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Abstract Selection

Evidences of vascular origin of cochleovestibular dysfunction. Szirmai, A., Kuestel, M., Panczel, G., Kocher, I., Repassy, G., Nagy, Z. Semmelweis University, Budapest, Department of Otolaryngology and Head and Neck Surgery, H-1083, Szigony u 36, Budapest, Hungary. szirmai@fulo.sote.hu. *Acta Neurologica Scandinavica* (2001) August, Vol. 104(2), pp. 68–71.
OBJECTIVES: When the vascular disorder of the cochleovestibular system is mentioned, the diagnosis is based on exclusion of other diseases. Since arteries of the cochleovestibular system cannot be directly visualized, physicians must deduce from the vascular risk factors and the vascular lesion of other territories to the vascular cochleovestibular disease. MATERIALS AND METHODS: Authors analysed the data of 19 patients with vertigo. Detailed blood tests, complete neurootological and audiological examination including ABR, carotid and vertebral artery Doppler sonography, MRI and MRA was performed. RESULTS: Cochleovestibular examination and ABR showed abnormalities in 73.7 per cent, either carotid and vertebral artery Doppler or MRI showed abnormalities in 57.9 per cent. MRA was abnormal in 47.4 per cent. In most of the patients multiple risk factors of cerebrovascular disorder could be found. CONCLUSIONS: The cochleovestibular system disorders can be considered to be of vascular origin if the examinations exclude other diseases, if the patients have vascular risk factors and if other territories of brain accessible for imaging methods show vascular disorders.

Improved mandible function after hemimandibulectomy, condylar head preservation, and vascularized fibular reconstruction. Nahabedian, M. Y., Tufaro, A., Manson, P. N. Division of Plastic and Reconstructive Surgery, Johns Hopkins Hospital, Baltimore, MD 21287, USA. *Annals of Plastic Surgery* (2001) May, Vol. 46(5), pp. 506–10.
Temporomandibular joint dysfunction after tumour extirpation of the hemimandible is a frequent sequela after condylar head reconstruction. Condylar head resection is often performed because of oncological and vascular considerations. Recent studies have demonstrated that malignancies of the mandibular ramus and body rarely involve the condylar head, and that the vascularity and supportive structures of the condylar head are sufficient to maintain viability and function. This study demonstrates that temporomandibular joint function is preserved after hemimandibulectomy without resection of the condylar head. Fixation of a vascularized fibular flap to the condylar head is performed in situ. Condylar viability and growth is maintained with painless incisal opening. The condylar head is a growth center for the mandible in the pediatric population. Its preservation in these patients will avoid the long-term problems associated with growth center loss such as malocclusion and concomitant maxillary deformity.

Is voice therapy an effective treatment for dysphonia? A randomized controlled trial. MacKenzie, K., Millar, A., Wilson, J. A., Sellars, C., Deary, I. J. Department of Otorhinolaryngology and Head and Neck Surgery, Glasgow Royal Infirmary, Glasgow G31 2ER. kmk2x@clinm, ed.gla.ac.uk. *British Medical Journal* (2001) September 22, Vol. 323 (7314), pp. 658–62.
OBJECTIVES: To assess the overall efficacy of voice therapy for dysphonia. DESIGN: Single blind randomized controlled trial. SETTING: Outpatient clinic in a teaching hospital. Participants: 204 outpatients aged 17–87 with a primary symptom of persistent hoarseness for at least two months. INTERVENTIONS: After baseline assessments, patients were randomized to six weeks of either voice therapy or no treatment. Assessments were repeated at six weeks on the 145 (71 per cent) patients who continued to this stage and at 12–14 weeks on the 133 (65 per cent) patients who completed the study. The assessments at the three time points for the 70 patients who completed treatment and the 63 patients in the group given no treatment were compared. MAIN OUTCOME MEASURES: Ratings of laryngeal features, Buffalo voice profile, amplitude and pitch perturbation, voice profile questionnaire, hospital anxiety and depression scale, clinical interview schedule, SF-36. RESULTS: Voice therapy improved voice quality as assessed by rating by patients ($p = 0.001$) and rating by observer ($p = 0.001$). The teatment effects for these two outcomes were 4.1 (95 per cent confidence interval 1.7 to 6.6) points and 0.82 (0.50 to 1.13) points. Amplitude perturbation showed improvement at six weeks ($p = 0.005$) but not on completion of the study. Patients with dysphonia had appreciable psychological distress and lower quality of life than controls, but voice therapy had no significant impact on either of these variables. CONCLUSION: Voice therapy is effective in improving voice quality as assessed by self rated and observer rated methods.

Prevalence of permanent childhood hearing impairment in the United Kingdom and implications for universal neonatal hearing screening: questionnaire based ascertainment study. Fortnum, H. M., Summerfield, A. Q., Marshall, D. H., Davis, A. C., Bamford, J. M. MRC Institute of Hearing Research, University Park, Nottingham NG7 2RD. hf@ihr.mrc.ac.uk. *British Medical Journal* (2001) September 8, Vol. 323 (7312), pp. 536–40.
OBJECTIVE: To estimate the prevalence of confirmed permanent childhood hearing impairment and its profile across age and degree of impairment in the United Kingdom. DESIGN: Retrospective total ascertainment through sources in the health and education sectors by postal questionnaire. SETTING: Hospital based otology and audiology departments, community health clinics, education services for hearing impaired children. PARTICIPANTS: Children born from 1980 to 1995, resident in United Kingdom in 1998, with severe permanent childhood hearing impairment (hearing level in the better ear >40 dB averaged over 0.5, 1, 2 and 4 kHz. MAIN OUTCOME MEASURES: Numbers of cases with date of birth and severity of impairment converted to prevalences for each annual birth cohort (cases/1000 live births) and adjusted for under ascertainment. RESULTS: 26 000 notifications ascertained 17 160 individual children. Prevalence rose from 0.91 (95 per cent confidence interval 0.85 to 0.98) for three year olds to 1.65 (1.62 to 1.68) for children aged nine to 16 years. Adjustment for under ascertainment increased estimates to 1.07 (1.03 to 1.12) and 2.05 (2.02 to 2.08). Comparison with previous studies showed that prevalence increases with age, rather than declining with year of birth. CONCLUSIONS: Prevalence of confirmed permanent childhood hearing impairment increases until the age of nine years to a level higher than previously estimated. Relative to current yields of universal neonatal hearing screening in the United Kingdom, which are close to 1/1000 live births, 50–90 per cent more children are diagnosed with permanent childhood hearing impairment by the age of nine years. Paediatric audiology services must have the capacity to achieve early identification and confirmation of these additional cases.

Ear-lobe keloids: treatment by a protocol of surgical excision and immediate postoperative adjuvant radiotherapy. Ragoowansi, R., Cornes, P. G., Glees, J. P., Powell, B. W., Moss, A. L. Department of Plastic and Reconstructive Surgery, St George's Hospital, London, UK. *British Journal of Plastic Surgery* (2001) September, Vol. 54 (6), pp. 504–8.
There is no universally agreed policy for treating keloid scars of the ear lobe following piercing. We treated 35 patients (34 women) for high-risk ear-lobe keloids; the average age was 24 years (range: 16–44 years). All had failed to respond to prior treatment with massage and silicone, and corticosteroid injection. The keloids were excised extralesionally and the defects were closed with interrupted prolene sutures. The operative scar was covered with topical two per cent lignocaine-0.25 per cent chlorhexidine sterile lubricant gel under a transparent adhesive dressing. Adjuvant postoperative radiotherapy of 10 Gy, applied as 100 kV photons (4 mm high-voltage therapy (HVT) A1), was given within 24 h of surgery. All keloid scars were controlled at four weeks' follow-up. At one year, three out of 34 cases followed up had relapsed

(probability of control: 91.2 per cent). At five years, a further four out of the remaining 31 patients had relapsed (cumulative probability of control at five years: 79.4 per cent). There were no cases of serious toxicity.

Zimmer splintage: a simple effective treatment for keloids following ear-piercing. Russell, R., Horlock, N., Gault, D. Plastic Surgery Unit, Mount Vernon Hospital, Northwood, UK. *British Journal of Plastic Surgery* (2001) September, Vol. 54 96), pp. 509–10.
An auricular keloid occurring following ear-piercing remains a difficult condition to treat. Various treatments have been described, with different reported degrees of success. Pressure therapy has been shown to be an effective treatment for auricular keloids, although the devices used have not all been universally accepted. We assessed 30 patients, between 1989 and 1999, who had been fitted with pressure devices made from Zimmer splints. There was a 50 per cent or greater reduction in the size of each keloid when assessed at one year. Zimmer splints are cheap, readily available, easily moulded to fit the patient and can be decorated so that they can be worn as earrings.

Human papillomavirus positive squamous cell carcinoma of the oropharynx: a radiosensitive subgroup of head and neck carcinoma. Lindel, K., Beer, K. T., Laissue, J., Greiner, R. H., Aebersold, D. M. Department of Radiation Oncology, Inselspital, University of Bern, Freiburgstrasse 10, 3010 Bern, Switzerland. katja.lindel@insel.ch. *Cancer* (2001) August 15, Vol. 92 (4), pp. 805–13.
BACKGROUND: Epidemiologic evidence points to a connection between viral infection by the human papillomavirus (HPV) and a subgroup of squamous cell carcinoma of the oropharynx. To assess the impact of HPV infection on the response of these tumours toward radiotherapy, the authors retrospectively determined the presence of the virus and the integrity of the viral E2 gene in tumours of patients who have undergone curative irradiation. METHODS: Paraffin embedded biopsies from 99 patients were analysed for HPV infection and E2 gene integrity by multiplex PCR. The experimental findings were correlated with clinical characteristics, known risk factors, and treatment outcome. RESULTS: Fourteen of 99 tumours were HPV positive (11 HPV16, one HPV33, one HPV35 and one HPV45). Human papillomavirus positivity was closely linked to female gender (odds ratio (OR), 5.75; $p = 0.004$), age older than 56 years (OR, 7.42; $p = 0.012$), nonsmokers (OR, 21.33; $p = 0.00001$), and alcohol abstainers (OR, 5.35; $p = 0.012$). There was an inverse association with p53 nuclear immunoreactivity (OR, 0.06; $p = 0.008$). The Kaplan-Meier survival estimates showed a better survival ($p = 0.046$, log-rank) for patients with HPV positive tumours. In the multivariate analysis, HPV positivity remained to be associated with a lower risk of local failure (risk ratio (RR), 0.31; $p = 0.048$). Four of 11 HPV16 positive tumours had a disrupted E2 gene. Only tumours with a disrupted E2 gene manifested local treatment failure. CONCLUSIONS: Human papillomavirus positivity designates a specific subgroup of oropharyngeal squamous cell carcinomas of the oropharynx that arise preferentially among individuals with no consumption of an increased sensitivity toward radiotherapy.

Botulinum toxin treatment for cricopharyngeal dysfunction. Shaw, G. Y., Searl, J. P. Voice and Swallowing Laboratory, Research Medical Center, Kansas City, Missouri 64131, USA. gshaw@kc-net.com. *Dysphagia* (2001) Summer, Vol. 16 (3), pp. 161–7.
Hypertonicity and spasticity of the cricopharyngeal muscle (CPM) often result in dysphagia characterized by difficulty passing a bolus through the upper esophageal sphincter. Past treatments for this problem have included mechanical dilation and endoscopic and transcervical cricopharyngeal myotomy. More recently, botulinum toxin injections into the CPM have been successful, but only in isolated case studies and small series. This study reports pre- and post-botulinum toxin A injection results for 12 subjects, including patient ratings of symptom severity, changes noted during modified barium swallow studies, and, in some cases, manometry of the upper esophageal sphincter. Results indicate that botulinum toxin A treatment provided significant improvement in swallowing as indicated by patient symptom ratings and investigator ratings of function from modified barium swallow studies. Greater improvement was seen in those with more isolated CPM or Xth nerve dysfunction rather than those with more global dysphagia abnormalities.

Effectiveness of the ultrasonic harmonic scalpel for tonsillectomy. Sood, S., Corbridge, R., Powles, J., Bates, G., Newbegin, C. J. Department of Otolaryngology–Head and Neck Surgery, Huddersfield Royal Infirmary, Huddersfield. sanjsood@aol.com. *Ear, Nose and Throat Journal* (2001) August, Vol. 80 (8), pp. 514–6.
The Ultracision harmonic scalpel (UHS) cuts and coagulates tissue with high-frequency ultrasound. We describe the results of our use of the UHS to perform tonsillectomies in 59 patients. The mean operative blood loss was 7 ml (range: 0 to 75); 56 per cent of patients experienced no measurable blood loss. The mean length of operating time was eight minutes and 10 seconds (range: 3:45 to 20:25). Patients were assessed for two weeks for postoperative pain on the basis of a 10-point linear analog scale. The main pain score on postoperative day one was 4.7; the score peaked at 6.0 on day four and fell to less than 3.0 by day 11. Patients returned to full function in an average of 10.9 days (range: three to 15). Three patients experienced secondary hemorrhage, one of whom required surgical intervention. We found the UHS to be a well-designed and easy-to-use instrument. Operating time was short, blood loss was minimal, and the degree of early postoperative pain was low. We believe that our findings are encouraging and that the UHS might well have a place in the surgical armamentarium for tonsillectomy.

Antibiotic treatment of adults with sore throat by community primary care physicians: a national survey, 1989-1999. Linder, J. A., Stafford, R. S. General Medicine Division, Massachusetts General Hospital, 50 Staniford St, 9th Floor, Boston, MA 02114, jlinder@partners.org. *Journal of the American Medical Association* (2001) September 12, Vol. 286 (10), pp. 1181–6.
CONTEXT: Most sore throats are due to viral upper respiratory tract infections. Group A beta-hemolytic streptococci (GABHS), the only common cause of sore throat warranting antibiotics, is cultured in five per cent to 17 per cent of adults with sore throat. The frequency of antibiotic use for pharyngitis has greatly exceeded the prevalence of GABHS, but less is known about specific classes of antibiotics used. Only penicillin and erythromycin are recommended as first-line antibiotics against GABHS. OBJECTIVES: To measure trends in antibiotic use for adults with sore throat and to determine predictors of antibiotic use and nonrecommended antibiotic use. DESIGN, SETTING, AND SUBJECTS: Retrospective analysis of 2244 visits to primary care physicians in office-based practices in the National Ambulatory Medical Care Survey, 1989-1999, by adults with a chief complaint of sore throat. MAIN OUTCOME MEASURES: Treatment with antibiotics and treatment with nonrecommended antibiotics, extrapolated to US annual national rates. RESULTS: There were an estimated 6.7 million annual visits in the United States by adults with sore throat between 1989 and 1999. Antibiotics were used in 73 per cent (95 per cent confidence interval (CI), 70–76 per cent) of visits. Patients treated with antibiotics were given nonrecommended antibiotics in 68 per cent (95 per cent CI, 65–72 per cent) of visits. From 1989 to 1999, there was a significant decrease in use of penicillin and erythromycin and an increase in use of non recommended antibiotics, especially extended-spectrum macrolides and extended-spectrum fluoroquinolones ($p<0.001$ for all trends). In multivariable modelling, increasing patient age (odds ratio (OR), 0.86 per decade; 95 per cent CI, 0.79–0.94) and general practice specialty (OR, 1.54 compared with family practice specialty; 95 per cent CI, 1.10–2.14) were independent predictors of antibiotic use. Among patients receiving antibiotics, nonrecommended antibiotic use became more frequent over time (OR, 1.17 per year; 95 per cent CI, 1.11–1.24). CONCLUSIONS: More than half of adults are treated with antibiotics for sore throat by community primary care physicians. Use of nonrecommended, more expensive, broader-spectrum antibiotics is frequent.

Intraoperative magnetic resonance imaging during transsphenoidal surgery. Fhalbusch, R., Ganslandt, O., Buchfelder, M., Schott, W., Nimsky, C. Department of Neurosurgery, University Erlangen-Nuernberg, Erlangen, Germany. *Journal of Neurosurgery* (2001) September, Vol. 95 (3), pp. 381–90.
OBJECT: The aim of this study was to evaluate whether intraoperative magnetic resonance (MR) imaging can increase the efficacy of transsphenoidal microsurgery, primarily in non-hormone-secreting intra- and suprasellar pituitary macroadenomas. METHODS: Intraoperative imaging was performed using a 0.2-tesla MR imager, which was located in a specially designed operating room. The patient was placed supine on the sliding table

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of the MR imager, with the head placed near the five-gauss line. A standard flexible coil was placed around the patient's forehead. Microsurgery was performed using MR-compatible instruments. Image acquisition was started after the sliding table had been moved into the center of the magnet. Coronal and sagittal T1-weighted images each required over eight minutes to acquire, and T2-weighted images were obtained optionally. To assess the reliability of intraoperative evaluation of tumour resection, the intraoperative findings were compared with those on conventional postoperative 1.5-tesla MR images, which were obtained two to three months after surgery. Among 44 patients with large intra- and suprasellar pituitary adenomas that were mainly hormonally inactive, intraoperative MR imaging allowed an ultra-early evaluation of tumour resection in 73 per cent of cases; such an evaluation is normally only possible two to three months after surgery. A second intraoperative examination of 24 patients for suspected tumour remnants led to additional resection in 15 patients (34 per cent). CONCLUSIONS: Intraoperative MR imaging undoubtedly offers the option of a second look within the same surgical procedure, if incomplete tumour resection is suspected. Thus, the rate of procedures during which complete tumour removal is achieved can be improved. Furthermore, additional treatments for those patients in whom tumour removal was incomplete can be planned at an early stage, namely just after surgery.

Analysis of risk factors associated with radiosurgery for vestibular schwannoma. Foote, K. D., Friedman, W. A., Buatti, J. M., Meeks, S. L., Bova, F. J., Kubilis, P. S. Department of Neurosurgery, University of Florida, Gainesville, USA. *Journal of Neurosurgery* (2001) September, Vol. 95 (3), pp. 440–9.

OBJECT: The aim of this study was to identify factors associated with delayed cranial neuropathy following radiosurgery for vestibular schwannoma (VS or acoustic neuroma) and to determine how such factors may be manipulated to minimize the incidence of radiosurgical complications while maintaining high rates of tumour control. METHODS: From July 1988 to June 1998, 149 cases of VS were treated using linear accelerator radiosurgery at the University of Florida. In each of these cases, the patient's tumour and brainstem were contoured in 1 mm slices on the original radiosurgical targeting images. Resulting tumour and brainstem volumes were coupled with the original radiosurgery plans to generate dose-volume histograms. Various tumour dimensions were also measured to estimate the length of cranial nerve that would be irradiated. Patient follow-up data, including evidence of cranial neuropathy and radiographic tumour control, were obtained from a prospectively maintained, computerized database. The authors performed statistical analyses to compare the incidence of posttreatment cranial neuropathies or tumour growth between patient strata defined by risk factors of interest. One hundred thirty-nine of the 149 patients were included in the analysis of complications. The median duration of clinical follow up for this group was 36 months (range 18–94 months). The tumour control analysis included 133 patients. The median duration of radiological follow up in this group was 34 months (range six–94 months). The overall two year actuarial incidences of facial and trigeminal neuropathies were 11.8 per cent and 9.5 per cent, respectively. In 41 patients treated before 1994, the incidences of facial and trigeminal neuropathies were both 29 per cent, but in the 108 patients treated since January 1994, these rates declined to five per cent and two per cent, respectively. An evaluation of multiple risk factor models showed that maximum radiation dose to the brainstem, treatment era (pre-1994 compared with 1994 or later), and prior surgical resection were all simultaneously informative predictors of cranial neuropathy risk. The radiation dose prescribed to the tumour margin could be substituted for the maximum dose to the brainstem with a small loss in predictive strength. The pons-petrous tumour diameter was an additional statistically significant simultaneous predictor of trigeminal neuropathy risk, whereas the distance from the brainstem to the end of the tumour in the petrous bone was an additional marginally significant simultaneous predictor of facial neuropathy risk. The overall radiological tumour control rate was 93 per cent (59 per cent tumours regressed, 34 per cent remained stable, and 7.5 per cent enlarged), and the five-year actuarial tumour control rate was 87 per cent (95 per cent confidence interval (CI) 76–98 per cent). Analysis revealed that a radiation dose cutpoint of 10 Gy compared with more than 10 Gy prescribed to the tumour margin yielded the greatest relative difference in tumour growth risk (relative risk 2.4, 95 per cent CI 0.6–9.3), although this difference was not statistically significant ($P = 0.207$). CONCLUSIONS: Five points must be noted. 1) Radiosurgery is a safe, effective treatment for small VSs. 2) Reduction in the radiation dose has played the most important role in reducing the complications associated with VS radiosurgery. 3) The dose to the brainstem is a more informative predictor of postradiosurgical cranial neuropathy than the length of the nerve that is irradiated. 4) Prior resection increases the risk of late cranial neuropathies after radiosurgery. 5) A prescription dose of 12.5 Gy to the tumour margin resulted in the best combination of maximum tumour control and minimum complications in this series.

Near total transection of the trachea following percutaneous dilatational tracheostomy. Kedjanyi, W. K., Gupta, D. Department of Otolaryngology, Head and Neck Surgery, Royal Devon and Exeter Hospital (Wonford), UK. *Journal of the Royal College of Surgeons of Edinburgh* (2001) August, Vol. 46 (4), pp. 242–3.

The bedside procedure of percutaneous dilatational tracheostomy (PDT) in the intensive care unit continues to gain popularity. Percutaneous dilatational tracheostomy is recommended as simple, safe and cost-effective. The procedure can be associated with serious life-threatening complications. We report a case of near total transection of the trachea following PDT.

Hearing assessment of classical orchestral musicians. Kaehaeri, K. R., Axelsson, A., Hellstroem, P. A., Zachau, G. Lindholm Development, Department of Sound Vibration, Goeteborg, Sweden. kim.kahari@lindholmen.se. *Scandinavian Audiology* (2001), Vol. 30 (1), pp. 13–23.

Pure-tone audiometry was performed on 140 classical orchestral musicians employed at the Gothenburg Symphony Orchestra and the Gothenburg Opera in Sweden. This report is based on the results from hearing threshold measurements, presented as median audiograms according to gender, age group and instrument group. The results did not show severe hearing losses that could be attributed to exposure to musical noise. However, the study reflects the subjects' present hearing ability status and does not give an answer to the question of future hearing dysfunction. Female musicians were shown to have significantly better hearing thresholds in the high-frequency area than did male musicians. Furthermore, the median pure-tone hearing thresholds for the male musicians displayed a notch configuration at 6 kHz in the left ear, similar that of to noise-induced hearing loss. A small, but in general not significant, difference was detected when comparing the median hearing thresholds between each instrument group. Percussion and woodwind players displayed slightly worse hearing thresholds than did other musicians. Players of large string instruments had the best hearing threshold values. When comparing age groups and gender it was noted that the median hearing thresholds were stable and within 20 dB HL up to the age group of 40–49 years for both females and males.

Motion-specific laryngeal reinnervation using muscle-nerve-muscle neurotization. Hogikyan, N. D., Johns, M. M., Kileny, P. R., Urbanchek, M., Carroll, W. R., Kuzon, W. M. Jr. Department of Otolaryngology–Head and Neck Surgery, University of Michigan, Ann Arbor 48109-0312, USA. *Annals of Otology, Rhinology and Laryngology* (2001) September, Vol. 110 (9), pp. 801–10.

There is no current treatment method that can reliably restore physiologic movement to a paralysed vocal fold. The purposes of this study were to test the hypothesis that 1) muscle-nerve-muscle (M-N-M) neurotization can be induced in feline laryngeal muscles and 2) M-N-M neurotization can restore movement to a paralysed vocal fold. Muscle-nerve-muscle neurotization can be defined as the reinnervation of a denervated muscle via axons that are induced to sprout from nerves within an innervated muscle and that then traverse a nerve graft interposed between it and the target denervated muscle. A paralysed laryngeal muscle could be reinnervated by axons from its contralateral paired muscle, thus achieving motion-specific reinnervation. Eighteen adult cats were divided into sham, hemilaryngeal-denervated, and M-N-M-reinnervated thyroarytenoid muscle groups. Five of the six reinnervated animals had histologic evidence of axons in the nerve graft, four of the six had evoked electromyographic evidence of crossed reinnervation, and one of the six had a return of appropriately phased adduction. This technique has great potential and should be further investigated.

Effects of low-pass filtering on the intelligibility of speech in quiet for people with and without dead regions at high frequencies. Vickers, D. A., Moore, B. C., Baer, T. Department of Experimental Psychology, University of Cambridge, United Kingdom. *The Journal of the Acoustical Society of America* (2001) August, Vol. 110 (2), pp. 1164–75.

A dead region is a region of the cochlea where there are no functioning inner hair cells (IHCs) and/or neurons; it can be characterized in terms of the characteristic frequencies of the IHCs bordering that region. We examined the effect of high-frequency amplification on speech perception for subjects with high-frequency hearing loss with and without dead regions. The limits of any dead regions were defined by measuring psychophysical tuning curves and were confirmed using the TEN test described in Moore et al. (British Journal of Audiology 2000;34:205–224). The speech stimuli were vowel-consonant-vowel (VCV) nonsense syllables, using one of three vowels (/i/, /a/, and /u/) and 21 different consonants. In a baseline condition, subjects were tested using broadband stimuli with a nominal input level of 65 dB SPL. Prior to presentation via Sennheiser HD580 earphones, the stimuli were subjected to the frequency-gain characteristic prescribed by the 'Cambridge' formula, which is intended to give speech at 65 dB SPL the same overall loudness as for a normal listener, and to make the average loudness of the speech the same for each critical band over the frequency range important for speech intelligibility (in a listener without a dead region). The stimuli for all other conditions were initially subjected to this same frequency-gain characteristic. Then, the speech was low-pass filtered with various cutoff frequencies. For subjects without dead regions, performance generally improved progressively with increasing cutoff frequency. This indicates that they benefited from high-frequency information. For subjects with dead regions, two patterns of performance were observed. For most subjects, performance improved with increasing cutoff frequency until the cutoff frequency was somewhat above the estimated edge frequency of the dead region, but hardly changed with further increases. For a few subjects, performance initially improved with increasing cutoff frequency and then worsened with further increases, although the worsening was significant only for one subject. The results have important implications for the fitting of hearing aids.

Middle-ear function with tympanic-membrane perforations. I. Measurements and mechanisms. Voss, S.E., Rosowski, J. J., Merchant, S. N., Peake, W. T. Picker Engineering Program, Smith College, Northampton, Massachusetts 01063, USA. svoss@email.smith.edu. *The Journal of the Acoustical Society of America* (2001) September, Vol. 110 (3 Pt 1), pp. 1432–44.

Sound transmission through ears with tympanic-membrane (TM) perforations is not well understood. Here, measurements on human-cadaver ears are reported that describe sound transmission through the middle ear with experimentally produced perforations, which range from 0.5 to 5.0 mm in diameter. Three response variables were measured with acoustic stimulation at the TM: stapes velocity, middle-ear cavity sound pressure, and acoustic impedance at the TM. The stapes-velocity measurements show that perforations cause frequency-dependent losses; at low frequencies losses are largest and increase at perforation size increases. Measurements of middle-ear cavity pressure coupled with the stapes-velocity measurements indicate that the dominant mechanism for loss with TM perforations is reduction in pressure difference across the TM; changes in TM-to-ossicular coupling generally contribute less than 5 dB to the loss. Measurements of middle-ear input impedance indicate that for low frequencies, the input impedance with a perforation approximates the impedance of the middle-ear cavity; as the perforation size increases, the similarity to the cavity's impedance extends to higher frequencies. The collection of results suggests that the effects of perforations can be represented by the path for air-volume flow from the ear canal to the middle-ear cavity. The quantitative description of perforation-induced losses may help clinicians determine, in an ear with a perforation, whether poor hearing results only from the perforation or whether other pathology should be expected.

Middle-ear function with tympanic-membrane perforations. II. A simple model. Voss, S. E., Rosowski, J. J., Merchant, S. N., Peake, W. T. Picker Engineering Program, Smith College, Northampton, Massachusetts 01063, USA. svoss@email.smith.edu. *The Journal of the Acoustical Society of American* (2001) September, Vol. 110 (3 Pt 1), pp. 1445–52.

A quantitative model of the human middle ear with a tympanic-membrane (TM) perforation is developed. The model is constrained by several types of acoustic measurements made on human cadaver ears, which indicate that perforation-induced changes in transmission result primarily from changes in driving pressure across the TM and that perforation-induced change in the structure of the TM and its coupling to the ossicles contributes a substantially smaller component. The model represents the effect of a perforation on the pressure difference across the TM by inclusion of a path for sound coupling through the perforation from the ear canal to the middle-ear cavity. The model implies the hearing loss with perforations depends primarily on three quantities: the perforation diameter, sound frequency, and the volume of air in the middle-ear cavity. For the conditions that produce the largest hearing loss (low frequency and large perforation), the model yields a simple dependence of loss on frequency, perforation diameter, and middle-ear cavity volume. Predictions from this modal may be useful to clinicians in determining whether, in particular cases, hearing losses are explainable by the observed perforations or if additional pathology must be involved.

Benign paroxysmal positional vertigo after stapedectomy. Atacan, E., Sennaroglu, L., Genc, A., Kaya, S. Department of Otolaryngology–Head and Neck Surgery, Hacettepe University Medical Faculty, Ankara, Turkey. *The Laryngoscope* (2001) July, Vol. 111 (7), pp. 1257–9.

OBJECTIVE: To determine the incidence of benign paroxysmal positional vertigo (BPPV) following stapedectomy in a patient group and the efficacy of the Epley maneuver in this group. STUDY DESIGN: Prospective study in a university-based tertiary referral system. METHODS: The patient group comprised 63 patients who had undergone stapedectomy; a control group consisted of normal healthy individuals with no otolaryngological complaints. All individuals underwent the Dix-Hallpike maneuver for the diagnosis of BPPV. Patients who exhibited vertigo, torsional nystagmus (which reverses its direction on return to sitting position) preceded by a latent period, and the fatigability of these findings were considered to have BPPV. If the test result was positive, they underwent the Epley therapeutic maneuver. RESULTS: Four of the patients who had undergone a stapedectomy showed characteristic findings of BPPV. No individual in the control group had BPPV. All patients responded well to the Epley maneuver. CONCLUSIONS: Stapedectomy may be regarded as an etiological factor in BPPV. Because the fenestra is located in the posterior part of the stapes footplate, the pathophysiology appears to be related to utricular rather than saccular trauma. Correct measurement of the distance between the incus and stapes footplate is essential in stapedectomy. An Internet survey of teh relevant literature in English shows a scarcity of publications on the incidence of BPPV following stapedectomy. In the present study, 63 patients who had undergone a stapedectomy were investigated for the presence of BPPV; all had Dix-Hallpike maneuvers performed for the diagnosis. Sixty-three individuals with no otolaryngological complaints made up the control group. Four of the patients who had undergone stapedectomy showed characteristic findings of BPPV, and no individual in the control group had BPPV; the difference between the two groups was statistically significant. All four of the patients diagnosed with BPPV responded well to the Epley maneuver. The pathophysiology appears to be related to utricular trauma. Correct measurement of the distance between the incus and stapes footplate is essential in stapedectomy.

Recurrence and its avoidance in juvenile angiofibroma. Howard, D. J., Lloyd, G., Lund, V. Institute of Laryngology Otology, University College London, UK. *The Laryngoscope* (2001) September, Vol. 111 (9), pp. 1509–11.

OBJECTIVE: Angiofibroma is a highly vascular lesion for which a wide range of surgical approaches has been recommended. Irrespective of the approach, a significant and often rapid recurrence rate is reported in all major series. AIM: To consider the impact of lessons learned from imaging on the recurrence rate of angiofibroma. MATERIAL AND METHODS: From a cohort of 90 male patients with histologically proven angiofibroma, 40 individuals were studied. The recurrence rate in 20 cases treated before March 1998 was compared with that in 19 cases treated thereafter. In the latter group, an additional exploration of the basisphenoid had been undertaken. RESULTS: The two cohorts

were comparable in age range (seven–27 years and 11–24 years, respectively), and all had been treated by midfacial degloving. In the first group, eight recurrences occurred which were multiple in one patient. In the next 19 patients, the area of the pterygoid canal was meticulously explored and the basisphenoid drilled to remove all residual tumour. No recurrences have occurred in this group during a follow-up of between six months to three years. CONCLUSION: Meticulous removal of angiofibroma infiltrating the pterygoid canal and basisphenoid is paramount to avoid 'recurrence'.

Tympanic membrane grafting with alloderm. Benecke, J. E. Jr. *The Laryngoscope* (2001) September, Vol. 111 (9), pp. 1525–7.
OBJECTIVES/HYPOTHESIS: The purpose of this work is to evaluate the performance of an acellular dermal allograft (AlloDerm; LifeCell Corp., The Woodlands, TX) in tympanic membrane (TM) grafting. STUDY DESIGN: A retrospective review of 20 consecutive tympanoplasty surgeries using temporalis fascia and 20 consecutive adults who underwent AlloDerm. METHODS: The charts of 20 consecutive adults who underwent tympanoplasty surgery were reviewed to evaluate graft take and hearing results. Similarly, 20 consecutive patients who had TM grafting with AlloDerm were reviewed. Pre- and postoperative air-bone gaps (ABG) at 500 Hz, 1000 Hz, 2000 Hz, and 4000 Hz were compared. RESULTS: There were no graft failures in either the temporalis fascia group or the AlloDerm group. No statistically significant difference was noted in hearing results when comparing the residual conductive loss in both postoperative groups. CONCLUSIONS: AlloDerm is a suitable material for TM grafting. This product is especially valuable in revision surgery in which the availability of appropriate autologous grafting material is limited.

Hodgkin's and non-Hodgkin's lymphoma of the head and neck. Urquhart, A., Berg, R. Department of Otolaryngology–Head and Neck Surgery, Marshfield Clinic, Marshfield, Wisconsin 54449, USA. urquhara@mfdclin.edu. *The Laryngoscope* (2001) September, Vol. 111 (9), pp. 1565–9.
OBJECTIVES/HYPOTHESIS: Lymphomas are a frequent cause of malignant lymphadenopathy in the head and neck. This study was performed to evaluate the head and neck manifestations of lymphomas and to emphasize the different presentations of Hodgkin's disease (HD) and non-Hodgkin's lymphoma (NHL). STUDY DESIGN: Retrospective review. METHODS: A retrospective review was made of all cases of lymphomas involving the head and neck at Marshfield Clinic (Marshfield, WI) between 1988 and 1996. Specifically, the clinical presentations, staging, and prognosis for HD and NHL with head and neck involvement were sought. RESULTS: Three hundred eleven patients were included in the study, 76 with HD and 235 with NHL. The median age at diagnosis for patients with HD was 27.7 years, and for patients with NHL, 67.2 years. This difference was highly significant ($p<0.001$). No significant difference in gender was noted, with male patients occurring in 59 per cent with HD and 49 per cent with NHL ($p = 0.135$). Extranodal involvement including the oral cavity, oropharynx, nasopharynx, paranasal sinuses, and larynx occurred with HD in three patients (four per cent) and with NHL in 54 patients (23 per cent, $p = 0.001$). Cervical adenopathy consisted of a single node in 24 per cent of patients with HD and 33 per cent of those with NHL (no significant difference, $p = 0.236$). The difference in mediastinal nodal involvement was highly significant, occurring in 65 per cent of patients with HD and 38 per cent of patients with NHL ($p<0.001$). Abdominal nodes occurred in 20 per cent of cases of HD and 45 per cent of cases of NHL ($p<0.001$). A significant difference in constitutional symptoms was noted with 41 per cent of cases in HD and 27 per cent of cases in NHL ($p = 0.020$). For the percentage of patients with stage IV disease, there was a highly significant difference by diagnosis with 10 per cent in HD and 36 per cent in NHL ($p<0.001$). The median follow-up time was 51 months, and 12 per cent of patients with HD and 41 per cent of patients with NHL died of their disease. Both the overall survival and survival from death attributable to disease were significantly better for HD ($p<0.001$). CONCLUSIONS: Hodgkin's disease presents at a younger age and is less common than NHL. Cervical lymphadenopathy is the most common head and neck presentation for both diseases. Associated mediastinal adenopathy as more common with HD, and abdominal adenopathy with NHL. Constitutional symptoms were more common with HD. More advanced disease with a decreased overall survival was seen with NHL.

Cochlear implantation in healthy and otitis-prone children: a prospective study. Luntz, M., Teszler, C. B., Shpak, T., Feiglin, H., Farah-Sima-an, A. Department of Otolaryngology–Head and Neck Surgery, Bnai Zion Medical Center, Faculty of Medicine, Technion–Israel Institute of Technology, Haifa, Israel. luntz@csts.net. *The Laryngoscope* (2001) September, Vol. 111 (9), pp. 1614–8.
OBJECTIVE: To evaluate and compare the timing of surgery, intraoperative findings, and otitis media-related outcome of cochlear implantation in children who are otitis-prone with their counterparts who are not otitis-prone. STUDY DESIGN: Prospective. METHODS: Children referred for cochlear implantation were assigned to a non-otitis-prone group (group A: normal otoscopy on their first visit after referral) or an otitis-prone group (group B: current or a recent history of otitis media at referral). Group B patients were managed using a structured protocol aimed at preimplantation otitis media control. The study reviewed pre-, and intra-, and postoperative data. RESULTS: Of the 18 children studied, eight were assigned to group A (mean age at referral, 40.6 mo) and 10 to group B (mean age at referral, 31.6 mo). For otitis media control, all otitis-prone children underwent ventilating tube insertion (various numbers of procedures before implantation). Only one otitis-prone child required cortical mastoidectomy also. Time from referral to implantation was similar in the two groups (mean, 6.6 mo). High-resolution computed tomography data showed mastoid pneumatization to be significantly smaller in the otitis-prone group, but the facial recess was not smaller in this group. During implantation, 10 children had inflamed middle ear mucosa. Seven of these belonged to group B. All of these seven children had a round window niche obliterated by the inflamed mucosa, which had to be removed for round window membrane identification. After implantation, only one child had drainage through the ventilating tube for more than one week. Two children in group B developed otitis media (one year postimplantation) that was overcome within one week. There were no otitis media-related complications. CONCLUSIONS: If a structured protocol is used for the control of otitis media before cochlear implantation, otitis media should not require a delay in implantation. In otitis media-prone children, the round window niche is often obscured by inflamed mucosa. Its removal is mandatory for identification of the round window membrane. After cochlear implantation, otitis media is not a frequent occurrence.

Tetracaine topical anesthesia for myringotomy. Hoffman, R. A., Li, C. L. Department of Otolaryngology/Head and Neck Surgery, Beth Israel Medical Center, New York, NY 10003, USA. *The Laryngoscope* (2001) September, Vol. 111 (9), pp. 1636–8.
OBJECTIVES/HYPOTHESIS: To study the efficacy and safety of topical tetracaine anesthesia for office myringotomy and myringotomy with a tube. STUDY DESIGN: Retrospective review of patients undergoing office myringotomy, with or without tube insertion, performed over a four-year period. METHODS: A topical solution of eight per cent tetracaine base in 70 per cent isopropyl alcohol was used in 381 ears. Five to 10 drops of the solution were applied to the tympanic membrane for 10 to 15 minutes and aspirated. Myringtomy was performed either with a myringotomy knife or with a CO(2) laser (OtoLAM). RESULTS: Topical tetracaine was used in all 231 ears (100 per cent) undergoing myringotomy without a tube and 150 of 212 ears (71 per cent) undergoing myringotomy without a tube and 150 of 212 ears (71 per cent) undergoing myringotomy with a tube. Tetracaine alone was effective in providing tympanic membrane anesthesia in 95 per cent of myringotomy without a tube (220 ears) and in 93 per cent of myringotomy with a tube (139 ears). There were six complications, including five cases of severe vertigo and one unusual prolonged, transient facial nerve weakness. CONCLUSION: Topical tetracaine is efficacious and safe for use in office myringotomy.