The pathogenesis of cholesteatoma is complex and cholesteatomas may arise from various simultaneous mechanisms.

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Mastoidectomy: How I do it (1) (V637)

ID: 637.1

How to do scutumplasty after cortical mastoidectomy or atticotomy

Presenting Author: **Masafumi Sakagami**

Masafumi Sakagami

Hyogo College of Medicine

Learning Objectives: To learn how to do scutumplasty for intact canal wall tympanoplasty and atticotomy/antrotomy in the video session

Introduction: Postoperative retraction of the ear drum sometimes occurs after cortical mastoidectomy or atticotomy for attic cholesteatoma. One of the most important points to protect retraction is to firmly reconstruct the scutum with a sliced cartilage.

Surgical procedures: After the tympanomeatal flap is elevated anteriorly beyond the scutum, choleateatoma matrix was removed with canal wall up method or attictomy. Concha cartilage was thinned by 0.5 mm or less with a cartilage slicer. The most important point for the scutumplasty is to firmly pile up a thinly sliced cartilage on the anterior bony edge of the scutum bone defect. When a cartilage size is not enough to cover the posterior bony edge, a piece of cartilage is added to cover the posterior site. The inferior edge of the cartilage is placed on the malleus neck.

Subjects and Methods: Between 2006 and 2011, 138 ears with primary acquired cholesteatoma were operated on with atticotomy/scutumplasty (28 ears), canal wall up method (87 ears), and canal wall down and reconstruction (23 ears). One-stage operation was 49 ears and two-stage operation was 89 ears. The mean follow-up time was 44.1 months (9–100 months).

Results: Postoperative recurrence due to the ear drum retraction was 17.0% using Kaplan-Meier analysis. Successful hearing outcomes (A-B gap 20 dB or less) was 83/124 (66.9%) according to the AAO-HNS criteria in 1995.

Conclusion: To reconstruct the scutum bone defect firmly is a key point to succeed canal wall up method and atticotomy for attic cholesteatoma. At the presentation, surgical videos and slides will be presented.

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Mastoidectomy: How I do it (1) (V637)

ID: 637.2

Cochlear Implantation after Subtotal Petrosectomy in Chronic Otitis Media

Presenting Author: **Gianluca Piras**

Gianluca Piras, Sampath Chandra Prasad, Mario Sanna

Gruppo Otologico

Learning Objectives: Subtotal petrosectomy combined with cochlear implantation is a procedure required in specific situations and lowers the risk of repetitive ear infections, CSF leakage, and meningitis by closing off all connection with the external environment. Additionally, it gives excellent visibility and access in difficult anatomy or in drill-out procedures. Here we demonstrate the usefulness of Subtotal Petrosectomy in a case of recurrent chronic otitis media with sensorineural hearing loss in the only hearing ear, where it was possible to perform a simultaneous cochlear implantation.

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Emerging Technologies (1) (R641)

ID: 641.1

Codacs as new treatment option for patients with severe and profound mixed hearing loss including cases with chronic otitis and cholesteatoma

Presenting Author: **Thomas Lenarz**

Thomas Lenarz

Medical University Hannover

Learning Objectives: Use of Codacs

Objective: Implantable hearing aids have become a valid option for the therapy of various forms of hearing loss. Codacs Direct Acoustic Cochlear Implant System is the first vibratory implant available for patients with MHL. By directly coupling sound energy into the perilymph, a very high maximum power output (MPO) is achieved over a broad frequency range. Via a conventional stapedotomy, the vibratory energy of the electromagnetic actuator is transferred directly to the perilymph through the oval window.

Patients and Methods: Patients with different etiologies of MHL were implanted:

Otosclerosis: n = 29

Tympanosclerosis: n = 4 (1 with subtotal petrosectomy)

Chronic otitis media: n = 15 (12 with subtotal petrosectomy)

In cases with intact posterior canal wall the implantation was done through the posterior tympanotomy. Stapes footplate was perforated and the stapes prosthesis was fixed at the long process of the incus. In cases with canal wall down and chronic otitis media there was a two-step procedure with subtotal petrosectomy and optimal fat obliteration followed by Codacs implantation six month afterwards. Pre- and postoperative bone and air conduction thresholds and word recognition scores were recorded preoperatively with fitted hearing aid (only 32 of the reported patients were able to use a hearing aid before implantation or subtotal petrosectomy) and postoperatively over time.

Results: Bone conduction thresholds showed no significant change over all in the implanted group. In few patients with mobile footplate some loss of bone conduction was observed. The mean free field thresholds were 43 +/−7 dB (0.5–4 kHz) and the monosyllabic word score was 67 % at 65 dB presentation level compared to conventional hearing aids with 24 %. Speech intelligibility in noise was 2.1 dB SNR in the OLSA Matrix test (S0N0) three month after activation.

Conclusion: Codacs provides an effective treatment for patients with MHL.

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Emerging Technologies (1) (R641)

ID: 641.2

Fully Implantable Hearing Aids

Presenting Author: **Philippe Lefebvre**

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University of Liège

Learning Objectives: 30% of the population over 65 years of age is hearing impaired, corresponding to 7% of the general population. At the present time, this frequent handicap can only reduced by the use of hearing aids allowing to deliver higher sound energy to the inner ear. These prosthesis have undergone tremendous improvement over the last few years in particular on the electronic and aesthetic aspects. In this presentation, we will review the progresses which have been made on implantable hearing devices transmitting the sound energy directly to the ossicular chain in the middle ear.

Semi implantable devices are composed of an external part containing the microphone, the battery and the electronic transferring the information transcutaneously to the internal receiver which activates the transducer attached to the ossicular chain.

In the fully Implantable Hearing Device, the subcutaneous microphone picks up ambient sounds, converts them into an electrical signal, amplifies the signal according to the wearer's needs, and sends it to an electro-mechanical transducer. The transducer tip is mounted in a laser-drilled hole in the body of the incus and translates the electrical signal into a mechanical motion that directly stimulates the ossicles and enables the wearer to perceive sound. The implanted battery is recharged daily via an external charger and the wearer can turn the implant on and off with a hand held remote control.

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Emerging Technologies (1) (R641)

ID: 641.3

Implants in chronic ear disease – new advances

Presenting Author: **James Ramsden**

James Ramsden
University of Oxford

Learning Objectives: Chronic ear disease poses a challenge to hearing restoration. There is often a tension between controlling the disease and restoring hearing. Outcomes of CSOM surgery in the long run have mixed hearing results and patients often must be phlegmatic about their hearing deficits. New technologies in hearing and vestibular devices can alleviate the deficits but are sometimes difficult to apply to patients with disordered anatomy from chronic ear disease. Hearing aids, BAHA and middle ear implants are the mainstay of hearing rehabilitation, but new options include totally implantable middle ear implants, active stapedectomy devices (CODACS) and vestibular implants. In this session I will discuss where the newer devices fit in to the treatment options, and Prof Lenarz, Prof Lefebvre and Mr Donnolly will outline in more detail specific emerging technologies.

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In this session I will discuss where the newer devices fit in to the treatment options, before the co-presenters will outline in more detail specific emerging technologies.

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Emerging Technologies (1) (R641)

ID: 641.4

Surgical aspects of vestibular implantation

Presenting Author: **Neil Donnelly**

Neil Donnelly[1], James Johnston[1], James Tysome[1], Patrick Axon[1], Yu Chuen Tam[1], Richard Knight[1], Ross Deas[2]
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Learning Objectives: Implantable vestibular prostheses are currently being developed in order to restore balance to patients with severe bilateral vestibular hypofunction. This presentation will examine the key research findings to date and examine on going challenges.

Implantable vestibular prostheses are being developed with a view to restoring balance to patients with severe bilateral vestibular impairment that are not responsive to currently available treatments. Electrical stimulation of nerve fibres in the vestibular system in animal and human experiments has been shown to evoke eye movements which mimic the vestibular ocular reflex (VOR).

An important technical issue faced in implanting a vestibular prosthesis is ensuring optimal positioning to provide electrical stimulation to the nerve fibres. The ideal test of this would be performed intra-operatively at the time of implantation to allow precise placement, and adjustment if required.

The aims of this clinical trial were to systematically record both the ECAPs and electrically evoked eye movements obtained by electrical stimulation of the semicircular canals in