscopic evaluation is easy and quick and can be an important aid to prevent ear surgery failure. The objective is to reach the istmus with a tiny instrument to analize the ear from an internal point of view.

ABSTRACT NUMBER: 1665

DIFFERENT ENDOSCOPIC SURGERGICAL STRATEGIES IN THE TREATMENT OF JUVENILE NASOPHARYGEAL ANGIOFIBROMA– SHANGHAI EENT HOSPITAL` EXPERIENCE

Prof. DeHui Wang, XiCai Sun, MD, HuaPeng Yu, MD, Li Hu, MD

OBJECTIVE: The aim of this study is to present our management experience of Juvenile nasopharygeal angiofibroma (JNA).

METHODS: This is a retrospective observational study of patients with JNA treated in our department between January 2002 to January 2007. Fifty-eight patients were presented in this time period. According to the Radkouski staging system, there were 4 patients with Ia, 9 with Ib, 12 with IIa, 12 with IIb, 10 with IIc, 9 with IIIa, and 2 with IIIb. All patients were divided into two groups according to operative approch. The traditional group with 28 cases. The endoscopic group with 30 cases. Basically, three endoscopic approaches were adopted in relation to the site and extent of tumor. Strictly endoscopic approach (type I) was performed on patients with Ia-IIb. Whenever the lesion extended into infratemporal fossa, orbit, middle cranial fossa and cavernous sinus, the modified endonasal endoscopic Denker approach (type II) was used. If tumor was very large in infratemporal fossa, endoscopic-assistant approach (type III approach) was adopted. Preoperative embolization was performed on all patients with IIc+ stage.

RESULTS: With 12-69 months follow-up , Recurrent tumor was seen in 11 patients with traditional approaches (11/28). Meanwhile, with endo-

scopic approaches there were only 4 recurrence cases (4/30) ($p<0.01$). No serious complication was observed except short-term nasal crusting.

CONCLUSION: With proper preoperative evaluation and embolization, majority of JNA can be successfully resected via different endoscopic approaches with low recurrence rate. In our department, the traditional approach was replaced by the endoscopic approach.

ABSTACT NUMBER: 1669

COMPLICATIONS AND SEQUELAE OF FRACTURES INVOLVING THE SPHENOID SINUS

Joseph Sciarrino

BACKGROUND: The sphenoid sinus has important anatomic relationships with many skull base structures, including the carotid arteries and various cranial nerves. Craniofacial trauma may cause fractures involving the walls of the sphenoid sinus, resulting in injury of any of these important structures. The aim of this study was to determine the incidence and clinical course of complications resulting from sphenoid sinus fractures.

METHODS: 68 patients presented to our institution with fractures involving the sphenoid sinus between March 2005 and May 2008. Imaging and clinical data were available in 41 patients. Records were reviewed for fracture location, associated injuries, clinical symptoms, and clinical outcomes.

RESULTS: The mechanisms of injury in this series were falls (42.6%), motor vehicle collisions (23.8%), and motor vehicle versus pedestrian accidents (21.4%). 27 (65.8%) of patients had a fracture of the sphenoid sinus wall adjacent to the course of the carotid arteries. Only one patient had an associated carotid artery injury (pseudoaneruysm). 12 (28.6%) patients showed evidence of fracture involving the optic canal, with 3 showing evidence of traumatic optic neuropathy. 3 (7.1%) patients showed evidence of CSF leak originating from the sphenoid sinus.

CONCLUSION: The literature contains little information regarding the evaluation and treatment of complications associated with sphenoid sinus fractures. Based on this study, a small proportion of patients with sphenoid sinus fractures may have injury to surrounding structures. Optic nerve injuries and CSF leaks are more common than carotid artery injuries. The information presented will help to direct optimal evaluation and treatment for patients with sphenoid sinus fractures.

ABSTRACT NUMBER: 1670

EPSTEIN-BARR VIRUS–MILD ACQUIRED IMMUNE DEFICIENCY SYNDROME IN SINUSITIS, IMPLICATIONS FOR TREATMENT OF BIOLOGIC CHRONIC FATIGUE SYNDROME

Paul Toffel, M.D., Paul Phail, B.Sc., Joshua Christensen, B.Sc.

BACKGROUND: Recent studies have reported on and investigated association of chronic fatigue syndrome with chronic rhinosinusitis (CRS). These studies have noted the association of chronic fatigue with CRS but have not postulated a unifying theory of causation. They have noted that functional endoscopic sinus surgery (FESS) in chronic rhinosinusitis patients with this associated co-morbidity could result in improved quality of life. We reported in 2002 (American Journal of Rhinology 16, 291-295, 2002) that FESS has remarkably improved the treatment of chronic rhinosinusitis patients. Most experienced practitioners achieve reported success rates of 85-95% among their surgical patients. However, the 5-15% refractory patients reported by all rhinologic surgeons leaves a perplexing group, who, despite appropriate mechanical corrections, continue to experience debilitating rhinosinusitis episodes requiring repeated extensive medical therapy. In our experience, these patients have also reported the consistent co-morbidity of chronic fatigue.

METHODS: Recent studies have indicated that immune mechanisms may be altered in sinusitis patients. After years of observation, we found that these difficult patients may suffer from a common thread of significant partial immunocompromise. Drawing on military experience of treating immune-immature populations prone to Epstein-Barr Virus (EBV) infectious mononucleosis, and the consequent fatiguing post-mononucleosis syndrome, it was sought to screen refractory post-surgical sinusitis patients for this factor, and treat them with long-standing military protocols for the immune-immature populations dispatched to third-world combat conditions.

RESULTS: Treatment of refractory sinusitis patients with Epstein-Barr Virus - Mild Acquired Immune Deficiency Syndrome (EBV-MAIDS) consisted of periodic intramuscular serum immune globulin injections (immunomodulator therapy), after obtaining their thorough written informed consent, which produced substantial and sustainable improvement in patient's quality of life, including consistent improvement of chronic fatigue.

CONCLUSION: Detection of mild-to-moderate acquired immune deficiency among chronic rhinosinusitis patients can lead to successful treatment and an improved quality of life. This treatment has also resulted in overwhelming evidence of sustainable improvement of associated chronic fatigue syndrome in a cadre of 181 patients.

ABSTRACT NUMBER: 1671

APPLICATION OF GENETIC ASSOCIATION STUDIES TO THE STUDY OF CHRONIC RHINOSINUSITIS: A NEW ERA DAWNS

Martin Desrosiers, MD, Leandra Mfuna Endam, Msc, Abdelali Filali-Mouhim, PhD, Yohan Bossé, PhD

Chronic rhinosinusitis is common inflammatory disease of the paranasal sinuses which is frequently debilitating and may require multiple surgeries for management. Biopsy specimens taken at time of surgery for CRS have documented a Th2 type inflammatory infiltrate, with eosinophilic and neutrophilic infiltrate. This has widely been held to be secondary to a dysregulation of Th2 regulation; however, the role of bacteria in the development of disease has not been explained. Our previous work has implicated bacterial biofilms of Staphylococcus Aureus and Pseudomonas Aeruginosa as etiologic agents. Over the past four years, we have developed a population of patients with severe CRS for studies of genetic factors associated with CRS and probed it using either candidate gene based approaches or an innovative pooling-based genome wide association study technique. The results have been surprising as they demonstrate significant polymorphisms within several receptors, effector mechanisms and regulatory elements of the innate immune defence mechanisms. This suggests that disorders in recognition and defence against pathogens are involved in the development of CRS, and is in distinctly opposition to what has previously believed to be responsible for this disease. If true, these findings suggest that therapy be reassessed and possible new therapeutic avenues and diagnostic strategies developed for maximal prevention and efficacy of therapy. Given the close relationship between CRS and asthma, it is possible that these findings may also apply to asthma. In this presentation, we present a practical review of progress in this area, with an emphasis on practical applications of these findings.

ABSTRACT NUMBER: 1673

BONE REMOVAL DURING TRANSPHENOIDAL HYPOPHYSECTOMY USING AN ULTRASONIC ASPIRATOR

Jastin Antisdel, MD, Raj Sindwani, MD

INTRODUCTION: Otolaryngologists are becoming increasingly involved with transsphenoidal hypophysectomy (TSH). Exposure of the sella during TSH requires the controlled removal of bone at the sphenoid face and within the sinus itself. Traditionally this has been accomplished using curettes, ronguers, or high-speed drills; all of which risk injury to adjacent vital structures. Advances in ultrasonic aspirator (UA) technology now permit in situ bone emulsification which is respectful of nearby soft tissue. We explored the utility of this technology in TSH.

METHODS: Case-control study. Data were collected on 20 patients undergoing endonasal TSH performed by the same surgeons. The same technique was used in all cases except that in the study group (n=10) bone removal was performed using the UA, whereas conventional instrumentation (high-speed drill and rongeurs) was used in the control group (n=10).

RESULTS: The mean age for the UA group was 71 years (range 61-76), and 59.5 years (range 35-89 years) for the control group. The UA was effective in removing bone within the sphenoid and adequately uncovering the sella in all cases. No instances of dural or mucosal injury were noted even when the back of the UA tip made contact with these structures intentionally. There was no significant difference in complications or operative time between groups.

CONCLUSIONS: UA's are safe and efficacious for bone removal in confined spaces such as the sphenoid sinus. Due to their non-rotational ultrasonic design they are less likely to traumatize adjacent soft tissues, which is especially advantageous in endonasal transsphenoidal surgery.

ABSTRACT NUMBER: 1674

VENTRAL SKULL BASE EROSIONS AS RISK FACTORS FOR THE RECURRENCE OF ALLERGIC FUNGAL RHINOSINUSITIS AFTER ENDONASAL ENDOSCOPIC SURGERY

Prof. Omar El-banhawy, Dr. Mohammad El-Tuaijury, Ali El Amri, Bander Elkahtany

OBJECTIVE: To study Ventral skull base erosion (VSBE) as a risk factors for the recurrence of allergic fungal rhinosinusitis (AFRS) after endonasal endoscopic surgery (EES).

DESIGN AND SETTING: Prospective controlled multicenter study conducted during 5 years period in Kingdome of Saudi Arabia and Egypt.

METHODS: Fifty patients (age range, 5-47 years) met previously published criteria for AFRS were included. They were divided into 2 groups A & B. Group A (study group) included 25 patients with VSBE and group B (control group) without VSBE. All underwent EES after short period of oral systemic corticosteroids followed by postoperative nasal corticosteroid spray. Age, sex, presentation, preoperative serum IgE levels, radiological extent of disease, intraoperative evaluation and postoperative recurrence were analyzed in both groups.

RESULTS: Twenty patients (80 %) in group A showed clinical and radiological evidence of postoperative recurrences during the follow-up period (range from 2 to 60 months, average 16.24 months, and median 8 months). They were 16 Saudis and 4 Egyptians. Six patients (24 %) in group B showed evidence of recurrence during the same follow-up period (range from 18 to 60 months, average 39.8 months, and median 40 months). They were 4 Saudis and 2 Egyptians.

CONCLUSION: Patients of AFRS with VSBE showed a higher incidence of early recurrence after EES. However, further studies would be necessary before the results of these studies could be generalized.

ABSTRACT NUMBER: 1675

MOLECULAR CHARACTERIZATION OF THE POLYMICROBIAL FLORA IN CHRONIC RHINOSINUSITIS (CRS)

Marie-France Stephenson, M.D., Martin Desrosiers, MD, Leandra Mfuna, MSc, Scot Dowd

INTRODUCTION: Conventional sinus cultures have identified staphylococcus aureus and coagulase-negative staphylococcus as the main pathogens implicated in CRS. These results are questioned by recent studies of biofilms using molecular probes that implicate Haemophilus Influenzae instead.

OBJECTIVES: 1) Identify all bacterial species present on sinonasal mucosa by using molecular techniques and 2) Compare molecular and conventional culture results.

METHODS: Patients undergoing endoscopic sinus surgery for chronic sinusitis (CRS) were recruited prospectively. Conventional swab culture performed was at time of surgery and processed in the hospital laboratory. A simultaneous mucosal biopsy was taken for genetically-based bacterial identification and analyzed using the 16-S molecular amplification technique.

RESULTS: Standard cultures on 18 patients were positive in 82% of subjects, identifying an average of 1.4 isolates/sample (range 0-3). In contrast, molecular cultures were positive in 100%, yielding a mean of 10 isolates/specimen (range 1-20). Conventional cultures demonstrated mainly coagulase negative staphylococci (53%) and staphylococcus aureus (18%). Molecular cultures demonstrated a predominance of anaerobes, particularly propionibacterium, diaphorobacter, petidophilus and corynebacterium, with a 50% prevalence of S Aureus. Haemophilus Influenza was only identified in 17%.

CONCLUSION: S aureus continues to be implicated as a major pathogen in CRS; however Haemophilus does not appear to play a major role. Surprisingly, anaerobes are more frequently recovered in CRS than previously presumed and may play a role in pathogenesis. These results suggest that molecular cultures represent powerful and innovative tools for bacterial identification in CRS. Their clinical role still remains to be determined.

ABSTRACT NUMBER: 1676

POLYMORPHISMS IN THE NOS1 AND NOS1AP GENES ARE ASSOCIATED WITH SEVERE CHRONIC RHINOSINUSITIS

Yuan Zhang, Maste Leandra Endam, Msc, Luo Zhang, MD,PhD, Martin Desrosiers, MD

INTRODUCTION: Bacterial biofilms have been implicated in the pathogenesis of chronic rhinosinusitis (CRS). Nitric oxide (NO) plays a role in control of bacterial biofilms both by a direct bactericidal effect and interference with quorum sensing, thus modifications in genes regulating NO may contribute to the development of CRS. We wished to determine whether polymorphisms in genes regulating NO synthesis are associated with CRS.

METHODS: An established population of 206 individuals with severe CRS and 196 postal matched controls has previously been screened using a pooling genome wide associations study (pGWAS) to estimate allelic frequency. Genes regulating NO synthesis and with a maximal probability of association were identified. High probability SNPs from the NOS1 and NOS1AP were retained for indiviudal genoyping using the Sequenom platform. PLINK software was used to determine association.

RESULTS: 18 SNPs were genotyped successfully with a genotype distribution in agreement with Hardy-Weinberg equilibrium. Two of four SNPS for NOS1 (rs1483757, p-value: 0.0053, Odds ratio (OR): 0.64; rs965828, p=0.029; OR: 0.69) and two of fourteen SNPs for NOS1AP (rs4657164, p= 0.0071, OR: 1.81, rs12061249, p=0.037, OR: 1.71) were significantly associated with CRS. Subgroup analysis for polyps-only, gender and presence of asthma did not influence strength of associations.

CONCLUSION: Polymorphisms in the NOS1 and NOS1AP genes are associated with severe CRS. These may lead to functional modifications in NO metabolism and may contribute to the development of CRS, potentially by facilitating biofilm development. These results suggest that NO merits further study and may represent a new target for therapy.

ABSTRACT NUMBER: 1677

EXPLORING LEGAL RISKS RELATED TO ENDOSCOPIC SINUS SURGERY

David Keschner, MD, JD

OBJECTIVE: To provide the endoscopic surgeon with an overview of legal risks related to functional endoscopic sinus surgery (FESS). The presentation will review relevant aspects of US tort law and examine specific risks related to FESS. We will review opportunities to reduce legal risks, from decision-making and documentation to what constitutes an adequate informed consent. At the conclusion, it is hoped that a participant will have a fuller understanding of the basics related to tort law, specific issues of liability related to FESS, and how an unfavorable outcome might be addressed.

ABSTRACT NUMBER: 1678

MORPHOLOGICAL VARIATION OF NASAL CAVITY EFFECT ON NASAL PATENCY– CFD SIMULATION WITH A TURBULENT MODEL

Heow Pueh Lee, PhD, Xiaobing Chen, Meng, Vincent Fook Hin Chong, MD
De Yun Wang, MD

INTRODUCTION: The human nasal airways constitute one of the most complex airflow domains in nature due to the complex internal geometry. The purpose of this study is to analyze the effects of morphological variation on the aerodynamic flow pattern compared with a normal nose by Computational Fluid Dynamics (CFD) tools.

METHODS: A 3-dimensional model of nasal cavity was constructed from the MRI scans of a healthy human subject, with the use of the software MIMICS 12.0. Thereafter high resolution 3D volume meshes comprising boundary layer effect and computational domain exterior to the nose were constructed. Nasal cavities corresponding to healthy, moderate and severe nasal obstructions were simulated by enlarging the inferior turbinate geometrically. Numerical simulations were carried out using FLUENTS for CFD simulations. The Reynolds averaged Navier-Stokes equations were solved for the turbulent flow with the model.

RESULTS: With inhalation flow, the contours of turbulent kinetic energy show that the locations of peak values move from the inferior to the superior parts for the healthy, moderate and severely obstructed noses. However, due to the turbinate expansion, with exhalation flow, there is less noticeable turbulence in those regions for all the three cases. With a large inhalation flow rate of 34.8 L/min, a maximum velocity of 5.69 m/s, 7.39 m/s and 11.01 m/s, are detected respectively for the healthy, moderately and severely obstructed noses. For the severely obstructed nose, the total pressure loss from the ambient inlet to the nasopharynx increases by more than three times and the maximum shear stress is two times that of the healthy one. Increased flow rate will result in a much larger turbulent kinetic energy distribution, especially for the severely obstructed nose.

CONCLUSION: Nasal obstruction with inferior turbinate enlargement generates turbulent flow patterns inside the nose cavity, especially in the superior part of the nose for inhalation. The existence of turbulence increases the velocity and shear stress distribution drastically, which needs to be carefully treated as it may affect the olfactory functions of the nose.

ABSTRACT NUMBER: 1682

THE VALIDITY OF PEAK NASAL INSPIRATORY FLOW

Dr. Kornkiat Snidvongs, Dr. Valin Rujanavej, Dr. Supinda Chusakul,
Dr. Songklot Aeumjaturapat

INTRODUCTION: The peak nasal inspiratory flow (PNIF) is used as an outcome measure in post-treatment clinical and research evaluation. It is simple and cost effective. The objectives of this study were to assess its validity and to define the cut point.

METHODS: The nasal patency of one hundred and forty subjects was measured by the PNIF and anterior rhinomanometry. All subjects' sino-nasal symptoms, instant sensation of nasal obstruction and nasal endoscopy finding were recorded. The sensitivity, specificity, likelihood ratio, positive predictive value, negative predictive value of the PNIF was analyzed. The cut point was defined from the Receiver Operating Characteristic curve analysis. The agreement between the PNIF and the stuffiness and between the PNIF and the presence of sino-nasal diseases were assessed.

RESULTS: With the cut point of 90 L/min, the sensitivity of the PNIF was 87.1. The specificity was 52.3. The negative predictive value was 93.4. The positive predictive value was 34.2. The likelihood ratio was 1.81. The mean of the PNIF in normal subjects was 97.11 + 31.15. The agreement between the PNIF and the instant sensation of nasal blockage was 0.14 and the agreement between the PNIF and the sino-nasal diseases was 0.09.

CONCLUSIONS: The PNIF, regarding the cut point of 90 L/min, revealed good sensitivity and high negative predictive value but it had low specificity and low positive predictive value. The nasal peak flow did not agree well with the subjects' symptoms of blockage and sino-nasal diseases.

ABSTRACT NUMBER: 1683

PULP NECROSIS AND SEPTORHINOPLASTY

Mehdi Bakhshaee, Vahid Poursadegh, Saeed Moradi, Rayhaneh Bonyadimanesh

INTRODUCTION: Bony manipulation near the nasal spine or maxillary crest trimming can predispose teeth to be injured during septorhinoplasty especially when there is an aberrant vascular supply or a high situated root apex in the premaxilla.

METHODS AND MATERIALS: A prospective study on 438 teeth (maxillary incisive and canines) suppose to be affected and 73 control teeth (mandibular lateral incisive) in 73 candidates of septorhinoplasty was carried out pre and post-operation to determine the frequency of pulp necrosis using electrical, heat and cold pulpal tests. Those with difficult intubation, history of root canal or orthodontic procedures, history of dental trauma, preoperation positive test were excluded from the study. Patients were followed-up 1 week, 1 month, 3 months and 6 months postoperatively and the results of tests were compared preoperation and four intervals postoperation.

RESULTS: Seventy three consecutive patients including 62 females and 11 males (mean age = 24 ± 6) met the study criteria. Septoplasty with anterior maxillary crest trimming and anterior nasal spine manipulation was performed for 63 and 52 cases, respectively. Only 10 cases underwent septoplasty without manipulation of maxillary crest or anterior nasal spine. Considering pulp testing no case of pulp necrosis was seen through 6 months follow up.

CONCLUSION: There is a few report of dental problem during septorhinoplasty; however it is unlikely cause serious dental complication such as pulp necrosis. An aberrant vascular supply, or highly situated root apex in the premaxilla, might be a good explanation for such a rare condition.

ABSTRACT NUMBER: 1685

SPLUNC1 EXPRESSION OF NASAL POLYP EPITHELIAL CELLS IN AIR-LIQUID INTERFACE CULTURE TREATED WITH IL-13

Te-Huei Yeh, MD, Wei-Chung Hsu, MD

INTRODUCTION: Short palate, lung, and nasal epithelium clone 1 (SPLUNC1) protein is an airway epithelial cell-derived molecule exerting host defense against pathogen. However, the function and regulation of SPLUNC1 in nasal epithelial cells are still unclear. Chronic rhinosinusitis with nasal polyps (CRSwNPs) is a disorder characterized by eosinophilic Th2 inflammation and frequent microbial colonization. The pathogenesis has been postulated as a disturbed mucosal immune response. We try to investigate the SPLUNC1 expression of nasal polyp epithelial cells in air-liquid interface (ALI) culture and after treating with Th2 inflammatory cytokines IL-13.

METHODS: Human nasal polyp epithelial cells isolated from patients with CRSwNPs were put in ALI culture for 21 days developing ciliary differentiation and assessed for expression of SPLUNC1 by microarray. Cultured cells were then incubated with human recombinant IL-13 for up to 7 days. The expression of SPLUNC1 was assessed by real-time polymerase chain reaction, and western blot analysis.

RESULTS: Ciliary differentiated nasal epithelial cells constitutively expressed high levels of SPLUNC1. Instead, SPLUNC1 is reduced under traditional submerged culture. SPLUNC1 is also significantly down-regulated after incubation with IL-13.

CONCLUSIONS: SPLUNC1 expression in cultured human nasal polyps' epithelial cells is increasing with the degree of mucociliary cell differentiation. An allergic milieu containing IL-13 may be detrimental to the host innate immune response in part through the inhibition of SPLUNC1 production. One mechanism contributing to microbial colonization and abnormal immune responses associated with CRSwNP appears to be a direct effect of the leukocyte-derived Th2 cytokines present in the sinonasal mucosa.

ABSTRACT NUMBER: 1693

TRAUMATIC OPTIC NEUROPATHY : ROLE OF BONE MARROW MONONUCLEAR STEM CELL IMPLANT?

Ashok Gupta, MS, Neelam Marwaha, MD, Ratti Sharma, MD, Amod Gupta, MS

INTRODUCTION\BACKGROUND: Traumatic optic neuropathy presents with complete or partial visual loss. Spontaneous visual improvement is reported in 20 to 40% patients; whereas 40-50% patients failed to have visual improvement even after steroids, optic nerve decompression or both. There are evidence that stem cells from blood or other neural tissues of the body trans-differentiate into bonafide neural stem cells. These neural stem cells are known to give rise to neurons, astrocytes and oligodendrocytes and hold great potential for brain repair and regeneration.

PURPOSE: The aim is to study the role of allograft stem cells for the regeneration of optic nerve in cases with traumatic optic neuropathy.

DESIGN: Randomized, prospective observational study.

MATERIAL & METHODS: A total number of 184 patients of traumatic optic neuropathy were treated with loading dose of 30 mg/kg methyl prednisolone, followed by 15 mg/kg every 6 hours for 3 days. 132 cases who failed to steroids were subjected to endoscopic optic nerve decompression. Out of patients who had failed to treatment, 36 were randomly selected to study the role of stem cells for the reversal of visual loss. 18 patients comprised the study group where after decompression of intracanalicular part of optic nerve, 0.2 ml of processed bone marrow stem cells with a dose of 1 x 108 MNCs/ml were injected in the transacted ends of optic nerve and an equal number of age and sex matched patients acted as a control where normal saline was injected in the transacted ends of optic nerve. All patients were followed at monthly interval for evaluation of visual acuity, fundoscopy and field of vision.

RESULTS: Out of patients who had presented within one week of injury, 71.8% had improvement compared to 39.3% visual improvement amongst those with late presentation ($p < 0.05$). 85.7% patients with compression of optic nerve had visual improvement compared to 45.8% patients with laceration ($p < 0.05$). In spite of all treatment 40% patients fails to show visual improvement and were considered for stem cell therapy. \r\n18 patients (38.9%) with bone marrow mononuclear stem cell implant 38.9% showed visual improvement as compared to those in the control group ($p < 0.05$). The post period was uneventful.

CONCLUSION: In the present study, we have successfully used the adult human neural cells for the restoration of damaged optic nerve fibres in 38.9% cases. This reversal of visual loss points to the promise of using this therapy to help human to regain their lost vision.

ABSTRACT NUMBER: 1696

RELATIONSHIP BETWEEN OLFACTORY ACUITY AND PEAK EXPIRATORY FLOW DURING POSTOPERATIVE FOLLOW-UP IN CHRONIC RHINOSINUSITIS ASSOCIATED WITH ASTHMA

Katsuhisa Ikeda, MD, Hidenori Yokoi, Toru Yao, Tetsuya Saitoh

The link between nasal and bronchial disease has been conducted extensively for chronic rhinosinusitis (CRS) and asthma. The concept of "united airway allergy" has become widely accepted in the recent decade. Histopatholgic features of CRS and asthma largely overlap. Heterogenous eosinophilic infiltration and the resultant features of airway remodeling are observed in the mucosa of CRS and asthma. Based on the hypothesis that both upper and lower respiratory airway is the same etiology and that genetic factors play a critical role in the manifestation of sinonasal and bronchial inflammation, the pathological changes are expected to occur simultaneously, which is explained by epiphenomenon. Precise and simultaneous observation of functions of both upper and lower respiratory airway is required to clarify these reliable relationship. \r\nPeak expiratory flow (PEF) is known to provide reliable data of daily pulmonary function. In contrast, reliable and objective measures to evaluate the upper airway function have not yet been established. CRS associated with asthma is characterized by the initial symptom of anosmia, which can be explained by the early development of polypoid pathology in the olfactory cleft. We developed self-smell test as a reliable tool to monitor the postoperative recurrence in CRS associated with asthma. The present study was designed to evaluate the relationship between upper and lower airways during follow-up after ESS by monitoring sinonasal and pulmonary functions Eleven patients showed the similar changes between both parameters, namely concomitant decrease or recovery in both olfaction and PEF. In contrast, the smell capability was not correlated with PEF in post-ESS course. There were no changes in both parameters after ESS. These findings suggest the direct connection by which CRS could worsen asthma.

ABSTRACT NUMBER: 1697

MASTOID BONE AS A NEW GRAFT MATERIAL IN RHINOPLASTY

Mahmoud Sadoughi, MD, Ali Kouhi, MD, Mehdi Bakhshaee, MD

INTRODUCTION: Management of some nasal deformity including saddle noses, low radix especially in the secondary rhinoplasty challenges the surgeon to provide both cosmetic and functional improvement. We describe a new technique for creation of a split mastoid bone to provide dorsal support while increasing tip projection in patients with substantial saddle nose deformities due to trauma or excessive surgical resection.

MATERIALS AND METHODS: In a Case series since 2004, sculptured lateral cortex of mastoid bone was used in 56 patients for dorsal nasal augmentation, smoothing dorsal nasal irregularities or augmentation of radix. Eighteen patients had been suffered overresection of ostecartilaginous nose structures during previous aesthetic nose surgeries while 38 cases were candidate of primary rhinoplasties (18 low radix and 20 saddle nose) due to structural deformity or trauma.

RESULTS: Fifty six consecutive patients (mean age: 25±6 year, female/male: 45/11) with postoperative follow-up from 6 to 49 months (mean: 23 months) met the study criteria. All cases resulted in an augmented, straightened nasal dorsum, increased tip projection and adjusted radix. The final results were satisfied throughout follow-up with no evidence of graft infection. Only in two cases the graft was displaced needing revision. The amount of graft absorption even 2 years after operation was acceptable.

CONCLUSIONS: This graft provides adequate autologous bone for large group of patients. Furthermore the donor site is in the field of an otolaryngologist task with low morbidity and camouflaged scar. We recommend overcorrection of the defect using additional bone graft considering some predictable future bone resorption.

ABSTRACT NUMBER: 1700

SPHENOPALATINE ARTERY PSEUDOANEURYSM AFTER FESS: A LITERATURE REVIEW AND CASE REPORT

Dr. Raewyn Campbell

INTRODUCTION: Iatrogenic SPA pseudoaneurysm (PA) has only been reported after transsphenoidal surgery or maxillofacial surgery. The purpose of this paper is to present the first case report of a SPA PA after functional endoscopic sinus surgery (FESS). We review the pertinent anatomy, pathophysiology, preventative and management considerations in this rare complication.

METHOD: We present a case of a 76 year old lady with a SPA PA after FESS and a literature review of the relevant issues.

RESULTS: A 76 year old lady with myelodysplastic disorder presented with a six month history of unilateral facial pain, anosmia and postnasal drainage which was unresponsive to antibiotics. CT scanning revealed complete opacification of her left frontal, ethmoidal and maxillary sinuses and partial opacification of her left sphenoid sinus. Due to concerns of fungal or neoplastic processes septoplasty, unilateral FESS and bilateral inferior turbinate reduction was recommended. However, surgery was abandoned after the septoplasty and FESS due to generalized bleeding. The patient was packed anteriorly and posteriorly. After 2 failed attempts to remove the packing, angiography confirmed a SPA PA which was immediately and successfully embolised 14 days post-operatively.

CONCLUSION: SPA anatomy varies widely and therefore impacts on surgical technique. SPA PA is a rare, but significant complication of FESS and should be considered in patients with posterior epistaxis during or after FESS or posterior nasal packing. The pathogenesis may include intra-operative trauma, infection or pressure necrosis from packing. Optimal management involves either ligation or embolisation depending on anatomical, patient and staff factors.

ABSTRACT NUMBER: 1701

DETECTION OF STAPHYLOCOCCUS AUREUS IN NASAL TISSUE WITH PEPTIDE NUCLEIC ACID–FLUORESCENCE IN SITU HYBRIDIZATION

Marie-Noëlle Corriveau, MD, Nan Zhang, MD,PhD, Gabriele Holtappels, Claus Bachert, MD,PhD

BACKGROUND: Staphylococcus aureus (SA) in nasal tissue can act as a simple colonizer, as an intraepithelial reservoir causing recurrent infection or as a specific immune modulator through superantigen mechanisms. The detection of SA in the tissue is often difficult. The aim of this study was to identify SA in the nasal tissue of healthy and of CRS patients using PNA-FISH technique and to correlate it to the presence of inflammatory cytokines.

METHODS: Nasal tissue was collected in 40 subjects (9 controls, 21 chronic rhinosinusitis with (CRSwNP) and 10 chronic rhinosinusitis without nasal polyps (CRSsNP). Tissue was homogenized; cytokines and specific IgE against SA enterotoxins (SAE-IgE) were measured using ELISA kits and the UNICAP system. The tissue was analysed for the presence of SA with the PNA-FISH technique (AdvanDX) and a semi quantitative scoring system was applied. Mann Whitney exact test was used for statistical analysis.

RESULTS: SA was detected within the mucosal tissue, more frequently in CRSwNP subjects vs. controls and CRSsNP; this only reached significance in the aspirin sensitive patient subgroup (p = 0,01). In CRSwNP patients, Th2 markers were increased according to their SAE-IgE status (ECP p= 0,05 and total IgE p= 0,08). However, there was no correlation between those markers and the presence of SA in the tissue.

CONCLUSION: This is the first study describing the detection of SA within nasal tissue using the PNA-FISH technique. This study showed that SA is more prevalent in the aspirin sensitive CRSwNP patients. The increase of inflammatory markers is dependent on an immune reaction of the local TH2 cells to SA superantigens, but does not correlate to the number of SA in the tissue.

ABSTRACT NUMBER: 1702

REPAIR OF FRONTAL SINUS CEREBROSPINAL FLUID LEAK: SELECTING A SURGICAL APPROACH

Jian-bo Shi, Feng-hong Chen, Rui Xu, Geng Xu

OBJECTIVES/HYPOTHESIS: To clarify the process for selecting the safest and most effective procedure for repair of frontal cerebrospinal fluid (CSF) leak.

STUDY DESIGN: A retrospective chart review.

METHODS: Analysis of prospectively collected data in fourteen patients treated with frontal sinus CSF leaks at our institutions from 2002 to 2008. CSF leaks originated immediately adjacent to or within the frontal recess or frontal sinus proper for inclusion in the study. The transnasal endoscopic approach or combined transfrontal endoscopic approach was used to repair the fistulas. Data collected included demographics, presenting signs and symptoms, site and size of defect, surgical approach, repair technique, and follow up.

RESULTS: Four defects originated in the frontal recess, while ten others involved the posterior table of frontal sinus. Nine patients were directly repaired and four were repaired with frontal sinusotomy using transnasal endoscopic approach, while the other one patient was repaired using combined approach. First attempt was successful in thirteen cases (93%). One patient (7%) had recurrence CSF leak one month after initial repair and was successful repaired at the second attempt. Two patients had complications. One developed left frontal lobe abscess requiring paranasal drainage and obliteration. Another one developed frontal sinus obstructive mucocele requiring endoscopic frontal sinusotomy.

CONCLUSIONS: Most of frontal CSF rhinorrhea could be successfully repaired using transnasal endoscopic approach, but selecting the approach should considering the site and size of the fistula to improve the success rate and reduce the complication.

ABSTRACT NUMBER: 1706

CORRELATION BETWEEN SUBJECTIVE ASSESSMENT AND OBJECTIVE MEASUREMENT OF NASAL OBSTRUCTION

Gehua Zhang, MD, Yuan Li, MD, Ronald S. Fenton, MD, Philip Cole

OBJECTIVE: To investigate the correlation between subjective assessment from clinician and patients and the objective measurement from active posterior rhinomanometry and acoustic rhinometry.

METHODS: Clinician and patients' assessment of nasal patency was achieved by visual analogue scale (VAS). Objective measurement included active posterior rhinomanometry and acoustic rhinometry. The mean of clinician's assessment and patients' VAS was compared by using paired-samples t-test. The correlation between unilateral nasal airflow resistance and unilateral nasal airway volume, unilateral minimal cross section area, and also subjective assessment and objective measurement of nasal patency were analyzed by using Spearman correlation analysis in total patients.

RESULTS: In total of 316 patients, pre-decongestion and post-decongestion, unilateral nasal airflow resistance and unilateral nasal airway volume, unilateral minimal cross section area had significant negative correlation respectively (P=0.000). The mean of clinician's assessment and patients' VAS had significant difference (P <0.001) before and after decongestion. Clinician's assessment had significant positive correlation with patients' VAS, nasal airflow resistance, and significant negative correlation with nasal airway volume, minimal cross section area of nasal cavity before and after decongestion(P=0.000). Patients' VAS had significant positive correlation with nasal airflow resistance, and significant negative correlation with nasal airway volume, minimal cross section area of nasal cavity before and after decongestion(P=0.000). The correlation coefficients from clinician's assessment and objective measurements were greater than those from patients VAS and objective measurements.

CONCLUSIONS: The parameter of active posterior rhinomanometry had significant negative correlation with the parameters of acoustic rhinometry. Clinician assessment of nasal patency had significant positive correlation with patients' VAS; both of them had significant correlation with the parameters of rhinomanometry and acoustic rhinometry. Clinician's assessment is more objective and reliable to the parameters of objective measurement than patients' VAS.

ABSTRACT NUMBER: 1708

PREVALENCE OF METABOLIC BONE DISEASE IN CHRONIC RHINOSINUSITIS

Karthik Rajasekaran, BA, Abby Abelson, MD, Rahul Seth, MD, Pete Batra, MD

BACKGROUND: The treatment of chronic rhinosinusitis (CRS) with/without polyposis often requires chronic oral steroid treatment which can result in adverse skeletal effects, including osteoporosis and increased risk of fracture.

OBJECTIVE: The purpose of this study was to determine the prevalence of low bone mass (osteopenia) and osteoporosis in patients with CRS.

METHODS: Retrospective chart analysis was performed at a tertiary-care rhinology practice. Patients with CRS with or without polyposis evaluated between September 2003 and July 2008 were included if they had (1) previous history of oral steroid usage (5mg or greater daily for at least 3 months) and (2) previous bone mineral density (BMD) evaluation.

RESULTS: A total of 197 patients were included with mean age of 51.1 years. The primary diagnoses included CRS with polyposis in 176 cases (89.3%) and CRS without polyposis in 21 cases (10.7%). Concomitant asthma was present in 161 patients (81.7%). Overall, the prevalence of osteopenia was 35.5% (70) and osteoporosis was 7.1% (14), respectively. Among postmenopausal women, the rates of osteopenia and osteoporosis increased to 48.9% (22) and 13.3% (6), respectively. Eighty patients (40.6%) were further evaluated by rheumatology. Management consisted of calcium and vitamin D supplementation in 164 cases (83.3%) and bisphosphonates in 99 patients (50.2%).

CONCLUSION: Patients with CRS with/without polyposis who have been treated with oral steroids have a high prevalence of osteopenia or osteoporosis. High index of suspicion is required to identify at risk patients and to initiate careful evaluation and treatment to prevent additional bone-related complications.

ABSTRACT NUMBER: 1709

DIFFUSION WEIGHTED MAGNETIC RESONANCE IMAGING OF PARA-NASAL DISEASES

Adam French, MD, Stephanie Joe, MD, Ali Sepahdari, MD, Mahmood Mafee, MD

INTRODUCTION: The purpose of this study is to examine the diffusion characteristics of benign and malignant diseases in the paranasal sinuses with diffusion weighted magnetic resonance imaging (DWI).

METHODS: Patients with a history of sinus pathology from a single academic institution underwent DWI of the paranasal sinuses. Sinus pathology was diagnosed by biopsy, culture results, or surgical excision. Apparent diffusion weighted imaging coefficients (ADCs) were calculated from the diffusion weighted imaging images. These ADC values were compared across malignant masses, benign masses, and inflammatory sinus diseases.

RESULTS: There were twenty-nine patients examined, including fifteen men and fourteen women. The benign group containing twelve patients was subdivided into eight inflammatory cases and four solid masses. The malignant group contained seventeen patients. There was a statistically significant difference in mean ADC values between the malignant (0.96, SD = 0.32) and benign (1.37, SD = 0.85) groups. The ADCs were also significantly different between inflammatory pseudomasses (2.04, SD = 0.92), benign masses (1.37, SD = 0.41), and malignant sinus lesions (0.96, SD = 0.32).

CONCLUSIONS: DWI can be used as an adjunctive tool in diagnosis of paranasal sinus pathologies and possibly aid in surveillance and detection of malignant disease recurrence.

ABSTRACT NUMBER: 1710

ENDOSCOPIC BACK AND FORTH SEPTOPLASTY TECHNIQUE

Trimarchi Matteo, MD, Bellini Chiara, MD, Recanati Paola, MD, Bussi Mario, MD

BACKGROUND: Septoplasty is a well-described surgical technique for management of nasal airway obstruction (NAO). The advances in endoscopic technique have facilitated endoscopic septoplasty (ES) that is now a good alternative to "headlight" approaches by limiting the dissection to the area of the deviation, in particular for endoscopic resection of septal spurs, deformities and posterior deviation.

METHODS: From January 2005 to November 2008, 243 patients, 50 females and 193 males (age range 21-60 yr) underwent ES at the Department of Otorhinolaryngology, San Raffaele Hospital Milan. The most common concomitant diagnoses included allergic rhinitis and turbinate hypertrophy. We excluded from the study patients with sinonasal polyposis and chronic rhinosinusitis. So concomitant procedures was turbinate reduction (95%). The endoscopic back and forth septoplasty (EBFS) facilitates the interruption of perichondrial and periosteal bridges that are more represented in the anterior portion of the septum between the caudal quadrangular cartilage and the vomeropremaxillary crest.

RESULTS: Among patients who underwent primary EBFS technique for NAO 74,1% achieved resolution, 16,4% reported improvement of their nasal obstruction and 9,5% noted persistence of symptoms. Complications included transient dental pain/hypesthesia (6,1%), septal hematoma (4,86%), septal perforation (1,64%), synechiae formation (2,05%), epistaxis (2,05%), chick swelling (0,41%), septal abscess (0,41%).

CONCLUSION: EBFS is a viable alternative to traditional headlight septoplasty with very good outcomes and acceptable complications. This technique allows to lise the tissue fibers preserving the integrity of mucosa at the critical area using less force e reducing the probability of mucosal tears.

ABSTRACT NUMBER: 1711

ANASTOMOSIS OF NASAL MUCOSAL AND LACRIMAL SAC FLAPS: KEY ROLE IN ENDOSCOPIC DACRYOCYSTORHINOSTOMY

Chiara Bellini, MD, Matteo Trimarchi, MD, Antonio Giordano Resti, MD, Mario Bussi, MD

BACKGROUND: Endoscopic dacryocystorhinostomy (DCR) is a well-established alternative to external approaches in the treatment of nasolacrimal canal obstruction. It is a safe and less invasive compared to standard surgical procedures.

METHODS: From July 2004 to September 2008, 85 endoscopic DCRs (age range 5-76 yrs) were performed on 82 patients (18 male, 64 female) at the Department of Otorhinolaryngology, San Raffaele Hospital, Milan. All patients were affected by chronic dacryocystitis with epiphora. Preoperative work-up (performed by Ophthalmologists and ENT specialists) included lacrimal pathways irrigation, Jones Tests (1 and 2), nasal endoscopy, and imaging evaluation by computed tomography. The technique involved anastomosis of nasal mucosal, lacrimal sac flaps and a large bony ostium. A silicone tube was inserted in all patients that remained for a period of 3 months. Follow up assessment included nasal endoscopy to evaluate anatomical patency and symptoms with Jones tests. The average follow up time was 16 months (range 2-51 months).

RESULTS: The first endoscopic intervention was successful in 91,76% of patients. After a second revision endoscopic DCR the overall success rate raised to 96,47%.

CONCLUSIONS: Endoscopic DCR is an efficacious method with a higher success rate both in primary nasolacrimal obstructions and in revision cases. Anastomosis of nasal mucosal between lacrimal sac flaps plays a key role in endoscopic DCR success rate.

ABSTRACT NUMBER: 1714

FLUTICASONE PROPIONATE DELIVERED WITH THE OPTINOSE DELIVERY DEVICE EFFECTIVELY TREATS CHRONIC RHINOSINUSITIS

Dr. Per Djupesland, Fleur Hansen, Tony Flint, Prof. Wytske Fokkens

INTRODUCTION: Chronic Rhinosinusitis (CRS) severely impacts on quality of life, with few effective treatments currently available. OptiNose's breath-actuated, bi-directional nasal delivery improves middle meatus deposition, considered essential to achieve clinical effects in CRS with a topical steroid.

METHODS: Efficacy and safety of fluticasone propionate self-administered using OptiNose's delivery device (Opt-FP) were assessed in a prospective, single centre, randomized, double-blind, parallel group, placebo-controlled pilot study in 20 adult patients with CRS without nasal polyps or with only cobblestone polyps grade 1 (Lildholdt's scale). Opt-FP 400 µg or placebo (PBO) was delivered twice daily for 12 weeks (n=10 subjects/group). All patients also used saline rinse. Results are change from baseline at week 12 unless otherwise stated. P-values refer to differences with placebo.

RESULTS: Endoscopy score for oedema showed a highly significant and progressive improvement (Opt-FP -3.1, PBO -1.0, p<0.01). PNIF was increased (4 weeks: p<0,01; 8 weeks: p<0,05). Non-significant increases in nasal volumes were observed (Acoustic rhinometry). Total RSOM-31 QOL-score and all subscale scores also improved against placebo. The nasal RSOM-31 subscale was significantly improved (4 weeks: p<0.05, 8 weeks: p<0.01, 12 weeks: p=0.053). Overall VAS-score showed an improvement trend (Opt-FP -23.6, PBO -3.3, p=0,19). Diary scores for sense of smell, nasal discomfort and combined score, both morning and evening, were all significantly improved (p<0.05).

CONCLUSIONS: Fluticasone propionate (400 µg b.i.d) administered using OptiNose's breath-actuated bi-directional delivery device in combination with saline wash was highly effective in treating CRS with significant improvements over placebo. The treatment was safe and well tolerated.

ABSTRACT NUMBER: 1715

OUTCOMES TESTING FOR ENDOSCOPIC SKULLBASE SURGERY INCLUDING NASAL TISSUE RESECTION

Zara Patel, MD, Vijay Mukhija, MD, Eric Genden, MD, Satish Govindaraj, MD

INTRODUCTION: Resection of nasal tissue has been a source of much discussion in the rhinologic literature. As the pendulum has swung in favor of minimally invasive sinus surgery, rhinologists are simultaneously pushing the boundaries in the advancing field of endoscopic skull base surgery. The objective of our study was to take this unique population with no history of nasal complaints and assess the effect of increasingly invasive endoscopic surgery.

METHODS: All patients undergoing endoscopic skull base surgery at a tertiary care center from 1999 through 2008 were included in a retrospective chart review. The SNOT-20 was also performed on all subjects. T-test and ANOVA analysis were used.

RESULTS: 54 patients underwent endoscopic skull base surgery, with a male to female ratio of 1:1.8. Age ranged from 26 to 83. SNOT-20 scores were not correlative with age, gender, diagnosis, addition of radiation or extensiveness of middle turbinate resection. There was a significant inverse relationship between time from surgery and SNOT-20 score, with a significant difference at 2,4 and 6 years (p<0.001).

CONCLUSIONS: Preserving nasal tissue and natural physiology is always a goal in endoscopic surgery. However, as surgeons become more skilled at larger skull base resections they may occasionally need to take nasal tissue along with the pathologic specimen. Our data suggests that while we may need to help these patients through short term nasal symptoms, they do not appear to suffer long term nasal complications as a result.

ABSTRACT NUMBER: 1720

ORBITAL MASS LESIONSS: IMPLICATIONS AND LIMITATIONS OF ENDONASAL ENDOSCOPIC APPROACH

Mohsen Naraghi, MD

INTRODUCTION: Orbital Masses could be intraorbital, sinonasal or intracranial. Various surgical approaches have been applied for treatment of the orbital masses. The medial orbital wall is composed mainly of lamina papyracea which could be accessed through the ehtmoid sinuses. In this article, our experience in endoscopic approach to the orbital masses have been explained.

METHODS: 224 patients with differrent orbital masses were referred to undergo endoscopic management with the mucoceles as the most common lesions. In sinogenic orbital lesions, treatment was complete by treating sinus of origin. In the case of the intact lamina paryracea, it was removed followed by an incision through the periosteum. At the latter stage, much percision was applied to avoid bleeding and occular muscles injury.

RESULTS: The outcomes were dependent on the type of the lesions. In the inflammatory conditions, the endoscopic surgery was performed as a curative modality with functional benefits for the sinuses. In the benign lesions, complete resection of the tumor was accomplished in most of the cases. In some cased it needed to add an external approach to have better exposure for removal if tumor. Malignant tumors required adjuvant modalities like chemotherapy.

CONCLUSION: Endoscopic surgery could be an alternative treatment for the selected cases with orbital masses. The minimally invasive nature of this approach could make it superior to the other approaches. Less edema and swelling, most cosmetic effects, eliminating the need to any dressing and in many cases capability of performing under local anesthesia are advantages of this approach.

ABSTRACT NUMBER: 1722

ENDOSCOPIC REPAIR OF BASAL SINONASAL CEPHALOCELES

Prof. Mohammed Hassab, Ali Ansari, MD

INTRODUCTION: a basal sinonasal cephalocele is a condition in which the brain and/or meninges herniated through a defect in the skull base to present endonasally within the sinonasal region. Surgical repair of these "herniations" is mandatory to avoid series complications such as meningitis. These lesions vary considerably in size and site of the underlying skull base defect. In the current study, an attempt is made to stratify these lesions based upon their size and site of the defect.

METHODS: a case series of 16 patients with basal sinonasal meningoceles/encephaloceles managed over a 12 year period is presented. None of the patients had a history of trauma to account for their cephalocele.

RESULTS: Fifteen of these lesions were managed endoscopically. An external approach was required in 1 patient. The lesions managed in this case series varied considerably in size from 2 mm up to 4 cm. Microcephaloceles 2 mm–6mm in length predominantly occurred in middle aged females (in 11 patients) along weak areas in the skull base. An empty sella on the CT studies occurred in 4 of these patients. The skull base defect in this group of patients was small allowing for a single layer repair. Macrocephaloceles 2 cm–4 cm in length occurred in a much younger age group (in 5 patients) with a sizeable skull base defect either in the cribriform plate or the fovea ethmoidalis. Because of the larger size of the skull base defect in this group of patients, a multiple layer repair was carried out. None of the patients had a recurrence except one of the patients with a microcephalocele and empty sella.

CONCLUSION: Based upon the findings of this case series, it is proposed that macrocephaloceles are true congenital lesions while microcephaloceles are acquired ones probably resulting from benign increased intracranial pressure.

ABSTRACT NUMBER: 1724

NASAL CONGESTIVE AND INFLAMMATORY RESPONSE TO INHALATION CHALLENGE WITH HEXAMETHYLENE DIISOCYANATE (HDI): A PILOT STUDY

Dr. Roberto Castano, Dr. Martin Desrosiers, Vic Johnson

INTRODUCTION: Diisocyanates are among the main causes of occupational asthma. Rhinitis symptoms are commonly reported by workers exposed to diisocyanates; however, they are rarely investigated despite evidence showing occupational rhinitis as a risk factor for asthma development. The purpose of this pilot study was to assess nasal congestive and inflammatory responses to inhalation challenges with diisocyanates.

METHODS: Nine workers (men, mean age 40.6 years) with a history of upper and lower respiratory symptoms associated to workplace exposure to diisocyanates were enrolled. After a control challenge day to assess nonspecific nasal responses, they underwent a specific challenge day with hexamethylene diisocyanate (HDI). We measured nasal volume (2-5 cm) before and hourly up to 6h after challenge by acoustic rhinometry to monitor nasal congestion. Nasal lavage (NAL) was performed in 6 subjects before and at 30min and 6h after challenge to assess changes in inflammatory cells.

RESULTS: The mean (SD) maximum percentage decrease in nasal volume compared with baseline values was 15.0 (9.2) % on the control day. After a 4 min-challenge with HDI, the maximum decrease was 21.3 (7.8) %. No significant changes were noted in the percentage of neutrophils and eosinophils in NAL on the control day. An increase in the percentage of eosinophils was observed in 4 subjects after challenge with HDI in comparison to baseline values and to values on the control day.

CONCLUSIONS: We demonstrated that inhalation challenges with HDI can induce changes in nasal patency and upper airways inflammation that may be indicative of occupational rhinitis.

ABSTRACT NUMBER: 1726

EXTRANODAL ROSAI-DORFMAN DISEASE INVOLVING PTERYGOPALATINE FOSSA, ORBIT AND MIDDLE CRANIAL FOSSA– CASE REPORT

Tsan-Jen Chiu, MD, Yuan Hsu, MD, Peir Chen, MD

Rosai-Dorfman disease (RDD), also recognized as sinus histiocytosis with massive lymphadenopathy (SHML), is characterized by a nonmalignant proliferation of distinctive histiocytic/phagocytic cells within lymph node sinuses and extranodal lymphatics. However, it is rare in pterygopalatine fossa. We report a 40-year-old woman who complained of severe right side headache and facial numbness for 6 months. Before being referred to our clinic, she had received dental treatment but in vain. Physical examination revealed no cervical lymphadenopathy. Right trigeminal neuralgia was suspected. Computed tomography (CT) scan of the skull showed a heterogeneous enhancing tumor in the right side pterygopalatine fossa, which invaded the orbit, infra-temporal fossa and abutted the cavernous sinus. Thereafter, a trans-maxillary sinus pterygopalatine fossa endoscopic biopsy was performed. Pathological examination confirmed RDD with emperipolesis and positive stain for S-100 protein. The headache improved much after two week's steroid therapy, but the steroid was tapered due to its side effects. After that, the headache flared up and CT showed tumor was of the same size. Then four courses of Rituximab were given. She became symptom-free with decreasing of the tumor size, and remained in stable condition as of 6 months' follow-up. We present this case to highlight that RDD may encounter on the uncommon site with aggressive clinical course, and intensive medical treatment is needed in this condition. Besides, the extranodal RDD diagnosis is still challenging for the pathologist. Fibrosis tends to be more evident and emperipolesis is less conspicuous in the extranodal type. The clinical features and treatment modalities of RDD are reviewed.

ABSTRACT NUMBER: 1727

ANTIBIOTIC PROPHYLAXIS IN SINUS SURGERY: A REVIEW OF CURRENT PRACTICES

Anita Sethna, MD, Sarah Wise, MD, Rodney Schlosser, MD, John DelGaudio, MD

INTRODUCTION: Use of perioperative antibiotics is documented to prevent postoperative infectious complications in various surgical procedures. However, perioperative antibiotic use in sinonasal surgery has not been extensively studied. This study surveys members of the American Rhinologic Society (ARS) regarding perioperative antibiotic usage practices for rhinologic procedures.

METHODS: 650 U.S.-based, non-Resident members of the ARS were questioned using a 50-item survey. Participation was voluntary and anonymous. Data were analyzed for response frequencies and significant differences across the spectrum of sinonasal procedures.

RESULTS: Initial survey response rate was greater than 30%. A significant difference existed for the use of preoperative antibiotics across surgery types, with more preoperative antibiotics being used for inflammatory sinus procedures (functional endoscopic sinus surgery [FESS]) than expected and fewer preoperative antibiotics used for septoplasty and extended sinus procedures (orbital and skull base surgery) than expected, ($p < 0.05$). Fifty percent of respondents used intraoperative antibiotics for septoplasty, 57% for FESS, and 85% for extended sinus procedures. Postoperative antibiotic use ranged from 69% for septoplasty to over 80% for FESS and extended approaches. There was no statistical difference across surgery types for rates of intraoperative and postoperative antibiotic use ($p > 0.05$). Across surgery types, first generation cephalosporins were the most common intraoperative antibiotic (53-84%). Culture-directed antibiotics were used preoperatively in 26-32% and postoperatively in 10-17% of FESS cases.

CONCLUSIONS: A consensus on perioperative antibiotic use for sinonasal surgery is currently lacking. These trends may serve to initiate further investigation into quality-control standards in antibiotic use for sinonasal procedures.

ABSTRACT NUMBER: 1728

ORBITAL INFECTION ASSOCIATED WITH SINUSITIS IN THE ADULT POPULATION.

Geir Tryggvason, MD, Mohannad Al-Qudah, MD, Jeffrey Nerad, MD, Scott Graham, MD

INTRODUCTION: Orbital infection secondary to bacterial sinusitis is a serious problem that carries potential dramatic complications including intracerebral abscess, bacterial meningitis, vision loss and cavernous sinus thrombosis. The subject has been well studied in pediatric patients however few studies addressed this complication in adult population. The aim of this study is to review adult cases with orbital infection secondary to sinusitis in a tertiary university hospital.

MATERIALS AND METHODS: Patients carrying the diagnosis of orbital cellulitis (ICD 376.01) and sinusitis (461.1-9) from July 2001 to March 2008 were found with a computer search of the the hospital's database. Retrospective chart review was done and information regarding the following factors was collected: age, sex, cultures, predisposing factors, site of sinus disease, site of ophthalmologic disease, visual status, management and complications.

RESULTS: A total of 18 cases were analyzed with an age range of 20-85years (average 46).Thirteen patients were male and five were female. Ten cases had involved the left eye and eight the right. Five patients had prior facial fracture, two prior sinus surgery, one was immunocompromised and another had massive frontoethmoid osteoma. All patients had maxillofacial CT scan. 14 (78 %) had ethmoid sinus involvement, 11 (61 %) frontal, 10(56 %) maxillary and 2 (11%) had sphenoid disease. Defect in orbital wall was seen in 10 cases (53%). Four patients had periorbital cellulitis the remaining had abscess ,six at the orbital roof, four at the medial wall ,two at the inferomedial wall and another two at orbital floor. Microbiology swabs had been taken in a total of 17 cases, of which fifteen grew specific organisms, staphylococci species in 5 patients, streptococci species in 3, hemophilus specious in 3, pseudomonas aeruginosa in 2, mixed anaerobes and mixed oral flora in the two others. Thirteen out of the 18 cases (72%) had required surgery, seven had combined open and endoscopic approach, 4 had endoscopic management and two had open procedure. The average visual acuity at presentation was 20/84 and -5.0 was the ocular motility. On discharge no patient's acuity or motility had worsened, the average acuity and motility were 20/40 and - 0.4 respectively. There was one case with intracranial extension who underwent frontal craniotomy for evacuation of subdural empyema one week after endoscopic management.

CONCLUSION: Orbital infection as a complication of sinusitis is uncommon in adult patients. In most cases swab culture can be used to guide antimicrobial treatment. In our series it occurred in patients with multiple sinus involvement and in those with orbital wall defect. The majority of patients required surgical intervention which is safe and effective.

ABSTRACT NUMBER: 1729

GENOME-WIDE ANALYSIS OF GENE EXPRESSION CHANGES IN THE CHRONIC RHINOSINUSITIS

Alla Solyar, MD, Joshua Rosenberg, MD, Thomas Belbin, PhD, Marvin Fried, MD

OBJECTIVES: To determine differential gene expression patterns in the nasal mucosa of patients with chronic rhinosinusitis (CRS) without nasal polyps compared to normal controls using cDNA microarray analysis.

METHODS: Nasal mucosa samples were obtained from seventeen subjects, nine with CRS and eight healthy controls, at the time of their elective nasal surgery. After total RNA extraction, a microarray containing 27,323 cDNA clones was utilized to examine gene expression profiles by comparing CRS and non-CRS RNA to reference RNA containing pooled aliquots from both groups. Each gene on the microarray was ranked according to its ability to separate CRS subjects from normal control subjects based on its level of gene expression using a Student's t-test.

RESULTS: Microarray analysis resulted in 166 genes (68 more highly expressed in CRS subjects, 98 more highly expressed in control subjects) that could separate the two subject groups with a p-value < 0.01. Genes that were up-regulated in CRS subjects relative to controls included glucose-6-phosphate transporter and multiple ubiquitin modifiers, while genes that were down-regulated included leukocyte associated Ig-like receptor, interleukin enhancer binding factor 2, and tumor necrosis factor receptor associated protein.

CONCLUSIONS: cDNA microarray analysis of nasal mucosal samples can detect quantitative changes in gene expression in patients with CRS compared to healthy controls. Differentially expressed genes may play significant roles in the pathogenesis of CRS. Furthermore, these expression patterns may provide molecular markers that may have implications for understanding pathogenesis of CRS as well as assessing disease severity, prognosis and response to specific treatments.

ABSTRACT NUMBER: 1731

CONTROLLED STEROID DELIVERY VIA BIOABSORBABLE STENT: SAFETY AND PERFORMANCE IN A RABBIT MODEL

Peter Li, MD, David Downie, MD, Peter Hwang, MD

INTRODUCTION: Middle turbinate lateralization, adhesions and inflammation are causes of sub-optimal sinus patency following surgery. A bioabsorbable, drug-eluting stent has been developed to maintain sinus patency while providing controlled steroid delivery to the sinus mucosa. The aim of this study was to characterize the in-vivo safety and performance of this stent in a rabbit model.

METHODS: Bioabsorbable stents coated with mometasone furoate were placed in the maxillary sinuses of 31 rabbits bilaterally via dorsal maxillary sinusotomy. Animals were sacrificed between 5 days and 18 weeks postoperatively. Safety was assessed by endoscopic and histologic evaluation of the sinus mucosa, and by measurement of plasma steroid concentrations. Performance was assessed by measuring tissue concentrations of steroid in maxillary sinus mucosa. Structural integrity of the stent over time was also assessed.

RESULTS: At all time points, endoscopic and histopathologic examinations of mucosa were normal, comparable to controls. Therapeutic mucosal drug concentrations were attained in a time-dependent fashion (range 175ng/g – 28,189ng/g). Plasma drug concentrations were generally near or below the lower limit of quantification (15pg/mL). Structural integrity of the stent was maintained to 14 days. Microscopic fungal hyphae were noted in a small proportion of both treatment and control sinuses, without evidence of associated adverse tissue reaction.

CONCLUSIONS: Drug-eluting sinus stents are safe and can provide controlled local steroid delivery with negligible systemic absorption. They may prove useful following endoscopic sinus surgery in maintaining sinus patency and reducing inflammation.

ABSTRACT NUMBER: 1732

A ROLE FOR OBSERVATION IN THE TREATMENT OF ISOLATED DISEASES OF THE PEDIATRIC SPHENOID SINUS AND CLIVUS

Vijay Ramakrishnan, MD, Jesse Smith, BA, Kenny Chan, MD

INTRODUCTION: It is unclear how to manage isolated sphenoid opacification or benign appearing irregularities of the clivus in asymptomatic or minimally symptomatic children. In adults, isolated sphenoid sinus opacification carries a 16-24% rate of neoplasm, and diagnostic surgery is often recommended in patients with mild symptoms.

METHODS: Retrospective chart review of all cases of sphenoid surgery performed at a pediatric hospital over a thirteen-year period.

RESULTS: Of 69 patients undergoing sphenoidotomy, 52 patients had concurrent sinonasal pathology of infectious, inflammatory, or neoplastic etiology. On preoperative imaging, nine patients had isolated sphenoid sinus opacification, and eight patients had retrosphenoid irregularities. Of the nine patients with isolated sphenoid opacification, four were asymptomatic. The remaining five patients suffered from headache (75%), nasal obstruction (25%), or neurologic deficit (50%). The four asymptomatic patients had normal sinuses at the time of surgery, whereas the five symptomatic patients had demonstrable pathology. Of the eight patients with retrosphenoid abnormalities, three had obvious sellar and congenital abnormalities. The remaining five suffered from vague headaches and had benign appearing radiographic changes limited to the clivus. On pathologic analysis, four of these patients were found to have been benign fibroadipose and marrow tissue, and the fifth case was diagnosed as fibrous dysplasia.

CONCLUSIONS: Indications for sphenoid imaging and surgery are less defined in the pediatric population than in adults. Isolated sphenoid sinus opacification is uncommon, but appears relevant in a symptomatic child. Incidentally discovered sphenoid sinus opacification and benign appearing clival bony irregularities may be observed in asymptomatic patients.

ABSTRACT NUMBER: 1733

NASOPHARYNGEAL SWAB CYTOLOGY FOR NASOPHARYNGEAL CARCINOMA BY NON-OTORHINOLARYNGOLOGISTS

Dr. S Tiong, David Downie, MD, Peter Hwang, MD

INTRODUCTION: Middle turbinate lateralization, adhesions and inflammation are causes of sub-optimal sinus patency following surgery. A bioabsorbable, drug-eluting stent has been developed to maintain sinus patency while providing controlled steroid delivery to the sinus mucosa. The aim of this study was to characterize the in-vivo safety and performance of this stent in a rabbit model.

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CONCLUSIONS: Drug-eluting sinus stents are safe and can provide controlled local steroid delivery with negligible systemic absorption. They may prove useful following endoscopic sinus surgery in maintaining sinus patency and reducing inflammation.

ABSTRACT NUMBER: 1734

THE EFFECT OF MIDDLE TURBINATE SUTURE MEDIALIZATION ON OLFACTION

Jay Dutton, MD, Mark Hinton

OBJECTIVE: To assess the effect of suture medialization of the middle turbinate (MT) during endoscopic sinus surgery (ESS) on olfactory sensation.

BACKGROUND: One of the primary goals of endoscopic sinus surgery (ESS) is to create widely patent sinus ostia, and lateralization of a middle turbinate following ESS can obstruct an otherwise patent ethmoid cavity. Numerous methods have been utilized to assist in the avoidance of this complication including the use of packing in the ethmoid sinus as a "spacer", controlled creation of synechiae between the middle turbinate and septum, and suture medialization of the middle turbinate to the septum. The latter is an effective technique, but since the olfactory groove lies superior in the groove between the middle turbinate and septum, concerns have been raised as to the effect of this maneuver on olfaction. The aim of this study was to objectively evaluate olfaction before and after suture medialization of the middle turbinates, and secondarily to evaluate the effectiveness of this technique in preventing lateralization of the middle turbinate.

METHODS: Objective assessment of olfactory function using the University of Pennsylvania Smell Identification Test (UPSIT) was performed prior to and 6 months after ESS in 202 patients between January 2006 and January 2008. Post-operative follow up exams were also performed to determine the effectiveness of the medialization procedure and the patency of the ethmoidectomy cavities.

RESULTS: UPSIT testing did not show a statistically significant difference in the pre-operative and post-operative period. Post-operative endoscopic examination revealed that lateralization of the middle turbinate was a rare complication after suture medialization of the MT.

CONCLUSION: MT suture medialization during ESS is an effective method for preventing lateralization of the MT and does not impair olfaction postoperatively.

ABSTRACT NUMBER: 1736

UPREGULATION OF BCL-2 IN NASAL POLYPS OF PATIENTS WITH CYSTIC FIBROSIS

Victor Scapa, MD, Vijay Ramakrishnan, MD, Maxwell Smith, MD, Todd Kingdom, MD

INTRODUCTION: Nasal polyps in patients with cystic fibrosis (CF) are believed to be phenotypically different than polyps affecting non-CF, aspirin-tolerant patients. Preliminary data from our lab has suggested differences in cell cycle regulatory mechanisms of these two patient groups. The objective of this study was to further examine these differences in efforts to confirm preliminary findings. Multiple techniques were utilized to confirm the upregulation of anti-apoptotic Bcl-2 family proteins in CF polyps.

METHODS: Nasal polyps were prospectively obtained from CF and non-CF patients. The Sigma Panorama Protein Microarray was used to identify differences in protein expression between the two polyp groups. Western blot analysis confirmed altered expression of a subset of these proteins. Immunohistochemical staining was performed on archived tissue to further investigate Bcl-2 expression. Following review by a pathologist, slides were digitized using an Aperio ScanScope XT system and staining intensity was quantified with the Positive Pixel Count algorithm. The mean staining intensity for each polyp group was compared using an unpaired t-test.

RESULTS: The protein microarray suggested a greater than two-fold upregulation of Bcl-xl in CF polyps relative to non-CF polyps. Western blot analysis confirmed the upregulation in CF polyps of Bcl-2, a more commonly studied protein analog of Bcl-xl. The CF polyp group was discovered to have a higher quantitative intensity of immunohistochemical staining for Bcl-2 compared to the non-CF group ($p<0.05$).

CONCLUSION: Through multiple modalities of protein investigation, we have demonstrated an upregulation of Bcl-2 family proteins in CF polyps relative to polyps from non-CF patients.

ABSTRACT NUMBER: 1739

SNORING IN ADULT PATIENTS WITH NASOPHARYNGEAL TUBERCULOSIS

Dr. S Tiong

OBJECTIVE: Patients with nasopharyngeal tuberculosis (NPTB) is treated with anti-TB therapy (ATTBT) with effective response rather than conventional CPAC or surgery. This presentation resulted from study on such ENT patients with snoring.

METHODS: A retrospective study of all snoring adult patients seen in ENT Clinic in a developing country from January to December 2007 was undertaken and those treated for nasopharyngeal TB were selected.

RESULTS: This study found 54 patients, and 2 had nasopharyngeal TB. First was a 48 years old housewife with snoring of 16 months duration. She visited her aunt who had ATTBT 6 months before. Nasopharyngeal endoscopy showed hyperaemic swelling at posterior wall with biopsy showing features of TB. Her chest Xray(CXR) was normal. ATTBT was started. Six months after, she had no more snoring. \r\nSecond patient, 53 years old nurse, worked at local hospital with no TB contact known. She had 5 months snoring and right hypoacusia. ENT examination showed right serous otitis media and nasopharyngeal endoscopy revealed oedematous swelling at lateral wall. The swelling biopsy was consistent with TB. Her CXR was normal. She responded well to ATTBT with normal hearing and no more snoring 6 months after. Ziehl-Neelsen smear and Lowenstein-Jensen culture of the biopsy tissues were negative in both patients.

CONCLUSIONS: The findings illustrate the importance of nasopharyngeal examination with biopsy for TB diagnosis in suspected cases especially in developing countries where TB is prevalent. Delay in diagnosis or conventional snoring treatment could result in risk of TB spread and public health.

ABSTRACT NUMBER: 1742

THE EFFECTIVENESS OF PULMICORT DELIVERY WITH THE MUCOSAL ATOMISATION DEVICE IN TREATING ALLERGIC FUNGAL SINUSITIS

Bedy Lau, MD, Carl Philpott, MD, Amin Javer, MD

BACKGROUND: Allergic fungal sinusitis (AFS) has proven itself to often be refractory to effective control without resorting to systemic steroids and oral antifungals. The ideal treatment would therefore reduce the risk of systemic side-effects whilst enabling disease control.

OBJECTIVES: To assess the effects of budesonide application using the mucosal atomisation device (MAD) in controlling allergic fungal sinusitis both in terms of objective i.e. mucosal staging, serum IgE and eosinophil counts and subjective i.e. SNOT-22 outcomes.

METHODS: A prospective study in a tertiary rhinology centre of 100 patients with AFS in whom the mucosal staging had worsened on their existing regime. Patients were asked to complete a SNOT-22 questionnaire and have an IgE level and full blood count blood sample taken. These investigations were repeated at follow-up visits at 6 and 12 weeks.

RESULTS: A significant change in endoscopic grading and symptom scores was observed in patients using the MAD application of budesonide at all 3 time intervals after commencement (p= 0.048). A significant reduction in the SNOT-22 questionnaire scores was also observed (p= 0.017). There was no significant correlation with serum IgE levels (p=0.95).

CONCLUSIONS: The use of topical Budesonide via the MAD is an effective means of controlling recurrent disease in patients with AFS following endoscopic sinus surgery, both subjectively and objectively.

ABSTRACT NUMBER: 1745

POLYSOMNOGRAPHIC EVALUATION OF THE EFFECT OF PROPOFOL ON SLEEP FOR BOTH HEALTHY AND OSAHS PATIENTS: PRELIMINARY RESULTS

Fabiana Valera, PhD, Fabio Rabelo, MD, Heidi Sander, MD, Daniel Küpper, MD

INTRODUCTION: Nasofibroscopy during sedation with propofol has been reported as the exam which is the most similar to regular sleep, predicting the areas collapsed during it. Nevertheless, it is being strongly questioned by some authors because of unknown effect of this drug during sleep, which could lead to possible adverse effects, and also changes the respiratory pattern. The objective of the present study was to determine changes in sleep parameters induced by propofol using polysomnohraphic examination and to validate evaluation by nasofibroscopy under sedation.

METHODS: Nine subjects (3 controls/6 with OSAHS) were submitted to diurnal polysomnography during 120 minutes both with and without the use of propofol. The exams were compared regarding the presence of snoring, apnea/hypopnea index (AHI), oxygen desaturation, and sleep architecture.

RESULTS: The use of propofol did not induce snoring in the control subjects, whereas 100% of the OSAHS patients snored. Apnea, hypopnea and AHI did not differ significantly in the diurnal exams with and without sedation ($P > 0.05$). The measurements of mean and minimum oxygen saturation (SaO2) were significantly reduced during propofol sedation ($P < 0.05$), although the difference was not clinically important.

CONCLUSIONS: sedation with propofol permits evaluation under conditions close to physiological sleep regarding the main parameters evaluated in OSAHS, supporting the view that nasofibrolaryngoscopy under sedation with propofol is a promising exam for the management of this disease.

ABSTRACT NUMBER: 1747

COBLATION ASSISTED ENDOSCOPIC RESECTION OF A JUVENILE NASOPHARYNGEAL ANGIOFIBROMA WITH PRE-OPERATIVE TRANSNASAL EMBOLIZATION

Jose Ruiz, MD, Belachew Tessema, MD, David Neskey, MD

INTRODUCTION: Advances in endoscopic surgery allow for resection of selected juvenile nasopharyngeal angiofibromas (JNA). Methods to reduce intraoperative estimated blood loss (EBL) include hypotensive anesthesia and pre-operative embolization. In the literature, typical EBL for endoscopic JNA resection is approximately 200-650 mL. We report our experience using Coblation technology to assist in the endoscopic resection of vascular JNA tumors and our experience with the delivery of pre-operative embolization using a transnasal endoscopic approach.

METHODS: A 23-year-old gentleman with epistaxis and nasal obstruction had a 3.4 cm tumor extending through the nasopharynx roof into the sphenoid. JNA staging was Radkowski stage IIA and Andrews stage II. Transnasal endoscopic embolization was performed 48 hours pre-operatively using an intratumoral injection of ethylene vinyl alcohol co-polymer (Onyx-18) under live fluoroscopy. Resection was completed via an exclusively endoscopic approach including removal of sphenoid and pterygomaxillary extension.

RESULTS: Preoperative embolization resulted in no complications. The tumor was resected in two parts, with the initial mass separated using the Coblator and delivered transoral with 75 mL of EBL. The final EBL was 150 mL and surgical time was 105 minutes. There were no peri-operative complications and no packing was required. The patient was discharged on post-operative day one.

CONCLUSIONS: Coblation can be used to assist in endoscopic resection of JNA tumors. Our patient had low EBL, short surgical time, no packing required, and early discharge. Transnasal pre-operative embolization was successful and resulted in no complications.

ABSTRACT NUMBER: 1750

FLUID RESIDUALS AND DRUG EXPOSURE IN NASAL IRRIGATION

Richard Harvey, MD, Nick Debnath, MD, Rodney Schlosser, MD

INTRODUCTION: Topical treatment options in the management of chronic rhinosinusitus (CRS) are rapidly growing with our increased understanding of the inflammatory process. Additives to irrigation devices have become increasingly popular. Some additives, such as menthol, provide little more than sensory feedback. However, glucocorticosteroids and antibiotics represent powerful pharmaceutical approaches with little knowledge regarding patient exposure and absorption. To date there is no data on residual volume and percentage of fluid retained after nasal irrigation in patients.

METHODS: To determine the residual volume and percentage of total nasal irrigation that is retained from a single delivery of fluid either from a neti pot (NasaFlo™) or a squeeze bottle (Sinus Rinse™). Patients were consenting adults (male and female, 18yrs+) already on nasal saline irrigations as part management of their CRS. Participants were divided into pre and post sinus surgery (ESS). 17 control irrigations on non-rhinological patients were collected for comparison. Nasal irrigation was performed with accurate collection of the excess to determine retained amount.

RESULTS: The overall retention of fluid was 2.14% +/- 1.14SD. This represents only 5.14ml+/-3.36mlSD for the 240ml irrigations. Squeeze bottle s and Neti Pots were similar 2.36+/-1.18% and 1.70+/-1.08% respectively (p=0.33). CRS patients had the least retained volume 1.41+/-0.59%. The influence of group and device is discussed.

CONCLUSIONS: Quantification of the residual volume has important implications for both the treatment of inflammatory disease with saline as well as for potentially novel topical therapies.

ABSTRACT NUMBER: 1754

CASE STUDY: MECHANISMS OF ACTION FOR BALLOON DILATION OF THE OSTIOMEATAL UNIT (OMU) IN PATIENTS WITH CHRONIC RHINOSINUSITIS

James Atkins Jr., M.D., Theodore Truitt, M.D., James Stankiewicz, M.D., Thomas Tami, M.D.

INTRODUCTION: Balloon dilation of sinus outflow tracts is now widely used. However, little data on OMU remodeling is available and assessment of the anatomic impact of balloon dilation with computed tomography (CT) imaging can be challenging.

METHODS: High resolution CT scans before, and one month after, bilateral trans-antral maxillary balloon antrostomy were performed on a patient with CRS of the maxillary and anterior ethmoid sinuses. Both CT images were carefully aligned. Pre-treatment images in multiple coronal and axial slices at the maxillary ostium and infundibulum were selected and matched with the same slices in the post-operative scans. Dimensions were recorded and cross-sectional areas of infundibulum expansion in the coronal and axial planes were calculated.

RESULTS: The average cross-sectional area of the right infundibulum as measured from the 3 coronal slices increased from 9.6 mm2 to 19.2 mm2. The average cross-sectional area in the axial plane increased from 11.1 mm2 to 20.1 mm2. The left side was obstructed pre-operatively with an area of 0.0 mm2. After dilation, the coronal and axial plane areas increased to 40.3 mm2 and 28.4 mm2 respectively. This patient also had a clinically significant improvement in symptoms. The Sino Nasal Outcome Test 20 score decreased from 2.5 at baseline to 1.1 at 12-month follow-up.

CONCLUSION: Dimensional analyses of high resolution CT images before and after balloon dilation demonstrate a significant increase in the cross-sectional area of the maxillary outflow tracts after treatment.

ABSTRACT NUMBER: 1758

IS LOOSE NASAL PACKING EFFICIENT AND SAFE AFTER INFERIOR TURBINECTOMY

Tung-Tsun Huang, M.D.

INTRODUCTION: Compact nasal packing is commonly used to control postoperative bleeding in patients undergoing inferior turbinectomy. However, it can be associated with significant pain on its removal. To our knowledge, loose nasal packing has not been tried before. The purpose of this study was to investigate the efficacy and safety of loose nasal packing following inferior turbinectomy.

METHODS: A prospective study was conducted on twenty patients undergoing inferior turbinectomy from November 2006 to November 2008. Loose nasal packing was applied with one piece of the surgicel on the abraded surface of each inferior turbinate and two Vaseline gauzes (put inside the fingerstalls of the surgical glove) in each nasal cavity. Pain scores, using a visual analogue scale, and bleeding severity during packing removal were recorded. Another twenty patient undergoing inferior turbinectomy with compact nasal packing (one Merocel plus one or two Vaseline gauzes) before November 2006 were enrolled for comparison.

RESULTS: No patients in either group suffered from significant bleeding and required re-packing during the initial postoperative period. Pain score and bleeding severity on packing removal was statistically lower in loose packing group than in compact packing group ($p<0.05$).

CONCLUSIONS: Loose nasal packing is as effective as compact nasal packing in controlling postoperative bleeding following inferior turbinectomy. Its removal, however, is less traumatic for the nasal mucosa and less painful for the patient. Therefore, we recommend the use of loose nasal packing to improve patient's comfort after inferior turbinectomy.

ABSTRACT NUMBER: 1760

ENDOSCOPIC TRANSMAXILLARY APPROACH TO THE PTERYGOPALATINE SPACE

Hwa Jung Son, MD, Rakesh Chandra, MD, David Conley, MD, Robert Kern, MD

INTRODUCTION: The pterygopalatine space (PPS) is a relatively inaccessible area that houses many neurovascular contents, including the second division of the trigeminal nerve, Vidian nerve, and internal maxillary arterial branches. The skull base in the PPS lies below the temporal lobe. Classic approaches to this region have required medial maxillectomy via lateral rhinotomy or midface degloving.

METHODS: We present 4 cases where an endoscopic transmaxillary approach was utilized to address pathology of the PPS.

RESULTS: The lesions addressed included recurrent lacrimal adenocarcinoma with perineural extension, schwannoma, JNA, and a large temporal lobe meningocele. All cases were successfully accomplished through an endoscopic maxillary antrostomy without complications. Image guidance was used in each procedure. We observed the following nuances of this approach: (1) wide antrostomy, (2) identification of the orbital process of the palatine bone, (3) control of internal maxillary arterial branches, (4) using a drill, when necessary, to address dense bone of the pterygoid root, and (5) consideration of a Caldwell-Luc if enhanced lateral exposure is required.

CONCLUSION: Transmaxillary access to the PPS can be accomplished safely and effectively via modifications of techniques originally described in the management of lateral sphenoid recess lesions.

ABSTRACT NUMBER: 1761

SECONDHAND TOBACCO SMOKE EXPOSURE AND CHRONIC RHINOSINUSITIS–A CASE-CONTROL STUDY

Douglas Reh, MD, Sandra Lin, MD, Sandra Clipp, BS, Ana Navas-Acien, MPH

BACKGROUND: Sinusitis is a costly and morbid disease that is influenced by environmental factors such as tobacco smoke, however few studies have evaluated the association between secondhand tobacco smoke (SHS) exposure and chronic rhinosinusitis (CRS). The objective of this study was to evaluate the association of SHS and the risk of CRS in a community-based case-control study of adult non-smokers.

METHODS: 100 cases with a confirmed diagnosis of CRS and 100 controls matched for age, sex, and former-never smoking status were recruited and interviewed among 7,386 residents from Washington County, MD. A validated questionnaire was used to assess past and present SHS exposure as well as disease-specific quality of life.

RESULTS: Cases were more likely to live with a smoker as children (78 vs. 67%, p=0.08) and to be exposed longer to SHS (median 9.9 vs. 5.0 hours/week, p=0.06), although these differences did not reach statistical significance. CRS cases exposed to SHS (n=39) had worse mean scores in nasal obstruction/blockage (3.1 vs. 2.5, p=0.02), nasal discharge (3.3 vs. 2.7, p=0.03), headaches (2.4 vs. 1.5, p=0.01), and cough (2.1 vs. 1.5, p=0.04) than cases without SHS exposure (n=61). Cases exposed to SHS were also more likely to use nasal decongestants (53.9 vs. 34.4%, p=0.06).

CONCLUSION: Exposure to SHS during childhood and adulthood may be a risk factor for CRS. While we found no association between current (SHS) exposure and CRS risk, cases with rhinosinusitis exposed to SHS reported worse nasal symptoms and used more nasal decongestants compared to unexposed cases.

ABSTRACT NUMBER: 1764

MINIMALLY INVASIVE TREATMENT MODALITY FOR SINONASAL MALIGNANCY WITH ANTERIOR SKULL BASE INVASION– A PRELIMINARY REPORT

Yu-Fu Chou

INTRODUCTION: Sinonasal malignancies are rarely encountered, frequently involving the anterior skull base. Traditionally, these diseases was treated surgically by external approach , such as craniofacial resection, often bringing major morbidities. Therefore, endoscopic excision of these tumors provides a possible less invasive way of treatment.

METHODS: We treated sinonasal malignancy with skull base invasion by endoscopic approach. The tumor was removed until the origin at anterior skull base was well defined and the operation field was created as wide as possible by pansinusectomy and endoscopic Lothrop operation. The bony roof of anterior skull base was removed along with the tumor stalk with adequate safety margin, keeping dura defect as small as possible, reconstructed with turbinate graft, and there were often inadequate intracranial resection margin. Subsequently, the patients received adjuvant therapy with Gamma knife radiosurgery or intensity modulated radiotherapy (IMRT) for intracranial safety margins. The patients were then followed regularly by sinoscopy and image studies.

RESULTS: From 2005~2008, we experienced four patients of sinonasal malignancies requiring surgical excision. Two of them were primary sinonasal cancer–One was esthesioneuroblastoma, and the other was the third recurrence of sinus cancer, previously treated by external approach. The other two were recurrent nasopharyngeal carcinoma after primary treatment with chemoradiation therapy. There patients were followed for 18 to 36 months, and no recurrence was found.

CONCLUSION: Endoscopic excision of sinonasal cancer boosted with radiotherapy or radiosurgery may provide a promising way that may have satisfactory tumor free rate and better life quality.

ABSTRACT NUMBER: 1765

OLFACTORY BULB VOLUME IN IDIOPAHIC OLFACTORY LOSS

Philippe Rombaux, MD, Hélène Potier, MD, Thierry Duprez, MD, Thomas Hummel, MD

INTRODUCTION: Olfactory loss is considered as idiopathic when no aetiology has been demonstrated in the history neither the clinical evaluation of the patient. Olfactory bulb (OB) volume has been related to the olfactory function both in normal and pathological condition. This study aimed to investigate the relation between the OB volume and the olfactory dysfunction in a group of patients with idiopathic olfactory loss.

MATERIAL AND METHOD: Twenty two patients were compared to 22 controls for their OB volume and olfactory ability with the psychophysical testing using the Sniffin stick test. Diagnosis of idiopathic olfactory loss was performed when others causes have been ruled out and when the olfactory deficit was acquired and not congenital.

RESULTS: As expected, psychophysical testing revealed that patients had lower scores than controls : $p < 0.001$ for treshold, discrimination, identification and global TDI score. Mean total OB volume was 53.4 mm^3 (46.1–60.2 mm^3) for patients vs 74.5 mm^3 for controls (74.5 mm^3 - 81.9 mm^3($p<0.005$ for right, left, total, and max volume of OB). Pearson's corrleations were statistically significant for TDI scores and total OB volume when calculated for the 44 subjects (0.549, $p<0.0001$).

CONCLUSIONS: Patients with idiopathic olfactory loss have lower OB volume than controls. This was already demonstrated for others causes of olfactory loss such as postinfectious and posttraumatic olfactory loss. Idiopathic olfactory loss is at least to a certain degree explained by this decreased OB volume and viewed as a constitutional disease speculating that such patients per se have more to loose than others when exposed to injury to their olfactory pathways.

ABSTRACT NUMBER: 1766

THE INFLUENCE OF SEPTAL FLAP RECONSTRUCTION ON SINONASAL FUNCTION AND QUALITY OF LIFE

Harshita Pant, MD, Amol Bhatki, MD, Carl Snyderman, MD

BACKGROUND: Septal flap reconstruction (SFR) for skull base defects has significantly improved clinical outcomes in patients undergoing endoscopic endonasal approach (EEA) to the skull base. However, the impact of SFR on patient's quality of life (QOL) and sinonasal function has not been addressed. The aim of this study was to evaluate the postoperative QOL and sinonasal function in patients who required SFR compared with those who did not.

METHOD: Prospective study. Patients undergoing transsellar EEA for pituitary lesions filled out SNOT 22 and a multidimensional disease-specific skull base QOL questionnaires at various time points after their surgery during routine post operative clinic visits. Minimum followup was 1 and maximum 18 months.

RESULTS: 36 patients were included in the study. 21 patients had SFR and 15 required no reconstruction. The QOL and SNOT 22 scores at 1 month were not significantly different between the study groups. However, at 2-3 months, scores were significantly better in patients without SFR compared with those who did. By 4-6 months and beyond, there was no significant difference in scores between the two groups. The impact of SFR on the sense of smell at 4-6 months and beyond showed no significant difference between the two groups.

CONCLUSION: SFR is associated with higher short-term sinonasal morbidity however this is temporary and in the long-term is not significantly different to patients without SFR. Overall, patients have a very good QOL after SFR of skull base defects.

ABSTRACT NUMBER: 1767

CLINICAL EVALUATION OF A NEW APPROACH IN ACUTE RHINOSINUSITIS

Anders Clemens, K Hörmann, Ludger Klimek, Oliver Pfaar

INTRODUCTION: It is currently estimated that 14% of the US population is affected by an episode of rhinosinusitis, afflicting all age groups and all segments of the population. Lyophilized extract of Cyclamen europeaum nasal spray is a new treatment that facilitates physiological drainage and cleansing of the paranasal cavities through the mucous membranes. The objective of the clinical trial was to evaluate the efficacy and safety of this product in patients diagnosed with moderate to severe acute rhinosinusitis.

METHODS: A randomized, double-blind placebo-controlled trial was conducted in patients with acute rhinosinusitis. All patients received antibiotics during 8 days as base treatment. Efficacy was assessed at 2 weeks by patient reported symptoms (nasal obstruction, nasal secretion, facial pain, loss of smell) using a visual analogical scale. Mucous oedema and mucopurulent secretion was measured by endoscopy. Patient and Investigator satisfaction with treatment was evaluated. Safety evaluation was performed by reporting adverse events.

RESULTS: 99 patients were randomized (Cyclamen:48, Placebo:51). Study groups were homogeneous on demographic and clinical baseline data. The analysis shows statistically significant differences between means of facial pain (-1.2 with CI 95% from -2.3 to -0.1; p=0,036). Cure of endoscopic signs was higher (p=0,043) in Cyclamen (48,7%) than placebo (30,9%). Both patient (p=0,0327) and investigator (p=0,0324) satisfaction were in favor of Cyclamen. No serious or unexpected adverse events were reported.

CONCLUSION: Cyclamen europeaum is a new therapy suitable in acute rhinosinusitis treatment that has demonstrated its efficacy and safety.

ABSTRACT NUMBER: 1768

ENDOSCOPIC TRANSPHENOIDAL APPROACH TO PETROUS APEX LESIONS

Leela Lavasani, M.D., James Evans, M.D., Gregory Artz, M.D., Marc Rosen, M.D.

INTRODUCTION: Multiple different surgical approaches have been utilized in the past for access to the petrous apex. These include transcochlear and translabrynthine, subcochlear, middle fossa and transethmoidal-sphenoidal approaches. Recently, with the advances made in image-guided endoscopic sinus surgery, minimally-invasive techniques of approaching these lesions has become a viable and safe option when lesions are located in the medial petrous apex. The endoscopic technique is advantageous as it allows for a shorter surgical time, obviates the need for a craniotomy and involves less risk to the facial nerve and otic capsule, while provide a drainage pathway and a easy means of surveillance by nasal endoscopy. This paper will review a series of patients who successfully underwent endoscopic transphenoidal petrous apex surgery. We will also discuss the anatomic considerations and the details of our surgical technique.

METHODS: Retrospective chart review.

RESULTS: We will review a series of five patients over the past three years with petrous apex lesions that were successfully managed via endoscopic techniques. Three of these patients were found to have cholesterol granulomas and two will low-grade chondrosarcomas.

CONCLUSIONS: The endoscopic transphenoidal approach is a safe and minimally invasive technique for the diagnosis and management of lesions of the petrous apex. It should be considered a first line surgical approach to lesions that involve the medial petrous apex.

ABSTRACT NUMBER: 1769

A 24-YEAR EXPERIENCE IN ENDOSCOPIC SURGICAL MANAGEMENT OF SINO-NASAL MUCOCELES

Devyani Lal, MD, Joshua Thom, BS, Jennifer Lavin, BA, Margaret S. Carter, BS, James Stankiewicz, MD

OBJECTIVES: 1. Characterize clinical presentation of sino-nasal mucoceles 2. Study outcomes from mucocele surgery

METHOD: Retrospective chart review of 204 mucocele patients from 1985-2008.

RESULTS: Patients included 105 males and 99 females aged 15 to 85 years. Frontal (38.7%), ethmoid (16.7%) and fronto-ethmoid (12.3%) mucoceles were most common. Headache (37.8%), congestion (30.9%), pressure over involved sinus (22.6%) and facial pain (20.6%) were frequent. Visual disturbances (10.8%), proptosis (9.3%), and periorbital cellulitis (4.4%) were rare. Mucoceles were managed purely endoscopically in 91.2%. Combined endoscopic–open approaches were used in 4.9%, and exclusively open approaches in 3.4%. Follow up ranged from 3 weeks to 10.5 years. Post-operative complications occurred in 6.4%. One case of periorbital cellulitis followed the combined approach. All other complications were associated with endoscopic surgery. Intra-operative cerebrospinal fluid (CSF) leak was repaired in one, and delayed CSF leak fixed in another two patients. Major intra-operative hemorrhage occurred in one patient, who was intubated for 4 days due to mental status changes. Post-operative diplopia occurred in two patients; anosmia and infra-orbital anesthesia were noted in one each. Two patients had epistaxis, one controlled under general anesthesia. Two patients had post-operative MRSA infection requiring intravenous antibiotics. Mucoceles recurred in 17 patients (8.3%). Recurrence was 14.3% with open surgery, 8.1% with endoscopic surgery, and 10% with the combined approach. Surgery for mucocele recurrence was performed in 15 patients, with 13 (87%) done endoscopically.

CONCLUSIONS: The study presents the largest experience in endoscopic surgery for mucoceles. The data confirms that mucoceles can be safely and effectively managed endoscopically. Open approaches are rarely indicated.

ABSTRACT NUMBER: 1775

INCIDENCE OF FONTANEL DEFECTS AND THE TWO HOLES SYNDROME

Ranko Mladina, MD, Katarina Vukovic, MD, Gorazd Poje, MD

INTRODUCTION: Defects in the fontanel region of the lateral nasal wall have been described in the literature as „accessory“ or „secundary“ ostia. The authors consider them a sign of chronic maxillary sinus inflammation. Along with mucus recirculation between the natural ostium and the fontanel defect we call it the Two Holes Syndrome (THS). The aim of this study was to determine the incidence of fontanel defects in patients with chronic sinusitis (CRS) and in healthy subjects.

METHODS: 8879 out-patients with CRS were examined by means of nasal fiberendoscopy. The control group consisted of 1442 healthy volunteers with no previous history of CRS.

RESULTS: defect in the posterior fontanel was found in 1713/8879 CRS patients (19.3 %). It was bilateral in 1165 cases (68.03%). Defect in the anterior fontanel was found in 54 patients (0.61%).The circulating mucus ring was identified in 162 patients with fontanel defects (9.17%). The defect in the posterior fontanel was found in 7/1442 healthy volunteers (0.48%). It was never bilateral, the circulating mucus was not observed and defect in the anterior fontanel was not found.

CONCLUSIONS: posterior fontanel defects were found more frequently in CRS patients than in healthy subjects. These defects have been clinically related to chronic infection of the maxillary sinus and should not be called "accessory" or "secundary" ostia. CRS with defects of the fontanel region and mucus recirculation can promote a number of health disturbances (chronic postnasal drip, headache, cough, alopecia areata, iridocyclitis). We call this entity the Two Holes Syndrome (THS).

ABSTRACT NUMBER: 1777

RADIOLOGIC EVALUATION OF ANTERIOR ETHMOID ARTERY ANATOMY IN THE NON-DISEASED FRONTAL RECESS

Gamwell Rogers, MD, Sarah Wise, MD, Amanda Corey, MD, John DelGaudio, MD

INTRODUCTION: The anterior ethmoid artery (AEA) is an important landmark to the sinus surgeon, with potential for significant complications if injured. This study evaluated AEA anatomy with respect to specific frontal recess structures and drainage pathways.

METHODS: Adult AEA and frontal recess anatomy was evaluated on an imaging workstation on thin-slice (0.625 mm) axial CT scans with triplanar reconstructions. Included CT scans did not have opacification, significant mucosal thickening, or a history of skull base (SB) or frontal recess surgery.

RESULTS: Fifty-four CT scans were reviewed (108 sides). 53/108 sides (49%) demonstrated a mesenteried AEA below the bony SB, with mean distance to the SB of 5.54 mm (range 3.4-9.4 mm, SD 1.6 mm). Supraorbital ethmoid cells (SOE) were observed in 49/108 sides (45%). A mesenteried AEA occurred concomitantly with SOE cells at a rate significantly higher than expected ($p < 0.001$). In 100% of cases, the SOE drainage pathway was anterior to the AEA. With respect to the middle turbinate basal lamella (MTBL) SB attachment, the AEA referenced at the lamina papyracea was anterior to the MTBL in 46/108 sides (43%) and within the MTBL in 58/108 sides (54%). Mesenteried AEA was not significantly associated with presence of an agger nasi cell, fontal cells, or AEA position with respect to the MTBL ($p = NS$).

CONCLUSION: AEA dehiscence and SOE cells were common, and were often seen concurrently. In all cases, SOE cells were noted to drain anterior to the AEA.

ABSTRACT NUMBER: 1778

A COMPREHENSIVE ALGORITHM AND SYSTEMATIC REVIEW FOR ENDOSCOPIC SKULL BASE RECONSTRUCTION

Mihir Patel, MD, Ricardo Carrau, MD, Amin Kassam, MD, Adam Zanation, MD

OBJECTIVES: As endoscopic skull base resections have advanced, the need for reconstruction options have also advanced. The ladder for skull base reconstructions includes avascular grafts, nasoseptal pedicled flaps (NSF), turbinate flaps, and novel endoscopic regional flaps (pericranial or temporoparietal). Given these recent advances, we review the options for reconstruction and provide an algorithm for endoscopic skull base reconstruction.

METHODS: Retrospective review of our skull base reconstructive data and systematic review.

RESULTS: Small CSF leaks may be repaired with avascular grafts with a 95% success rate. Typically repair incorporates sinus obliteration or the use of standard inlayed grafting techniques. The expanded endonasal approaches (EEA) usually have a much larger dural defect and often have high flow leak situations (cistern or ventricle opening). The success rate for EEA procedures using avascular reconstruction approaches 90%, however, in high flow leak situations the success rate is much lower (50-70%). From 150 prospective NS flaps, the NSF has an overall 96% success rate. If an NSF is not available, the anticipated location of the defect guides vascualrized flap choice. Anterior and sellar defects are best managed with an endoscopically harvested pericranial flap. Clival and posterior defects may be reconstructed with an inferior turbinate flap or a transposed temporoparietal fascia flap. We discuss a reconstructive algorithm and display the success rates for each technique.

CONCLUSIONS: This review provides a comprehensive overview of the endoscopic reconstructive options and points to the increased use of various vascularized reconstructions for larger or higher complexity skull base defects.

ABSTRACT NUMBER: 1782

DEVELOPMENT OF A CHINCHILLA MODEL TO ALLOW DIRECT, CONTINUOUS IMAGING OF FLUORESCENT NONTYPEABLE HAEMOPHILUS INFLUENZAE DURING EXPERIMENTAL CHRONIC RHINOSINUSITIS

Subinoy Das, MD, Joseph Jurcisek, BS, Glen McGillivary, PhD, Lauren Bakaletz, PhD

OBJECTIVES: Nontypeable Haemophilus Influenzae (NTHI) is a common causative agent of chronic rhinosinusitis (CRS). To improve our ability to study CRS, we endeavored to develop a relevant and robust animal model using the chinchilla host and based on successful protocols developed in our laboratory for modeling otitis media. Herein, we demonstrate the ability to non-invasively monitor NTHI infection within the paranasal sinus cavities of the chinchilla after intranasal challenge via the use of a clinical isolate of NTHI which was modified genetically so that it could be used as a fluorescent reporter.

METHODS: A fluorescent NTHI reporter was constructed by digesting, purifying, and blunt end ligation of a GFP cassette to the outer membrane protein P2 promoter of NTHI. The ligated products were used to transform NTHI 86-028NP. An adult chinchilla (Chinchilla lanigera) was then inoculated intranasally with 10e-8 CFU of this fluorescent reporter. The chinchilla was sedated and imaged with a Xenogen (TM) IVIS system and a small animal computed tomography (CT) scanner to detect fluorescent NTHI.

RESULTS: After inoculation, fluorescent NTHI were detected within the anterior nares. After 7 days, fluorescence was detected in the ethmoid sinuses, a location that was confirmed with CT scanning. Flourescence was detectable for up to 28 days post-inoculation.

CONCLUSIONS: This model represents a significant improvement in our ability to non-invasively study CRS using a rodent host. We expect that future studies will allow us to monitor biofilm formation by NTHI within the sinuses and test molecular therapies aimed at therapeutic biofilm resolution.

ABSTRACT NUMBER: 1784

ENDOSCOPIC MANAGEMENT OF SPHENOCLIVAL NEOPLASMS: ANATOMIC CORRELATES AND PATIENT OUTCOMES

Clementino Solares, MD, Amber Luong, MD, Martin Citardi, MD, Pete Batra, MD

INTRODUCTION: The sphenoclival region poses a significant surgical challenge given the central location at the skull base and proximity to critical structures. The advent of minimally invasive endoscopic techniques has greatly facilitated management of pathology in this location.

MATERIALS & METHODS: Fresh-frozen cadaver heads were dissected to study the endoscopic anatomy of the sphenoclival region. Retrospective chart review was performed of patients undergoing endoscopic resection of sphenoclival neoplasms between 2000 and 2008.

RESULTS: Transnasal endoscopic access to the sphenoid sinus was obtained in 10 cadaver heads. A clival window with mean dimensions of 1.4 cm x 1.7 cm was created. Through the clival window, identification and dissection of the basilar and vertebral arteries, mamillary bodies, third ventricle and cranial nerves III-VI, IX, X, XI and cervical rootlets were possible. Twenty-two patients with mean age of 58 years were treated. The most common pathologies were chordomas (5), inverted papillomas (5), squamous cell carcinoma (2), and adenoid cystic carcinoma (2). All patients were managed endoscopically with surgical navigation with neurosurgical standby or involvement. None of the patients required adjunct craniotomies. Twelve patients received adjuvant therapies. The mean follow-up was 26 months.

CONCLUSIONS: The anatomy of the central skull base is complex and intimate knowledge is an absolute prerequisite prior to considering surgery in this region. This study demonstrates that transnasal endoscopic access to the sphenoclival region is technically feasible and allows for successful surgical extirpation of tumors, obviating the need for a craniotomy.

ABSTRACT NUMBER: 1785

TREATMENT-RECALCITRANT CHRONIC RHINOSINUSITIS WITH POLYPS IS ASSOCIATED WITH ALTERED EPITHELIAL CELL EXPRESSION OF INTERLEUKIN-33

Andrew Lane, MD, Yadong Wang, BA, Douglas Reh, MD, Leda Pawliuk, BA

INTRODUCTION: Abnormalities in host mucosal immunity exist in CRSwNP, but it is unclear whether this is a cause or an effect of the eosinophilic inflammation and frequent microbial colonization that characterizes the disease. Sinonasal epithelial cells are critical participants in healthy anti-microbial innate immune defense. They also can promote Th2 inflammation with various mediators, including IL-33, which induces T helper cells to produce Th2 cytokines.

METHODS: CRSwNP sinonasal epithelial cells were obtained during sinus surgery and stored. Patients were subsequently classified as either treatment-responsive or treatment-recalcitrant, based on long-term outcomes of medical and surgical therapy. Epithelial cells from these patients were grown in air-liquid interface culture and treated with interleukin-13, as well as the bacteria-associated molecule, CpG. Expression of interleukin-33 mRNA was determined by real-time PCR.

RESULTS: Recalcitrant CRSwNP epithelial cells had increased baseline expression of IL-33 compared to responsive CRSwNP, which was further increased by 24 hour exposure to CpG. Treatment-responsive epithelial cells were not induced by CpG to express IL-33. Prolonged treatment with IL-13 during differentiation at the air-liquid interface diminished the baseline expression of IL-33 and prevented the subsequent induction of IL-33 by CpG.

CONCLUSIONS: Mucosal innate immunity likely plays an important role in CRSwNP pathogenesis. A definitive link between infectious triggers and the development of Th2 inflammation has been elusive. We have found constitutive IL-33 expression by sinonasal epithelial cells in recalcitrant CRSwNP, which can be further induced by a bacteria-associated molecular pattern. Dysregulated epithelial cell immune interactions between host and environment may contribute to Th2 inflammation in CRSwNP.

ABSTRACT NUMBER: 1786

CONCURRENT RESECTION OF PITUITARY ADENOMA AND PLANUM SPHENOIDALE MENINGIOMA IN A PATIENT WITH CUSHING'S DISEASE: A CASE REPORT

Gopi Shah, MD, Marc Rosen, MD, Christina Mitchell, MD, James Evans, MD, Serge Jabbour, MD

BACKGROUND: The endoscopic approach to pituitary tumors has been well described in the literature and has become the preferred operation at many centers. Endoscopic resection of anterior skull base meningiomas still remains controversial. The coexistence of these two lesions provides an opportunity for simultaneous resection through an endoscopic approach.

CASE REPORT: We report a case of a 42 year old female who presented with a history of Cushing's disease, dysguesia, nasal obstruction and visual disturbance. On imaging, she was found to have a pituitary microadenoma and a 2.7x2.1x1.3cm planum sphenoidale meningioma.

OPERATIVE TECHNIQUE: Using neuronavigation, an endoscopic transnasal resection of an ACTH-producing pituitary tumor was accomplished. This was followed by posterior ethmoidectomy and planum sphenoidale drill-out for intradural resection of meningioma. Repair of the dura was accomplished by fasciae late harvest, and repair of the skull base defect was accomplished by elevation of a nasoseptal pedicled vascularized flap.

DISCUSSION: Endoscopic transphenoidal approach for the simultaneous resection of a pituitary microadenoma and a meningioma is rare, and can be performed with favorable outcomes. Furthermore, the indications and limitations of this single endoscopic approach will be discussed as well as the effect of Cushing's disease on the healing and morbidity of endoscopic transphenoidal surgery.

ABSTRACT NUMBER: 1787

LARGE B-CELL LYMPHOMA OF THE FRONTAL SINUS: A CASE REPORT

Gopi Shah, MD, Marc Rosen, MD, James Evans, MD

OBJECTIVES: Isolated B cell Lymphoma of the frontal sinus is rare, and few cases have been reported. The goal of this presentation is to review a case of a large cell lymphoma found in the frontal sinus presenting initially as chronic rhinosinusitis and subsequently osteomyelitis with erosion of the posterior table of the frontal sinus.

CASE REPORT: We report a case of a 22 year old male who was treated with a functional endoscopic sinus surgery for frontal sinusitis and subsequent frontal sinus obliteration through a bicoronal approach for osteomyelitis. Symptoms of headache and frontal bone swelling continued to persist despite multiple courses of intravenous antibiotics. He was referred to our institution three months after the second surgery. At this time, an MRI showed abnormal signal within the right frontal bone and epidural enhancement extending into the right inferior frontal lobe consistent with infection. A CT showed mottled

appearance of the frontal bone. Both images were consistent with frontal bone osteomyelitis associated with reactive edema or cerebritis, and erosion of the posterior table of the frontal sinus. An endoscopic Draf Type III bilateral frontal drill out with intraoperative neuronavigation was performed. Pathology revealed benign respiratory mucosa with chronic inflammation and focal fat necrosis in the fontal sinus. Several weeks post-operatively, the patient returned with headache, forehead swelling, and tenderness. He was treated with oral antibiotics without improvement. However, his symptoms improved greatly after a course of oral steroids. A bone scan was negative for osteomyelitis. Repeat imaging revealed the frontal sinus outflow tract had narrowed significantly. A revision endoscopic frontal drill out was performed and routine biopsies were taken. Final pathology revealed a large B-cell lymphoma of the frontal sinus.

DISCUSSION: The diagnosis of B cell lymphoma explains this patient's improvement on steroids despite his poor response to aggressive sinus surgery and antibiotics. The unusual occurrence of a B- cell lymphoma or other neoplasm should be considered when an inflammatory process of the frontal sinus fails to respond to aggressive therapy. The importance of biopsy will be addressed. In addition, erosion of the posterior table and obliteration in the management and workup of posterior table defects will be discussed.

ABSTRACT NUMBER: 1788

AIRWAY MANAGEMENT AND PERIOPERATIVE CONCERNS SURROUNDING ENDOSCOPIC SURGERY FOR PITUITARY TUMORS IN ACROMEGALY PATIENTS

Douglas Johnston, MD, Marc Rosen, MD, James Evans, MD

OBJECTIVES: The purpose of this article is to review perioperative and airway concerns in acromegalic patients for the skull base surgeon in order to reduce preventable perioperative complications.

STUDY DESIGN: Review of comprehensive skull base surgery database and literature review.

SETTING: Tertiary Care Hospital

PARTICIPANTS: 19 patients with acromegaly

MAIN OUTCOME MEASURES: Literature review, airway management strategies, cardiovascular and respiratory comorbidities.

BACKGROUND: Patients with acromegaly present unique challenges to skull base surgery and anesthesia teams in the perioperative period, especially with regard to airway management. Abnormal airway anatomy may result from soft tissue hypertrophy and bony alterations. Additional perioperative challenges relate to the management of medical comorbidities and specific surgical technical issues.

RESULTS: Glide scope intubation (video assisted direct laryngoscopy) was required in 7/19 patients (36.8%) and fiberoptic intubation in 3/19 patients (15.8%). Cardiovascular comorbidities (hypertension and conduction abnormalities predominated) were present in 12/19 patients (63.1%) and obstructive sleep apnea, or other respiratory conditions existed in 11/19 patients (57.9%).

CONCLUSIONS: The views presented herein are based on the collective experience of otolaryngologists and neurosurgeons at a dedicated skull base center with several hundred endoscopic skull base surgeries. Preoperative preparation and perioperative awareness of the challenges of acromegalic patients is essential in successful endoscopic skull base surgery in this unique population.

ABSTRACT NUMBER: 1790

REVISION RHINOPLASTY FOR CORRECTION OF DEVIATED NOSE

Yong Ju Jang, M.D.

BACKGROUND: Revision rhinoplasty for deviated nose carries special challenges both for patients and surgeon. Despite the complexity in managing this problem, there is paucity of available literature addressing revision surgery for deviated nose. Therefore, the author will present our experience in revision rhinoplasty, and will suggest a management strategy for this type of patients.

METHODS: Sixty-two patients who underwent revision rhinoplasty for correction of deviated nose between Jan 2003 and July 2008 were retrospectively reviewed. The medical records were analyzed with regard to the specialty of the primary surgeon, grafts used, techniques applied and surgical outcomes. Preoperative and postoperative photographic analysis was performed. Postoperative results were evaluated by two otolaryngologists. Patient's satisfaction was also assessed.

RESULTS: Forty-three patients (69.4%) had previous septoplasty in primary surgery and in 17 of them an additional harvesting of septal cartilage was possible leaving enough L-strut to support septal cartilage framework. When additional grafting for straightening and strengthening the cartilaginous framework was required, autologous costal cartilage was used in 30 cases and homologous costal cartilage was selected in 15 cases. Dorsal augmentation was performed in all 62 patients. In the objective assessment of surgical outcome by independent surgeons, Surgical outcomes were classified as the following; "completely corrected (n = 50)" and "corrected but residual deviation (n = 12)".

CONCLUSIONS: For a successful correction of deviated nose in revision, reconstruction of the septal cartilage framework using septal or costal cartilage is of critical importance. Dorsal augmentation using adequate graft material was required in revision rhinoplasty.

ABSTRACT NUMBER: 1791

CLASSIFICATION AND TREATMENT OUTCOME OF CONVEX NASAL DORSUM DEFORMITY IN ORIENTALS

Ji Heui Kim, M.D., Ji-Sun Kim, Hyung-Min Song, Yong Ju Jang

BACKGROUND: The degree and types of convex nasal dorsum deformity on profile view varies greatly among patients requiring their dorsal hump correction. The authors would suggest a classification system of dorsal hump and its treatment outcome according to the different types of deformity.

METHODS: Ninety-three patients (62 men, 31 women) who underwent rhinoplasty for the correction of convex nasal dorsum deformity from January 2003 to July 2007 were analyzed. By anthropometric measurements of proportional length of hump base and tip height with regard to the nasal length, the convex nasal dorsum was classified into three types: generalized hump, isolated hump, and relative hump with low tip. The postoperative photographic analysis was performed by two independent rhinoplastic surgeons.

RESULTS: Of the 93 patients, 51 (54.8%) had generalized hump, 38 (40.9%) had isolated hump, and 4 had relative hump with low tip. When we compared the surgical techniques required for proper management between the generalized hump and isolated hump group, open approach was used in 92% of generalized hump and in 79% of isolated hump. Osteotomies were conducted in 92% of generalized hump and in 82% of isolated hump. Open roof deformity was closed using spreader grafts in 78% of generalized hump and in 55% of isolated hump. Successful surgical outcome was achievable in 65% of generalized hump, but in 84% of isolated hump.

CONCLUSIONS: Our classification system could help surgeon for tailored management of convex nasal dorsum deformity. Generalized hump needs to be reduced more aggressively to have better surgical outcome.

ABSTRACT NUMBER: 1792

TECHNICAL MODIFICATIONS OF THE PEDICLED NASOSEPTAL FLAP FOR ENDONASAL SKULL BASE RECONSTRUCTION

Amol Bhatki, M.D., Annie Lee, M.D., Carl Snyderman, M.D., Ricardo Carrau, M.D.

OBJECTIVES: he introduction of the expanded endonasal approach to the ventral skull base has posed new challenges for the repair of the resultant skull base defects. The Hadad-Bassagasteguy (HB) pedicled nasoseptal flap has become the cornerstone for providing a reliable, watertight reconstruction. Technical modifications of the HB flap increase its versatility and allow it to accommodate specific skull base defects. This paper reviews the specific anatomy and technique of the HB flap, and also presents our experience with its technical variations.

METHODS: he anatomy and technique of the HB flap was initially studied in cadavers and, later, tested in an extensive clinical experience of over 300 endonasal skull base procedures in 3 years. Modifications have evolved over this experience and data was collected prospectively.

RESULTS: echnical variations include augmentation of the mucosal paddle, adjustments for septal perforations, and strategies to increase reach. Large defects following endoscopic transcribriform resection (n=47) require anterior extension while a bifid flap (n=6) may be used to remucosalize a transsphenoid fenestration of a petrous cholesterol granuloma. Also, the "rescue" flap provides a more conservative technique that allows for the preservation of the flap pedicle and septal mucosa during tumor exposure so that it may be used only if arachnoid penetration occurs.

CONCLUSION: The HB nasoseptal flap is the workhorse for endonasal skull base reconstruction. Technical modifications increase the versatility of this flap without compromising the reliability. Furthermore, variations of this technique may help overcome anatomical obstacles and also provide reconstruction for especially challenging defects.

ABSTRACT NUMBER: 1794

LUMBAR DRAIN UTILIZATION IN ENDOSCOPIC SKULL BASE SURGERY

Ameet Singh, MD, Seth Brown, MD, Gurston Nyquist, MD, Vijay Anand, MD

INTRODUCTION: Lumbar drains are utilized to prevent post-operative cerebrospinal fluid (CSF) leaks and promote skull base healing by decreasing CSF volume and pressure. Inherent risks include headaches, prolonged imobility, pneumocephalus and herniation. The goal was to study patient and tumor characteristics which prompted pre-operative drain placement, report complications, and ascertain predictors of post-operative leaks.

METHODS: A retrospective review of 234 patients undergoing endoscopic skull base surgery was performed. Patient characteristics, tumor type and size, duration of surgery, and complications were analyzed. Pivot table and statistical analysis was performed.

RESULTS: Pre-operative drains were placed in 60 of 234 (25%) patients with preferential placement in patients with higher BMI's(31 vs 27.8), female gender(40 vs 20), and larger tumors (2.81 vs 2.15cm). Drains were more commonly placed in patients with meningiomas, encephaloceles and craniopharyngiomas. Sixteen of 234 (7%) patients had post-operative CSF leaks, 8 of whom had pre-operative drains. Among leak patients, surgery duration (260 vs 176min) and tumor dimension(2.92 vs 2.13cm) were statistically higher in patients with pre-operative drains. Eighty seven percent (14/16) of patients with post-operative leaks were sucessfully managed with lumbar drain, bedrest, and stool softeners. A trend toward increased leakage in patients with meningiomas, encephaloceles, expanded approaches, larger tumors, and higher BMI's was noted.

CONCLUSIONS: Patients with non-sellar lesions, larger tumors, female gender and a higher BMI received preferential lumbar drains pre-operatively. This is likely secondary to anticipation of a complex resections, larger defects, and higher CSF pressure. No statistically significant predictors of post-operative CSF leak were found.

ABSTRACT NUMBER: 1797

SINUS SPACER: A PRELIMINARY ANALYSIS OF EFFICACY & SAFETY

Mark Thong, MD, Vincent Chan, MD, Ray Weiss, MD, Peter Catalano, MD

INTRODUCTION: Standard surgical treatment for chronic inflammatory disease of the ethmoid sinus is endoscopic ethmoidectomy. A new surgical tool, the Sinus Spacer, was recently introduced into clinical practice as an option for minimally invasive treatment of chronic ethmoid mucosal disease. This device is easily and temporarily implanted into the ethmoid complex to enable local targeted delivery of a therapeutic agent for a sustained period of time. The device is easily removed in the office setting. The aim of this study is to evaluate the preliminary outcomes and safety of this device.

METHODS: A prospective study involving 23 patients (a total of 40 ethmoid sinuses) treated with the Sinus Spacer infused with triamcinolone, and followed for 6-months. Outcomes were assessed by interval changes in 20-item Sino-Nasal Outcome Test (SNOT-20) and Lund-Mackay CT scores, respectively. Safety was determined by adverse events.

RESULTS: Overall, the pre-op SNOT-20 mean score was 2.07, versus post-op score of 0.97, an improvement of 1.10 ($p < 0.001$). Pre-op Lund-Mackay mean score was 5.33, compared with post-op score of 2.91, an improvement of 2.42 ($p < 0.001$). When ethmoid sinuses were specifically evaluated, pre-op Lund-Mackay ethmoid score was 1.73, versus post-op score of 1.00, an improvement of 0.73 ($p < 0.001$). There were no intra-op or post-op complications encountered.

CONCLUSIONS: The Sinus Spacer appears safe and effective in treating chromic ethmoid sinus disease. The ability to deliver medication directly to diseased mucosa holds wide-ranging potential.

ABSTRACT NUMBER: 1798

CLINICAL PROTOCOL FOR ENDONASAL SKULL BASE RECONSTRUCTION–THE PITTSBURGH ALGORITHM

Annie Lee, MD, Amol Bhatki, MD, Carl Snyderman, MD, Ricardo Carrau, MD

OBJECTIVES: The introduction of the expanded endonasal approach to the skull base has posed new challenges for the repair of the resultant defect. The evolution of vascularized, pedicled tissue flaps has dramatically increased the reliability and durability of the reconstruction of more extensive defects. This paper reviews the anatomical and technical details of several vascularized flaps and presents an algorithm for their use in skull base reconstruction.

METHOD: These flaps were initially developed in cadavers and then clinically tested in an extensive experience of over 300 cases. An algorithm has evolved as new techniques became available and were incorporated into the clinical experience.

RESULTS: The following flaps provide reconstructive options for a wide range of skull base defects. The nasoseptal flap(n=220) serves as the workhorse because of its generous size and large arc of rotation. If the nasoseptal flap is unavailable, a posteriorly-based inferior turbinate flap(n=11) is a viable option for clival defects, while a posteriorly-based middle turbinate flap(n=5) may be used for sellar and planum sphenoidale defects. The endoscopic pericranial flap(n=7) and the transpterygoid temporo-parietal flap(n=4) may provide coverage of larger cribriform/planum defects, and planum, sella or clivus defects, respectively. Lastly, the Oliver palatal flap can serve to reconstruct defects of the planum, sella, and clivus when other options are unavailable.

CONCLUSIONS: There are various vascularized flaps that may be utilized for the skull base reconstruction after expanded endonasal surgery. Although the nasoseptal flap is often adequate, endonasal skull base surgeons should be familiar with alternative reconstructive options.

ABSTRACT NUMBER: 1800

ENDOSCOPIC REPAIR OF EXPANDED ENDONASAL SKULL BASE DEFECTS USING A STABLE BILAYER "BUTTON" CLOSURE

Marc Rosen, MD, Adam Luginbuhl, MD, James Evans, MD

INTRODUCTION: As experience with the expanded endonasal approach to the skull base has grown, larger and more difficult lesions have been approached. One of the greatest problems to date with the technique has been the closure of the skull base defects and prevention of post-operative CSF leaks. Even with the advent of mucoperiosteal vascularized flaps, such as the pedicle septal flap, which have revolutionized the closure, the skull base repair still begins with a direct repair of the dural defect. This closure is still the first line in the maintenance of a barrier between the intracranial and intranasal spaces. A problem with placing inlay (intradural) and onlay (epidural) dural grafts is the migration of the inlay graft away from the defect prior to healing. Factors affecting graft migration may include physiological and gravitational forces. Many innovative techniques have been described to stabilize these grafts, including compression balloon catheters, "gaskets", and packing. In our experience, the majority of postoperative leaks and reoperation were found to be related to migration of the graft leaving a gap in the dural repair.

SURGICAL TECHNIQUE: The "button" is constructed so that the inlay portion is at least 25% larger than the dural defect and the onlay portion is just large enough to cover the dural defect. The two grafts are sutured together using two to four #4-0 neurolon sutures depending on the size of the grafts. The graft is then endoscopically placed with the inlay portion intradurally and the onlay portion extradurally with the edges of the graft flush with the respective dural surface. If needed, a septal flap, turbinate flap, or free mucosal graft can be used to reinforce the repair.

RESULTS: The benefit of this new technique is the lack of migration of the inlay graft away from the dural defect. The "button" technique seems superior to previous attempts of securing the inlay graft with biological glue, which can actually act as a barrier to graft ingrowth/healing and mucosalization. We have utilized synthetic collagen grafts to perform the "button" repair for pituitary macroadenomas with CSF leaks. For intradural endonasal procedures with open basal cisterns or third ventricle, we utilize autologous fascia to make a "button" repair. This button technique seems to eliminate the need for additional structural support from balloon catheters or fat packing. We have used the button graft in 14 patients to date that have large dural defects for craniopharyngioma, meningioma and cordoma resections and our leak rate has dropped to below 20% and when combined with the mucoperiosteal vascularized flaps (n=10) our leak rate has been 0%.

CONCLUSION: This series of button graft repairs as compared to reconstruction methods during the previous two years where the leak rate approached 60% for large resections is a promising technique for reducing our complications rates.

ABSTRACT NUMBER: 1801

PROSPECTIVE EVALUATION OF 70 NASOSEPTAL FLAPS FOR ENDOSCOPIC RECONSTRUCTION OF HIGH FLOW INTRAOPERATIVE CSF LEAKS DURING ENDOSCOPIC SKULL BASE SURGERY

Adam Zanation, MD, Carl Snyderman, MD, Ricardo Carrau, MD, Amin Kassam, MD

INTRODUCTION: Over the past 10 years, significant anatomic, technical and instrumentation advances have facilitated the exposure and resection of intradural lesions via a fully endoscopic expanded endonasal approach (EEA). The vascularized nasoseptal flap (based on the posterior nasoseptal artery) has become our primary endoscopic reconstructive technique. The goals of this study are to prospectively evaluate the nasoseptal flap and high risk CSF leak variables.

METHODS: Prospective evaluation EEA patients with intraoperative high flow leaks (either a cistern or ventricle open to nasal cavity during tumor dissection) who underwent nasoseptal flap reconstruction.

RESULTS: Seventy consectutive nasoseptal flaps for high flow intraoperative leaks were evaluated prospectively by the primary author. Twelve risk factors were then graded at the time of the operations and correlated to CSF leak outcomes. The overall post operative CSF leak rate was 5.7% (4/70). All four post operative leaks were successfully managed with endoscopic repair and CSF diversion. A multivariate analysis of all 12 risk factors is detailed. Pediatric patients, large dural defects and radiation therapy were noted to be factors in reconstructive failure. One flap death occurred in a patient with prior surgery and proton therapy, this leak was managed with a temporoparietal flap and endonasal repair.

CONCLUSIONS: The nasoseptal flap is an excellent anterior skull base reconstructive technique. Patients with high flow intraoperative CSF leaks had a 94% successful reconstruction rate. Patients with skull base proton radiation therapy are at higher risk for flap failure and preparation for non radiated tissue reconstruction should be discussed with the patient.

ABSTRACT NUMBER: 1802

ENDOSCOPIC MANAGEMENT OF CEREBROSPINAL FLUID LEAKS OF THE SPHENOID SINUS

Annie Lee, MD, Amol Bhatki, MD, Carl Snyderman, MD, Ricardo Carrau, MD

OBJECTIVE: To illustrate a single institution's experience of endoscopic repair of cerebrospinal fluid (CSF) leaks in the sphenoid sinuses with specific details regarding intraoperative and post-operative management strategies.

METHODS: Retrospective review of medical records was performed on patients who underwent endoscopic repair of CSF leaks of the sphenoid sinus in a tertiary care medical center between July 1998 and December 2007.

RESULTS: Twenty-seven patients who underwent endoscopic repair of CSF leaks of the sphenoid sinuses were included in this study. The causes of CSF leaks included posttraumatic, spontaneous, and iatrogenic causes. A transpterygoid approach was utilized in 10 patients. The sinuses were obliterated in 18 cases (67%). Layered reconstruction using banked pericardium, cadeveric dermal allograft, or collagen dural graft matrix was used in 18 cases (67%) and a pedicled nasoseptal flap was used in 9 cases (33%). Four patients had persistent or recurrent CSF leak necessitating a revision repair. Fourteen patients had a lumbar drain placed following their repair. All of these patients underwent a lumbar puncture 24 hours after the removal of the drain with subsequent ventriculoperitoneal shunting if the opening pressure exceeded 20cm H2O. Four patients had a shunt placed according to this algorithm.

CONCLUSION: Endoscopic repair of the sphenoid sinus CSF leak is a highly successful approach. The repair strategies evolved towards vascularized pedicled flap as our experience with skull base reconstruction grew. Also, an algorithm was developed to quickly recognize and efficiently treat those patients with high-pressure hydrocephalus as the cause of their CSF leak.

ABSTRACT NUMBER: 1804

COMPARISON OF DISEASE-SPECIFIC QUALITY OF LIFE INSTRUMENTS IN THE ASSESSMENT OF CHRONIC RHINOSINUSITIS

Jamie Litvack, MD, MS, Timothy Smith, MD,MPH

INTRODUCTION: Multiple disease-specific quality of life (QOL) instruments exist for chronic rhinosinusitis (CRS), leading to confusion about the potential role and application of each instrument. The purpose of this study was to compare two instruments, the Rhinosinusitis Disability Index (RSDI) and the Chronic Sinusitis Survey (CSS). The results are discussed in the context of a review of the validated disease-specific QOL instruments in the CRS literature and the strengths and weaknesses of various approaches.

METHODS: 481 patients from a multi-institutional prospective cohort study were examined. Pearson's correlation coefficients between two instruments, the RSDI and CSS, were calculated. A systematic review of the adult English-language literature was then performed using MEDLINE to identify the types and frequencies of disease-specific QOL instruments currently available and to determine the validity, reliability and sensitivity to change of each instrument.

RESULTS: Total RSDI and physical RSDI subscale moderately correlated with CSS symptom scores (r= 0.44, r=0.54; both p<0.001); physical RSDI also moderately correlated with CSS total score (r=0.41; p<0.001). RSDI did not correlate with CSS medication scores (all r≤0.12). Patients with asthma, allergy, and aspirin intolerance reported worse disease-specific QOL whereas patients with nasal polyposis reported better QOL. The three most frequently referenced validated disease-specific QOL instruments in the adult CRS literature were the Sinonasal Outcome Test (SNOT-20), CSS, and RSDI. Several other instruments also exist; many are modifications to older measures.

CONCLUSIONS: Disease-specific QOL is an important and informative measure of CRS. Different instruments provide complementary information regarding patients' disease experience.

ABSTRACT NUMBER: 1805

ENDOSCOPIC TRANSSPHENOIDAL APPROACH TO CRANIOPHARYNGIOMAS

Adam Luginbuhl, MD, Scott Troob, Brian McGettigan, MD, Marc Rosen, MD

INTRODUCTION: The following is our experience with endonasal resection of craniopharyngiomas.

METHODS: The TJUH Minimally Invasive Cranial Base Center database and surgical pathology database were queried for all patients who underwent endoscopic resection of craniopharngiomas. Inclusion criteria included pure endoscopic endonasal resection and planned second stage procedures after a craniotomy approach. Completeness of tumor resection was determined by surgeon-input and postoperative MRI.

RESULTS: The final patient population consisted of 13 patients who under went a total of 14 transnasal transsphenoidal (endonasal) endoscopic resection of craniopharyngiomas from November 2005 to June of 2008. Of the 13 patients, 3 had previous resections of the tumor by frontotemporal (N=2) or temporal (N=1) craniotomy. One patient with a >10 centimeter, calcified craniopharyngioma underwent endonasal resection as a planned second stage procedure to an interhemispheric, transcallosal approach. Ninety three percent (13/14) of the patients presented with visual complaints and 11of those 13 (85%) had visual improvements after surgery. Based on surgical observation and post op MRI resection was considered complete in 4/14 cases. In the remaining 10 cases gross residual tumor was left unresected, due to its adherence to critical neurovascular structures. Of the 14 surgical procedures that were performed, 8 were free of postoperative complications. The remaining 6 patients developed CSF leaks which resolved with immediate surgical repair and/or temporary lumbar drains. One of these patients required a VP shunt for hydrocephalus. Preoperative diabetes insipitus was present in 4/14 cases. None of these cases had resolution of DI postoperatively and of the 10 cases with no preoperative DI only one went on to have persistent DI at time of discharge. No vascular injuries or deaths occurred in this series.

CONCLUSIONS: Endonasal resection of craniopharyngiomas can provide equivalent or better results to the traditional approaches to these challenging tumors. Compared to historic controls, we feel that the endonasal approach can provide excellent resections, shorter hospital stays, and minimal long term complications. With experience, the degree of tumor resection and of successful cranial base repair without CSF leak both improve. As the technology, instruments, and the collective experience with endonasal surgery advances, this technique will likely become the primary surgical means of treating craniophayngiomas.

ABSTRACT NUMBER: 1806

"GASKET-SEAL" RECONSTRUCTION OF THE SELLAR FLOOR USING NON-AUTOLOGOUS MATERIAL IN REVISION ENDOSCOPIC PITUITARY SURGERY

Abtin Tabaee, MD, Raj Shrivastava, MD

INTRODUCTION: A variety of techniques and materials for reconstruction of the sellar floor following endoscopic pituitary surgery have been described. Reconstruction in the setting of revision surgery, high volume intraoperative cerebrospinal fluid (CSF) leak and large skull base defect represents a unique challenge.

METHODS: The medical records of three patients undergoing revision endoscopic pituitary surgery with high volume intraoperative CSF leak and a large skull base defect are described. Reviewed are the patient and tumor demographics and outcomes at last follow up. The "gasket-seal" technique of sellar repair using non-autologous material is described.

RESULTS: The indications for surgery were macroadenoma with suprasellar extension and optic nerve compression in 2 patients and growth hormone secreting tumor (acromegaly) in 1 patient. All patients underwent a multilayered closure consisting of autologous fat placed in the tumor cavity followed by reconstruction of the sellar floor with an oversized sheet of acellular dermal matrix placed over the skull base defect and sunken into the sella with a bioabsorbable miniplate. No patients underwent perioperative lumbar drainage. There were no instances of postoperative CSF leak and all patients remained free of leak at follow up. Postoperative nasal endoscopy revealed a well mucosalized sphenoid sinus in all patients.

CONCLUSION: Sellar reconstruction following endoscopic pituitary surgery represents an ongoing technical challenge. A robust closure is especially required in revision cases with high volume intraoperative CSF leak. The early experience with the "gasket-seal" closure using non-autologous material appears favorable.

ABSTRACT NUMBER: 1807

LOCAL MUCOSAL FLAPS IN THE MANAGEMENT OF POST-SPHENOIDOTOMY STENOSIS

John Lee, MD, Jayakar Nayak, MD, Alexander Chiu, MD

BACKGROUND: Traditional endoscopic techniques at enlarging the natural sphenoid ostium is an effective procedure for the majority of sphenoid sinus disease. However, in the background of significant bony inflammation or infection, post sphenoidotomy stenosis can be a difficult long term problem to manage and treat.

OBJECTIVE: To describe our technique of using local mucosal flaps in the management and prevention of post-sphenoidomy stenosis.

METHODS: This was a prospective study of patients undergoing our described procedure in the Division of Rhinology at the University of Pennsylvania. Patient etiologies, intra-operative findings, as we as long term sphenoid patency rates were recorded.

RESULTS: We will first describe our technique of using local flaps in the prevention and management of post-sphenoidotomy stenosis (video). Indications for this procedure in our series of patients included sphenoid neo-osteogenesis and fungal mycetoma. This procedure resulted in decreased crusting in the post-operative period while achieving 100% long term patency rates.

CONCLUSION: The use of local mucosal flaps appears to be an effective technique at managing and preventing the development of post-sphenoidotomy stenosis.

ABSTRACT NUMBER: 1808

LIMITATIONS OF THE PEDICLED NASOSEPTAL FLAP FOR ENDOSCOPIC RECONSTRUCTION OF TRANSSELLAR SKULL BASE DEFECTS IN PEDIATRIC PATIENTS

Rupali Shah, MD, Ricardo Carrau, MD, Carl Snyderman, MD, Adam Zanation, MD

INTRODUCTION/PURPOSE: Retrospective data has shown an overall 11% postoperative CSF leak following expanded endoscopic approaches (EEA) in pediatric patients. Anecdotal data by the senior author revealed a limitation in flap size in the youngest patients. We discuss the limitations of the nasoseptal flap reconstruction for transsellar defects in pediatric patients.

METHODS: In a prospective series of 150 nasoseptal flaps, four pediatric patients were identified who underwent transsellar EEA with nasoseptal flap reconstruction. Patients were analyzed for intraoperative available flap area compared to defect size and defect coverage. In addition, age stratified radioanatomic correlations were performed in 50 CT scans.

RESULTS: Clinical data revealed inadequate flap coverage of transellar defects in patients <12 years; this was significant ($p<0.05$) in comparison to a cohort of patients 13-20 years old and in adult patients (>20 years). Radioanatomic data revealed septal length to be smaller than potential sphenoidal/transsellar defect length in patients < 7years. Rate of septal growth is highest between 10 and 13 and the ratio of septum to the largest anterior skull base defect is over 1.0 after the age of 13/14.

CONCLUSIONS: The nasoseptal flap may be inadequate for reconstruction of endoscopic transellar defects in the youngest children (<7 years old–high risk and 7-13–intermediate risk). In these cases, preoperative counseling with parents is critical and the patient should be consented for fat bolstering if needed. The effect of the nasoseptal flap on craniofacial growth has not yet been determined but is a consideration and should be discussed preoperatively.

ABSTRACT NUMBER: 1810

OUTCOME RESULTS OF ENDOSCOPIC VERSUS CRANIOFACIAL RESECTION OF SINONASAL MALIGNANCIES: A POOLED-DATA ANALYSIS

Thomas Higgins, MD, Brian Thorp, BS, Brad Rawlings, MD, Joseph Han, MD

INTRODUCTION: Endoscopic approaches to the management of sinonasal malignancies are now being described. This study aims to conduct a systematic review with a pooled-data analysis to compare outcomes of endoscopic versus craniofacial resection of sinonasal malignancies.

METHODS: A search was conducted of MEDLINE (1966 to 2008), EMBASE (1980 to 2008), Cochrane Central Register of Clinical Trials (CENTRAL), Cochrane Database of Systematic Reviews, clinicaltrials.gov, and The National Guideline Clearinghouse databases and supplemented by references in retrieved articles. All authors used a detailed list of inclusion and exclusion criteria to determine articles eligible for final inclusion. The authors extracted data regarding study criteria appraisal, sinonasal malignancy characteristics, survival outcomes, and recurrence. Kaplan-Meier survival and locoregional control rates were calculated and compared using the Log-rank test.

RESULTS: Of the 2,314 citations reviewed, the search yielded 15 case series with individual data on 226 patients. The most common malignancies were esthesioneuroblastoma (47%), adenocarcinoma (24%), and undifferentiated carcinoma (22%). The overall 5-year survival rate for the sample was 56.5% (SE ±3.8). Among low-stage malignancies (T1-2 or Kadish A-B), the endoscopic and open approaches demonstrated no statistically significant difference in outcome results. The 5-year overall survival was 87.4% (SE ±5.3) in the endoscopic group versus 76.8% (SE ±8.3) for open approaches [P=0.351]; disease-specific survival was 94.7% (SE ±3.7) versus 87.7% (SE ±6.7) [P=0.258]; and locoregional control rate was 89.5% (SE ±5.0) versus 77.2% (SE ±10.4) [P=0.251].

CONCLUSION: Transnasal endoscopic resection appears to be a reasonable alternative to craniofacial resection in the management of low-stage sinonasal malignancies.

ABSTRACT NUMBER: 1814

AN INITIAL CLINICAL EVALUATION OF A THREE DIMENSIONAL ENDOSCOPE SYSTEM FOR ENDOSCOPIC SINUS AND SKULL BASE SURGERY

Adam Zanation, MD, Rupali Shah, MD, William Leight, MD, Anand Germanwala, MD

PURPOSE: As endoscopic surgery has progressed into the realm of skull base surgery, one criticism is that the 2D endoscope does not allow for microneurovascular dissection like the open microscopic approaches. Recently, advances have been made to improve visualization with the development of three-dimensional (3-D) endoscope systems. In order to evaluate the utility of a 3-D endoscope system (VISIONSENSE), we performed a small clinical cohort with the system as well as a laboratory evaluation to attempt to measure which tasks the 3D endoscope was most helpful/limited.

METHODS: Prospective clinical cohort and controlled laboratory evaluation of the 3D endoscope.

RESULTS: Eight endoscopic cases were performed with the 3D endoscope. Four skull base and four functional sinus cases. Both single handed (FESS) and two handed (skull base) surgery was performed. Analysis of the system was evaluated by the resident surgeon, the attending otolaryngologist and the attending neurosurgeon if he was involved in the case. The utility and limitations of the system was recorded after each case. A series of laboratory exercises was created to evaluate the usefulness of the system in various endoscopic tasks. The results showed trends for improved accuracy with the 3D system. We discuss and show (via video presentation) our operative experience and what we feel are the limitation of the current system as well as strength for future development.

CONCLUSIONS: The 3D endoscope is a promising tool for endoscopic sinus and skull base surgery. We discuss the advantages, limitations and potential future for such technology in our field.

ABSTRACT NUMBER: 1815

CURRENT PRACTICE IN THE USE OF SYSTEMIC STEROIDS IN CRS

Amy Anstead, S. Joe, Kristen Pytynia

BACKGROUND: Systemic steroids have been widely used for CRS, although paucity exists in the literature of trials determining efficacy, dosing schedule, and side affects of this treatment. We set out to identify which disease variations of chronic rhinosinusitis are considered appropriate for systemic steroid treatment by practicing Rhinologists and to determine awareness of steroid side affects among these physicians.

METHODS: Survey distributed to practicing Rhinologists registered with the American Rhinologic Society, American Academy of Otolaryngologists and the American Academy of Otolaryngic Allergy. The survey consisted of three sections: (1) Questions regarding oral steroid use in eighteen different CRS disease states; (2) Components of CRS in which oral steroids are beneficial; (3) Common side effects of oral steroids. Demographic data on each clinician was also obtained.

RESULTS: 353 surveys were collected and analyzed. We found that steroids were widely used for nasal polyposis, even if no significant symptoms were present. There was a decrease in steroid use with medical comorbidities, but still >50% of physicians stated they would still use the medication. There was more use of oral steroids as initial therapy in patients with nasal polyposis. Use in CRS without polyps more than doubles when refractory to initial medical management. This trend is across all clinical situations, including multiple medical comorbidities. Side effect profiles were largely acknowledged by Otolaryngologists.

CONCLUSION: This survey shows that oral steroids are widely used among Rhinolgists. Physicians are aware of the possible side effects and use the medication especially in the treatment of CRS with polyposis.

ABSTRACT NUMBER: 1816

ANTIMICROBIAL LIPID COMPOSITION OF SINUS SECRETIONS IN PATIENTS WITH AND WITHOUT CHRONIC RHINOSINUSITIS

Jivianne Lee, MD, Mike Jansen, BS, David Keschner, MD, Edith Porter, MD

INTRODUCTION: Airway secretions possess intrinsic antimicrobial properties that contribute to the innate host defense of the respiratory tract. These microbicidal capabilities have largely been attributed to the presence of antibacterial polypeptides. However, recent investigation has demonstrated that lipids also exhibit similar antimicrobial properties. The purpose of this study was to determine whether sinus secretions contain such antimicrobial lipids and to compare the lipid composition in patients with and without a history of CRS.

METHODS: Maxillary sinus fluid was obtained via antral lavage through the canine fossa from subjects with (9) and without (10 controls) a history of CRS. Following specimen collection, lipid quantification was performed by subjecting specimens to lipid extraction according to Bligh & Dyer followed by reverse phase HPLC on a C18 PA2 column. Lipid contents (total, cholesterol + cholesteryl esters, and cholesteryl esters) were then calculated based on the extracted volume and protein content.

RESULTS: Antimicrobial lipids were identified in the maxillary sinus secretions of patients with and without CRS. However, levels of lipid composition differed between the two groups, with CRS patients exhibiting statistically significantly greater amounts of all classes of lipids (total, cholesterol, and cholesteryl esters) when compared to controls.

CONCLUSIONS: Sinus secretions of patients with CRS demonstrate elevated levels of antimicrobial lipids compared to controls. This upregulation suggests that host-derived lipids act as mediators of mucosal immunity in CRS. Further study is necessary to determine if such antimicrobial lipids function in isolation or synergistically with antibacterial peptides in conferring such inherent microbicidal properties.

ABSTRACT NUMBER: 1818

AN ADJUSTABLE IMPLANT FOR NASAL VALVE DYSFUNCTION: A 3 YEAR EXPERIENCE

Charles Hurbis, MD

OBJECTIVE: To measure the degree of improvement and the maintenance this improvement when using the Monarch Nasal Implant for surgically correcting the dysfunctional nasal valve.

METHODS: We present our long term data for the Monarch Implant. Currently, over forty patients have been implanted with follow-up extending beyond 36 months for 9 of the patients. Implant effectiveness was determined through the use of anterior acoustic rhinomanometry and a NOSE format subjective patient questionnaire. These studies were administered pre-operatively and at 1–3 month intervals post-operatively.

RESULTS: Rhinomanometry studies and patient questionnaires revealed a significant initial improvement in the internal nasal valve areas and an improvement in patient symptomatology respectively. These results were maintained or even improved at 36 months. The cosmetic changes imparted by the implant were acceptable to the patients in exchange for the symptomatic improvement they receive. The average patient age for this study was 66 years and this implant clearly is designed for correction of nasal valve problems of a senile nature. The avoidance of complications, which should be rare when the implant is properly used, will be discussed.

CONCLUSIONS: The Monarch Nasal Implant provides a consistent and lasting correction of nasal valve dysfunction in the geriatric patient with minimal downside when properly used.

ABSTRACT NUMBER: 1819

COMPARISON OF EXTERNAL RHINOPLASTY VERSUS ENDOSCOPIC APPROACH TO TRANSSPHENOIDAL SELLAR MASS RESECTION

Naveen Bhandarkar, MD, Stephanie Joe, MD, Mike Yao

OBJECTIVE: 1) Compare outcomes between the external rhinoplasty versus endoscopic approach to access the sella and discuss advantages of each. 2) Compare outcomes in endoscopic versus microscope assisted resection of sellar masses.

METHODS: Retrospective chart study. External rhinoplasty approach is described in detail.

RESULTS: 100 total patients were studied. Mean follow-up was 18 months. 48 patients underwent an external rhinoplasty approach with microscope-assisted resection. Interventions to correct functional nasal deformities were performed in greater than 50% of patients, including cartilage grafting and septoplasty. 52 patients had an endoscopic approach to expose the sella, of which 22 had endoscopic and 30 had microscope-assisted resection. Post-operative incidence of diabetes insipidus or hypopituitarism was higher for the purely endoscopic group (55% vs 23%). However, frequency of residual tumor was higher in microscope assisted resection group (53% vs 23%). With regards to microscope-assisted resection, 20% of patients in the endoscopic group had intranasal complications including septal perforation and synechiae formation requiring intervention compared to 0% in the external group. Incidence of post-operative cerebrospinal fluid leak was equally rare in all groups.

CONCLUSIONS: Advances in technology have resulted in a trend towards a purely endoscopic approach for resection of sellar masses, but we should not overlook the external rhinoplasty approach and its potential advantages in exposure and improving quality of life in carefully selected patients. Intranasal complications are fewer in the external versus endoscopic approach when the microscope is used. The difference between outcomes of endoscopic versus microscope-assisted resection following an endoscopic approach may relate to the improved angled visualization allowing for more complete resection of tumors.

ABSTRACT NUMBER: 1822

LATERAL CRUS PULL-UP FOR THE COLLAPSE OF EXTERNAL NASAL VALVE: RHINOMANOMETRIC AND RHINOMETRIC STUDY.

Ignazio Tasca, MD, Giacomo Ceroni, MD

INTRODUCTION: Collapse of the nasal vestibule during inspiration is a frequently encountered condition, often caused by weak or medially displaced lateral crura in the lower lateral cartilages. Various surgical techniques to restore the external nasal valve have been described. We herein report our experience on the lateral crus pull-up technique and evaluate the effectiveness of this procedure by means of rhinomanometry and acoustic rhinometry.

METHODS: Fourteen patients (8 males, 6 females) with a mean age of 36 years (range: 25-41 years), suffering from impaired nasal breathing due to external nasal valve collapse were recruited for this study. Rhinomanometry and acoustic rhinometry were performed before the operation and at 1-6-12 month follow-ups. The lateral crura were mobilized using a delivery approach, then rotated in a superolateral direction and held in place by bringing a suture through the skin.

RESULTS: There were no intraoperative or postoperative complications. All patients expressed immediate substantial improvement in their nasal breathing and this level of satisfaction persisted at end point follow-up. Rhinomanometry showed a decrease in nasal resistances, while acoustic rhinometry revealed an increase in minimal cross-sectional areas. These results remained stable at 1 year follow-up.

CONCLUSIONS: We demonstrated that lateral crus pull-up is an effective method to increase the vestibule width, by providing a superolateral rotation of the lateral crura and is useful to improve nasal respiration by giving additional support for the lateral wall of the nasal vestibule.

ABSTRACT NUMBER: 1823

NASAL DORSUM COSMETIC CONTOUR BY CARTILAGINOUS SANDWICH GRAFT TECHNIQUE

Ignazio Tasca, MD, Giacomo Ceroni, MD

INTRODUCTION: A very frequent cause of secondary rhinoplasty is the occurrence of residual nasal dorsum irregularities after a primary procedure. This makes often the patient unsatisfied and asking for a revision surgery. In order to prevent this possible event, we have developed a technique effective for the camouflage of slight nasal dorsum irregularities as final step of rhinoplasty. This procedure can be useful also for rhinoplasty requiring minimal to moderate dorsal augmentation.

METHODS: 36 patients undergoing rhinoseptoplasty in our ENT Department were treated by nasal dorsum camouflage using the cartilaginous sandwich graft technique. After the infracture of nasal bonies, irregularities of nasal dorsum were appreciated digitally. Graft consisted of two thin strips of SpongostanTM containing autologous crushed cartilage, previously harvested from the septum. Graft is inserted into position after elevating the dorsal skin. Stabilization is obtained by undermining the dorsal skin only to the extent need for graft insertion so that the resulting tight pocket restricts the movement of the graft.

RESULTS: This technique has yielded consistently good aesthetic results: after dressing removal, nasal dorsum appeared smooth and regular in all patients. These results remained stable at 1 year follow-up.

CONCLUSIONS: Cartilaginous sandwich graft technique is a reliable cosmetic procedure for the contouring of residual nasal dorsum irregularities. SpongostanTM serves as a carrier and support for the cartilage implant. After sponge resorption, cartilage remains in situ surrounded by a thin connective tissue capsule. Autologous septal cartilage, being harvested from the same operative field, does not determine an increase in morbidity.

ABSTRACT NUMBER: 1824

SEPTOPLASTY IN CHILDREN BY ENDONASAL APPROACH: RESULTS AT LONG-TERM FOLLOW-UP

Ignazio Tasca, MD, Giacomo Ceroni, MD

INTRODUCTION: The opportunity of septoplasty in childhood is still a matter of open debate in literature, since it is thought that a surgical procedure on a developing structure can produce some adverse effects on the normal facial growth; on the other hand, a percentage of septal deformities are bound to worsen following the growth of the nose. In order to clarify this topic, we report our experience on septoplasty in children, analyzing the anatomic and functional results in a long-term.

METHODS: 44 patients, 25 males and 19 females, aged between 5 and 12 years (average: 8.5 years), underwent septoplasty by endonasal approach. All the patients were reassessed after a 9 year follow-up (range 5-12 years) by means of morphometry, rhinomanometry, and acoustic rhinometry.

RESULTS: Complications did not occur during or after surgery. During the last follow-up, nasal septum was in axis in 36 patients. In these patients, rhinomanometric and rhinometric measurements revealed normal tracings. The remaining 8 patients, manifesting a residual septum deformity, were scheduled for a revision surgery. Morphometric evaluation did not identify any growth retardation in all patients.

CONCLUSIONS: Pediatric septoplasty is indicated in selected cases of congenital or posttraumatic obstructive nasal septum deformity and in cases of symptomatic septal alterations that are associated with recurrent inflammatory diseases of the upper airways. However, recurrent septum pathology may occur even several years after surgery. Therefore, adequate information should be given regarding long follow-up and the possibility of a second operation after the adolescent growth spurt.

ABSTRACT NUMBER: 1827

ENDOSCOPIC DACRYOCYSTORHINOSTOMY WITH MUCOSAL FLAP FIS SILICONE STENT NECESSARY?

Prof. DeHui Wang, HuaPeng Yu, MD, Prof. ChaoPing Zang, Prof. HouYong Li

OBJECTIVE: Many kind of new innovative surgical techniques are being to introduced continually to increase the successful rate of endoscopic dacryocystorhinostomy (DCR). The aim of this study is to present our experience of endoscopic DCR with mucosal flap, but without silicone tubing stent for the patients with chronic nasolacrimal duct obstruction.

METHODS: From January 2003 to DEC 2007, thirty four consecutive endoscopic DCR procedures were performed in 31 patients with post sac lacrimal duct obstruction, with 3 patients having bilateral surgery. The age of patient ranged from 8 to 52 years old (average, 34 years old). The mean duration of postoperative follow-up was 16 months (ranging from 3 to 60 months). Surgical success was defined as complete relief of epiphora and patent ostium of nasolacrimal drainage tract on endoscopic examination.

RESULTS: Surgical success rate was 94.1% (32/34), postoperative endoscopic examination revealed that 3 patients (8.8%) had granulation tissue at the rhinostome site. No other severe complications were observed.

CONCLUSIONS: Considering the similar success rate, but less granulation formation comparing , we suggest endoscopic dacryocystorhinostomy with mucosal flap, but without intubation as the management of choice of postsaccal obstruction of lacrimal canal. The silicone stent is not necessary for endoscopic dacryocystorhinostomy.

ABSTRACT NUMBER: 1828

ENDOSCOPIC MODIFIED ENDONASAL DENKER OPERATION FOR MANAGEMENT OF TUMOR IN PTERYGOPALATINE AND INFRATEMPORAL FOSSAE

Prof. DeHui Wang, JingJing Wang, MD, HuaPeng Yu, MD, Thomas Pasic, MD

OBJECTIVE: Although endoscopic approaches allow good visualization and access for many areas of the skull base, the lesions in the pterygopalatine fossa (PPF) and infratemporal fossa (ITF) are a challenge for otolaryngologists. The aim of our report is to describe an endoscopic modified endonasal Denker operation for the treatment of nonmalignant tumors in the PPF and ITF.

METHODS: From January 2004 to June 2007, five patients who had tumors in the PPF and/or ITF and underwent surgical resection of the tumors with the endoscopic modified endonasal Denker operation, were reviewed regarding demographics, preoperative images, tumor cell type, surgical techniques and outcomes.

RESULTS: Five patients underwent the procedure mentioned above; 3 females and 2 males with a mean age of 38 and a range from 21 to 58 years of age. All patients had adequate exposure and total tumor resection with the endoscopic modified endonasal Denker operation. None of the patients required an external approach for tumor extirpation. There were no major postoperative complications. Transient epiphora and hypoesthesia in the infraorbital nerve distribution resolved fully in all affected patients.

CONCLUSION: The Endoscopic modified endonasal Denker operation for the management of lesions of the PPF and ITF provides excellent exposure and results with good hemostasis and low morbidity. This approach is a viable alternative to the open approaches to these areas.

ABSTRACT NUMBER: 1829

ENDOSCOPIC REMOVAL OF A SILENT MIDDLE TURBINATE ANGIOFIBROMA

Ping-Hung Shen, MD

Angiofibroma is a rare nasopharyngeal tumor that primarily occurs in adolescent males. Extranasopharyngeal angiofibroma is relatively rare, and the most affected site is the maxillary sinus reported in the literature. We present an extremely rare case of extranasopharyngeal angiofibroma in a 42-year-old man arising from the right middle turbinate. The tumor was incidentally found during an operation for endoscopic inferior turbinoplasty. We report this case of an extranasopharyngeal angiofibroma and discuss the possibility of endoscopic resection of this tumor without preoperative embolization.

ABSTRACT NUMBER: 1832

A PILOT STUDY OF A CHINESE VERSION OF THE UNIVERSITY OF PENNSYLVANIA SMELL IDENTIFICATION TEST FOR APPLICATION IN TAIWAN

Rong-San Jiang, MD, Mao-Chang Su, MD, Kai-Li Liang, MD, Jiun-Yih Shiao, MD

OBJECTIVES: The 40-item University of Pennsylvania Smell Identification Test (UPSIT) is the most widely used smell test in the world. It has the advantages of high reliability, convenience, and accuracy. Presently, culturally modified versions of this test are available in 12 languages. This study describes the first assessment of a prototype Chinese version of the UPSIT (UPSIT-C) that has been translated into traditional Chinese for administration in Taiwan.

METHODS: The American English language version of the UPSIT and the UPSIT-C were administered to 40 healthy Taiwanese subjects on two test occasions separated from one another by two weeks.

RESULTS: The mean (SD) UPSIT score was 28.2 (3.8) for the first test administration and 28.4 (4.5) for the second. The mean (SD) UPSIT-C score was 33.2 (2.9) for the first administration and 32.6 (3.8) for the second. The UPSIT-C scores were significantly higher than those of the UPSIT on both test occasions (ps < 0.0001). Despite a marked attenuation of test scores due to the narrow age range assessed, Pearson correlations computed across the two test occasions were positive and statistically significant for both the UPSIT and the UPSIT-C (respective rs = 0.81 & 0.63, ps < 0.001).

CONCLUSION: As expected, the scores on the prototype UPSIT-C were significantly higher than those on the American UPSIT when administered to a Taiwanese sample. Both versions of the UPSIT were stable across repeated test sessions.

ABSTRACT NUMBER: 1833

FLAP RECONSTRUCTION OF NASAL SEPTAL PERFORATION

Yaser Khalil, MD, Ahmad Al barah, MD

OBJECTIVE: In this work we compare between bilateral bipedicled nasal mucosal flaps and upper buccal mucosal flap from upper lip,in closing nasal septal perforation.

STUDY DESIGN & SETTING: We reviewed a sample of 12 patients all having septal perforation. All patients underwent preoperative and postoperative C.T scan nose and paranasal sinuses (P.N.S). and diagnostic endoscopy . The patients were randomized into two groups each group includes six patients . Group (A) : Six patients were managed by using bilateral bipedicled nasal mucosal flap through an external approach rhinoplasty. Group (B) : Six patients were managed by using superior labial flap using external approach rhinoplasty.

RESULTS: Complete closure of the perforation in group (A) patients was achieved in four cases, one of the remaining two cases showed central perforation 1.5 cm while the other one showed complete failure. Regarding results of the patients in group (B) five patients showed complete closure, only one patient shows slight posterosuperior perforation .

CONCLUSION: Reconstruction of nasal septal perforation using bipedicled nasal mucosal flap is a good method for repair particularly when using wide approach like external rhinoplasty approach but it needs high skills to elevate the nasal mucosal flap & suturing without tension on suture line. in the other method of repair of septal perforation using upper labial flap gives good results also but the patients complaints not improved greatly.

ABSTRACT NUMBER: 1834

QUALITY OF LIFE IS IMPROVED BY ENDOSCOPIC SINUS SURGERY IN NASAL POLYPOSIS WITH ASTHMA

Anders Ehnhage, MD, Petter Olsson, MD, Prof. Steven Nordin, Pär Stjänre, MD

INTRODUCTION: Nasal polyposis (NP) is associated with asthma. The aim of this study was to investigate the health impact of NP with asthma and to study effects of endoscopic sinus surgery (ESS), as well as addition of fluticasone propionate nasal drops (FPND), on health related quality of life (HRQoL) in this patient group.

METHODS: A prospective 21-week study of 68 patients, with NP and asthma. Effects of ESS were measured with Study 36-Item Short Form (SF-36). A randomized, double-blind, placebo-controlled 14-weeks phase measuring additive effects of FPND 400µg twice daily was included.

RESULTS: At baseline HRQoL was significantly decreased in both Physical Component Summary, PCS, (45 vs 48, p=0.049) and Mental Component Summary, MCS, (43 vs 51, p<0.001), as well as in six out of eight domains compared with the reference population. ESS significantly improved five out of eight SF-36 domains as well as PCS (p=0.027) and MCS (p=0.021) after 5 weeks. We found significant additional benefit of FPND 400µg twice daily on three domains (RP, p=0.002; VT, p= 0.007; SF, p=0.002). The increase in HRQoL with FPND 400µg twice daily reached reference population levels in all domains, as well as in both PCS and MCS, 5 weeks after ESS.

CONCLUSIONS: ESS has benefits on HRQoL. FPND 400µg twice daily can be added to improve, and to reach population levels of, HRQoL already 5 weeks post-ESS. Physicians should evaluate HRQoL and consider ESS in their assessment of these patients.

ABSTRACT NUMBER: 1835

THE EFFECT OF POSTAURICULAR FASCIAL FLAP IN OTOPLASTY

Yaser Khalil, MD

BACKGROUND: Prominent ears are the most common congenital deformity of the external ear. Corrective otoplasty is a commonly performed procedure but the multitude of surgical techniques described suggests that the ideal procedure is yet to be found. This paper compares the addition of a post-auricular fascial flap to the posterior suturing technique and cartilage scoring, with the posterior suturing technique and cartilage scoring, without the post-auricular fascial flap in terms of morbidity and aesthetic outcome.

PATIENTS AND METHODS: 50 patients underwent otoplasty in, from August 2004 to September 2006. Considering every ear on the same patient as an independent variable, a total of 80 procedures have been performed (30 bilateral and 20 unilateral). The patients were divided into two groups: Group A: (31 patients) with 51 ears :Posterior suturing and anterior scoring with post-auricular fascial flap ;Group B: (19 patients) with 29 ears: Posterior suturing and anterior scoring without post-auricular fascial flap.

RESULTS: The recurrence rate was 2.5% and 10% in Groups A and B respectively ($p < 0.0214$) (HS). Complications were more common in Group B (25%) compared to Group A (2.5%) ($P < 0.0208$)(HS). Late complications were also minimum in Group A, compared to Group B.

CONCLUSION: The fascial flap is a simple and safe procedure and seems to act as a double breasting layer over the sutures preventing extrusion, increasing postauricular support, and reducing recurrence.

ABSTRACT NUMBER: 1840

TRANSNASAL ENDOSCOPIC IMAGE-GUIDED ORBITAL APEX SURGERY

Chester Griffiths, MD, Howard Krauss, MD

Image-Guidance has emboldened surgeons while at the same time allowed safer surgery. Transnasal Endoscopic Orbital Surgery has been described in the treatment of Nasolacrimal Duct Obstruction and Graves' Ophthalmopathy and as an approach to optic canal decompression in cases of Traumatic Optic Neuropathy. To expand the utility of this technology, we have utilized a Transnasal Endoscopic Image-Guided approach to biopsy or excise medial orbital apex tumors since 2001. Collaboration of a Surgical Neuro-Ophthalmologist and Head and Neck Surgeon has brought together unique skills to achieve a less invasive, safer and more cost effective treatment for these disease processes which can now be treated on an outpatient basis. Specifically in the case of orbital apex tumors, obviating the need for a neurosurgical or extended lateral approach affords a greatly decreased morbidity. Case presentations, including our first transnasal orbital apex tumor excision performed in 2001 will detail our surgical planning with emphasis on radiologic anatomic boundaries of dissection leading to a safe surgical approach. Potential disease states applicable to this approach will be presented to highlight our 8 year experience.

ABSTRACT NUMBER: 1841

COMPARISON OF RETROPALATAL AND RETROGLOSSAL AIRWAY OBSTRUCTION IN OBSTRUCTIVE SLEEP APNEA SYNDROME

Baharudin Abdullah, MMED, Khairul Azhar, MD, Suzina Sah, MMED

INTRODUCTION: Endoscopic upper airway evaluation either awake or during sleep is predictive and useful in identifying patient with OSAS. It may also assist surgeons to accurately define the location of upper airway obstruction and address it with appropriate surgery.

OBJECTIVES: To assess the level of upper airway obstruction and its severity in obstructive sleep apnea syndrome (OSAS).

METHODOLOGY: Flexible nasopharyngolaryngoscopy (NPLS) was performed in seated erect and supine position. Continuous video recording at the retropalatal and retroglossal regions was done during quiet breathing and Muller maneuver in both positions. Captured images were measured using computerized image processor and narrowing rate was calculated.

RESULTS: A total of 59 patients participated in this study and the majority of them fell into a severe group, 29 (49.2%) followed by moderate group, 16 (27.1%) and 14 (23.7%) in mild group. Based on Fujita classification, 29 (49.1%) participants had type 1 (retropalatal) obstruction, 23 (39.0%) type 2 (retropalatal and retroglossal) and 7 (11.9%) type 3 (retroglossal) obstruction. The retropalatal region in supine position (SRP) was affected the most with 50 (84.7%) participant in the severe obstruction group (51 – 100% collapse) followed by retropalatal region in erect position (ERP) 35 (59.3%).The retroglossal region in erect position (ERG) and retroglossal region in supine position (SRG) fell into the less severe obstruction group(0–49% collapse).

CONCLUSION: The retropalatal region was more affected compared to retroglossal region either in erect or supine position.The retropalatal region in supine position has more severe obstruction as compared to the erect position.

ABSTRACT NUMBER: 1842

QUALITY OF LIFE IN PATIENTS WITH CHRONIC RHINOSINUSITIS, NASAL SEPTAL DEVIATION, OBSTRUCTIVE SLEEP APNEA, HEADACHES, AND GERD

Helen Perakis, MD, Troy Woodard, MD, Sunny Khichi, BS, Stilianos Kountakis, MD

INTRODUCTION: The 20-Item Sino-Nasal Outcome Test (SNOT-20) has been well validated as a measure of rhinosinusitis health status and quality of life in patients with Chronic Rhinosinusitis (CRS). Our goal was to compare quality of life outcomes in patients with CRS to those with obstructive sleep apnea (OSA), nasal septal deviation (NSD), Headaches (HA) and GERD.

STUDY DESIGN: Retrospective analysis of prospectively collected data

METHODS: 41 patients with CRS, 84 patients with OSA, 58 patients with nasal septal deviation, 35 patients with HA and 20 patients with GERD were evaluated at a tertiary medical center over one year. All patients subjectively completed SNOT-20 questionaires when first evaluated. The SNOT-20 scores of the all groups were then divided into a score for the first 10 questions and a score for the last 10 questions. Comparisons between all groups were performed using Tukey-Kramer Multiple Comparison Test and comparison of each groups separate SNOT-20 scores were evaluated with paired t-test.

RESULTS: Mean SNOT-20 score for patients with CRS was 28.1 +/- 13.2, with OSA was 28.4 +/- 10.7, with NSD was 22.7 +/- 13.4, with HA was 28.3 +/- 13.3 and for GERD was 22.4 +/- 12.8. Although there was no significance between the total SNOT-20 scores among groups, when evaluating the scores of the last ten questions, the OSA patients had significantly higher scores than the CRS, NSD, and CRS group (p 0.02). When comparing the first 10 question score to the last 10 question score, there was a significant difference in the OSA patients ($p < 0.0001$), a significant difference in the CRS group (p 0.03) and a significant difference in the NSD group (p 0.02).

CONCLUSION: There appears to be a difference in the pattern of distribution between SNOT 20 scores for CRS, NSD, and OSA. This study demonstrates that the last 10 questions of the SNOT 20 may be used as a separate questionnaire to evaluate patients with presumed OSA.

ABSTRACT NUMBER: 1844

VALIDITY OF "HYDRODISSECTION" FOR SUBPERICHONDRAL SEPTOPLASTY – AN EXPERIMENTAL ANATOMICAL STUDY.

Dr. Patrick Dubach, Dr. Mantokoudis Georgios, Yara Banz, MDPhD, Prof. Marco Caversaccio

AIMS: The validity of hydrostatic dissection by local anesthetics and vasoconstrictive agents in creating a surgical subperichondral plane is controversial. Classical textbooks promote it "as the essential step in septoplasty" or consider its practicability "a mere fable". The literature is full of apodictic statements based on theoretical considerations but experimental tests are missing. Not only is this a technical question, but various reports exist about fatal side effects of hydrodissection (cardiovascular events, blindness).

METHODS: Three surgeons simulated subperichondral septoplasty with 19 mineral salt fixated human cadaveric heads infiltrating 1ml of Lidocain/Adrenaline mixture with 1:10 China ink unilaterally into the septum. Each septum was histologically examined using serial 3mm sections in 100mm intervals through the center of the infiltrated area. Tissue cleavage containing the ink deposits with minimal distance to the proposed subperichondral zone, intravasal spread and tissue deposition were analyzed.

RESULTS: Physical dissection between different anatomical layers of the nasal septum was possible (n=19). However, dissected planes showed random distribution within the perichondrium (n=9) or adjacent connective tissue layers. Only five cases showed dissection in a subperichondral zone. Infiltrated matter did not only accumulate in the split connective tissue layers but also penetrated the surrounding vessels and the large sinusoids of the septal swell body (n=8).

CONCLUSION: A reliable subperichondral dissection plane by hydrostatic infiltration could not be reproduced experimentally. A risk of penetration into the venous sinusoids and vessels exists when large volumes of vasoactive substances are used, promoting rapid systemic distribution and leading to potentially serious side effects.

ABSTRACT NUMBER: 1849

SINONASAL ORBITAL LESIONS AND THEIR MANAGEMENT

Hossam Elbasraty, MD

INTRODUCTION: The orbit lies in a very intimate relation to the nose. The nose and paranasal sinuses share in the orbital boundaries. Many orbital lesions might be primarily nasal lesions extending to the orbit giving rise to orbital symptoms.

METHODOLOGY: Various types of sinonasal-orbital lesions Traumatic, inflammatory & neoplastic) were demonstrated and how they are managed endoscopically.

RESULTS: Sinonasal surgery might be used as an access to the orbit or might sometimes results in orbital complications. In this paper we presents a variety of naso-orbital cases that might face the otolaryngologists.

CONCLUSIONS: Otolaryngologists should be aware and capable of dealing with some orbital pathologies because it lies in their surgical field.

ABSTRACT NUMBER: 1850

DEVELOPMENT OF A MOUSE MODEL OF CHRONIC MAXILLARY SINUSITIS

Xiaoyang Hua, MD, Brent Senior, MD, Stephen Tilley, MD

BACKGROUND: Chronic rhinosinusitis (CRS) is a very common chronic disease. Its pathogenesis remains largely unknown. Mouse models with human diseases have been extensively used in biomedical research for both disease pathogenesis studies and drug discovery. However, mouse model with CRS is less developed.

METHODS: We intraperitoneally sensitized the C57BL/6 mice with OVA and intranasally challenged them to generate a mouse model with chronic maxillary sinuses. Mouse noses and sinuses were histologically analyzed by different stains (eosinophils, H&E; mast cells, toluidine blue; goblet cells, AB-PAS).

RESULTS: Mice challenged with OVA all exhibited eosinophil infiltration and goblet cell metaplasia in the maxillary sinuses. We also observed the mast cell infiltration in the nasal cavity, maxillary sinuses and nasal septums.

CONCLUSIONS: We successfully generated a mouse model with maxillary sinusitis, which exhibited several chronic features of human CRS.

SIGNIFICANCE: The generation of mouse model with maxillary sinusitis provides us a useful tool to study the pathogenesis of CRS.

ABSTRACT NUMBER: 1852

IMPACT OF NASAL POLYPS ON QUALITY OF LIFE OF CHRONIC SINUSITIS PATIENTS

Prof. Lakshmi Vaid, Prof. Pritampal Singh, Dr. Seema Khanna

INTRODUCTION: To study the significance of nasal polyps on the symptoms of chronic rhinosinusitis (CRS) and their influence on surgical outcomes.

METHODS: Retrospective analysis of prospectively collected data comparing two groups of patients diagnosed with CRS with and without polyps who underwent surgery with a minimum of 3 month follow up period. Subjective scoring was performed using the Sino-nasal Outcome Test (SNOT-20) questionnaire. Computed tomography (CT) scans were compared using the Lund –Mackay scoring system. Endoscopic findings were graded according to Lanza and Kennedy staging system. The two groups were analyzed for the need of revision surgery. 30 patients underwent surgical management of CRS over a period of one year. 20 were male, 10 were female and the average age was 26 years (range 15-55years). Polyps were present in 15 patients with CRS while, the other 15 did not have polyps. The average CT score was 10.13 for the polyp group and 9.79 for patients without polyp.The Polyp group SNOT-20 preoperative scores averaged 20.27 with improvement to 3.80 at 2 weeks, 2.67 at 1 month and 2.93 at 3 months (86.21% improvement p=0.001). Non-polyp group SNOT-20 scores were 18.80 preoperatively with improvement to 4.67 at 2 weeks, 3.40 at 1 month and 3.27 at 3 months (81.83% improvement). Preop diagnostic endoscopy on polyp group was 5.27 which improved to 2.13 in 2 weeks, 1.33 in 1 month and 1.53 in 3 months (73% improvement. In the non polyp group it was 4.53 pre-operatively which improved to 1.20 in 2 weeks, 0.93 in 1 month and to 1.13 in 3months (69% improvement). 6 patients required revision surgery (20%), 3(10%) belonging to polyp group and 3 (10%) who did not have polyps.

CONCLUSION: Nasal Polyp has a significant negative impact on the patients with CRS. Patients with polyps have higher symptom scores, worse objective findings compared with patients without polyp, but patients with polyp show more improvement after surgical intervention and need for revision surgery is equal in both groups.

ABSTRACT NUMBER: 1853

PGE2 SUPPRESSES STAPHYLOCOCCAL ENTEROTOXIN-INDUCED EOSINOPHILIA-ASSOCIATED CELLULAR RESPONSES DOMINANTLY VIA AN EP2-MEDIATED PATHWAY IN NASAL POLYPS

Mitsuhiro Okano, MD, Takaya Higaki, MD, Seiichiro Makihara, MD, Kazunori Nishizaki, MD

BACKGROUND: Recent investigations have revealed that Staphylococcal enterotoxins (SEs) and/or cyclooxygenase (COX) metabolism may participate in the pathogenesis of eosinophilic airway diseases such as chronic rhinosinusitis with nasal polyps.

OBJECTIVE: We sought to determine whether COX metabolism, especially prostaglandin E2 (PGE2), plays a significant role in SE-induced cellular responses in nasal polyps.

METHODS: Dispersed nasal polyp cells (DNPC) were prepared from nasal polyps by enzymatic digestion. DNPC were cultured with SEB in the presence or absence of COX inhibitors (diclofenac and indomethacin) for 72 hours; then, the levels of IL-5, IL-13, RANTES, and eotaxin in the supernatants were measured. The effect of PGE2 on SEB-induced responses by diclofenac-treated DNPC was examined, especially in terms of receptor specificity.

RESULTS: DNPC produced significant amounts of IL-5, IL-13, and RANTES in response to SEB. COX inhibitors significantly increased the production of these cytokines. The degree of local eosinophilia was significantly and positively correlated with the changes in IL-5 production induced by diclofenac treatment. PGE2 significantly and dose-dependently inhibited SEB-induced IL-5, IL-13 and RANTES production by diclofenac-treated DNPC. EP2 receptor-selective agonist strongly inhibited the production of all of three cytokines. EP3 and EP4 receptor-selective agonists partially suppressed these responses while EP1 receptor-selective agonist did not. Interestingly, all of the combined treatments with two of the four EP receptor-selective agonists significantly inhibited the SEB-induced responses by diclofenac-treated DNPC.

CONCLUSIONS: These results suggest that PGE2 inhibits the pathogenesis of SEB-induced eosinophilic inflammation primarily via the EP2-mediated pathway in patients with chronic rhinosinusitis with nasal polyps.

ABSTRACT NUMBER: 1855

THE ROLE OF TITANIUM PLATES IN SEPTORHINOPLASTY

Andres Godoy, Inter, Jose Godoy, MD, Jose Godoy

INTRODUCTION: Reconstruction of the nose is a complex issue in revision septorhinoplasty patients, due to a distorted anatomy, excessive scarring, and decreased nasal function. Multiple options for nasal reconstruction have been used, including alloplastic materials, autogenous tissues or a combination of both.

OBJECTIVE: The authors propose a novel technique for the use of a titanium plate in septorhinoplasty reconstruction utilizing one or more of the following as indications: 1) Lack of support of the nasal tip. 2) Deviated nasal septum. 3) Traumatic nasal Reconstruction. We expose its proper use, main advantages and disadvantages.

METHOD: A retrospective chart review of patients undergoing septorhinoplasty with this technique utilizing a titanium plate between 2001-2008 was performed. Twenty-five patients who fulfilled the criteria where operated. Patient demographics, surgical indication, immediate and late complications outcomes were recorded.

RESULTS: In twenty-one cases, the indication was to correct a previously operated deviated nasal septum. In four cases, the indication was reconstruction of the nasal valve with elevation of the tip in revision rhinoplasty. In this eight year review, the procedure has shown no side effects, rejection nor any other clinical disadvantages compared to traditional methods.

CONCLUSION: The titanium plate is a light weight, high strength, inert and highly biocompatible material, making it a viable alternative for reconstructive septorhinoplasty. We advocate the use of this technique and material in revision septorhinoplasty cases and in primary deviated nasal septum with a complete occlusion of the nasal fossa.

ABSTRACT NUMBER: 1859

FUNCTIONAL VOICE OUTCOMES FOLLOWING EXTERNAL MEDIALIZATION THYROPLASTY USING AUTOLOGOUS NASAL SEPTAL CARTILAGE UNDER LOCAL ANESTHESIA

Tamer Mesallam, MD, Yaser Khalil, MD

HYPOTHESIS/OBJECTIVES: A persistent insufficiency of glottal closure is mostly a consequence of unilateral vocal fold movement impairment. It can also be caused by vocal fold atrophy or scarring processes. Because of consequential voice, breathing, and swallowing impairments, a functional surgical treatment is required. The goal of the study was to outline the functional outcomes after medialization thyroplasty with autologous septal cartilage from the nose.

METHODS: External vocal fold medialization using autologous septal cartilage was performed on 14 patients (4 females and 10 males). The patients were in the age range of 23 to 67 years. Eight patients had a right vocal fold paralysis, and six patients had paralysis on the left vocal fold. Detailed functional examinations were executed on all patients before and after the surgery including: perceptual voice assessment according to the modified GRBAS "over-all grade, roughness, breathiness" scale, acoustic voice analysis, and videostroboscopic examination.

RESULTS: All patients reported improvement of voice quality pos-operatively, Videostroboscopy revealed an almost complete glottal closure after surgery in all of the patients. All voice-related parameters showed a significant improvement.

CONCLUSIONS: The results confirm the external medialization of the vocal folds as an adequate method in the management of voice impairment attributable to an insufficient glottal closure. The autologous septal cartilage implant offers, apart from good tissue tolerability, the advantage of an easy, time-saving, and individually adjustable application during the operation.

ABSTRACT NUMBER: 1861

PACKINGLESS RHINOLOGIC SURGERY: A 20 YEAR EXPERIENCE

Chester Griffiths, MD, Cadvan Griffiths, MD

The authors will present an analysis of their combined experience in over 2000 cases over 20 years of rhinologic surgery, the majority completed without use of nasal packing. Routine nasal packing in rhinologic surgery including rhinoplasty, septoplasty, and sinus surgery has been curtailed without major adverse sequelae and resulting in a significant reduction in post-operative morbidity and increased patient satisfaction. Techniques and results will be presented.

ABSTRACT NUMBER: 1864

IS LATERAL OSTEOTOMY AN OBLIGATION IN RHINOPLASTY FOR CROOKED AND NON-CROOKED NOSE OR NOT

Shahriar Nazari, M.D.

INTRODUCTION: Lateral osteotomy is one of most prevalent steps in rhinoplasty and for correcting of some deformity like broad base nose and open roof deformity after hump removal and also for correcting of misaligned nasal bone it seems that its obligatory but many surgeons do this procedure in all rhinoplastic surgery as an inevitable step ,but a question will remained is it an obligation in all rhinoplastic surgery or not.

MATERIAL AND METHOD: In 112 patients,77 of them had some criteria of crooked nose ,and who had done rhinoplasty by the author from 2006 till 2008, I used a flexible approach for their operation and in some of them that I assessed the shape of nose and the alignment and broadness of nose after completion of operation is good I finished the operation without doing lateral osteotomy, all of cases had pre- operative photography and post operative photo in 1,3,6,and 12 month after operation in cases of long follow up. all patient followed up for 3 month to 24 month and all asked about their satisfaction of the shape and alignment and broadness of their noses and the photos are compared by the surgeon to assess the results after operation then the results are compared to each other between two groups of osteotomized and non osteotomized group by statistical proportion test.

RESULTS: In 112 patients who had done rhinoplasty from 2006 to 2008,77 patients had crooked nose(68.7%)and 35 patients had not deviated nose(31.3%).in these group of patients in 30 cases I had not done lateral osteotomy(26.7%) and in 82 case I had done lateral osteotomy in both side (73.3%) .in these 30 patients ,19 patients(63.7%) had crooked nose and 11 patients had not twisted nose(36.3%) .in these 30 patients in ,3 cases unilateral ostetomy had done(10%) and in 27 cases any lateral osteotomy had not done ,in these 77 patients in 7 cases crooked not repaired completely,(9%),6 cases in osteotomized patients and 1 in non osteotomized .there is no statistically significant difference between these two groups.

CONCLUSION: Lateral Osteotomy is one of the most prevalent and most important step in rhinoplasty especially after hump removal ,for correcting open roof deformity ,misalignment of nasal bones , and broad nasal vault base ,but it can cause step deformity ,lacrimal system injuries ,prolonged hematoma and bruising and also bleeding and narrowing of nasal airway system , and if it is possible to achieve the same results without osteotomy and with less trauma to nasal airway it will be preferable ,in this article it is shown that lateral osteotomy could be avoided with the same aesthetic result as the osteotomized patients with less trauma to nasal airway and less possibilities of complication and the same satisfaction of results by patients and surgeon.

ABSTRACT NUMBER: 1865

MULTILAYER SPREADER GRAFTS

Shahriar Nazari, M.D.

INTRODUCTION: Correcting crooked nose is one of the most challenging issues in rhinoplasty and recurring the deviation is not a rare condition .to have straighten nose after crooked nose surgery ,we introduced a new technique of multilayer spreader grafts.

MATERIAL AND METHODS: In a series of 112 patients who had done rhinoplasty by the author, 77 patients had crooked nose. each crooked nose has two side, one depressed or longer side and the other compressed or shorter side ,for correcting the deviation ,by open approach septoplasty was done for all of them and a big L strut in anterior and dorsal part was left ,the upper lateral cartilages were separated submucosally ,and then spreader grafts in different length were inserted, the longest one, inside and most medial to septum and the second or even third spreader graft in the depressed or longer side or concave side of septum, in some cases bilateral spreader grafts inserted and fixed in their place by 2 to 3 ,5-0 nylon sutures .after 1,3,6 and,12 months follow up post operative photos was taken and compared to their preoperative photos ,and correction of deviation of nose was determined by the surgeon and the satisfaction of patients were determined.

RESULTS: In 112 patients, 56 of cases had spreader grafts,(50%),total number of grafts inserted was 112 grafts, in 26 cases in right,20 cases in left, and in 10 cases bilaterally between 1 to 3 grafts inserted.77 of cases had crooked nose. in 49 cases(63%)of this group spreader graft inserted. in 7 non crooked noses, spreader grafts used as well. In 39 cases (50%),2 (32 cases or 82%) or 3 (7 cases or 18%) layer spreader grafts were inserted in concave side of deviation or longer side of crooked nose .in 2(4%) cases crooked not corrected even with use of multilayer spreader grafts .but in 47 cases(96%) crooked corrected in significant degree .in follow up pictures the broadness of midvault was assessed and interestingly there was not significant difference between non spreader and spreader group and patients do not complain of broadness of the nose.

DISCUSSION: For correcting twisted nose septoplasty is the main step of the operation but ancillary procedures like spreader grafting, beveling hump removal, multiple osteotomy, allar batten grafting, were discussed by different authors ,in this report it is shown that multiple layer spreader grafts in one side of septum could be inserted without broadness of midvault and good and long lasting results will be achieved and its result in some cases is superior to one layer spreader graft.

CONCLUSION: Multilayer spreader grafting in one side of septum is a good and amenable technique for correcting crooked nose.

ABSTRACT NUMBER: 1866

INCIDENCE OF MIDDLE TURINATE PNEUMATIZATION, CONCHA BULLOSA IN TWISTED NOSE

Shahriar Nazari, M.D.

OBJECTIVE: To investigate wether the presence of middle turbinate pneumatization,concha bullosa,(CB) is related to twisted or deviated nose or not.

METHODS: CT scan was done for 112 patients who had done aesthetic septorhinoplasty for reshaping of their noses and correcting twisted noses,and these ct scans analysed for the presence of CB.

RESULTS: CB was detected in 53 cases of 112 patients(47.32%), 77 of 112 patients have some appearent axis deviation or twisted nose. 45 cases of these 77 patients had CB(58.44%)in 13 patients of these 45 cases CB was bilatral (28.8%) with predominancy of size of CB in concave side of septal deviation. With statistical test of proportions, correlation of CB with twisted nose in comparison of CB in the study group was checked and we found a p value <0.01 that was statistically significant.

CONCLUSION: It seems a strong correlation between twisted nose and CB would be coexisted. It may be a compensatory mechanism of air flow regulation like inferior turbinate hypertrophy in concave side of septal deviation and may need especial concern in correcting the deviated nose.

ABSTRACT NUMBER: 1870

ORBITAL COMPLICATIONS OF RHINOSINUSITIS

Fatma Kayhan, As.Pr, Ibrahim Sayin, M.D, Zahide Yazýcý, M.D, Omer Erdur, M.D.

OBJECTIVE: One of the most common complications of rhinosinusitis are orbital complications. This report presents our clinical experience on orbital complications of rhinosinusitis.

METHODS: The current report is a retrospective study of 59 consecutive patients admitted to the ENT Clinic of the Bakýrköy Sadi Konuk Education and Research Hospital in Istanbul, Turkey between January 2002 and January 2009 with complications of rhinosinusitis.

RESULTS: The mean age of the patients was 19.8.(range 6 months to 55). Twenty out of 59 patients (33.9%) were female where as 40 (66.1%) of the patients were male. One (1) patient showed 3 distinct complications, 3 patients showed 2 distinct complications at different times. The complications were classified according to Chandler's orbital complication classification. 43 (67.2%) complications were diagnosed as preseptal cellulitis, 9 (14.1%) complications were diagnosed as orbital cellulitis, 8 (12.5%) complications were diagnosed as subperiosteal abscess and 4 (6.2%) patients were diagnosed as orbital abscess. Forty eight (48 patients-75%) complications were treated with medical theraphy alone whereas in 16 (25%) complications additional surgical intervention was needed.

DISCUSSION: Fifty nine (59) patients characteristics including age, sex, type of the complication, medical history, accompanying diseases, presenting symptoms, findings of rhinologic and ophtalmologic examination, results of imaging techniques, bacteriological findings, medical and surgical therapy and prognosis are presented and discussed.

CONCLUSION: Altough orbital complications of rhinosinusitis were uncommon, these complications were regarded as therapeutic emergency and should be threated properly.

ABSTRACT NUMBER: 1871

THE EFFECT OF MONTELUKAST ON QUALITY OF LIFE IN PATIENTS WITH NASAL POLYPOSIS ACCOMPANYING ASTHMA BRONCHIALE-PRELIMINARY RESULTS

Fatma Kayhan, Zahide Yazýcý, M.D, Ibrahim Sayin, M.D, Eyüp Bozkurt, M.D

OBJECTIVE: Nasal polyposis occured as a result of chronic mucosal irritation. Previous reports showed that nasal polyposis restricted the daily activity and decrease the quliaty of life. In this report we have eveluated the effect of montelukast on quality of life in patients with nasal polyposis accompanying asthma bronchiale.

STUDY DESIGN: Prospective study.

METHODS: Thirty (30) patients with nasal polyposis were included for this study. All patients were treated with appropriate medication (antibiotic, nasal steroid, antihistaminic) previously at least for three months. Previous medication was continiued and an additional 10 mg montelukast theraphy was added. Patients were eveluated with rhinosinusitis disability index (RDI) previos the montelukast theraphy and 1 months after the theraphy started. All patients were eveluated for aspirine hypersensitivity.

RESULTS: Twenty (20-66.6%) out of 30 patients were male and 10 (33.3%) patients were female. The mean age aes 43,0±12,36 years (range 18 between 72). Emotional subscales of RDI showed decrease after threatment (45,30±22,64 vs 40,10±23,49). This difference did not showed a statistically significant difference ($p>0.01$) Functional subscales of RDI showed decrease after threatment (38,36±21,52 vs 36,63±23,36). This difference did not showed a statistically significant difference ($p>0.01$) Physical subscales of RDI showed decrease after threatment (53,55±22,89 vs 41,44±23,61). This difference showed a statistically significant difference ($p<0.01$).

CONCLUSION: These results suggest that the addition of montelukast on standard theraphy of nasal polyposis improves quality of life in these patients.

ABSTRACT NUMBER: 1874

TREATMENT OF NASAL POLYPOSIS WITH ORAL METHYLPREDNISOLONE AND DOXYCYCLINE: A DOUBLE-BLIND, RANDOMIZED, PLACEBO-CONTROLLED TRIAL WITH EVALUATION OF CLINICAL AND BIOLOGICAL ACTIVITY.

Van Zele Thibaut, PhD, Gevaert Philippe, PhD, Holtappels Gabi, Bachert Claus, PhD

RATIONALE: Oral corticosteroids (CS) are commonly used in the treatment of nasal polyposis (NP) because their obvious efficacy. However, investigation of oral CS in NP has been remarkably insufficient. Secondly S. Aureus and high MMP-9 levels are implicated in the pathogenesis of nasal polyps. This study aims to evaluate the immediate and long-term effect of oral CS and doxycycline on NP size, nasal peak inspiratory flow (nPIF), nasal symptoms and local inflammatory markers.

METHODS: In a double-blind, placebo-controlled, randomized, multicenter study, 48 subjects with bilateral NP were randomized to receive either methylprednisolone, doxycycline or placebo for 20 days. During 3 months the clinical and biological activity was assessed by nasal peak inspiratory flow (nPIF), symptoms, nasal endoscopy, and markers of inflammation like eosinophils, ECP, MMP-9, MPO and IgE in peripheral blood and nasal secretions.

RESULTS: Methylprednisolone and doxycycline decreased significantly NP size during. A fast recurrence one and two months after treatment was seen in the methylprednisolone group. Methylprednisolon significanlty decreased rhinorrhee, loss of smell, congestion and post nasal drip and increases nPIF significantly until week 4. Afterwards a rapid increase of symptoms and a fast decrease of nPIF was observed. Only a minimal but significant inhibition of ECP release was observed for methylprednisolone while doxycycline reduced significantly MMP-9 and ECP levels.

CONCLUSION: This is the first double-blind, placebo controlled study that shows that doxycycline reduces nasal polyps and a recurrence of polyps and symptoms is observed four weeks after treatment with methylprednisolone.

ABSTRACT NUMBER: 1878

SENSATION OF NASAL PATENCY THROUGH MUCOSAL HEAT LOSS RATHER THAN AIR TEMPERATURE

Kai Zhao, PhD, Kara Blacker, Yuehao Luo

The lack of sensation of nasal airflow (i.e. nasal patency) is the primary cause that drives patients with nasal sinus diseases to seek medical treatment. However, to objectively assess the degree of nasal patency remains a challenge to clinicians as objective measurements such as rhinomanometry or acoustic rhinometry do not correlate well with perceived patency. The current study examined other factors that may influence the perception of patency, including air temperature, humidity, nasal resistance, and trigeminal sensitivity. 44 healthy subjects unilaterally rated patency under different conditions using a visual analogue scale. In one condition, subjects samples untreated air in a test room. In three other conditions (cold air, untreated room air, and dry air), air was pumped into a face box. In all conditions, temperature and relative humidity were recorded. Nasal resistance and airway cross section area were measured unilaterally using rhinomanometry and acoustic rhinometry, respectively. Trigeminal sensitivity was assessed by measuring lateralization thresholds for butanol. No significant correlation was found between perceived patency and nasal resistance, although, within subjects, there was a significant difference in perceived patency between the high and low resistance nostrils. In contrast, air temperature, humidity and butanol threshold, taken together, could significantly predict ratings of patency ($R2=0.145$, $p<0.000$), with temperature being the most heavily weighted predictor. However, the significance of air humidity in patency rating suggesting that the heat loss in the nasal mucosa rather than temperature alone, and the trigeminal feedback may likely play a central role in individual's perception of patency.

ABSTRACT NUMBER: 1879

OBJECTIVE ASSESSMENT OF THE IMPACT OF CHRONIC RHINOSINUSITIS (CRS) ON OLFACTORY FUNCTION

Kai Zhao, PhD, Edmund Pribitkin, MD, Nancy Rawson, PhD, Beverly Cowart, PhD

Chronic rhinosinusitis (CRS) is both one of the most common chronic diseases in the U.S., afflicting over 30 million adults, and one of the most common causes of smell loss. Yet, not all sufferers of CRS experience smell problems. In order to develop targeted therapies for this form of smell loss, it is critical to identify effective tools that can evaluate the functional impact of the disease process on the olfactory system. To this end, the Monell-Jefferson Chemosensory Clinical Research Center has enrolled 55 patients with clearly defined CRS and performed a battery of objective assessments on them, including acoustic rhinometry, rhinomanometry, CT scans and nasal endoscopic evaluations, with each tool indexing different aspects of disease status. Rhinometry primarily reflects the airway cross-sectional area and resistance contributed by the anterior portion of the nasal cavity, endoscopy evaluates the main nasal airway, ostiomeatal complex and olfactory cleft, whereas CT staging scores weight heavily on the surrounding sinuses. Our findings indicate that none of these tools by themselves discriminate degrees of olfactory loss due to CRS. Endoscopy scores and CT scores of the ethmoid sinuses are excellent indices for the most severe olfactory loss, anosmia, yet fail to differentiate hyposmic patients from those with no olfactory loss. The minimum cross sectional area (MCA) measured by acoustic rhinometry correlates significantly with unilateral olfactory thresholds of patients, but only for the high soluble odorant l-carvone, not for the low soluble d-limonene, which may reflect a conductive mechanism. In the future, carefully weighted combinations of multiple objective tools may provide a better evaluation of the aspects of this disease process that impact olfactory function. Supported in part by NIH grant DC 006760.

ABSTRACT NUMBER: 1880

BIOFILM-FORMING CAPABILITY IN PSEUDOMONAS AERUGINOSA INCREASES UPREGULATION OF THE PRO-INFLAMMATORY CYTOKINE CXCL1/KC IN MURINE NASAL EPITHELIUM

Nicholas Smith, MD, John Kostrzewa, MD, Shaoyan Zhang, PhD, Bradford Woodworth, MD

INTRODUCTION: Chronic rhinosinusitis (CRS) that is refractory to medical and surgical treatment may involve a particularly resistant form of infection known as a bacterial biofilm. Pseudomonas aeruginosa is a notorious biofilm-forming culprit in severe CRS that modifies the secretion of a number of virulence factors according to environmental and host conditions. Whether biofilm-forming capacity confers the ability to incite more host inflammation has yet to be fully investigated.

METHODS: After identical growth conditions, the supernatants from wild-type Pseudomonas aeruginosa (PAO1) and two mutant, non-biofilm-forming strains (sad-31 and sad-36) were administered to the apical surface of murine nasal septal epithelial (MNSE) cultures (grown at an air-liquid interface) and incubated for 24 hours. A potent lipopolysaccharide derived from Escherichia coli (100ng/ml) acted as a positive control. The apical and basal media of the cultures were collected and analyzed using the Mouse CXCL1/KC Immunoassay (functional homolog of human IL-8).

RESULTS: MNSE cultures exposed to PAO1 supernatant produced significantly elevated CXCL1/KC concentrations (1267.4 ± 54.3 pg/ml) when compared to sad-31 and sad-36. ($p<0.001$) There was no difference in cytokine production between mutant strains ($p=0.135$). KC concentration in the basal medium was 65% higher than in apical fluid measurements ($p<0.0001$).

CONCLUSIONS: Secreted factors in the extracellular milieu of the biofilm forming strain of Pseudomonas aeruginosa incited significant upregulation of the pro-inflammatory chemokine CXCL1/KC in murine nasal respiratory epithelium when compared to mutant strains. Furthermore, cytokine production was greater in the media of the basal compartment indicating the appropriate area of measurement for future studies.

ABSTRACT NUMBER: 1884

DIFFERENTIATION OF CHRONIC RHINOSINUSITIS (CRS) AND ITS COUPLING TO LOWER AIRWAYS

Kåre Håkansson, MD, Prof. Christian von Buchwald, Simon Thomsen, PhD, Jacob Thyssen, MD

BACKGROUND: A close relation between the nose and lungs is increasingly accepted and has led to the hypothesis of the "united airways". In this study, a descriptive analysis of rhinitis in a Danish general population was performed as a preparation for a future study focusing on Chronic Rhinosinusitis (CRS) and its association to lower airway disease.

METHOD: A general health examination was performed in 2006 in Copenhagen, the capital of Denmark. A postal questionnaire including questions about rhinitis were mailed to a random sample from the general population (n = 7931, age 18-69 years) and 3471 (44%) participants showed up for a health examination including specific IgE to common aeroallergens. A chi-square test was used to test for differences between the following groups: I) positive specific IgE but no rhinitis, II) positive specific IgE and rhinitis (allergic rhinitis), III) negative specific IgE and rhinitis (non-allergic rhinitis, NAR), and IV) negative specific IgE and no rhinitis.

RESULTS: NAR was significantly more prevalent among women, smokers and subjects with symptoms of COPD. Also, we found a diminished quality of life in subjects with NAR compared with other groups. We found a similar distribution of asthma in subjects with allergic rhinitis and NAR. Social status and alcohol consumption was not found to be significantly associated to any group.

CONCLUSION: This study indicates that not only asthma, but probably also COPD is an important co-morbidity in NAR.

ABSTRACT NUMBER: 1885

ENDOSCOPIC REPAIR OF CSF LEAK RHINORRHEA IN 165 PATIENTS: THE OUTCOMES

Marina Nersesyan, MD, Dmitry Kapitanov, PhD, Prof. Andre Lopatin, Prof. Alexander Potapov

OBJECTIVE. A retrospective study of the surgical outcomes of patients\r\nwho underwent endoscopically guided repair of CSF rhinorrhea over a 10-year period.

METHODS. 165 patients were included in the study. The evaluation was conducted by chart review. The follow-up period ranged from 7 months to 10 years.

RESULTS. Of the 165 patients of the age 3 - 85 y. o. (mean 41,8): 75 were spontaneous, 38 - iatrogenic (30 after neurosurgeries and 8 after FESS) and 52 - traumatic. 132 patients (80%) were successfully treated with

endoscopic guidance at the first approach. Of the 24 (14,5%) who were underwent endoscopic revision for 18 patients had lumboperitoneal shunting. 9 patients (5,5%) had CSF leak recurrence 4 of whom required a subsequent intracranial approach and in 5 an endoscopic revision. Recurrence of CSF leakage was found to be associated with: raised CSF pressure and was higher in spontaneous leaks as well as in iatrogenic leaks after eurosurgeries. Interestingly, in spontaneous CSF leakage we found recurrence to be more commonly associated with fistulous tracts located along the lateral wall of well pneumatizated sphenoid sinuses. Spontaneous CSF leaks were more common in women (mean age 46*7 years), who were obese (BMI>39,6 kg/m^2), with empty sella syndrome, hypertensive, with respiratory pathology.

CONCLUSION. CSF rhinorrhea is successfully treated with endoscopic guidance, however, when the patient is an obese woman, hypertensive, and/or with pulmonary pathology, the neurosurgical colleagues, who are part of the skull base surgical team, should be on *stand by*, as their help may be needed for a successful outcome.

ABSTRACT NUMBER: 1887

COMPUTATIONAL MODELING OF NASAL AIRFLOW AND ODORANT TRANSPORT IN PATIENTS WITH CHRONIC RHINOSINUSITIS

Kai Zhao, PhD, Edmund Pribitkin, MD, Beverly Cowart, PhD, Pamela Dalton, PhD

Our 5-year multi-center study seeks to quantitatively characterize the conductive mechanisms contributing to olfactory loss in chronic rhinosinusitis (CRS) patients and in patients with other inflammatory disorders. As yet, the functional impact of the nasal obstruction experienced by CRS patients and the treatment outcomes in these patients have not been successfully indexed using existing tools such as acoustic rhinometry (AR), rhinomanometry (RM) or computed tomography (CT), the measurements of which correlate poorly with subjective symptoms. In this study, computational fluid dynamics (CFD) techniques are utilized to simulate nasal airflow and predict odorant delivery rates to the olfactory epithelium for each patient based on their pre & post-treatment CT. \r\n\r\nIn this report, 37 CRS patients have been evaluated using AR, RM and CT, and their olfactory function characterized using measures of unilateral threshold sensitivity to l-carvone, d-limonene and phenethyl alcohol. Patient symptoms and pathology varied considerably, as did their olfactory abilities. Correlations between measured olfactory sensitivity and CFD, AR and RM predictions were examined. We preliminarily supported the hypothesis that the calculated olfactory delivery rate from the individualized nasal CFD models is a better predictor of olfactory sensitivity among CRS patients than are conventional methods. In the future, we envision that CFD modeling techniques may provide predictive models of treatment for CRS and an important pre-treatment guide to optimize airflow and odorant delivery in human nose. NIH P50 DC006760

ABSTRACT NUMBER: 1888

CEREBROSPINAL FLUID DETECTION IN NASAL FLUIDS USING THE Â – TRACE PROTEIN NEPHELOMETRIC METHOD

Erica Ortiz, Marcelo Sampaio, Eulalia Sakano, Carlos Chone

INTRODUCTION. CSF rhinorrea is an abnormal communication between the anterior skull base and the nasal cavity. Its presence increases the incidence of complications, as meningitis, with risk of sequels. The early and correct diagnosis of the CSF leaks is important in order to perform surgical treatment as soon as possible. The CSF detection in nasal fluids could be made through the â2-transferrin test, an expensive immunological test, non available to the majority of the Brazilian hospitals. Recently, the detection of â-trace protein for identification of CSF leaks has been described. Literature data suggests the same sensibility and specificity to the â2-transferrin, because â-trace protein is also a specific brain protein and it is present in CSF in high concentrations. The majority of Brazilians hospitals have the nephelometric equipment for â-trace protein detection.

OBJECTIVE: To determine the cut-off value for the â-trace protein concentration measurement in nasal cavity secretions to confirm or not presence of CFS leak.

MATERIAL & METHODS: Nasal secretions were collected from patients with suspicion of CSF leak and from healthy volunteers. A nephelometric assay was used to determine the â-trace protein concetration.

RESULTS: It was found a value between 0.29 and 0.43 mg/L for the cut-off.

CONCLUSION: Concentrations above values between 0.29 and 0.43 are highly suggestive of the presence of cerebrospinal fluid in nasal secretion. The â-trace protein can be a good alternative for the detection of CSF leak in Brazilians hospitals.

ABSTRACT NUMBER: 1892

COMPARISON OF PRICK, INTRADERMAL TESTING, AND INVITRO TESTING IN PREDICTING RESPONSE TO NASAL PROVOCATION WITH RAGWEED ANTIGEN

Camysha Wright, MD, Jing Shen, MD, Matthew Ryan, MD

BACKGROUND: Skin prick testing is increasingly promoted as an alternative to intradermal dilutional testing (IDT). However, the sensitivity and specificity of skin prick testing as compared to traditional IDT is still in question. An additional consideration is that test results with these methods may be dependent on the allergen tested. In this study, the role of skin prick testing in detecting ragweed allergy has been brought into question. The purpose of this study is to define the relationship between the Multi-test II skin prick and intradermal test results in testing for ragweed allergy using nasal provocation as the gold standard and comparing modified RAST results.

METHODS: Subjects with suspected ragweed allergy and controls were tested using the Multi-Test II skin prick test and skin endpoint titration using intradermal dilutional testing. They had baseline assessment of nasal cross-sectional area using acoustic rhinometry and underwent nasal provocation with increasing ragweed concentrations. Cross sectional area and nasal visual analog scale were assessed with each concentration. Blood was drawn and sent for mRAST testing for each subject.

RESULTS: 27 subjects have completed the protocol to date. Of these subjects, 30% have been positive to skin prick, 33% have been positive by intradermal testing, 50% have been positive by nasal provocation testing, and 12% have been positive by RAST. No statistically significant difference has been noted thus far between intradermal and skin prick testing.

CONCLUSIONS: Further study is warranted to determine the generalizability and clinical significance of these findings.

ABSTRACT NUMBER: 1893

COBLATION ASSISTED ENDOSCOPIC SINUS SURGERY

Maurice Roth, MD

Coblation is a process of tissue dissociation using a plasma-based radiofrequency device which includes a variable degree of bipolar cautery. Coblation can be used to remove soft tissue within the nose and paranasal sinuses. In addition, coblation can assist with ethmoidectomy, maxillary antrostomy, sphenoidotomy, as well as middle turbinate resection. The device can also be used during endoscopic sinus surgery to limit bleeding, improve visibility, and reduce the quantity of epinephrine injection during polypectomy. However, if coblation is used improperly during endoscopic sinus surgery, serious complications may arise. The purpose of this video poster is to share my five year experience with coblation assisted endoscopic sinus surgery. Through high definition video the safe application of coblation to each of the tasks listed above will be demonstrated. Potential complications and pitfalls will be shared. Limits of coblation assisted endoscopic sinus surgery will be discussed. The relevant basic and clinical science will be reviewed. This poster highlights patient safety above all else. This poster is recommended for any otolaryngologist interested in the application of coblation to endoscopic sinus surgery even if the surgeon is an experienced coblation user.

ABSTRACT NUMBER: 1894

NEW FOCUS-OLD DISEASE: THE PARANASAL SINUSES A FOCUS FOR BACTERIAL LUNG INFECTIONS IN PATIENTS WITH CYSTIC FIBROSIS (CF)

Kasper Aanaes, MD, Christian Buchwald, MD, Helle Johansen, MD, Niels Høiby, MD

BACKGROUND: Sinusitis is a common complication of CF causing significant symptoms associated with the lung disease. CF patients who have had a lung transplant are colonised in their new lungs with the same clones as those that were cultured from their old lungs. The sinuses may serve as a bacterial reservoir for lung infections.

STUDY DESIGN: 47 CF patients (19 male, 28 female) (median age: 6y, range 6-50 y) have been treated with FESS using CT image guidance to evaluate whether their sinuses serve as a bacterial reservoir. 19 patients were chronically infected (14 with P. aeruginosa (PA), 2 with Burkholderia, 2 with Achromobacter, 1 with Moraxella) and 28 were intermittently colonised (17 with PA, 11 with other CF pathogens) in their lungs.

RESULTS: We found good agreement between lung and sinus bacteriology in15 out of 17 (88%) of the intermittently colonised patients. Seven patients chronically infected with PA had the same genotype in their lungs for more than 15 years and this genotype was identical to the PA obtained from the paranasal sinuses. In Gram stained smears from the sinuses we found that the bacteria were organised in biofilm structures similar to those seen in the lungs. In sinus smears we detected only few inflammatory cells compared to lung smears. Most of the children colonised with PA had growth of the same genotype of PA in their sinuses and sputum samples collected up to two years prior to the FESS operation. Five of 17 children intermittent colonised with PA were free of PA in their lungs after FESS operation (range 14-424).

CONCLUSIONS: The sinus colonisation might be immunological silent in intermittently colonised patients and cause only an insignificant anti- P. aeruginosa antibody response (Th1 response). Because of the weak signs of infection, the sinus colonisation can proceed unnoticed into a permanent infectious focus that cannot be eradicated with antibiotics. We believe that FESS operations can prevent lung infections in CF patients especially with an intensive postoperative treatment. This abstract will help physicians understand patients with cystic fibrosis, their chronic rhinosinusitis, the liberal indications for sinus surgery and the importance of postoperative treatment

ABSTRACT NUMBER: 1895

THE LONG-TERM EFFICACY OF MUCOSAL CPG OLIGODEOXYNUCLEOTIDES IN THE TREATMENT OF EUSTACHIAN TUBE DYSFUNCTION IN RATS

Deidra Blanks

BACKGROUND: Otitis media with effusion (OME) is a chronic inflammatory disease of the middle ear. Increasing evidence demonstrates an association between allergy and chronic OME. The binding of synthetic DNA-based immunotherapy agents composed of unmethylated cytosine-guanine dinucleotides (CpG ODN) to toll-like receptors are capable of inducing a shift in the cytokine profile and immune response that favors the Th1 pathway and suppress the Th2 pathway.

OBJECTIVE: The aim of the present study is to evaluate the long-term differences and ability of transtympanic and nasopharyngeal CpG ODNs to treat the allergic response to repeated allergy challenges, in ovalbumin sensitized Brown Norway rats.

DESIGN: Fifty Brown-Norway rats were divided into control and treatment groups. Eustachian tube dysfunction was evaluated by passive opening pressures, passive closing pressures, active clearance of negative pressure and mucociliary clearance transit time.

RESULTS: All CpG ODN treatment groups on day 43 required approximately 50% less pressure to open ($P < 0.001$) and close ($P < 0.001$) the Eustachian tube compared to the OVA allergic groups. The CpG ODN treatment groups had significantly lower opening and closing pressures until day 57.

CONCLUSION: CpG ODNs via transtympanic and nasopharyngeal application can treat allergy-induced eustachian tube dysfunction in rats for approximately 2 weeks without repeat treatment. CpG ODNs may offer substantial promise in the future management of eustachian tube dysfunction and OME.

ABSTRACT NUMBER: 1896

VALIDATION OF OPTICAL RHINOMETRY USING NASAL PROVOCATION TESTING IN ALLERGIC AND NONALLERGIC SUBJECTS

Amber Luong, MD, PhD, Esther Cheung, MD, Martin Citardi, MD, Pete Batra, MD

INTRODUCTION: Optical rhinometry (ORM) is a new method that quantifies light absorption in optical density (OD) to assess nasal blood flow as a measure of nasal patency. The purpose of this study is to validate ORM as an objective evaluation of nasal patency using nasal provocation testing (NPT) with histamine and oxymetazoline.

METHODS: Five adult subjects with and 5 without allergic rhinitis (AR) underwent NPT with histamine and oxymetazoline. Patients underwent NPT with increasing concentrations of histamine while undergoing ORM monitoring. The minimum concentration of histamine to cause a positive OD reading was recorded. The same subjects then underwent

histamine challenge with this minimum positive concentration followed by oxymetazoline. Nasal patency was assessed subjectively after each challenge with the visual analog scale (VAS).

RESULTS: The average minimum histamine concentration to cause a positive response on ORM was statistically lower in AR patients as compared to healthy controls at 210 g/ml and 330 g/ml, respectively ($p=0.035$). When comparing the relative change in light extinction in ORM with subjective nasal congestion based on VAS after histamine and afrin challenges, there was a statistically significant correlation with $r=0.589$ ($p < 0.003$).

CONCLUSION:This initial study demonstrates a correlation between subjective symptoms of nasal patency with measurements from the ORM. The lower histamine concentration necessary to incite nasal congestion on ORM in AR suggests that these patients are primed to the effects of histamine. ORM appears to represent a valid technique for assessment of nasal congestion.

ABSTRACT NUMBER: 1897

HISTOPATHOLOGY OF NASAL POLYPS FOR CRS; PRELIMINARY RESULTS

Joseph Han, MD, Rachel Moebus, BS, Marc Silverberg, MD

OBJECTIVE: Chronic rhinosinusitis (CRS) is an extremely common but yet poorly understood disease process of inflammation and infection. To better define the various forms of CRS, histopathologic pattern will be evaluated among the different forms of CRS.

MATERIALS & METHODS: Consecutive patients undergoing endoscopic sinus surgeries had their polyps undergo microscopic photodocumentation. The diverse forms of CRS that were examined were non-eosinophilic sinusitis, eosinophilic sinusitis with and without allergy, allergic fungal sinusitis (AFS), CRS among cystic fibrosis patients (CF), and aspirin triad. Control group was also examined. Samples were prepared histologically and examined. The area of most dense cellular population was found and a total of 500 cells were counted for eosinophils, PMNs, lymphocytes, and plasma cells. The epithelial morphology was recognized and the amount of ratio of epithelial cell to goblet cells was also determined. Cellular distribution was analyzed between each group and the control.

RESULTS: Seventy five samples were obtained and examined. Aspirin Triad, eosinophilic sinusitis with allergy, and eosinphilic without allergy had higher eosinophil counts than the control, non-eosinophilic, or CF groups ($p<0.05$). Among the eosinophilic diseases such as aspirin triad, eosinophlilic sinusitis, and AFS, the disease with an allergy component had a higher amount of lymphocyte ($p<0.01$). There was no statistical difference in the amount PMN, plasma cell, and goblet cells amongst all the groups ($p>0.05$). Variants of CRS with less eosinophils and more likely associated with infection had cells densely located in the subepithelial space, while the eosinophilic sinusitis had cells located in the stromal tissue.

CONCLUSIONS: Histopathologic patterns can be used to assist in the diagnosis for the diverse presentation of CRS, which in term affect the prognosis and treatment of the patient.

ABSTRACT NUMBER: 1898

SAFETY AND EFFICACY OF CITRIC ACID/ZWITTERIONIC SURFACTANT (NOVUS) CLEANSING SOLUTION IN A RABBIT MODEL OF SINUSITIS.

Jennifer M. Kofonow MS, Jennifer Medina MS, Eric Tam, Bei Chen MD, Laurel Dogrhamji, RN, Matthew Myntti, PhD, Alexander G. Chiu, MD, James N. Palmer, and Noam A. Cohen, MD, PhD

INTRODUCTION: Persistent Chronic rhinosinusitis (CRS) may involve a particularly resistant form of infection known as a bacterial biofilm that is recalcitrant to antibiotics secondary to physical barrier characteristics. Recently, a novel sinus cleansing solution, Citric Acid/Zwitterionic Surfactant (CAZS) was demonstrated to be extremely effective in disrupting biofilms in vitro however with substantial ciliotoxicity. The purpose of this study was to investigate the toxicity and efficacy of a second generation CAZS, termed Novus, in the rabbit sinusitis model.

METHODS: Scanning electron microscopy (SEM) and ciliary beat frequency (CBF) were performed at 1, 3, and 6 days following treatment with Novus. Acute pseudomonal maxillary sinusitis was treated with one application of Novus or saline. Daily saline irrigations were performed and viable bacteria assessed for three consecutive days.

RESULTS: Morphologic analysis revealed mixed deciliation one and three days following Novus treatment, with 62% ± 17.8% (range 47 - 79%) and 64% ± 23.2% (range 36% - 81%) ciliation respectively, while six days post irrigation, near complete reciliation was evident (96% ± 5.8%). Physiologic analysis demonstrated blunted CBF at 1 and 3 days following irrigation with frequency values 60% (range 39% - 88%) of the non-irrigated side while at 6 days CBF was 86% of non- irrigated side (range 76% -97%). Antibacterial activity, demonstrated a 1.5 log reduction in recovered viable bacteria at days 1 - 3 following treatment compared to saline.

CONCLUSIONS: This study demonstrates that in the rabbit acute pseudomonal maxillary sinusitis model a one time treatment with Novus sinus cleansing solution is able to reduce bacterial load by 1.5 logs for up to three days compared to saline but has mild reversible ciliotoxicity.