Conclusions: The bone obliteration technique combined with scar tissue and cartilage grafting saves time and effort in giving a dry and clean ear after recidivism. Most of the problems in a wet mastoid cavity are solved with this technique.

Learning Objectives: the video presentation gives a clear demonstration of the techique to be adopted by surgeons handling recidivism.

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Update on bacteriology and the role of biofilms in chronic otitis media (K753)

ID: 753.1

Bacterial Biofilms & Chronic Otitis Media: Stuck in the middle

Presenting Author: **Luanne Hall-Stoodley**

Luanne Hall-Stoodley

The Ohio State University

Otitis media is a multifactorial disease, a result of complex host-microbial interactions. Understanding the pathogenesis of chronic otitis media (COM) is crucial for improving therapies. Direct detection of aggregated adherent otopathogenic bacteria on middle ear mucosal biopsies from children with COM demonstrated that biofilms were consistent with an infectious etiology in spite of culture-negative clinical data. This seminar will provide an overview of how biofilms contribute to chronic infections like COM, including problems in diagnosing the infectious agent in the polymicrobial context of the upper airway, the challenges of treatment and new therapeutic approaches on the horizon.

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Biomaterials in middle ear reconstruction (R761)

ID: 761.1

Use of bone substitutes in mastoid obliteration

Presenting Author: **Daniele Bernardeschi**

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The purpose of this communication is to describe the indications, surgical technique and anatomical and function results of the mastoid and epitympanic obliteration using bone substitutes. This technique employed in our department since 2006, encompasses the use of synthetic biomaterials for the obliteration of mastoid and epitympanic spaces. Granules of biphasic ceramic have been used up to 2012 (n = 130) and, since 2013 (n = 74) we are using bioactive glass S53P4. Differences in composition and mechanism of action will be detailed, with particular attention to the antibacterial activity of the bioactive glass S53P4.

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Biomaterials in middle ear reconstruction (R761)

ID: 761.2

SerenoCemTM - glass ionomeric granules in mastoid obliteration, a hidden problem!

Presenting Author: **Ian Bottrill**

Ian Bottrill

John Radcliffe Hospital, Oxford

Introduction: A common problem with canal-wall down mastoidectomy procedures is a discharging cavity. Many techniques for mastoid obliteration to reduce the cavity size have been described. Different biomaterials have been tried on the basis that they should be non-resorbable, non-reactive and integrate. This study aimed to assess the effectiveness of Serenocem granules, a glass ionomeric cement, as a suitable biomaterial for mastoid obliteration and to review its longterm effects.

Methods: 16 patients with chronically discharging mastoid cavities were selected for mastoid obliteration. The subsequent procedures were performed between 2001 and 2003.The two main outcome measures were the number of attendances for aural care and the Glasgow Benefit Inventory (GBI). A secondary measure was the comparison of pre- and post-operative hearing thresholds.These patient were assessed in 2006 providing a minimum of 3 years follow up. As a result of recent chance finding following late revision surgery, a further review of implanted patients was undertaken in 2015/16.

Results: The need for aural care reduced in all but one patient. There was a significant difference in the number of aural visits pre and post operation.Benefit in quality of life was assessed using the GBI. In only one patient was there a negative score. The mean values indicate that there has been a positive benefit in quality of life. Complete pure tone average results were available for 13/16 patients. In 8/13 patients the hearing was improved, as intended by additional ossiculoplasty procedures. Of importance a reduction of hearing was noted in only 5 patients, the worst of which was 7.5 dB for the 4-tone average.

Conclusions: The initial results of this technique were promising, however, the recent chance review of one of these patients showed the granules may be inducing bone lysis in. All patients have been reviewed and the results will be presented.

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Biomaterials in middle ear reconstruction (R761)

ID: 761.3

Titanium in mastoid reconstruction

Presenting Author: **Konrad Schwager**

Konrad Schwager

Klinikum Fulda, Philipps University of Marburg - Campus Fulda

After cholesteatoma removal reconstruction of the canal wall is often necessary. There are several options. Autogenic tissue is first line, but cortical bone and the reimplantation of the posterior canal wall have doubtful results. Due to its bradytrophic nature cartilage has been used successfully in tympanoplasty and with its stability it is a well-established tissue for the reconstruction of the posterior wall. But adhesion forces in the diseased middle ear can cause retraction into the mastoid cavity. Amongst all different types of biomaterials titanium is one of the most accepted foreign materials. A titanium mesh can be formed into a "cage" to rebuild the mastoid and not only the posterior wall. This cage is covered with cartilage plates and chips. Nutritional support reaches the cartilage through the openings of the mesh. Wound healing and epithelialization are shown to be uneventful. The advantage of the cage over a pure canal reconstruction seems to be the anatomical restoration of the mastoid. Results show no exposure of the titanium construction, good epithelialization and acceptable functional results. Interestingly there is a notable risk of cholesteatoma recurrence in the former epitympanum at the typical place of cholesteatoma origin. In cases when major reconstruction is needed and an open cavity (radical cavity) is still not indicated, the mastoid reconstruction using a titanium cage is a good option in cholesteatoma surgery.

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Biomaterials in middle ear reconstruction (R761)

ID: 761.4

Tissue-reengineered bFGF-Repair of Chronic Tympanic Membrane Perforations

Presenting Author: **Gunesh Rajan**

Gunesh Rajan[1], Aanand Acharya[2], Harvey Coates[2]
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Background: In 2009, Kanemaru described a new concept of a minimally invasive tympanic membrane repair utilising bFGF (basic fibroblast growth factor), fibrin glue (Tisseel) and a gelatin foam (Gelfoam) scaffold. He recently published a 98% success rate using this technique on 53 patients. We report on our early experiences using his concept in adult and paediatric patients in Western Australia.

Objectives: To describe the scientific background and technique for regenerating the tympanic membrane of patients with chronic perforations utilising the tissue growth factor method devised by Kanemaru, and to report on the pilot study in Australia to validate and prove the safety of the Kanemaru technique.

Method: Adult and paediatric patients with chronic, dry tympanic membrane perforations undergo otoscopic and audiologic assessment to assess candidacy for the trial. After inclusion, the patients undergo the repair, which involves freshening of the perforation followed by the insertion of a gel foam plug soaked with genetically engineered bFGF; the gel foam plug is then covered by commercially available fibrin glue (tisseel) to provide a waterproof seal. The tympanic membranes and their healing are monitored otoscopically and audiologically at one, two, four, eight and twelve weeks after the repair.

Results: 60 patients enrolled in the study, 88% attained a perforation closure with a 3-layered neotympanone and audiologic improvement of hearing. Failures were related to postoperative water exposure; pre-existing middle ear infection and URTI post procedure. Mean operating time for the paediatric patients was six minutes (range three to ten minutes) under general anaesthetic and seven minutes in the adult patients (range four to ten minutes) under local anaesthetic.

Conclusion: The outcomes of the pilot study are promising with regard to closure rates, hearing outcomes and operating times. The advantages of this procedure are that it avoids invasive incisions, is possible in the majority of tympanic membrane perforations and is a short five to ten minute procedure.The next phase involves combining the bFGF with various scaffolds and compare outcomes and cost-efficiency.

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Free Papers (F762)

ID: 762.1

A multi-center randomized controlled trial of soft tissue preservation using a hydroxyapatite-coated abutment in percutaneous bone conduction hearing implant surgery – 1-year clinical outcomes

Presenting Author: **Marc van Hoof**

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Learning Objectives: To become aware of the clinical differences of soft tissue preservation surgery with a HA-coated abutment in comparison to the outcomes using the conventional technique.