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Abstract selection

Family with branchial arch anomalies, hearing loss, ear and commissural lip pits, and rib anomalies. A new autosomal recessive condition: branchio-oto-costal syndrome? Clementi, M., Mammi, I., Tenconi, R. Dipartimento di Pediatria, Universita di Padova, Italy. *American Journal of Medical Genetics* (1997) January 10, Vol. 68 (1), pp. 91–3.
We report on a family in which three sibs were affected with conductive deafness, bilateral preauricular and commissural lip pits, monolateral branchial fistula, and rib anomalies. On the basis of parental consanguinity, lack of clinical variability and affected subjects of both sexes, this condition seems to be inherited as an autosomal recessive trait. We suggest that these findings comprise a new autosomal recessive entity of branchial, auricular and costal anomalies, for which we suggest the acronym BOC (branchio-oto-costal) syndrome. Author.

An unusual complication of emergency tracheal intubation. Ooi, G. C., Irwin, M. G., Lam, L. K., Cheng, S. W. Department of Diagnostic Radiology, University of Hong Kong, Queen Mary Hospital, Pokfulam, Hong Kong. *Anaesthesia* (1997) February, Vol. 52 (2), pp. 154–8.
A 68-year-old woman presented with dyspnoea having undergone a short period of tracheal intubation during an episode of congestive cardiac failure 10 days earlier. On the fourth day of admission, she suddenly developed acute respiratory distress followed by a cardiac arrest and was found to have an enlarging neck mass. Following intubation and resuscitation, computerized tomography was carried out and surgical exploration revealed a retropharyngeal abscess and a pseudo-aneurysm of the common carotid artery resulting from pharyngeal rupture which most probably occurred as a complication of the original tracheal intubation. Author.

Treatment of high-flow vascular malformations in the head and neck with arterial ligation followed by sclerotherapy. Chen, M. T., Horng, S. Y., Yeong, E. K., Pan, Q. D. Division of Plastic Surgery, Department of Surgery, National Taiwan University Hospital, Taipei. *Annals of Plastic Surgery* (1996) February, Vol. 36 (2), pp. 147–53.
The traditional treatment of high-flow vascular malformations consists of selective embolization, surgical removal, or a combination of both. Recurrence of the lesion and bleeding control are still the main problems, and the result of treatment is sometimes disappointing. We suggest treatment of these lesions with surgical ligation of the distal major feeding arteries followed by intravascular injection of a sclerosing agent (three per cent tetradecyl sulfate) and surgical excision and reconstruction when indicated. We have found this to be an effective treatment regimen. We present 14 cases of high-flow vascular malformations of the head and neck area treated with this approach, of which four cases developed skin necrosis. Three of these four cases of skin necrosis were later treated with skin grafting and, in one case, an upper arm skin tube flap was used for nasal tip reconstruction. Three cases underwent delayed reconstruction using tissue expanders. From a symptomatic and aesthetic point of view, preliminary satisfactory results were obtained. We feel that this approach is a good option for treating difficult, high-flow vascular malformations. Author.

Microsurgical reconstruction of the head and neck: interdisciplinary collaboration between head and neck surgeons and plastic surgeons in 305 cases. Jones, N. F., Johnson, J. T., Shestak, K. C., Myers, E. N., Swartz, W. M. Division of Plastic and Reconstructive Surgery, University of Pittsburgh, PA, USA. *Annals of Plastic Surgery* (1996) January, Vol. 36 (1), pp. 37–43.
Three hundred five microsurgical free flaps have been performed for defects of the head and neck by a team of two head and neck surgeons and two plastic surgeons over a nine year period, with a success rate of 91.2 per cent. The most common flaps used were the jejunum (89), radial forearm (57), rectus abdominis (48), latissimus dorsi (40), scapular (32), fibula (15), and iliac crest (11). Thirty-three flaps required reexploration for anastomotic thrombosis or hematoma (10.8 per cent), of which 18 flaps were salvaged (54.5 per cent). Thirteen flap failures occurred in 113 patients who had received preoperative irradiation (11.5 per cent), but this was not statistically significant. Seven flaps failed in 20 patients who required an interposition vein graft (35 per cent) and this was statistically significant. Ninety patients (31.5 per cent) developed a major complication other than anastomotic thrombosis or death. Despite postoperative intensive care nursing and monitoring, 18 patients died postoperatively in the hospital (6.3 per cent). The average hospital stay was 21.1 days with a range from five to 95 days. During this nine-year time period, various free flaps have evolved as the preferred choice for free flap reconstruction of a specific defect of the head and neck. The latissimus dorsal muscle flap surfaced with a nonmeshed split-thickness skin graft is the optimal free flap for reconstruction of the scalp and skull, whereas a multiple-paddle latissimus dorsi musculocutaneous flap is the best flap for reconstruction of complex defects of the middle third of the face and maxilla. The radial forearm flap and free jejunal transfer have become the preferred choices for intraoral reconstruction and pharyngo-esophageal reconstruction, respectively. There still remains no universally accepted flap for mandibular reconstruction, but the fibular osteocutaneous flap and a reconstruction plate protected by a radial forearm flap have largely superseded the iliac crest and scapular osteocutaneous flaps. Radical resection of tumours of the head and neck with immediate reconstruction by microsurgical free tissue transfer followed by adjuvant radiation therapy provides the best possible chance for cure and functional and social rehabilitation of the patient. Author.

Auditory effects of aircraft noise on people living near an airport. Chen, T. J., Chen, S. S., Hsieh, P. Y., Chiang, H. C. Department of Physiology, Institute of Public Health, Kaohsiung Medical College, Taiwan, Republic of China. *Archives of Environmental Health* (1997) January-February, Vol. 52 (1), pp. 45–50.
Two groups of randomly chosen individuals who lived in two communities located different distances from the airport were studied. We monitored audiometry and brainstem auditory-evoked potentials to evaluate cochlear and retrocochlear functions in the individuals studied. The results of audiometry measurements indicated that hearing ability was reduced significantly in individuals who lived near the airport and who were exposed frequently to aircraft noise. Values of pure-tone average, high pure-tone average, and threshold at 4 kHz were all higher in individuals who lived near the airport, compared with those who lived farther away. With respect to brainstem auditory-evoked potentials, latencies between the two groups were not consistently different; however, the abnormality rate of such potentials was significantly higher in volunteers who lived near the airport, compared with less-exposed counterparts. In addition, a positive correlation was found between brainstem auditory-evoked potential latency and behavioural hearing threshold of high-frequency tone in exposed volunteers. We not only confirmed that damage to the peripheral cochlear organs occurred in individuals exposed frequently to aircraft noise, but we demonstrated involvement of the central auditory pathway. Author.

Infrared tympanic temperature as a predictor of rectal temperature in warm and hot conditions. Hansen, R. D., Amos, D., Leake, B. Department of Life Sciences, University of Sydney, New South Wales, Australia. *Aviation, Space and Environmental Medicine* (1996) November, Vol. 67 (11), pp. 1048–52.
BACKGROUND: Infrared (IR) thermometry has been proposed

as a rapid, non-invasive means of monitoring core temperature. However, it has not been validated for use in warm to hot environments. HYPOTHESIS: IR tympanic temperature (Tty) accurately predicts rectal temperature (Tre) during simulated marching in warm and hot conditions. METHODS: Tty, and thermistor-derived Tre, aural canal (Tac) and cheek skin (T cheek) temperatures were monitored in seven males during 100 min of treadmill walking, in combat uniforms, at 5 km h^{-1}, slope six per cent, in warm (30 degrees C, 60 per cent RH) and hot (40 degrees C, 30 per cent RH) conditions. RESULTS: Tty was significantly different to Tre in hot, but not warm, conditions. Final Tty was 0.2 degrees C <Tre in warm, but 0.4 degrees C >Tre in hot, conditions. From 60–100 min of the warm trial, Tty predicted Tre with a standard error of estimate (SEE) of 0.15 degrees C ($r = 0.9$, $P<0.0001$). In a multiple regression model, the combination of Tty, Tac, and Tcheek reduced this SEE to 0.1 degrees C. In the H trial, from 60–100 min Tty predicted Tre with a SEE of 0.21 degrees C ($r = 0.7$, $P<0.0001$). Tty and Tac correlated significantly in both trials. CONCLUSIONS: (1) the IR method should provide useful estimates of Tre in the field provided the influence of ambient conditions is taken into account; (2) the IR method is not as reliable as rectal monitoring in distinguishing accurately between degrees of heat strain; and (3) Tre prediction with the IR device may be improved in warm conditions if skin temperatures are combined with Tty. Author.

Audiological findings after multichannel cochlear implantation in patients with Mondini dysplasia. Munro, K. J., George, C. R., Haacke, N. P. Hearing and Balance Centre, University of Southampton, UK. *British Journal of Audiology* (1996) December, Vol. 30 (6), pp. 369–79.

Mondini dysplasia is a congenital malformation of the inner ear. To date, five individuals with this malformation have received cochlear implants at the South of England Cochlear Implant Centre. The aim of this study was to review the audiological findings of these individuals after implantation. The soundfield thresholds after implantation are in the region of 30–40 dB (A). The results of suprathreshold speech recognition tasks show substantial variability in performance but this is no greater than that obtained from implant users with no malformation. All individuals were able to detect and recognize a variety of environmental sounds that would previously have been inaudible. These findings, along with the reported improvement in quality of life, mean that Mondini dysplasia is not a contra-indication for multichannel cochlear implantation. This information will be useful to other centres when considering implantation in similar patients. Author.

Auditory performance and acoustic reflexes in young adults reporting listening difficulties. Higson, J. M., Morgan, N., Stephenson, H., Haggard, M. P. MRC Institute of Hearing Research, Nottingham, UK. *British Journal of Audiology* (1996) December, Vol. 30 (6), pp. 381–7.

We aimed to determine whether reported difficulties in speech understanding are associated with abnormal acoustic reflex thresholds (ARTs). The acoustic reflex has been shown to have a role in the understanding of speech at high intensities by ensuring that the strong low-frequency components of sound do not excessively mask the higher-frequency components, which are important for speech understanding. There is also wide variance in individual ARTs. Hence, the possibility arises that subjects reporting listening difficulties in noise have abnormal acoustic reflex function. In this investigation, a questionnaire to 2,395 university students was used to obtain 20 subjects reporting listening difficulties in background noise and requesting advice about their hearing problems; it also screened out significant histories of middle ear disease in childhood. These subjects, and 20 control subjects reporting no listening difficulties, received a battery of performance tests and measures of acoustic reflex thresholds. Results showed significant differences in auditory performance between subjects reporting listening difficulties and those with no such difficulties, but no differences in acoustic reflex thresholds. These findings extend the relationship between reported listening difficulties and auditory performance within the 'normal hearing' range, but this relationship is unlikely to be due to abnormal acoustic reflex thresholds. Author.

Mechanisms of gastric juice-induced hyperpermeability of the cultured human tracheal epithelium. Ohrui, T., Yamaya, M., Suzuki, T., Sekizawa, K., Funayama, T., Sekine, H., Sasaki, H. Department of Geriatric Medicine, Tohoku University School of Medicine, Sendai, Japan. *Chest* (1997) February, Vol. 111 (2), pp. 454–9.

PURPOSE: The respiratory aspiration of the stomach contents causes severe lung damage called aspiration pneumonia. The present study was undertaken to elucidate whether mucosal exposure of gastric juice causes hyperpermeability of the human airway epithelium and to determine the mechanisms responsible for gastric juice-induced airway epithelial damage. MATERIALS AND METHODS: Gastric juice was collected from 46 normal adults via gastroscope and samples were analysed for pH, osmolarity, and concentration of pepsin and trypsin. Tracheal surface epithelial cells were obtained from 16 autopsies, cultured onto porous filters, and mounted in the Ussing chamber. Electrical conductance (G) was measured before and after exposure of cells to gastric juice or Krebs-Henseleit solution with pH at 1.8, 2.8, 4.0, or 7.4 in the presence or absence of pepsin. D-(3H) mannitol flux study across the epithelial layer and histologic observations using an inverted microscope were also performed after exposure of cells to gastric juice. RESULTS: Exposure of cultured human tracheal epithelium to gastric juice caused increases in G in a time- and pH-dependent fashion. A pepsin inhibitor (pepstatin A) inhibited gastric juice-induced increases in G at a pH of 2.8, and the addition of pepsin augmented increases in G induced by the Krebs-Henseleit solution at a pH of 1.8 and 2.8. Lowering the osmolarity of the solution to levels similar to gastric juice also potentiated increases in G induced by acid and pepsin. Gastric juice caused increases in D-(3H) mannitol flux across the epithelial layer bidirectionally, and microscopic observation revealed separation of the intracellular space and cell detachment from culture vessels after exposure of cells to gastric juice. CONCLUSION: Gastric juice causes hyperpermeability across human airway epithelium probably through the additive effects of gastric acid, pepsin activity, and lower osmolarity. Author.

Preliminary observations on the development of auditory sensitivity in infants with Down syndrome. Werner, L. A., Mancl, L. R., Folsom, R. C. University of Washington, Department of Speech and Hearing Sciences, Seattle, USA. *Ear and Hearing* (1996) December, Vol. 17 (6), pp. 455–68.

OBJECTIVE: Hearing loss commonly is associated with Down syndrome, but little is known about the development of auditory sensitivity in individuals with Down syndrome. This study had two objectives: 1) to determine whether an observer-based procedure can be used to assess the behavioural sensitivity of infants with Down syndrome, and 2) to provide preliminary information about the early course of hearing development among infants with Down syndrome. DESIGN: Behavioural measures of sensitivity were made in 16 infants with Down syndrome using an observer-based procedure. Ten of the infants were followed longitudinally between two and 12 months of age. All infants passed a screening auditory stem response at 20 dB nHL during the study and completed screening tympanometry at each test session. The infants detected a 4,000 Hz tone at levels ranging from 25 to 50 dB SPL; psychometric functions and thresholds for the tone were obtained. RESULTS: Infants with Down syndrome completed 80 per cent of the test sessions they began, a rate similar to that seen in normally developing infants in the same type of study. Performance improved with increasing stimulus level, as one would expect, and thresholds were obtained from 15 of 16 infants for at least one age. The performance of infants with Down syndrome generally improved with age. The sensitivity of two to three month olds was poorer than that of older infants, but little if any improvement in sensitivity occurred between four and 12 months. This pattern is similar to that seen in normally developing infants. Thresholds of infants with Down syndrome were 10 to 25 dB higher than those reported for normally developing infants. The psychometric functions of infants with Down syndrome were shallower than the psychometric functions of normally developing infants, and the slope of the psychometric functions did not change with age. Infants with Down syndrome achieved only 75 to 80 per cent correct at any of the levels tested, five to 10 per cent poorer than reported for other infants. These characteristics of the psychometric functions of the infants with Down syndrome suggest that they are inattentive during testing more often than

are normally developing infants. CONCLUSIONS: An observer-based procedure can be used to obtain reasonable thresholds from infants with Down syndrome who are as young as two months of age. Both sensory and nonsensory factors could contribute to the threshold elevation seen in infants with Down syndrome. At least on preliminary examination, the course of auditory sensitivity development of infants with Down syndrome is qualitatively similar to that seen in normally developing infants. Author.

Comparison of conventional amplification and an assistive listening device in elderly persons. Jerger, J., Chmiel, R., Florin, E., Pirozzolo, F., Wilson, N. Department of Otolaryngology and Communicative Sciences, Baylor College of Medicine, Houston, Texas, USA. *Ear and Hearing* (1996) December, Vol. 17 (6), pp. 490–504.
OBJECTIVE: To assess the impact of personal amplification systems on quality of life of elderly persons and to compare conventional hearing aid with assistive listening device. DESIGN: Audiologic, neuropsychologic, and quality-of-life measures were prospectively administered to 180 elderly, hearing-impaired persons before and after randomized six week trials of four treatment conditions—a no-amplification condition and three different types of amplification: 1) conventional hearing aid, 2) assistive listening device, and 3) a combination of the two systems. All subjects volunteered to participate in a study comparing different amplification systems and were paid for their participation. RESULTS: Both self-perceived handicap and speech understanding were improved significantly by all three amplification systems. There were no significant group differences between new users and previous users of amplification in self-assessed handicap after amplification use. Anecdotally, subjects preferred the sound quality of the assistive listening device, but an overwhelming majority (97.3 per cent) still chose the conventional aid for use in daily living. CONCLUSIONS: Results affirm the significant impact of amplification on the quality of life of elderly persons. The strong preference for the conventional hearing aid in everyday use undoubtedly reflects the fact that elderly users usually are not willing to endure the difficulties associated with the use of remote-microphone systems. Author.

Initial independent results with the Clarion cochlear implant. Tyler, R. S., Gantz, B. J., Woodworth, G. G., Parkinson, A. J., Lowder, M. W., Schum, L. K. Department of Otolaryngology–Head and Neck Surgery, University of Iowa, Iowa City, USA. *Ear and Hearing* (1996) December, Vol. 17 (6), pp. 528–36.
OBJECTIVE: This paper reports some preliminary findings from patients, implanted at the University of Iowa, using the Advanced Bionics Clarion cochlear implant (version 1.0). We compared the performance of patients using both simultaneous analogue and nonsimultaneous pulsatile processing strategies. The performance of Clarion patients was also compared with a group of patients who were using either the feature-extraction Nucleus cochlear implant or the compressed-analogue Ineraid cochlear implant. DESIGN: One aim was to compare the analogue and pulsatile stimulation in 19 patients using the Clarion implant. This aim could be accomplished only partially because of difficulties encountered in adequately fitting patients with the analogue strategy. A second aim was to compare the Clarion users' performance with feature-extraction Nucleus and compressed-analogue Ineraid patients. Comparisons were made with all patients having nine months experience postimplantation. RESULTS: Subjects performed better using the pulsatile mode compared with the analogue mode. All subjects chose to use the pulsatile strategy after the first three months of the study. Results comparing performance at nine months with our compressed-analogue Ineraid and feature-extraction Nucleus patients indicated, in general, better average performance for the Clarion users. CONCLUSIONS: We conclude that the pulsatile version of the Clarion cochlear implant typically produces superior performance to the analogue version of that device at this stage in its development. After nine months of experience, users of the Clarion implant are performing better than are users of the feature-extraction Nucleus and compressed-analogue Ineraid cochlear implants with comparable amounts of experience. Author.

Effects of stapedial arch fractures on conductive hearing loss and stapedial reflexes. Simmons, M. J., Parkins, C. W. Louisiana State University Medical Center, Department of Otolaryngology and Biocommunication, Kresge Hearing Research Laboratory, New Orleans, USA. *Ear and Hearing* (1996) December, Vol. 17 (6), pp. 559–63.
OBJECTIVE: It has been stated in the clinical literature that stapedial fractures could produce a significant conductive hearing loss while leaving the contralateral stapedial reflex intact. The objective of this study is to test this hypothesis in an animal model. DESIGN: Nine hooded rats underwent acoustic-stapedial reflex (ASR) and cochlear microphonic (CM) threshold determinations before and after middle ear surgery. An argon laser was used to divide the tensor tympani tendon, the anterior stapedial crus, and the posterior stapedial crus, sequentially. The initial functional measures were repeated after each laser procedure to document its effect. RESULTS: Dividing the tensor tympani tendon and the anterior stapedial crus had variable and small effects on ASR and CM thresholds. Division of the second (posterior) crus eliminated stapedial reflexes and produced a significant hearing loss. CONCLUSIONS: This study refutes the hypothesis that fracture of one (anterior) stapedial crus will significantly alter ossicular sound transmission, but it supports the hypothesis that measured stapedial reflexes would not be significantly altered by a single crus fracture. Therefore, the surgeon exploring an ear for a conductive hearing loss with an intact contralateral stapedial reflex should look carefully for another source of the hearing loss if finding only a single stapedial arch fracture. Author.

Electrophysiological and morphological evaluation of the acute ototoxicity of sodium nitroprusside. Kong, W. J., Ren, T., Nuttall, A. L. Kresge Hearing Research Institute, University of Michigan, Ann Arbor 48109-0506, USA. *Hearing Research* (1996) September 15, Vol. 99 (1–2), pp. 22–30.
Nitric oxide (NO) is a messenger molecule that mediates several physiological functions and pathological processes. Sodium nitroprusside (SNP), a potent vasodilator, when given clinically as an anti-hypertension agent, exerts its function by releasing NO. It was reported recently that SNP causes a loss of auditory nerve compound action potential (CAP) after topical application of SNP on guinea pig round window membrane (RWM). The current study was designed to investigate the ototoxic target of SNP through both electrophysiological and morphological approaches. The CAP threshold at frequencies ranging from two to 36 kHz, the cochlear microphonic quadratic distortion product (cmQDP, F2–F1, where F1 = 17.1 kHz; F2 = 18 kHz), and the cochlear microphonic (CM) at the frequency of F1 were recorded via a round window electrode before and up to two hours after RWM application of one microlitre of drug solution. Cochlear blood flow (CBF) and arterial blood pressure were monitored. The cochleae were then processed for morphological examination. The effect of SNP on endocochlear potential (EP) was also studied. Results showed that cm QDP, CM, and CAP, as well as EP, were suppressed in varying amounts, while CBF was substantially increased following drug application. Morphological evaluations showed swelling of the afferent inner radial dendrites within the basal cochlear turn in the higher concentration groups of SNP, while the hair cells presented no evidence of damage at the light microscopic level. The results indicate that SNP has an acute ototoxic effect in a concentration- and time-dependent manner. The targets of SNP ototoxicity are at least the afferent dendrites and stria vascularis. Author.

Measuring health-related quality of life in rhinitis. Juniper, E. F. Department of Clinical Epidemiology and Biostatistics, McMaster University Medical Centre, Hamilton, Ontario, Canada. *Journal of Allergy and Clinical Immunology* (1997) February, Vol. 99 (2), pp. S742–9.
Patients with rhinitis are bothered both by the nasal symptoms themselves and by associated symptoms such as headache and fatigue. The combination can produce quite severe impairment of day-to-day physical, emotional, occupational, and social functioning and can cause emotional distress. This breadth of impairment of health-related quality of life in patients with rhinitis is often not recognized and is sometimes trivialized by some health care professionals. One of the aims of treating patients with rhinitis must be to ensure that all individual patient problems are recognized and treated appropriately. Several studies now show

that correlations between conventional nasal symptom-severity diaries and health-related quality of life are only weak to moderate. Therefore, to get an overall picture of a patient's health status, it is essential to measure quality of life. Genetic health-status questionnaires are able to compare burden of illness across different medical conditions, but they are often not responsive enough to small but clinically important changes in patients' quality of life. As a result, we have seen the emergence of disease-specific instruments for rhinitis that have strong measurement properties and that are much more sensitive to these changes. Most clinical trials in rhinitis now include a measure of health-related quality of life as a primary outcome, and many clinicians are incorporating quality of life into routine clinical assessments. Author.

Pathogenesis of allergic rhinitis. Baraniuk, J. N. Department of Medicine, Georgetown University, Washington, DC 20007-2197, USA. *Journal of Allergy and Clinical Immunology* (1997) February Vol. 99 (2), pp. S763–72.
Allergic rhinitis is an increasing problem for which new and exciting therapies are being developed. These can be understood through an appreciation of the newer concepts of pathogenesis of allergic rhinitis. Allergen induces Th2 lymphocyte proliferation in persons with allergies with the release of their characteristic combination of cytokines including IL-3, IL-4, IL-5, IL-9, IL-10, and IL-13. These substances promote IgE and mast cell production. Mucosal mast cells that produce IL-4, IL-5, IL-6, and tryptase proliferate in the allergic epithelium. Inflammatory mediators and cytokines upregulate endothelial cell adhesion markers, such as vascular cell adhesion molecule-1. Chemoattractants, including eotaxin, IL-5, and RANTES, lead to characteristic infiltration by eosinophils, basophils, Th2 lymphocytes, and mast cells in chronic allergic rhinitis. As our understanding of the basic pathophysiologic features of allergic rhinitis continues to increase, the development of new diagnostic and treatment strategies may allow more effective modulation of the immune system, the atopic disease process, and the associated morbidity. Author.

Otitis media and eustachian tube dysfunction: connection to allergic rhinitis. Fireman, P. Department of Pediatrics, University of Pittsburgh School of Medicine, Children's Hospital of Pittsburgh, PA 15213, USA. *Journal of Allergy and Clinical Immunology* (1997) February, Vol. 99 (2), pp. S787–97.
Otitis media and otitis media with effusion are among the most common childhood illnesses and contribute a great deal to health care costs. The cause of otitis media is multifactorial. Eustachian tube dysfunction, bacterial or viral infection of the middle ear, and nasal inflammation resulting from allergic rhinitis or upper respiratory infection are acknowledged contributing factors. Data from epidemiology studies indicate that 25 to 40 per cent of upper respiratory infections in children younger than three years are accompanied by an episode of otitis media, 40 to 50 per cent of children older than three years with chronic otitis media have confirmed allergic rhinitis. Studies of the pathogenesis of otitis media have identified interactions among infection, allergic reactions, and eustachian tube dysfunction. Nasal inflammation due to allergen challenge results in classic signs and symptoms of allergic rhinitis and eustachian tube dysfunction. Eustachian tube dysfunction leads to increased negative pressure in the middle ear and improper ventilation. Both viral upper respiratory infection and nasal allergic reaction provoke nasal inflammation, eustachian tube dysfunction, and enhanced nasal protein transudation and secretion, which is likely to be sustained and modulated by inflammatory mediators and cytokines. In a study of experimental infection with influenza A virus, histamine release increased from peripheral blood basophils of patients with allergic rhinitis. These data support an interaction between viral infection and nasal allergy in enhancing certain pathophysiologic responses. Viral upper respiratory infections may promote secondary bacterial infections by altering bacterial adherence, modulating host immune and inflammatory responses, and impairing eustachian tube function. In acute otitis media, bacteria are cultured from approximately 70 per cent of middle ear effusions with *Streptococcus pneumoniae* being the most common organism. Initial management of otitis media consists of appropriate antimicrobial therapy. In the presence of allergic rhinitis, antiallergic therapies may be used to augment symptom resolution and therapeutic response. Surgical insertion of tympanostomy or ventilation tubes to promote drainage of unresolved effusions has become common. Further delineation of the pathogenesis of otitis media and otitis media with effusion will guide appropriate medical management and may decrease the need and frequency of surgical procedures. Author.

Nasal polyposis: immunohistochemistry and bioelectrical findings (a hypothesis for the development of nasal polyps). Bernstein, J. M., Gorfien, J., Noble, B., Yankaskas, J. R. Department of Otolaryngology, State University of New York at Buffalo, USA. *Journal of Allergy and Clinical Immunology* (1997) February, Vol. 99 (2), pp. 165–75.
Nasal polyps and turbinates were obtained from individuals undergoing surgery for symptomatic nasal obstruction caused by nonatopic rhinosinusitis or allergic rhinosinusitis. One part of the tissue from each patient was fixed in neutral buffered formalin and prepared for study by histochemical and immunohistochemical methods. Monoclonal antibodies were used to identify macrophages, lymphocytes, and plasma cells. In most cases (12 of 16, 75 per cent) the remainder of the polyp and turbinate samples was treated with protease to achieve disaggregation of the epithelial cells. Those cells were cultured on permeable collagen matrix supports. Transepithelial potential difference and resistance were measured daily. At the time of maximal transepithelial potential difference, the epithelial cells were mounted in modified Ussing chambers and exposed to a sodium-positive channel blocker (amiloride hydrochloride) and to selected chloride-negative channel agonists (isoproterenol bitartrate and adenosine triphosphate). Middle turbinates and polyps were found to have more macrophages, lymphocytes, plasma cells, HLA-DR-positive cells, and eosinophils than the inferior turbinates. Epithelial cells obtained from polyps exhibited higher transepithelial potential differences and equivalent short-circuit currents than turbinate cell cultures. The responses to amiloride, isoproterenol, and adenosine triphosphate were also greater for polyp than for turbinate cultures. A theory for the pathogenesis of nasal polyps is proposed. Local release of inflammatory mediators could cause sodium absorption and chloride permeability to be higher in polyps than in turbinate epithelia. Increased sodium absorption is consistent with the hypothesis that epithelial fluid absorption contributes to the development of nasal polyps and is a result of the increased recruitment of inflammatory cells, which a present in nasal polyps. Author.

Epidemiologic evidence for Lancefield group C beta-haemolytic streptococci as a cause of exudative pharyngitis in college students. Turner, J. C., Hayden, F. G., Lobo, M. C., Ramirez, C. E., Murren, D. Department of Student Health, University of Virginia, Charlottesville 22908, USA. *Journal of Clinical Microbiology* (1997) January, Vol. 35 (1), pp. 1–4.
The isolation rates of strains of group C beta-haemolytic streptococci from throat swab cultures of patients with exudative pharyngitis, the common cold, and healthy controls were compared. By using a cohort study design in a college health service, patients with exudative pharyngitis were retrospectively identified by description of tonsillar exudate on chart review. Patients with rhinoviral infection were prospectively identified during a common cold study. Healthy controls were prospectively recruited from patients presenting with noninfectious conditions. Isolation of Lancefield group A and C beta-haemolytic streptococci from throat cultures was used as an outcome measurement. A total of 265 students (62 per cent female; average age 20.2 years) with exudative pharyngitis were identified. A total of 75 students (60 per cent female; average age 21.7 years) from a common cold study with rhinoviral infection were identified. A total of 162 students (53 per cent female; average age 22.6 years) were recruited as healthy controls. Group A beta-haemolytic streptococci were isolated from five per cent of patients with pharyngitis but none of those with rhinovirus ($P = 0.045$) and none of the controls ($P = 0.007$). Group C Streptococcus dysglactiae subsp. equisimilis was isolated from 11 per cent of patients with pharyngitis but none of those with rhinovirus ($P = 0.006$) and two per cent of controls ($P = 0.001$). Lancefield group C *Streptococcus anginosus* was isolated from eight per cent of patients with pharyngitis but three per cent of those with rhinovirus ($P = 0.18$) and one per cent of controls ($P = 0.006$). Heavier growth of colonies on the primary culture plate was observed for patients from whom *S. equisimilis* and group A beta-haemolytic strepto-

cocci were isolated. Lancefield group C beta-hemolytic streptococci appear to be associated with exudative pharyngitis in college students. Author.

Rhinocerebral and systemic mucormycosis. Clinical experience with 36 cases. Rangel-Guerra, R. A., Martinez, H. R., Saenz, C., Bosques-Padilla, F., Estrada-Bellmann, I. Neurology Service, Internal Medicine Department, Hospital Universitario U.A.N.L., Mitras Monterrey N.L., Mexico. *Journal of Neurological Sciences* (1996) November, Vol. 143 (1–2), pp. 19–30.
We analysed retrospectively our clinical experience with 36 cases of mucormycosis. They were seen during the last 15 years. The diagnosis suspected on clinical grounds, was confirmed in 31 cases by finding the hyphae in haematoxylin-eosin stained material obtained from aspirated or tissue biopsy or by isolation of the fungus in culture. Rhinocerebral mucormycosis was diagnosed in 22 patients. Diabetes was the underlying disorder in 20 cases, kidney failure in one and myelodysplastic syndrome in one. Nine had stable and 11 unstable diabetes (ketoacidosis in 10 and hyperosmolar coma in one). The earliest sign was facial edema, followed by proptosis, chemosis and extraocular muscle paresis. They were treated by extensive surgical debridement, insulin and antifungal drugs with 69 per cent of survival rate. The disseminated mucormycosis was diagnosed at the autopsy in five cases, acute leukaemia was the underlying disease in two of them. Pulmonary mucormycosis was diagnosed in two cases, cutaneous form in two, sinuorbitral form in four and brain abscess in one patient. Eight of these nine cases survived after therapy. We emphasize the importance of an early diagnosis. This can only be made in the presence of a typical clinical setting confirmed by finding the hyphae in tissue or culture. Antifungal drugs along with treatment of the underlying disorder and aggressive surgical debridement must follow. Author.

Instability of voice in adolescence: pathologic condition or normal developmental variation? (see comments). Boltezar, I. H., Burger, Z. R., Zargi, M. University Department of Otorhinolaryngology, Ljubljana, Slovenia. *Journal of Pediatrics* (1997) February, Vol. 130 (2), pp. 185–90. Comment in: *Journal of Pediatrics* (1997) February, Vol. 130 (2), pp. 169–70.
OBJECTIVE: Paediatricians often send adolescents with dysphonia to the otorhinolaryngologist's office to find the reason for their hoarseness. The aim of this study was to identify the main characteristics of adolescent voice and to determine which characteristic (variable of voice analysis) can distinguish normal variations of voice development from pathologic disorders. STUDY DESIGN: On the basis of history, indirect laryngoscopy, and stroboscopy, 51 adolescents (22 boys, 29 girls) from age 10 to 17 years were divided into four subgroups: candidates for singing lessons without voice problems, subjects with mutation voice disorders, subjects with functional dysphonia, and subjects with vocal cord nodules. Voice analysis by Multi-Dimensional Voice Program (Kay Elemetrics) evaluated the fundamental frequency, the variability of pitch and amplitude (loudness), and the presence of noise in the analysed voice sample of each of the subjects. Data were analysed with the SPSS+/PC Statistical Program. RESULTS: All mean values of variables that describe variability of pitch and amplitude were abnormal in boys and in girls, with greater abnormality among boys. The variability of loudness and specifically the variability of pitch were abnormal in a majority of subjects. A significant negative correlation between age and fundamental frequency was stated in boys only and between age and variability of amplitude in girls only. Variables that express variability of pitch and amplitude correlated positively between themselves. No significant differences were found between the first subgroup (candidates for singing lessons), which represented a normal population, and the other three subgroups (subjects with mutational disorders, functional dysphonia, and vocal cord nodules). In addition, no significant differences were found between the first three subgroups (subjects without voice problems and subjects with functional voice disorders) and the fourth subgroup (subjects with vocal cord nodules: organic lesion of laryngeal mucosa). CONCLUSIONS: According to this study, the main characteristic of adolescent voice is the instability of amplitude (loudness) and specifically the instability of pitch. Female voices appear more stable than male voices. No single variable of performed voice analysis can distinguish normal variation of voice development from pathologic disorders. The reason for this instability can be attributed to more gradual adaptation of the afferent and efferent nervous control to the rapid growth of the phonatory, respiratory, and resonatory organs. In the growing speech apparatus, optimal phonatory patterns can be created; therefore adolescence is an ideal period for treatment of functional voice disorders. Author.

Management of 1,000 vestibular schwannomas (acoustic neuromas): clinical presentation. Matthies, C., Samii, M. Department of Neurosurgery, Nordstadt Hospital, Hannover, Germany. *Neurosurgery* (1997) January, Vol. 40 (1), pp. 1–9; discussion 9–10.
OBJECTIVE: Despite good knowledge of the key symptoms of vestibular schwannomas and their significance for surgical results, the evolution of symptoms and signs and their relation to tumour extension still need thorough investigation. METHODS: From 1978 to 1993, operations were performed by the same surgeon (M.S.) on 1,000 vestibular schwannomas at the Neurosurgical Department of Nordstadt Hospital. The vestibular schwannomas were diagnosed in 962 patients, including 522 female patients (54 per cent) and 440 male patients (46 per cent); the mean age was significantly higher in female patients (47.6 years) than in men (45.2 years). We focused our analysis on the incidence of subjective disturbances versus objective morbidity, on the sequence of symptom onset, and on symptom duration and symptomatology versus tumour size and extension. RESULTS: The most frequent clinical symptoms were disturbances of the acoustic (95 per cent), vestibular (61 per cent), trigeminal (nine per cent), and facial (six per cent) nerves. Symptom duration was 3.7 years for hearing loss, 1.9 years for facial paresis, and 1.3 years for trigeminal disturbances. Symptom incidence and duration did not strictly correlate with tumour size. Key symptoms of various tumour extension classes precipitated the diagnosis, such as trigeminal disturbances in large tumours with brain stem compression or tinnitus in small neuromas. In cases of trigeminal or facial nerve symptoms, the overall duration of symptomatology was much shorter. According to the subjective perception of the patients, between only one- and two-thirds of nerve disturbances were noticed. Patients with preoperative deafness had become deaf either chronically (23 per cent) or suddenly (three percent); even in cases of moderate hearing deficit that lasts a long time, deafness can occur suddenly. The rate of tinnitus was higher in hearing than in deaf patients; however, deafness does not mean relief from tinnitus, because this symptom persists in 46 per cent of preoperatively deaf patients. Vestibular disturbances most often occur as some unsteadiness while walking or as vertigo, and the symptoms frequently are fluctuating, not constant. CONCLUSION: Differences in tumour biology can be underestimated and are not visible on radiological scans. For example, intrameatal tumours, despite their small size, present with a duration of symptoms that is representative of the larger tumours and are most frequently associated with vestibular symptoms and with tinnitus. Large tumours with brain stem compression present with relatively shorter symptom durations and at a younger age; both factors are suggestive of especially fast tumour growth. The clinical findings presented in this study promote new consideration of the dynamics of tumour growth and of the affected neural tissues. Author.

Management of 1,000 vestibular schwannomas (acoustic neuromas): surgical management and results with an emphasis on complications and how to avoid them. Samii, M., Matthies, C. Department of Neurosurgery, Nordstadt Hospital, Hannover, Germany. *Neurosurgery* (1997) January, Vol. 40 (1), pp. 11–21; discussion 21–3.
OBJECTIVE: To identify the actual benefits and persisting problems in treating vestibular schwannomas by the suboccipital approach, the results and complications in a consecutive series of 1,000 tumours surgically treated by the senior author were analysed and compared with experiences involving other treatment modalities. METHODS: Pre- and postoperative clinical statuses were determined and radiological and surgical findings were collected and evaluated in a large database for 962 patients undergoing 1,000 vestibular schwannoma operations at Nordstadt's neurosurgical department from 1978 to 1993. RESULTS: By the suboccipital transmeatal approach, 979 tumours were completely removed; in 21 cases, deliberate partial removal was performed either in severely ill patients for decompression of the brain stem or in an attempt to preserve hearing in the last hearing

ear. Anatomic preservation of the facial nerve was achieved in 93 per cent of the patients and of the cochlear nerve in 68 per cent. Major neurological complications included one case of tetraparesis, 10 cases of hemiparesis, and caudal cranial nerve palsies in 5.5 per cent of the cases. Surgical complications included haematomas in 2.2 per cent of the cases, cerebrospinal fluid fistulas in 9.2 per cent, hydrocephalus in 2.3 per cent, bacterial meningitis in 1.2 per cent, and wound revisions in 1.1 per cent. There were 11 deaths occurring at two to 69 days postoperatively (1.1 per cent). The techniques that were developed for avoidance of complications are reported. The analysis identifies preexisting severe general and/or neurological morbidity, cystic tumour formation, and major caudal cranial nerve deficits as relevant risk factors. CONCLUSION: The current treatment options of complete tumour resection with ongoing reduction of morbidity are well fulfilled by the suboccipital approach. By careful patient selection, the mortality rate should be further reduced to below one per cent. Author

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