

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)

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Tissue-reengineered bFGF-Repair of Chronic Tympanic Membrane Perforations

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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 audiologicaly 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 audiological 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)

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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

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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.