

Abstract Selection

Pneumococcal mastoiditis in children. Kaplan, S. L., Mason, E. O. Jr., Wald, E. R., Kim, K. S., Givner, L. B., Bradley, J. S., Barson, W. J., Tan, T. Q., Schutze, G. E., Yogev, R. Pediatric Infectious Disease Section of Baylor College of Medicine, Houston, Texas 77030-2399, USA. skaplan@bcm.tmc.edu *Pediatrics* (2000) October, Vol. 106 (4), pp. 695–9.

OBJECTIVE: To determine the impact of antibiotic resistance on the frequency, clinical features, and management/outcome of mastoiditis attributable to *Streptococcus pneumoniae*. **DESIGN:** Retrospective review of the medical records of children with mastoiditis caused by review of the medical records of children with mastoiditis caused by *S pneumoniae* from September 1993 through December 1998. **PATIENTS:** Infants and children with pneumococcal mastoiditis cared for at eight children's hospitals in the United States. **RESULTS:** Thirty-four children with pneumococcal mastoiditis were identified. The median age of the children was 12 months (range: two months–12.5 years); 28 (82 per cent) were <two years old. Six children had recurrent otitis media. A subperiosteal abscess was noted in 13 children (37 per cent). The mastoids were abnormal in all 25 patients on whom computed tomography was performed. There was no trend toward increasing numbers of cases per year despite increasing proportions of pneumococcal isolates, which were nonsusceptible to penicillin. Serogroup 19 accounted for 57 per cent of isolates, serogroup 23 for 14.3 per cent of isolates, and serotype three for 10. Seven per cent of isolates. Except for receipt of less antibiotic therapy in the previous 30 days, children with penicillin-susceptible isolates had similar demographic features and clinical findings and surgical treatment as did children whose isolates were nonsusceptible to penicillin. **CONCLUSIONS:** Pneumococcal mastoiditis occurs primarily in children two years of age and usually is not associated with a history of recurrent otitis media. The number of cases of mastoiditis caused by *S pneumoniae* occurring among eight children's hospitals has remained stable despite increasing rates of antibiotic-resistant *S pneumoniae*. Serogroup 19 is the leading serogroup associated with pneumococcal mastoiditis. *Streptococcus pneumoniae*, mastoiditis, serotypes, resistance.

Review of segmental and marginal resection of the mandible in patients with oral cancer. Politi, M., Costa, F., Robiony, M., Rinaldo, A., Ferlito, A. Department of Maxillo-Facial Surgery, University of Udine, Italy. *Acta Oto-Laryngologica* (2000) August, Vol. 120 (5), pp. 569–79.

This paper reviews the medical literature of the last decade to ascertain the criteria used to assess mandibular invasion by cancer of the oral cavity and to suggest how best to evaluate the mandible with a view to surgical management. It is generally agreed that patients with mandibular invasion should be treated surgically, but the extent of mandibular resection required remains a controversial matter and the accurate preoperative determination of neoplastic invasion of the mandible remains a challenge for head and neck surgeons. The relative reliability of preoperative orthopantomography, (OPG) bone scanning, computed tomography (CT) and magnetic resonance imaging (MRI), and of preoperative periosteal stripping and direct inspection in clinical assessment for mandibular surgery, is discussed. The histological patterns of tumor invasion and the most common routes of tumor entry in the mandible are described and the influence of variables such as prior radiotherapy and an edentulous vs a dentate state in relation to perineural invasion are also discussed. Finally, a comparison is drawn between the reported outcome of marginal vs segmental resection procedures and a decision-making algorithm is proposed. In selected cases, marginal mandibulectomy can ensure satisfactory tumor control, with a favorable effect on the morbidity associated with mandibular surgery.

Nasal airflow in health and disease. Eccles, R. Common Cold Centre, Cardiff School of Biosciences, Cardiff University, UK. eccles@cardiff.ac.uk. *Acta Oto-laryngologica* (2000) August, Vol. 120 (5), pp. 580–95.

This review examines our present understanding of the physiology, pathophysiology and pharmacology of nasal airflow. The main aim of the review is to discuss the basic scientific and clinical knowledge that is essential for a proper understanding of the usefulness of measurements of nasal airflow in the clinical practice of rhinology. The review concludes with a discussion of the measurement of nasal airflow to assess the efficacy of surgery in the treatment of nasal obstruction. Areas covered by the review include: influence of nasal blood vessels on nasal airflow; nasal valve and control of nasal airflow; autonomic control of nasal airflow; normal nasal airflow; nasal cycle; central control of nasal airflow; effect of changes in posture on nasal airflow; effect of exercise on nasal airflow; effect of hyperventilation and rebreathing on nasal airflow; nasal airflow in animals; cerebral effects of nasal airflow; sensation of nasal airflow; sympathomimetics and sympatholytics; histamine and antihistamines; bradykinin; and corticosteroids.

Topical aminoglycoside ototoxicity: attempting to protect the cochlea. Conlon, B. J., Smith, D. W. Hearing Research Laboratories, Division of Otolaryngology – Head and Neck Surgery, Duke University Medical Center, Durham, North Carolina, USA. bconlon@iol.ie. *Acta Oto-laryngologica* (2000) August, Vol. 120(5), pp. 596–9.

Cochlear damage following topical application of aminoglycoside antibiotics to the round window membrane is a recognized phenomenon in both animal experiments and clinical reports. The authors have recently reported the ability of the free radical scavenging agent, alpha lipoic acid, to protect against the cochleotoxic side effects of systemically administered aminoglycoside antibiotics. This study attempts to determine if the protective effect of this free radical scavenging agent is also seen following topical aminoglycoside application. Animals were implanted with osmotic pumps which delivered 2.5 microl/h solution of either neomycin five per cent or neomycin plus alpha lipoic acid (50 mg/ml). Control animals received normal saline solution. Drug solutions were presented directly to the round window membrane over a seven day period. Auditory sensitivity was monitored using compound action potentials (CAPs) of the auditory nerve recorded through an implanted chronic electrode terminating at the round window. Sixteen animals were entered into the study and randomized to one of the above groups. All animals receiving neomycin solution, with or without alpha lipoic acid, maintained normal thresholds for the first three days of the treatment period. Animals receiving neomycin solution alone experienced profound and rapid deterioration in auditory sensitivity, which was maximal by day six. Animals receiving neomycin plus alpha lipoic acid also experienced significant cochlear damage; however, the rate of deterioration was slower than that seen in the group receiving neomycin alone. All control animals receiving saline maintained good hearing thresholds throughout the treatment period.

Pathologic detection of occult metastases in regional lymph nodes inpatients with head and neck cancer. Daveney, S. L., Ferlito, A., Rinaldo, A., Devaney, K. O. Department of Pathology, University of Michigan, Ann Arbor, USA. *Acta Oto-laryngologica* (2000) March, Vol. 120 (3), pp. 344–9.

Squamous carcinomas of the head and neck region are exceedingly common problems in the routine practice of head and neck tumour surgery. Well-defined treatment protocols have evolved to manage patients afflicted with such tumours. This article explores the role of the hospital pathologist in the detection of occult metastases. The conventional approach to evaluation of cervical nodes from a neck dissection is reviewed, and then the potential

utility of more recently developed diagnostic approaches (such as immunohistochemistry and polymerase chain reaction) is explored.

Otoprotectant minimizes hearing defects caused by *Pseudomonas aeruginosa* exotoxin A. Popa, R., Anniko, M., Takumida, M. Department of Otolaryngology and Head and Neck Surgery, Uppsala University Hospital, Sweden. *Acta Oto-laryngologica* (2000) March, Vol. 120 (3), pp. 350–8.

Exotoxin A, produced by *Pseudomonas aeruginosa* (PaExoA), penetrates from the middle ear in to the cochlea and causes sensorineural hearing loss (SNHL). In this investigation we studied electrophysiological changes in the albino rat following instillation of PaExoA and N(G)-nitro-L-arginine methyl ester (L-NAME), a known inhibitor of nitric oxide synthesis, into the middle ear. Hearing thresholds were measured by auditory brainstem response (ABR) technique. Latency/intensity curves were constructed to distinguish between cochlear and conductive components of hearing loss. PaExoA caused damage to cochleae and SNHL, mainly at high frequencies. This impairment was blocked by (L-NAME). It would appear that nitric oxide may be a significant link in the mechanism of SNHL caused by bacterial toxin. L-NAME acts as an otoprotectant against the deleterious action of PaExoA.

What inner ear diseases cause benign paroxysmal positional vertigo? Karlberg, M., Hall, K., Quicker, N., Hinson, J., Halmagyi, G. M. Neurology Department, Royal Prince Alfred Hospital, NSW, Sydney, Australia. *Acta Oto-laryngologica* (2000) March, Vol. 120 (3), pp. 380–5.

Benign paroxysmal positional vertigo (BPPV) originating from the posterior semicircular canal (pSCC) is a common vestibular disorder that is easy to diagnose and usually easy to treat. The majority of patients with BPPV have no known inner ear disease; they have 'primary' or 'idiopathic' BPPV. However, a minority does have objective evidence of an inner ear disease on the same side as the BPPV and this group has 'secondary' or 'symptomatic' BPPV. Previous publications differ on the prevalence of secondary BPPV and about the types of inner ear diseases capable of causing it. In order to determine what proportion of patients have secondary as opposed to primary BPPV and which inner ear diseases are capable of causing secondary BPPV, we searched our database for the 10-year period from 1988 to 1997 and found a total of 2847 patients with BPPV. Of these, 81 (three per cent) had definite pSCC-BPPV secondary to an ipsilateral inner ear disease. Sixteen had Meniere's disease, 24 had an acute unilateral peripheral vestibulopathy, 12 had a chronic unilateral peripheral vestibulopathy, 21 had chronic bilateral peripheral vestibulopathy and eight had unilateral sensorineural hearing loss. It seems that any inner ear disease that detaches otoconia and yet does not totally destroy pSCC function can cause BPPV and that a case can be made for audiometry and caloric testing in all patients with BPPV.

Nasal nitric oxide is reduced in patients with HIV. Palm, J., Lidman, C., Graf, P., Alving, K., Lundberg, J. Department of Physiology and Pharmacology, Karolinska Institutet Stockholm, Sweden. Jorgen.Palm@fyfa.ki.se. *Acta Oto-laryngologica* (2000) March, Vol. 120 (3), pp. 420–3.

The gas nitric oxide (NO) is present in high concentrations in human nasal airways. Since NO is known to inhibit the growth of bacteria and viruses, it has been suggested that airborne NO represents the first line of defence against pathogens in the upper airways. Low nasal NO levels have been reported previously in patients susceptible to upper airway infection. Since HIV-positive patients are at risk for respiratory tract infections, including sinusitis, we studied the levels of NO in the upper and lower airways of these patients. A cross-sectional study with age-matched HIV patients and controls was carried out. Nasal and orally exhaled NO were measured in 31 HIV patients and 26 controls using a well-established chemiluminescence method developed for measurements of gaseous NO in the airways. Nasal NO was 21 per cent, lower ($p < 0.05$, Student's *t*-test) in HIV patients than in controls, whereas orally exhaled NO did not differ between the two groups. We conclude that nasal NO is reduced in patients with HIV infection. The reduction in nasal NO may contribute to the decreased resistance to airway infections in these patients.

Subglottic airway becomes stable with age in the human infant larynx. Yonekawa, S., Fukunaga, H., Umeno, H., Mori, K., Nakashima, T. Department of Otolaryngology, Kurume University School of Medicine, Japan. *Acta Oto-laryngologica* (2000) March, Vol. 120 (3), pp. 444–9.

Development of the mucosal defence system and its relationship to the pathogenesis of laryngeal diseases was studied by examining the changes in the laryngeal structures at the level of subglottic larynx of 59 human infants who died within one year of birth. By making a transverse section at the level of the cricoid cartilage, the area and diameter of each subglottic structure were examined using an image analysis system. The results were analysed, not only by their age at death, but also based on the total development score. The areas of the whole structure, cricoid ring, subglottic mucosa and inner cavity (available area) increased in close correlation with the inner cavity (available area) increased in close correlation with the total development score. In contrast to the increased diameter of the inner cavity, the thickness of the mucosa was almost the same size. These results indicate the stability of the subglottic airway with advancing age in the human infant larynx.

Is extended selective supraomohyoid neck dissection indicated for treatment of oral cancer with clinically negative neck? Ferlito, A., Mannara, G. M., Rinaldo, A., Politi, M., Robiony, M., Costa, F. Department of Otolaryngology – Head and Neck Surgery, University of Udine, Italy. clorl@dsc.uniud.it. *Acta Oto-laryngologica* (2000) October, Vol. 120 (7), pp. 792–5.

Oral cavity tumors may develop occult metastases to the cervical lymph nodes. Current imaging techniques and routine histopathologic methods may fail to detect lymph node micrometastases, but the surgeon has to electively dissect a neck at risk of developing clinical disease. Supraomohyoid neck dissection has been the elective surgery for treating a clinically negative neck in patients with oral cavity primaries. A literature review revealed that level IV nodes can be significantly affected by occult disease with and without metastases in level I-III lymph nodes. This means that level IV nodes have to be included in the supraomohyoid neck dissection, resulting in a more extensive surgical procedure to ensure a margin of oncological safety.

Adaptive bone modelling and remodelling in acute otitis media caused by non-typeable or type B *Haemophilus influenzae* or *Moraxella catarrhalis*. Caye-Thomasen, P., Tos, M. The ENT Department, Gentofte University Hospital of Copenhagen, Hellerup, Denmark. pcaye@dadlnet.dk. *Acta Oto-laryngologica* (2000) October, Vol. 120 (7), pp. 815–20.

Experimental studies have shown that acute otitis media caused by *Streptococcus pneumoniae* alters modelling dynamics in bone tissue structures surrounding the middle ear cavity. Initial resorption of bone is followed by formative activity, seen as massive osteoneogenesis. However, neither resorptive nor formative activity occurs in the otic capsule, supporting the existence of a perilymphatic zone of specialized bone. This study investigates adaptive bone modelling in acute otitis media caused by other bacteria frequently encountered in this disease. Seventy-five rats were inoculated with either non-typeable or type b *Haemophilus influenzae*, or *Moraxella catarrhalis* (25 rats in each group). Five rats from each group were sacrificed on days, four, eight, 16, 60 and 180 post-inoculation. Qualitative as well as quantitative histopathology revealed increasing apposition of new bone on both sides of the original bony wall of the middle ear bulla, i.e. at the inner and outer periosteum. Remodelling activity was seen on later days of sacrifice, as typical osteone (Haversian system) formation. Measured bone thickness in four anatomically well-defined localities progressed to a peak two months post-inoculation, followed by some degree of normalization. However, bone thickness was still massively increased six months after the acute incident. Except in the otic capsule, resorptive and formative activity was found in all bone tissue structures surrounding the middle ear cavity. These findings were irrespective of the type of inoculated bacteria. However, non-typeable or type b *Haemophilus influenzae* induces significantly more new bone formation than *Moraxella catarrhalis*. We conclude that acute otitis media caused by either of the bacteria is accompanied by massive and progressive net osteoneogenesis, already evident on day four and peaking two months post-inoculation, followed by some degree of normalization. Non-typeable and type b *Haemophilus*

influenzae induce more new bone formation than *Moraxella catarrhalis*, whereas other features of bone histomorphology were equivalent. The present findings further support the existence of a perilymphatic zone of specialized bone.

Vestibular neuritis: three-dimensional videonystagmography and vestibular evoked myogenic potential results. Chen, C. W., Young, Y. H., Wu, C. H. Department of Otolaryngology, National Taiwan University, Taipei. *Acta Oto-laryngologica* (2000) October, Vol. 120 (7), pp. 845–8.

Eight patients diagnosed with vestibular neuritis received the newly developed three-dimensional videonystagmography (3D VNG) and vestibular evoked myogenic potential (VEMP) examination in order to localize the lesion site. Two (25 per cent) of the eight patients exhibited spontaneous nystagmus with three components, indicating that both the horizontal semicircular canal (HSCC) and anterior semicircular canal (ASCC) were affected. The remaining six patients (75 per cent) displayed only horizontal nystagmus, meaning that only the HSCC was involved. Seven (88 per cent) of the eight patients had bilateral normal VEMPs, revealing sparing of the posterior semicircular canal (PSCC). In a comparative study, another seven patients with vestibular neuritis one year post-treatment also received the caloric test, 3D VNG and VEMP examination. Only one patient exhibited spontaneous nystagmus. An absent caloric response of the lesioned side persisted in five (71 per cent) of the seven patients. However, all patients showed normal VEMPs bilaterally. 3D VNG and VEMP examination indicates that vestibular neuritis mainly affects the superior division of the vestibular nerve, which innervates the HSCC and ASCC. Meanwhile, the function of the PSCC and saccule, innervated by the inferior vestibular nerve, is preserved.

Contrast-enhanced magnetic resonance imaging of the cranial nerves in patients with acoustic schwannoma: correlation with surgical findings. Okubo, T., Yoshioka, N., Hayashi, N., Abe, O., Masumoto, T., Sasaki, T., Ohtomo, K. Department of Radiology, University of Tokyo, Faculty of Medicine, Japan. tokubo-ky@umin.ac.jp. *Acta Oto-laryngologica* (2000) Vol. 542, pp. 13–7.

Eighteen patients with acoustic schwannoma were examined on a 1.5-T magnetic resonance imaging (MRI) unit with precontrast and postcontrast T1-weighted spin-echo sequences. Each abnormality was assessed in terms of the size, location, extensions and signal intensity of the lesions. If a nerve was enhanced and was involved by the tumor around the fundus of the internal auditory canal (IAC), the nerve was interpreted to be the originating nerve. The postcontrast T1-weighted images revealed enhanced masses of the cerebellopontine angle and/or the IAC in all cases. In 11 of the 19 operated patients with schwannomas, the site of tumor origin (or origin nerve) was confirmed by surgery. In two of the 11 cases (18 per cent), surgical findings coincided with the T1-weighted image findings. Facial nerve enhancement on the ipsilateral side of the tumor was noted in 10 cases (53 per cent) and the contralateral facial nerve enhancement was demonstrated in seven (70 per cent). The enhancement of facial nerve associated with acoustic schwannoma was not correlated to the degree of nerve compression by the tumor. These results demonstrate that it was possible, although infrequent, to predict the site of origin of acoustic schwannoma before surgery in some patients. Improvement of the imaging matrix or multiplanar reconstruction techniques with three-dimensional data acquisition may make it possible to overcome the limitations of MRI.

Sudden-onset tinnitus associated with arterial dissection of the vertebrobasilar system. Yokota, M., Ito T., Hosoya, T., Suzuki, Y., Aoyagi, M. Department of Otorhinolaryngology, Yamagata University School of Medicine, Japan. myokota@med.id.yamagata-u.ac.jp. *Acta Oto-laryngologica* Supplement (2000), Vol. 542, pp. 29–33.

Magnetic resonance (MR) images of 62 patients with tinnitus were reviewed. These included T1-weighted and T2-weighted axial images and three-dimensional spoiled gradient-recalled acquisition in steady-state (3D-SPGR) imaging with gadopentetate dimeglumine. In 49 cases with tinnitus occurring gradually, the MR images of two cases (4.1 per cent) suggested arterial dissection of the vertebrobasilar system. One of these patients underwent vertebral angiography (VAG) and no dissection was confirmed. In 13 cases of sudden-onset tinnitus, MR images of three cases (23.1 per cent) suggested arterial dissection. Of these three cases, VAG

was performed in two, resulting in arterial dissections being confirmed in two cases. It was concluded that the arterial dissection of the vertebrobasilar system was one of the causes of sudden-onset tinnitus. Abnormalities in neurotological examinations in cases with tinnitus caused by the arterial dissection of vertebrobasilar system implied that the tinnitus was caused by inner ear dysfunction.

Osseointegrated implants in children. Granstroem, G. Department of Otolaryngology, Head and Neck Surgery, Goeteborg University, Sweden. gosta.granstrom@orlss.gu.se. *Acta Oto-laryngologica* Supplementum (2000), Vol. 543, pp. 118–21.

This study was undertaken on 86 children aged 15 years or lower scheduled for installation of osseointegrated implants. Of these, 64 had implants installed for bone-anchored hearing aids (BAHA) or episthesis. The main indication for implant installation was a bilateral ear malformation. Surgery was generally performed as a two-stage procedure with a healing time of three to four months in between. Available bone thickness averaged 2.5 mm, and lack of bone necessitated bone augmentation in 12 patients. Forty-five per cent of the implants were installed in contact with the dura, sigmoid sinus or an air cell. Of 129 installed fixtures, 6.2 per cent were implant failures. Adverse skin reactions appeared in 7.6 per cent of patients over a 17-year follow-up period. Revision surgery was undertaken in 30 per cent of patients due to appositional growth of the temporal bone. It is concluded that implant failures and skin reactions in this population are comparable to those in an adult group of implant patients, whereas revision surgery is more common in children. Nevertheless, osseointegrated implants can be used with good functional and aesthetic outcome in children.

Acute mastoidectomy in a Danish county from 1977 to 1997 – operative findings and long-term results. Petersen, C. G., Ovesen, T., Pedersen, C. B. Ear, Nose and Throat Department, Aarhus University Hospital, Denmark. *Acta Oto-laryngologica* (Supplementum) (2000), Vol. 543, pp. 122–6.

Data from patients undergoing acute mastoidectomy were examined retrospectively to evaluate if the nature of acute mastoiditis (AM) treated surgically has changed during the last 20 years (1977–97). Moreover, a prevalence study was conducted to clarify the otological and audiological course following acute mastoidectomy. Patients with cholesteatoma and intracranial complications were excluded. Thus, 79 patients with a median age of 16 months were included. Thirty-seven per cent had a history of middle ear disease, and the mean duration from onset of symptoms to admission was nine days. Well-being was affected in 46 per cent, and 82 per cent had fever. The clinical picture was dominated by auricular protrusion (77 per cent) and pathological tympanic membrane (94 per cent). Postauricular oedema, hyperaemia and tenderness were demonstrated in 89 per cent, 78 per cent and 49 per cent of cases, respectively. Peroperatively, purulent middle ear effusion was recognized in 92 per cent, subperiosteal abscess in 66 per cent and pus in the mastoid in 90 per cent. Specimens revealed growth of pathogens in 58 per cent, predominantly Gram-positive bacteria. The observation period was one–20 years. The findings in operated ears were not significantly different from the contralateral non-operated ears concerning incidence of otitis media, hearing and ear canal volume. Conclusively, acute mastoidectomy is a safe and effective treatment to eliminate infection. The operation can be done with negligible risk and does not leave long-term sequelae.

Tympanoplasty with ionomeric cement. Kjeldsen, A. D., Grntved, A. M. Department of Otorhinolaryngology, Odense University Hospital, Denmark. *Acta Oto-laryngologica* Supplementum (2000), Vol. 543, pp. 130–1.

Patients with isolated erosion of the long incus process suffer from severe hearing loss caused by lack of continuity of the ossicular chain. This study is a retrospective evaluation of the hearing results using two different surgical procedures. Since January 1993, 12 consecutive patients with isolated erosion of the long incus process have been treated with a new surgical technique in which the ossicular chain was rebuilt with ionomeric cement. The results in hearing performance (mean pure-tone average (PTA) 0.5, 1 and 2 kHz) were evaluated pre- and post-surgery, and compared to those in a group of 20 historical controls who underwent surgery in 1991 and 1992 using incus autograft interposition. Among the 12 index patients, seven (58 per cent) achieved improvement in PTA

of >10 dB, in three there was no difference and in two a slight decline. Among the 20 controls, 14 (70 per cent) achieved improvement in PTA of >10 dB, in four there was a slight improvement and in two a decline. The difference was not statistically significant. Hearing improvement using ionomeric cement in type II tympanoplasty was satisfactory. Reconstruction of the ossicular chain with ionomeric cement is recommended, as the procedure is easy to perform, presents less risk of damage to the stapes and cochlea, requires less extensive surgery and does not exclude other surgical methods in cases of reoperation.

Stratum corneum barrier lipids in cholesteatoma. Svane-Knudsen, V., Halkier, S., Rensen, L., Rasmussen, G., Ottosen, P. Department of Otorhinolaryngology, University Hospital of Odense, Denmark. *Acta Oto-laryngologica*. Supplementum (2000), Vol. 543, pp. 139–42.

Specimens from primary cholesteatomas were examined under the electron microscope using a lipid-retaining method that is best suited for intracellular lipids and a method that is best for intercellular lipids. In the stratum granulosum of the squamous epithelium, a large number of Odland bodies emerged. When the corneocyte reaches the transitional stage to the stratum corneum, the Odland bodies accumulate near the cell membrane and discharge their contents of lipid and enzymes. The lipids are reorganized into multiple long sheets of lamellar structures that embrace the keratinized corneocytes, as seen in the formation and maintenance of the cutaneous permeability barrier. In this study we draw the attention to the facts that the cholesteatoma epithelium is capable of producing not only cholesterol, but also several lipids, and that the lipid molecules are organized in multilamellar structures in the intercellular space. In theory, the failure to desquamate seen in cholesteatomas could be caused by partial or total failure of Odland body delivery to the intercellular region, or to local breakdown of the permeability barrier.

Reasons for reoperation after tympanoplasty in children. Tos, M., Stangerup, S. E., Orntoft, S. Ear Nose and Throat Department, Gentofte University Hospital, Hellerup, Denmark. *Acta Oto-laryngologica*. Supplementum (2000), Vol. 543, pp. 143–6.

In 116 children and 124 ears with non-cholesteatomatous chronic otitis media operated on during a 13-year period from 1968 to 1980 via transcanal tympanoplasty and followed with several re-evaluations 15–27 years after operation, the causes of reoperation have been analysed. In total, 14 ears (11 per cent) had reoperation; in seven ears (5.6 per cent), the reoperations occurred early (during the first three months) and in seven ears late (after six months), but most often the reoperations occurred after 10 years. The early reoperations were presumably failures in surgery. Less experienced surgeons and inflamed, wet middle ear mucosa during the primary surgery seemed to be the two most important causal factors. Young age at surgery, size and site of the perforation and Eustachian tube function seemed to be of no importance for reoperation. The early reoperations were closed at surgery and remained closed into adulthood. The reasons for late reoperations are less clear; they were presumably caused by acute otitis media with perforation in an atrophic part of the drum, which did not heal. The reoperations were small, but it was possible to close all of them surgically if the patients wanted to be reoperated. It is concluded that tympanoplasty, even in young children, is a rewarding option with good and stable results.

Bacteriology of the tonsil core in recurrent tonsillitis and tonsillar hyperplasia – a short review. Lindroos, R. Dextra Medical Center, Helsinki, Finland. *Acta Oto-laryngologica*. Supplementum (2000), Vol. 543, pp. 206–8.

In recurrent tonsillitis, the tonsil core harbours numerous bacteria, some of which are pathogenic and may occur in great numbers. The most frequent bacteria are *Haemophilus influenzae*, followed by *Staphylococcus aureus* and *Streptococcus pyogenes*. A high tissue concentration of these bacteria correlates with clinical parameters of infection and hyperplasia of the tonsils. The role of *Streptococcus pyogenes*, while undisputed in acute and epidemic tonsillitis, should perhaps be re-evaluated in recurrent and/or hyperplastic tonsillitis.

Vestibular schwannoma surgery and headache. Levo, H., Blomstedt, G., Pyykkö, I. Department of Otolaryngology, Helsinki University Central Hospital, Finland. *Acta Oto-laryngologica*. Supplementum (2000), Vol. 543, pp. 23–5.

The aim of the study was to evaluate aetiological factors for postoperative headache after vestibular schwannoma (VS) surgery with respect to asymmetric activation of vestibular reflexes. After surgery, 27 VS patients with persistent postoperative headache, 116 VS surgery, 27 VS patients with persistent postoperative headache, 16 VS patients without headache and nine healthy controls were examined. The vestibular, cervicocollic and cervicospinal reflexes were evaluated to study whether asymmetric activation of vestibular reflexes could cause headache. The effect of neck muscle and occipital nerve anaesthesia and the effect of sumatriptan on headache were also evaluated. The vestibular function of VS patients with headache did not differ from that of VS patients without headache, but was abnormal when compared to that of normal controls. The cervicospinal and cervicocollic reflexes did not differ in the patient groups. Injection of lidocaine around the operation scar gave pain relief to two patients, and one of them had occipital nerve entrapment. Infiltration of lidocaine deep in the neck muscles in the vicinity of the C2 root did not alleviate headache, but caused vertigo. Nine patients with musculogenic headache got pain relief from supportive neck collars, and two patients with cervicobrachial syndrome got pain relief from manual neck traction. The study shows that asymmetric activation of cervicocollic reflexes does not seem to be the reason for headache. Headache seems to be linked to neuropathic pain, allegedly caused by trigeminal irritation of the inner ear and the posterior fossa, which has recently been linked to vascular pain.

Sudden sensorineural hearing loss: does application of glucocorticoids make sense? Alexiou, C., Arnold, W., Fauser, C., Schratzenstaller, B., Gloddek, B., Fuhrmann, S., Lamm, K. Klinikum rechts der Isar, Hals-Nasen-Ohren Klinik und Poliklinik, Ismaningerstr. 22, 81675, Muenchen, Germany. C. Alexiou@lrz.tu-muenchen.de. *Archives of Otolaryngology – Head and Neck Surgery* (2001) March, Vol. 127 (3), pp. 253–8.

BACKGROUND: Treatment of sudden sensorineural hearing loss (SSNHL) consists of administration of blood flow-promoting drugs with or without the addition of glucocorticoids. General guidelines based on scientific data do not currently exist. **OBJECTIVE:** To investigate the effect of glucocorticoids on the treatment of SSNHL. **SETTING:** Academic medical center. **PATIENTS AND METHODS:** We retrospectively analysed the audiograms of 603 patients with SSNHL: 301 patients (cared for between January 1, 1986, and December 31, 1991) received intravenous blood flow-promoting drugs without glucocorticoids and 302 patients (cared for between January 1, 1992, and December 31, 1998) received intravenous blood flow-promoting drugs with glucocorticoids (intravenous \pm oral application). The age distribution of patients with SSNHL in lower, middle and higher frequencies was similar in both groups. **RESULTS:** Patients with SSNHL in lower and middle frequencies (250–2000 Hz) who received glucocorticoids (prednisolone-21-hydrogen-succinate) showed significantly better recovery of hearing levels compared with those who did not receive glucocorticoids ($p < 0.05$). There was no significant difference at higher frequencies between the two groups. Patients with SSNHL throughout all frequencies (pancochlear hearing loss) who received glucocorticoids also had significantly better recovery of hearing levels compared with those who received blood flow-promoting drugs alone ($p < 0.05$). Also, patients with elevated blood sedimentation rates had better improvement of their hearing levels after receiving glucocorticoids. **CONCLUSIONS:** Administration of glucocorticoids should be recommended for treatment of patients with SSNHL. In particular, patients with SSNHL in the lower and middle frequency range and pancochlear hearing loss have significantly better recovery of hearing levels.

Cricotracheal resection in children. Rutter, M. J., Hartley, B. E., Cotton, R. T. Department of Otolaryngology, Children's Hospital Medical Center, 3333 Burnet Ave, Cincinnati, OH 45229-3039, USA. ruttm0@chmcc.org. *Archives of Otolaryngology – Head & Neck Surgery* (2001), March, Vol. 127 (3), pp. 289–92.

OBJECTIVE: To review our experience with cricotracheal resection in a pediatric population. **DESIGN:** Prospective case review of a cohort of patients undergoing cricotracheal resection. **SETTING:** Tertiary care pediatric hospital. **PATIENTS:** Forty-

four consecutive patients undergoing cricotracheal resection between January 1, 1993, and December 31, 1998. **MAIN OUTCOME MEASURES:** Decannulation rates. **RESULTS:** Thirty-eight (86 per cent) of the 44 children are decannulated. The ultimate decannulation rate was independent of the presenting grade of subglottic stenosis. Fourteen children (100 per cent) had a primary cricotracheal resection; all are decannulated. Twenty-one children had a salvage cricotracheal resection, and 19 (90 per cent) are decannulated. Nine children had an extended cricotracheal resection, of whom five (56 per cent) are decannulated. A primary cricotracheal resection was performed on a child on whom no previous open airway procedure had been performed. A salvage cricotracheal resection was performed on a child on whom previous open airway reconstruction had not resulted in an adequate airway. An extended cricotracheal resection was performed on a child on whom the cricotracheal resection was combined with a second procedure, either additional expansion cartilage grafting or an open arytenoid procedure. Most of these children had complex airway pathologic conditions. **CONCLUSION:** Cricotracheal resection complements standard laryngotracheal reconstruction techniques in a pediatric population.

Attitudes toward hearing-impaired children in less developed countries: a pilot study. Stephens, D., Stephens, R., von Eisenhart-Rothe, A. Welsh Hearing Institute, University Hospital of Wales, Cardiff. *Audiology, Journal of Auditory Communication* (2000) July-August, Vol. 39 (4), pp. 184–91.

Various anecdotal reports have been presented about attitudes to hearing loss and deafness in less developed countries but few studies have addressed this matter systematically. In the present study, we have applied a standardized questionnaire to 357 teachers from as uniform a sample as possible within 20 countries in Africa, Latin America, and Asia and compared the results with those obtained from 107 teachers in Western Europe. The questions tapped into their responses toward developing hearing loss themselves, hearing loss in children they encountered and which group of children with disabilities they would prefer to teach. The geographical origins of the teachers influenced all measures except their view of the contribution that deaf children would make to society. This was influenced solely by the age of the responding teacher.

Incidence/prevalence of sensorineural hearing impairment in Thailand and Southeast Asia. Prasansuk, S. Bangkok Otological Centre, Faculty of Medicine, Siriraj Hospital, Thailand. *Audiology,*

Journal of Auditory Communication (2000) July-August, Vol. 39 (4), pp. 207–11.

The Bangkok Otological Center (ISA-HI-1FOS/World Health Organization Collaborating Center) carried out a series of prevalence studies of hearing impairment throughout Thailand. This report includes background information for Thailand and its medical personnel and the results of five studies in different regions from 1988 to the present. This report emphasises sensorineural hearing loss (SNHL). Study 1 in three Thai provinces showed SNHL at 18.6 per cent. These results were considered abnormally high due to a number of extraneous reasons. Study 2 was conducted in 17 provinces in five regions and in Bangkok. Results showed that 8.3 per cent of those tested had a SNHL. Study 3, The Crown Prince Project, involved 21 Crown Prince Hospitals and showed an overall SNHL of 4.6 per cent. Study 4 was the Thai-Swedish project, where SNHL was reported at 22.7 per cent. Study 5 involved school children aged six to 15 in both rural Thailand and Bangkok. Results showed SNHL in Bangkok children at 3.5 per cent compared to 3.6 per cent in the rural children. After a careful review of the various studies, the overall results have been interpreted to suggest that the prevalence of SNHL in Thailand is between 3.5 and five per cent.

Hearing impairment in Latin America: an inventory of limited options and resources. Madriz, J. J. Ministry of Health, Government of Costa Rica, and ISA/HI/IFOS Regional Center, San Jose. *Audiology, Journal of Auditory Communication* (2000), July-August, Vol. 39 (4), pp. 212–20.

The availability of information about prevalence/incidence of hearing impairment in Latin American countries is very limited. A questionnaire on the subject was mailed to most Latin American and Caribbean countries. The information returned by 12 respondents (Argentina, Chile, Columbia, Costa Rica, Cuba, Grenada, Guatemala, Mexico, Nicaragua, Panama, Puerto Rico, and Uruguay) was analysed. Data are presented about available epidemiological studies on hearing impairment, national registers on deafness, publications on otitis media, and programs on hearing screening. Presence of training programs and available human resources in the broad field of hearing impairment is also discussed. Estimates of the enrolment of deaf children in schools for the deaf is also shown. This review concludes that hearing impairment is a low priority for national health systems in Latin America. Material and human resources are limited, audiology services are scarce, and technology continues to be very costly by regional standards.