

Abstract Selection

The peaked audiometric configuration in Meniere's disease: disease related? Ries, D. T., Rickert, M., Schlauch, R. S. Department of Communication Disorders, University of Minnesota and Minnesota Ear, Head, and Neck Clinic, Minneapolis 55455, USA. *Journal of Speech, Language, and Hearing Research* (1999) August, Vol. 42 (4), pp. 829–43.

A retrospective analysis of audiograms was completed for persons from three different patient groups. These three groups were (1) persons with unilateral Meniere's disease, (2) persons with unilateral acoustic tumour, and (3) persons from the general clinical population of an audiology clinic in a major medical center. As Paparella, McDermott, Luiz, and de Sousa (1982) also report, the most common audiometric configuration in the Meniere's disease group was peaked, a condition in which poorer hearing is reported in the low and high frequencies, and an island of better hearing sensitivity occurs at either 1.0 or 2.0 kHz. Some of the peaked audiograms from persons in our Meniere's disease group could be a result of a low-frequency hearing loss caused by Meniere's disease combined with a high-frequency hearing loss due to aging or other environmental factors. However, 27 per cent (13/48) of the peaked audiograms in ears with Meniere's disease were found in persons with no hearing loss in the high frequencies of their nondiseased ear. Thus, the peaked audiometric configuration is associated with Meniere's disease, as suggested by research results from animals with experimentally induced endolymphatic hydrops. Peaked audiometric configurations were also observed in roughly nine per cent of the general clinical population and in 12.5 per cent of ears of persons with acoustic tumours. A rule – based on the audiometric configurations that maximized identification of patients with Meniere's disease – using the general clinical population as a control did not fare as well when the tumour group was used as a control. This finding provides further evidence that peaked audiograms, although common to Meniere's disease, are not pathognomonic of this disease. Furthermore, these results indicate that the diagnosis of Meniere's disease from audiometric profiles is risky, at best.

Standardized format for depicting hearing preservation results in the management of acoustic neuroma. Rappaport, J. M., Nadol, J. B. J. R., McKenna, M. J., Ojemann, R. G., Thornton, A. R., Cortese, R. A. Massachusetts Eye and Ear Infirmary. *Otolaryngology – Head and Neck Surgery* (1999) September, Vol. 121 (3), pp. 176–9.

The Committee on Hearing and Equilibrium of the American Academy of Otolaryngology – Head and Neck Surgery recently published guidelines for reporting hearing preservation in the treatment of acoustic neuromas. These suggestions included pretreatment and posttreatment pure-tone hearing thresholds, word recognition scores, and hearing classification. We present a standardized reporting format that addresses the Committee's recommendations and displays individual patient audiologic data as a simple, concise plot of posttreatment hearing results. To illustrate the use of the recommended format, preoperative and postoperative hearing data from our institution are reported. Such reporting criteria will facilitate comparative reviews of studies of hearing preservation after surgical or radiotherapeutic management of acoustic neuromas, while providing specific data for individual patient outcome analysis.

Thermal myringotomy for eustachian tube dysfunction in hyperbaric oxygen therapy. Potocki, S. E., Hoffman, D. S. University of Texas Health Science Center at San Antonio, TX 78284-7777, USA. *Otolaryngology – Head and Neck Surgery* (1999) September, Vol. 121 (3), pp. 185–9.

Otolaryngologists are frequently asked to manage eustachian tube dysfunction (ETD) in patients undergoing hyperbaric oxygen therapy (HBO). HBO patients with intractable ETD currently are treated by tympanostomy tube placement; typically, these tubes

are indwelling far longer than is required by the duration of HBO. Also, tubes in this population are associated with higher complication rates of persistent perforation and otorrhea. We investigated the use of thermal myringotomy as an alternative to tympanoplasty tube placement in this clinical setting. Potentially, thermal myringotomy avoids the risks and complications associated with indwelling tympanostomy tubes and would be a temporally more appropriate treatment during short- and intermediate-term HBO. In this study 13 patients undergoing HBO who would have required tympanostomy tube placement instead underwent bilateral thermal myringotomies. At the fifth postoperative week, 96 per cent of myringotomies were patent; this duration is adequate for most HBO courses. No patient required a second myringotomy for premature closure. The persistent perforation rate was 15 per cent (at the end of six months), which compares favorably with the rate observed with tympanostomy tubes in this unique population of poor wound healers. Only one patient had otorrhea; this resolved with dry ear precautions. This study demonstrates thermal myringotomy to be an effective technique for middle ear ventilation in patients undergoing HBO in who ETD develops.

Interactive effects of the middle ear pathology and the associated hearing loss on transient-evoked otoacoustic emission measures.

Koike, K. J., Wetmore, S. J. Department of Otolaryngology – Head and Neck Surgery, West Virginia University School of Medicine, Morgantown, WV 26506-9200, USA. *Otolaryngology – Head and Neck Surgery* (1999) September, Vol. 121 (3), pp. 238–44.

Sixty-three children aged four to 17 years were examined by tympanometry, pure-tone audiometry, transient-evoked otoacoustic emissions (TEOAEs), and otoscopy to evaluate the effects of middle ear pathologies and the associated hearing loss on TEOAEs. TEOAE measures were highly specific (93.8 per cent) in identifying normal ears that passed both audiometric and tympanometric criteria. The sensitivity for identifying abnormal ears was also reasonable (83.3 per cent). The effects of the middle ear abnormality were most significant, regardless of the degree of hearing loss, when the tympanogram was type B with normal volume measures, which is associated with reduced eardrum mobility and middle ear fluid. The middle ear conditions producing the greater negative pressure, which in turn led to more conductive hearing loss, also produced more TEOAE failures. The mere presence of an open ventilation tube was not a determining factor for absent TEOAEs because 60 per cent of the open ventilation tubes had normal TEOAEs. Provided that the clinician understands the effects of middle ear pathologies on otoacoustic emissions, TEOAEs can be a great asset for diagnosis of both otologic and audiologic disorders.

Outcome of reflux therapy on pediatric chronic sinusitis. Bothwell, M. R., Parsons, D. S., Talbot, A., Barbero, G. J., Wilder, B. Division of Otolaryngology, University of Missouri-Columbia, USA. *Otolaryngology – Head and Neck Surgery* (1999) September, Vol. 121 (3), pp. 255–62.

OBJECTIVE: The cause of pediatric chronic sinusitis is multifactorial, but nasal edema appears to be the initial pathologic step. The objective of this study is to evaluate gastronomic reflux as a possible cause of pediatric sinusitis. **METHODS:** Thirty children with chronic sinusitis were believed to be appropriate candidates for functional endoscopic sinus surgery. Children were evaluated retrospectively for their response to reflux therapy with regard to their sinus symptoms and avoidance of sinus surgery. **RESULTS:** Two of the 30 children were eventually excluded because they were taken to surgery for the specific purpose of contact point release. Chart review at 24-month follow-up indicated that 25 of the 28 children (89 per cent) avoided sinus surgery. **CONCLUSION:** After reflux treatment, the number of children requiring

sinus surgery was dramatically reduced. The results of this preliminary pediatric study indicate that gastrosal reflux should be evaluated and treated before sinus surgical intervention.

Electrocochleographic changes after intranasal allergen challenge: A possible diagnostic tool in patients with Meniere's disease.

Gibbs, S. R., Mabry, R. L., Roland, P. S., Shoup, A. G., Mabry, C. S. Department of Otorhinolaryngology, University of Texas Southwestern Medical Center, Dallas 75235-9035, USA. *Otolaryngology – Head and Neck Surgery* (1999) September, Vol. 121 (3), pp. 283–4.

Numerous observers have suggested a relationship between allergy and Meniere's disease, but objective proof has heretofore been limited. Using standard criteria, we studied a group of seven patients with previously diagnosed Meniere's disease in whom significant allergy to one or more inhalants had also been diagnosed. Patients underwent a baseline electrocochleographic study followed by intranasal challenge with a carefully quantified amount of the allergen to which they were most sensitive. This was followed by a second electrocochleogram. Four of the seven patients demonstrated at least a 15 per cent increase in the summing potential/action potential ratio in one ear, associated with the production of subjective inner ear symptoms. We present this protocol as a potentially useful tool to further study whether inhalant allergy may be a causative factor in patients with Meniere's disease.

Does choice of hearing selection criterion and reporting criteria affect the hearing preservation rate in vestibular schwannoma surgery?

Da Cruz, M. J., Moffat, D. A., Baguley, D. M., Beynon, G. J., Hardy, D. G. Department of Otoneurological and Skull Base Surgery, Addenbrooke's Hospital, Cambridge, UK. *Otolaryngology – Head and Neck Surgery* (1999) September, Vol. 121 (3), pp. 313–7.

With increasing refinement in the surgery of vestibular schwannoma the aims of complete tumour removal and facial nerve preservation have been largely fulfilled. However, the reputation of and place for hearing-preservation surgery still remain uncertain. A major part of this uncertainty is the result of difficulties in interpretation of the various reported results of hearing-preservation surgery. Meaningful comparison between series is difficult because of the varied number of postoperative reporting criteria commonly in use today. Although it is acknowledged that the postoperative reporting criteria affect the hearing-preservation rates, what is not readily appreciated is that postoperative selection criteria for hearing-preservation cases can also significantly affect the success rate of hearing-preservation acoustic neuroma surgery. This article models the many possible outcomes of hearing-preservation schwannoma surgery by use of the previously reported Cambridge series as an illustrative example. With these models some understanding can be gained of the effect of choosing various preoperative and postoperative hearing criteria on the overall hearing-preservation success rate.

Clinical study of Widex Senso on first-time hearing aid users.

Berninger, E., Karlsson, K. K. Department of Audiology, Karolinska Institute, Huddinge University Hospital, Sweden. Erik.Berninger@aud.hs.sll.se. *Scandinavian Audiology* (1999), Vol. 28 (2), pp. 117–25.

Using psychoacoustic tests and questionnaires, the aim of this study was to clinically test Widex Senso (WS) versus analogue hearing aids on 200 first-time wearers. Half of the participants were selected at random for fitting with the behind-the-ear model (WS C8) or the in-the-canal model (WS CX). On a group basis, WS was found to provide more benefit than a palette of 29 analogue, modern hearing aid models from 10 manufacturers. Only three of 100 subjects changed from WS to another hearing aid. On average, the abbreviated profile of hearing aid benefit (APHAB) (Cox & Alexander, 1995) demonstrated superior performance for WS, i.e. no conflict existed between high comfort and high speech recognition. Median aided frequency-modulated tone thresholds in the sound field were better than 25 dB HL at frequencies up to 4 kHz inclusive. A distinct mean aided improvement of speech threshold in competing speech of 2.5 dB was found in both groups.

Clinical study of a digital vs an analogue hearing aid. Bille, M., Jensen, A. M., Kjaerbol, E., Vesterager, V., Sibelle, P., Nielsen, H. Department of Audiology, Bispebjerg Hospital, H:S, Copenhagen, Denmark. mbille@iname.com. *Scandinavian Audiology* (1999), Vol. 28 (2), pp. 127–35.

Digital signal processing in hearing instruments has brought new perspectives to the compensation of hearing impairment and may result in alleviation of the adverse effects of hearing problems. This study compares a commercially available digital signal processing hearing aid (HA) (Senso) with a modern analogue HA with programmable fitting (Logo). The HAs tested are identical in appearance and, in spite of a different mode of operation, the study design ensured blinding of the test subjects. Outcome parameters were: improvements in speech recognition score in noise (deltaSRSN) with the HAs; overall preference for HA; overall satisfaction; and various measures of HA performance evaluated by a self-assessment questionnaire. A total of 28 experienced HA users with sensorineural hearing impairment were included and 25 completed the trial. No significant differences were found in deltaSRSN between the two HAs. Eleven subjects indicated an overall preference for the digital HA, 10 preferred the analogue HA and four had no preference. Concerning overall satisfaction, eight subjects rated the digital HA superior to the analogue one, whereas seven indicated a superior rating for the analogue HA and 10 rated the HAs equal. Acceptability of noise from traffic was the only outcome parameter which gave a significant difference between the HAs in favour of the digital HA. It is concluded that there are no significant differences in outcome between the digital and analogue signal processing HAs tested by these experienced HA-users.

Nocturnal nasal congestion and nasal resistance. Stroud, R. H., Wright, S. T., Calhoun, K. H. Department of Otolaryngology, University of Texas Medical Branch, Galveston 77555, USA. *The Laryngoscope* (1999) September, Vol. 109 (9), pp. 1450–3.

OBJECTIVES: To compare total nasal resistance (TNR) in upright and supine positions in patients who did and did not complain of nocturnal (supine) nasal congestion symptoms without daytime (upright) congestion, and to determine what other conditions were associated with nocturnal nasal congestion (NNC) symptoms. **STUDY DESIGN:** A prospective study comparing objectively measured nasal airflow in different positions (upright and reclining) with subjective patient symptoms. **METHODS:** Subjects completed a questionnaire about nasal symptoms. Anterior rhinomanometry was performed with patients upright, reclined 45 degrees, and supine. TNR in subjects subsets was compared using the Student t test. **RESULTS:** TNR did not differ between upright patients with (n = 27) and without (n = 20) NNC. Supine TNR ($p < 0.04$) and increase in TNR ($p < 0.02$) between upright and supine was greater in patients with NNC. Smokers (n = 15, 10 with NNC, five without) had greater TNR increases when supine versus nonsmokers ($p < 0.02$). Patients with rhinitis symptoms (n = 29, 18 with NNC, 11 without) had greater TNR increases when supine than patients without rhinitis ($p < 0.01$). Patients who both smoked and had rhinitis (n = 11, seven with NNC, four without) had a greater supine TNR than patients who smoked or had rhinitis alone ($p < 0.02$). **CONCLUSIONS:** Some patients without daytime nasal congestion experience NNC. They have a significantly greater TNR increase when supine versus patients without NNC. Smokers and patients with rhinitis, with or without NNC, have a significantly greater TNR increase when supine versus nonsmokers or patients without rhinitis. Smoking cessation and treatment of rhinitis may improve the patients' NNC.

Lateral thigh free flap for head and neck reconstruction. Hayden, R. E., Deschler, D. G. Department of Otolaryngology – Head and Neck Surgery, Medical College of Pennsylvania-Hahnemann University, Philadelphia 19102, USA. *The Laryngoscope* (1999) September, Vol. 109 (9), pp. 1490–4.

OBJECTIVES: To present the technique of lateral thigh free flap reconstruction in the head and neck and review the use of this procedure in 58 head and neck defect reconstructions. **STUDY DESIGN:** Retrospective review in the setting of a tertiary, referral, and academic center. **METHODS:** Retrospective review of patient records in cases of lateral thigh free flap reconstruction for head and neck defects. Records were reviewed for patient age, gender,

pathologic findings, type of reconstruction (pharyngoesophageal, glossectomy, oropharyngeal, or external soft tissue defects), recipient and donor-site complications, and flap failure. **RESULTS:** Fifty-eight patients underwent lateral thigh flap reconstruction from 1984 to 1997. Patient age ranged from 10 to 76 years. Thirty-nine patients were men, and 19 were women. Forty-three flaps were used for pharyngoesophageal reconstruction, nine for glossectomy defects, two for oropharyngeal defects, and four for external, soft tissue defects. All resections were for squamous cell carcinoma, except one case of recurrent hemangiopericytoma. One flap failure occurred from venous thrombosis (1.7 per cent). Forty-two of 43 pharyngoesophageal defects were successfully reconstructed (97.6 per cent). Five temporary salivary leaks were noted, but no frank fistulas occurred. One fistula occurred in the oropharyngeal reconstruction group. Four minor donor-site complications were noted (6.9 per cent). **CONCLUSION:** This series demonstrates the low donor-site morbidity, as well as the reliability and versatility, of the lateral thigh free flap for head and neck reconstruction.

Outcome of frontal sinus obliteration. Mendians, A. E., Marks, S. C. Department of Otolaryngology, Wayne State University School of Medicine, Detroit, Michigan 48235, USA. *The Laryngoscope* (1999) September, Vol. 109 (9), pp. 1495–8.

OBJECTIVES: To evaluate the indications, technique, and results after long-term follow-up of osteoplastic frontal sinusectomy with fat obliteration. **STUDY DESIGN:** A retrospective review of a series of consecutive patients using objective and subjective outcome assessment. **METHODS:** A retrospective chart review was conducted of all patients undergoing osteoplastic flap procedure with obliteration between July 1, 1991, and July 1, 1997. Each patient also completed a symptom questionnaire rating the degree of symptoms both before and after surgery using a 10-point scale. The results were tabulated and analysed for statistical significance. **RESULTS:** Twenty osteoplastic flap procedures to obliterate the frontal sinus were reviewed. The average patient age was 41 years, with the average duration of follow-up being 40.2 months. No surgical failures were noted; one patient underwent a negative reexploration. One surgical and one medical complication are reported. Statistically significant improvement was noted in overall symptoms, headache, congestion, drainage, and frequency of infections when the preoperative to the postoperative symptom scores were compared ($p < 0.001$). **CONCLUSIONS:** Based on these results, the use of the osteoplastic flap in the obliteration of the frontal sinus continues to be an option in the era of endoscopic treatment of frontal sinus disease, particularly in endoscopic failures and chronic frontal sinus pain.

Effects of age, body mass index, and gender on nasal airflow rate and pressures. Crouse, U., Laine-Alava, M. T. Department of Physiology, University of Kentucky, Lexington 40536-0084, USA. *The Laryngoscope* (1999) September, Vol. 109 (9), pp. 1503–8.

OBJECTIVES: The purpose of this study was to evaluate the variation of airflow rate and oral-nasal pressure with age, body mass index (BMI), and gender (i.e. to evaluate whether the effects of age, BMI, and gender on airflow rate and pressures are convergent with their effects on nasal cross-sectional area and resistance). **STUDY DESIGN:** A cross-sectional study of 332 subjects (214 female and 118 male subjects) aged 16 to 82 years. **METHODS:** The aerodynamic measurements of nasal airflow rate and nasal and oral pressures were performed by posterior rhinomanometry. Age, gender, weight, and height were recorded for each subject, and the BMI was calculated. The effects of age, BMI, and gender on airflow rate and nasal and oral pressures were estimated by ANOVA. **RESULTS:** Nasal airflow rate and oral and nasal pressures increased with increasing BMI. In addition, the mean values of airflow rate and pressures were significantly higher in male than in female subjects. Increasing age was related to increased oral pressure, but was not associated with airflow rate or nasal pressure. **CONCLUSIONS:** This study suggests that, on the contrary to the findings in children and adolescents, BMI and gender should be taken into consideration when measuring the patency of upper airway in adults.

Effects of environmental tobacco smoke on objective measures of voice production. Lee, L., Stemple, J. C., Geiger, D., Goldwasser, R. University of Cincinnati Department of Communication Sciences and Disorders, OH 45221-0394, USA. linda.lee@uc.edu.

The Laryngoscope (1999) September, Vol. 109 (9), pp. 1531–4. **OBJECTIVE:** The effects of passive smoking on the voice and laryngeal structures of 20 female passive smokers and 20 age-matched nonsmokers were examined. **METHODS:** The voice evaluation consisted of acoustic, aerodynamic, and videostroboscopic analyses. **RESULTS:** Three passive smokers displayed mild edema or erythema. Passive smokers had higher mean flow rates and shorter mean maximum phonation times during sustained vowels at comfortable, low-, and high-pitch levels. However, means were only outside normal limits and significantly different from nonsmokers at high pitch. Variables such as the number of years and hours per day subjects were exposed to environmental tobacco smoke were considered. **CONCLUSION:** The majority of the variables indicated that vocal fold structure and function were not adversely altered by exposure to passive smoke. Differences between these results and clinical observations are highlighted.

Vestibular-evoked myogenic potentials in patients with dehiscence of the superior semicircular canal. Brantberg, K., Bergenius, J., Tribukait, A. Department of Audiology, Karolinska Hospital, Stockholm, Sweden. kbr@ent.ks.se. *Acta Oto-Laryngologica* (1999), Vol. 119 (6), pp. 633–40.

Recently Minor and co-workers described patients with sound- and pressure-induced vertigo due to dehiscence of bone overlying the superior semicircular canal. Identifying patients with this 'new' vestibular entity is important, not only because the symptoms can be very incapacitating, but also because they are surgically treatable. We present symptoms and findings for three such patients. On exposure to sounds, especially in the frequency range 0.5–1 kHz, they showed vertical/torsional eye movements analogous to a stimulation of the superior semicircular canal. They also showed abnormally large sound-induced vestibular-evoked myogenic potentials (VEMP), i.e. the short latency sternomastoid muscle response considered to be of saccular origin. The VEMP also had a low threshold, especially in the frequency range 0.5–1 kHz. However, in response to saccular stimulation by skull taps, i.e. when the middle ear route was bypassed, the VEMP were not enlarged. This suggests that the relation between the sound-induced and the skull tap-induced responses can differentiate a large but normal VEMP from an abnormally large response due to dehiscence of bone overlying the labyrinth, because only the latter would produce large sound-induced VEMP compared to those induced by skull taps.

Bell's palsy and tinnitus during pregnancy: predictors of pre-eclampsia? Three cases and a detailed review of the literature. Shapiro, J. L., Yudin, M. H., Ray, J. G. Department of Obstetrics and Gynaecology, Women's College Hospital, University of Toronto, Ontario, Canada. *Acta Oto-Laryngologica* (1999) Vol. 119 (6), pp. 647–51.

We present two cases of Bell's palsy, and another with tinnitus, all in association with pre-eclampsia in the third trimester of pregnancy. We also systematically reviewed the published literature on both Bell's palsy and tinnitus in pregnancy and the puerperium using Medline from January 1966 to October 1998, and searched through the references from review articles and original research publications for further studies. Studies were limited to those published in the English language. We then pooled the rates of occurrence for Bell's palsy according to trimester of pregnancy, and postpartum, as well as the associated prevalence of pre-eclampsia or gestational hypertension. We found that the majority of cases of Bell's palsy arose during the third trimester (pooled event rate 71.1 per cent, 95 per cent confidence interval (CI) 64.1–77.2), while almost none arose in the first trimester. During the postpartum period, the distribution of Bell's palsy was 21.3 per cent (95 per cent CI 15.7–28.1) of all cases, with the majority arising within days of delivery. Gestational hypertension or pre-eclampsia was present in 22.2 per cent of cases (95 per cent CI 12.5–36.4), well above the five per cent rate in the general population. Only one paper provided data on tinnitus in pregnancy, with the distribution equal across all three trimesters. When compared to non-pregnancy controls, the odds ratio for the development of tinnitus during pregnancy was 2.8 (95 per cent CI 1.0–8.1). In conclusion, Bell's palsy, and perhaps, tinnitus, occur more frequently during the third trimester of pregnancy. Both may be presenting prodromal signs of underlying early pre-eclampsia. The pathophysiological mechanism relating these two entities to pre-eclampsia is also discussed.

Experimental autoimmune labyrinthitis induced by cell-mediated immune reaction. Tomiyama, S., Jinnouchi, K., Ikezono, T., Pawankar, R., Yagi, T. Department of Otolaryngology, Nippon Medical School, Tokyo, Japan. tomiyama.Schunichi/ent@nms.ac.jp. *Acta Oto-Laryngologica* (1999), Vol. 119 (6), pp. 665–70.

This study was designed to establish an experimental cell-mediated autoimmune labyrinthitis model in C57BL/6 mice, which could exhibit high reproducibility and be adopted for precise immunological analysis. Inner ear antigen (IEA) was prepared from bovine membranous labyrinth. Following pretreatment with cyclophosphamide (CP) and primary sensitization with IEA/FCA, many inflammatory cells infiltrated transiently into the perilymphatic and endolymphatic regions of the cochlea, vestibule and the endolymphatic sac, but not into the kidney, lung, brain or liver. This reaction occurred from day seven and peaked on day 12 in all animals, and then rapidly reduced. This reaction occurred in all experimental mice during day 10 to day 12. The control mice showed no cellular reaction in the inner ear. These results suggest that the inner ear may possess cross-species organ-specific antigen and that a cell-mediated immune reaction may play an important role in the induction of autoimmune labyrinthitis.

Mucosal surface area determines the middle ear pressure response following establishment of sniff-induced underpressures. Doyle, W. J. Department of Otolaryngology, Children's Hospital of Pittsburgh and the University of Pittsburgh School of Medicine, PA, USA. *Acta Oto-laryngologica* (1991), Vol. 119 (6), pp. 695–702.

INTRODUCTION: Miura and colleagues presented data that they interpreted as evidencing a pressure-regulating function of the mastoid mucosa. Specifically, they reported different responses after sniff-induced middle ear (ME) underpressure for ears with and without a history of otitis media with effusion (OME). To understand the mechanism underlying that effect, a previously developed mathematical model was adapted to their experiment and used to simulate the expected pressure-time functions under different conditions. **METHODS:** A simple, two-compartment model of passive, gradient-driven, trans-mucosal gas exchange was used to simulate ME pressure behaviour. Initial conditions for the free parameters of the model were taken from published data for humans and monkeys. Functions relating surface area to volume for geometric representations of the ME were constructed and used as model parameters. The effect of sniffing on ME gas partial pressure was modelled as a fractional reduction proportional to gas representation in the ME. **RESULTS:** The model accurately simulated the time course and magnitude of the post-sniffing pressure change reported for both normal and abnormal MEs. The post-sniffing pressure increase is driven by sniff-induced blood-ME partial pressure gradients for CO₂, O₂, and H₂O, which cause passive counter-diffusion of those gases. The effect of disease on the rate of pressure increase is attributable to the reduced surface area for exchange caused by underdevelopment of the mastoid in ears with a history of OME. **CONCLUSIONS:** These results do not support a pressure-regulating role for the mastoid mucosa. Contrary to currently held beliefs, the model simulation suggests that small, not large mastoid volumes buffer ME pressure from rapid change due to trans-mucosal gas transfers.

Antibody responses to the outer membrane protein P6 of non-typeable Haemophilus influenzae and pneumococcal capsular polysaccharides in otitis-prone children. Hotomi, M., Yamanaka, N., Saito, T., Shimada, J., Suzumoto, M., Suetake, M., Faden, H. Department of Otorhinolaryngology, Wakayama Medical College, Japan. *Acta Oto-laryngologica* (1999), Vol. 119 (6), pp. 703–7.

Acute otitis media (AOM) is a common infectious disease in children. Some children experience recurrent episode of AOM. Recent investigations demonstrate antigen-specific immunological deficiencies in children prone to AOM. In the present study, the immune responses to non-typeable Haemophilus influenzae (NTHi) and Streptococcus pneumoniae (S. pneumoniae) were further investigated in otitis-prone children and normal children. Forty-eight per cent of otitis-prone children exhibited reduced IgG2 levels to S. pneumoniae and 55 per cent exhibited reduced IgG levels to NTHi. These data suggest that otitis proneness appears to be related to numerous immunological derangements. Pathogen-specific antibodies are a reliable measure of otitis proneness.

The A1555G mutation in the 12S rRNA gene of human mtDNA: recurrent origins and founder events in families affected by sensorineural deafness. Torroni, A., Cruciani, F., Rengo, C., Sellitto, D., Lopez-Bigas, N., Rabionet, R., Govea, N., Lopez De Munain, A., Sarduy, M., Romero, L., Villamar, M., del Castillo, I., Moreno, F., Estivill, X., Scozzari, R. Istituto di Chimica Biologica, Universita' di Urbino, Urbino, Italy. torroni@axcasp.casur.it. *American Journal of Human Genetics* (1999) November, Vol. 65 (5), pp. 1349–58.

The mtDNA variation of 50 Spanish and four Cuban families affected by nonsyndromic sensorineural deafness due to the A1555G mutation in the 12S rRNA gene was studied by high-resolution RFLP analysis and sequencing of the control region. Phylogenetic analyses of haplotypes and detailed survey of population controls revealed that the A1555G mutation can be attributed to >30 independent mutational events among the 50 Spanish families and that it occurs on mtDNA haplogroups that are common in all European populations. This indicates that the relatively high detection rate of this mutation in Spain is not due to sampling biases or to a single major founder event. Moreover, the distribution of these mutational events on different haplogroups is compatible with a random occurrence of the A1555G mutation and tends to support the conclusion that mtDNA backgrounds do not play a significant role in the expression of the mutation. Overall, these findings appear to indicate that the rare detection of this mutation in other populations is most likely due to inadequacy in patient ascertainment and molecular screening. This probable lack of identification of the A1555G mutation in subjects affected by sensorineural hearing loss implies that their maternally related relatives are not benefiting from presymptomatic detection and information concerning their increased risk of ototoxicity due to aminoglycoside treatments.

Osteosclerosis, hypoplastic nose, and proptosis (Raine syndrome): further delineation. Shalev, S. A., Shalev, E., Reich, D., Borochowitz, Z. U. The Genetics Institute, Haemek Medical Center, Afula, Israel. *American Journal of Medical Genetics* (1999), September 17, Vol. 86 (3), pp. 274–7.

We describe a newborn girl with a lethal sclerosing bone dysplasia leading to prenatal skeletal alterations and microcephaly, proptosis, hypoplastic nose and midface, small jaw, cleft palate, hypertrophied gums, intracranial calcifications, and generalized osteosclerosis. There is a remarkable similarity between our patient and six previously reported infants subsequently categorized as having a distinct entity: Raine syndrome. Autosomal recessive inheritance is postulated based on parental consanguinity in several of the previous cases and in our patient. Copyright 1999 Wiley-Liss, Inc.

Canal atresia reconstruction with dental school impression material. Weber, P. C., Davis, B., Adkins, W. Y. Jr. Department of Otolaryngology, Medical University of South Carolina, Charleston 29425, USA. *American Journal of Otolaryngology* (1999), July–August, Vol. 20 (4), pp. 236–40.

Medium-density viscosity dental impression material has recently been used after repair of an atretic canal to stent open the newly created external auditory canal for two weeks, followed by a hard acrylic stent. This may provide more benefits than traditional packing, but caution must still be used. We recently have used the dental impression material to help in the reconstruction of seven ear canals. The medium-viscosity impression material hardens quickly and provides a solid, nonmobile stent, which usually pulls out without difficulty. The stent that is removed may then be used by our prosthodontist to fashion a hard, acrylic, removable stent to be worn for the next few months. This hard stent is used to prevent further stenosis. As with any technique, complications may arise and, through experience, common mistakes that can hinder a good outcome can be avoided. We will report six cases with illustrated tips on how to avoid complications when using this technique.

Mandibular invasion in carcinoma of the lower alveolus. Lam, K. H., Lam, L. K., Ho, C. M., Wei, W. I. Department of Surgery, Queen Mary Hospital, the University of Hong Kong, Hong Kong. *American Journal of Otolaryngology* (1999) September–October, Vol. 20 (5), pp. 267–72.

PURPOSE: Efforts to conserve the mandible in resection for oral cancer tend to bring the resection margin progressively closer to the tumour front. This study of the manner of mandibular invasion

by carcinoma of the lower alveolus provides added information regarding carcinoma of the lower alveolus provides added information regarding the behaviour of the cancer within the bone. **MATERIALS AND METHODS:** Twenty-four resected specimens of squamous carcinoma of the lower alveolus were studied with X-rays and step-serial whole-organ histological sections. **RESULTS:** In 19 of the 21 specimens showing bone invasion, the spread was in the form of a broad front. Insinuation of tumour beyond the tumour front was extensive in nine of 13 tumours showing deep mandibular invasion. Horizontal subcortical spread took place in five of 18 specimens for a distance of up to one cm. Perineural spread along the inferior alveolar nerve was found in four of 13 specimens in which the tumour extended to the canal; tumour spread along the canal, without neural involvement, was never seen. Preoperative orthopantomogram correctly estimated the extent of mandibular invasion in 16 of 24 patients. **CONCLUSIONS:** The tumour front of mandibular invasion by carcinoma of the lower alveolus is usually broad. In the absence of deep invasion, which is defined by invasion reaching the alveolar canal, there is little or no insinuation of cancer cells beyond the tumour front, and no spread along the alveolar canal. Marginal mandibulectomy can be applied more widely, taking a margin of one cm in all directions.

Fractures of the frontal sinus: classification and its implications for surgical treatment. Ioannides, C., Frehofer, H. P. Department of Plastic and Reconstructive Surgery, Middlesex Hospital, University College Hospitals, London, England. *American Journal of Otolaryngology* (1999) September–October, Vol. 20 (5), pp. 273–80.

PURPOSE: To propose a clinical classification of fractures of the frontal sinus and discuss the implications on treatment. **PATIENTS AND METHODS:** One hundred patients with fractures of the frontal sinus seen and operated on in two University hospital units (Leuven and Nijmegen). The majority of the patients were surgically treated according to a protocol based on the proposed classification. Fractures were classified according to their location, extent, involvement of the nasofrontal duct, and injury to the dura. Fragments were reduced and fixed, defects were reconstructed with autologous bone grafts, and the sinus cavity was drained, obliterated, or cranialized. In the latter cases, the sinus mucosa was thoroughly removed before obliteration or cranialization. **RESULTS:** The follow-up ranged from six months to 12 years. There were functional complications in four per cent of patients. Minor aesthetic sequelae were noticed in 14 per cent of the patients. **CONCLUSION:** A detailed classification of fractures of the frontal sinus is proposed. It has helped the authors set up a treatment protocol. Optimally, if used by clinicians, it will contribute to a more standardized method of surgical care of patients with such injuries.

Latissimus dorsi myocutaneous flap for secondary head and neck reconstruction. Har El, G., Bhaya, M., Sundaram, K. Department of Otolaryngology, SUNY-Health Science Center at Brooklyn, NY 11203, USA. *American Journal of Otolaryngology* (1999) Septem-

ber–October, Vol. 20 (5), pp. 287–93.

PURPOSE: To review our experience and results with the use of pedicled latissimus dorsi myocutaneous flap (LDMF) for secondary reconstruction in head and neck surgery. **METHODS:** Twenty-two patients had LDMF, 17 of them for secondary reconstruction. Data were collected regarding the primary surgery, primary method of reconstruction, indication for secondary reconstruction, and outcome. **RESULTS:** Seventeen LDMF procedures were performed for secondary reconstruction. Flap success rate was 100 per cent. Reconstructive goals were achieved immediately in 16 (94.1 per cent) patients. **CONCLUSION:** LDMF is a thin flap with a large surface area and a long pedicle that allows it to reach any region in the head, neck and scalp. Its main disadvantages are the need for lateral positioning of the patient and the fact that its pedicle is not protected with muscle. In our experience, LDMF provides an excellent reconstructive option especially in complicated cases of secondary reconstruction. It may be used in cases where a free flap is usually used, but with significantly reduced surgical time.

Quantitative analysis of microdebriders used in endoscopic sinus surgery. Ferguson, B. J., DiBiase, P. A., D'Amico, F. Department of Otolaryngology, University of Pittsburgh School of Medicine, PA, USA. *American Journal of Otolaryngology* (1999) September–October, Vol. 20 (5), pp. 294–7.

PURPOSE: To develop a standardized in vitro model for evaluating efficacy of the microdebriders and to assess whether differences in efficacy exist among available microdebriders. Microdebriders combine suction of tissue with amputation by a hollow rotating cutter. Several models are available, and they are increasingly popular in endoscopic sinus surgery. **MATERIALS AND METHODS:** Seven microdebriders were tested by using a standardized soft tissue model (standard fresh raw oysters excluding muscle) and a firm tissue model (standard fresh raw oyster muscle). Efficacy was measured in grams of tissue aspirated per minute. Models to simulate lamina papyracea (eggshell) and dura (egg sac) were also tested with each microdebrider. **RESULTS:** Statistically significant differences in soft tissue aspiration were found between most microdebriders ranging from the Xomed (Jacksonville, FL) Straight Shot/4.0 mm blade (147 g/min); the ESSential Shaver (Smith & Nephew, Memphis, TN)/4.0 mm blade (99 g/min), the Linvatec (Largo, FL)/4.2 mm blade and Dyonic (Burscheid, Germany)/3.5 mm blade and Wizard Plus/4.0 mm blade (range 43 to 46 g/min), followed by the Hummer II (Stryker, Santa Clara, CA) 4.0 mm blade (22.5 g/min), and finally the Xomed Wizard Plus/3.5 mm blade at 16 g/min. The Xomed Straight Shot/4.0 blade was statistically superior to all other microdebriders in efficiency of aspiration in the firm tissue model. All microdebriders were able to abrade a 'bony' spicule and intact 'dura', whereas none could abrade intact 'bone'. **CONCLUSIONS:** Significant differences exist among the various microdebriders in this standardized model of efficiency of aspiration. Additional clinical factors including cost, safety, ease of use, and adaptability should also be considered in the choice of a microdebrider.