

near-normal adjacent mucosa, at the time of initial surgery, preventing recidivism and potentially preventing repeat otologic surgical interventions. 'Something borrowed' is using new magnetic resonance imaging (MRI) techniques from radiology to image either nascent cholesteatomas or to use MRI as the 'second look' procedure. The goal is to enable minimally invasive techniques of complete cholesteatoma removal while preserving hearing function either naturally or by immediate reconstruction, and avoiding 'clean' second look surgeries. Details of using all of these techniques, including pitfalls that should be avoided, will be discussed.

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Advances in Understanding of Eustachian Tube Dysfunction and Cholesteatoma (N675)

ID: 675.4

Controversies in Aetiology and Management of Cholesteatomas (N675) 6-6

Presenting Author: **Richard Chole**

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Learning Objectives: The objective of this presentation is to critically evaluate the different theories of cholesteatoma pathogenesis and to discuss the evidence for and against various theories.

It is clear that cholesteatomas arise due to a number of different mechanisms. Clinical and experimental observations support the etiologies of cholesteatoma formation. Cholesteatomas clearly can arise by the ingrowth of keratinizing epithelium from the lateral surface of the tympanic membrane and ear canal into the middle ear. These so-called secondary cholesteatomas arise from implantation of keratinizing epithelium or ingrowth of a perforation. Experimental and clinical evidence supports this etiology.

Cholesteatomas may also arise by formation of retract pockets in the pars tensa or pars flaccida. The retraction pockets develop because of Eustachian tube malfunction and inflammatory degradation and weakening of the tympanic membrane. These retraction pockets are sometimes benign, but sometimes accumulate keratin debris. Once the keratin debris accumulates in a retraction pocket, expansion of the retraction pocket into a cholesteatoma is usually relentless.

Experimental and human temporal bone evidence has shown that cholesteatomas may arise by perforation of the basal lamina of the keratinizing epithelium of the tympanic membrane and the development of micro-cysts in enlarging intramural cholesteatomas.

A theory of mucosal traction by ciliated cells of an attic retraction pocket has been proposed. However, the epithelium of most of the middle ear and attic regions does not contain ciliated cells (Chole & Lim). Furthermore, recent evidence (Thompson & Tucker) has shown that the epithelium of the attic and around the ossicles is of neural crest origin and the area near the Eustachian tube is of endodermal origin. Neural crest derived epithelium does not form cilia.

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Imaging for Cholesteatoma and ear structure (R676)

ID: 676.1

Labyrinthine Artery Detection in Patients with Idiopathic Sudden Sensorineural Hearing Loss by 7 T-MRI

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Learning Objectives:

Objective: The pathogenesis of idiopathic sudden sensorineural hearing loss (ISSHL) is still unknown, but an inner ear circulatory disturbance has been considered to be one possible pathogenesis. To date, there have been no reports evaluating the possibility of the labyrinthine artery infarction in ISSHL patients by ultra-high-field MRI. The present study aims to compare the detection rates of the labyrinthine artery in subjects with idiopathic sudden sensorineural hearing loss and in normal hearing controls using 7-T MRI.

Study Design: cross sectional study

Setting: Tertiary referral center

Subjects and Methods: In 22 patients (11 males, 11 females) with ISSHL and 43 volunteers (29 males, 14 females) with normal hearing, 7-T MRI (Discovery MR950, GE Medical Systems) was performed with the 3D time-of-flight spoiled gradient echo (3D TOF SPGR) sequence to compare the detection rates of the labyrinthine artery.

Results: MRI scans were performed from 3 to 173 days after onset. Of the 22 patients with ISSHL, 8 showed complete recovery, 10 showed partial recovery and the rest showed no recovery. The labyrinthine artery was depicted in 44 of 44 ears (100%) in the ISSHL group and 85 of 86 (98.8%) ears in the normal hearing group, with no significant difference in detection rates. Two ISSHL patients out of 4 patients with no recovery showed total deafness, but the labyrinthine artery was also depicted in both patients.

Conclusion: The present study is the first to report depiction of the labyrinthine artery by 7-T MRI. These preliminary results indicate occlusion of the labyrinthine artery would be rare in the pathogenesis of ISSHL and they also demonstrate that the labyrinthine artery could be detected by ultra-high-field MRI.

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Imaging for Cholesteatoma and ear structure (R676)

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Combine MR and CT imaging in cholesteatoma