

**Introduction:** Various techniques of diffusion-weighted (DW) magnetic resonance imaging (MRI) have shown valuable in diagnosing middle ear (ME) cholesteatoma high accuracy. PROPELLER (periodically rotated overlapping parallel lines) is one of these techniques and the purpose of this study was to investigate its accuracy in detection of primary acquired ME cholesteatomas.

**Methods:** In a prospective study 37 cases with clinically suspected primary acquired ME cholesteatoma underwent DW PROPELLER MRI scannings prior to surgery. One neuro-radiologist with expertise in Head & Neck Imaging evaluated the images without knowing the surgical findings. The surgical findings were compared with the radiology findings, and outcome measures included sensitivity, specificity, positive and negative predictive values.

**Results:** Cases with cholesteatoma demonstrated hyperintense foci on PROPELLER DW MRI. In 37 patients, surgery revealed cholesteatoma in 31 cases; 29 of these were MRI positive, whereas two were negative; these cases were between 2–3 mm in diameter. Surgery revealed no cholesteatoma in six cases, and these were all MRI negative. Sensitivity, specificity, and positive and negative predictive values were 94%, 100%, 100%, and 75%, respectively. In the 29 cases with positive radiological findings, the extent and location of the cholesteatoma correlated well with the surgical findings.

**Conclusion:** DW PROPELLER MRI imaging is an effective and reliable technique in the diagnosis of cholesteatoma diagnosis with high sensitivity and specificity as well as high correlation between the extension of the disease and surgical findings. Thus, this technique is a promising radiologic tool, however further studies are warranted with more patients.

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## Free Papers (F772)

**ID: 772.7**

### Repeated postoperative follow-up diffusion-weighted Magnetic Resonance Imaging to detect residual cholesteatoma

Presenting Author: **Emmanuel Mylanus**

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**Learning Objectives:**

**Aim:** In many clinics non-EPI DWI has replaced second look surgery because of its high negative predictive value. In our institution, follow-up DWI is performed at least twice after surgery. Aim of this study was to determine the yield of the second follow-up MR-DWI (MR-DWI2) after in patients with a negative first follow-up MR-DWI (MR-DWI1) and an absence of clinical otoscopic suspicion of recurrence or residual cholesteatoma.

**Methods:** Between 2006 and 2013 we retrospectively included 45 ears in 44 patients which had undergone cholesteatoma surgery, had a negative MR-DWI1 performed 6–24 months after surgery, an MR-DWI2 performed at least 6 months after MR-DWI1 and an absence of clinical suspicion of recurrence or residual cholesteatoma between surgery and MR-DWI2. Two radiologists independently scored MR-DWI1 and MR-DWI2. Descriptive analysis were used for determining the yield of MR-DWI2. Interobserver agreement was calculated using Cohen's kappa statistics.

**Results:** In 14 of 45 ears (31%) MR-DWI2 was equivocal (n = 6, 13%) or positive (n = 8, 18%). Interobserver agreement indicated substantial agreement ( $\kappa = 0.75$ ). Patients with a positive MR-DWI2 were younger of age compared to those with an equivocal or negative MR-DWI2. In the group of 8 patients with positive MR-DWI2, 6 were operated on with surgical confirmation of cholesteatoma in 5 of these patients. In 1 patient only fatty tissue was found.

**Conclusion:** The most important finding of this study is that 31% of MR-DWI2 showed equivocal or positive evidence of cholesteatoma despite clinical and MR-DWI1 follow-up. Given the known high sensitivity and specificity of non-EPI DWI, good quality of the included DWI examinations and high interobserver agreement in our study, it seems very unlikely this can be explained by a missed cholesteatoma larger than 2–3 mm on MR-DWI1. It is also striking that patients with a positive follow-up MR-DWI2 are younger of age. This may influence follow-up strategies in the future.

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## Cholesteatoma Management in the XXI Century (N773)

**ID: 773.1**

### Management of the facial nerve in cholesteatoma surgery: Multidisciplinary approach in a Facial Paralysis Unit

Presenting Author: **Luis Lassaletta**

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**Learning Objectives:** Upon completion of this presentation, the attendant should be able to: Learn the main aspects to consider when dealing with a facial nerve surrounded or invaded by cholesteatoma. Have a general idea about facial nerve reconstruction depending the status of the nerve, the time of evolution and patient's preferences.

**Introduction:** The incidence of facial paralysis in patients with middle ear cholesteatoma is generally low but still present in 2016. Particular situations such as petrous bone cholesteatoma, in which facial nerve involvement is reported to be as high as 45% to 65% of cases, or revision cases may lead to facial nerve problems more frequently.

In most cases, prompt nerve decompression is enough to achieve recovery. However, facial nerve reconstruction may be needed in certain patients.

Regarding the management of the facial nerve in temporal bone surgery, some aspects are still controversial:

1. Should we use intraoperative facial nerve monitoring in a routine basis?
2. How should the compressed nerve be managed intraoperatively?
3. What is the best reinnervation technique for a particular situation?

*Methods:* A series of cholesteatoma cases with difficult management of the facial nerve will be presented in a step-by-step manner. Pictures and videos with the key aspects will be shown.

*Results:* Different surgical techniques including nerve decompression, nerve grafting, and reinnervation procedures were included. Eye care including eyelid surgical procedures, as well as botox injection and neuromuscular retraining were also needed for some patients. All the patients improved facial function following different therapeutic options.

*Conclusions:* Facial paralysis is still a possible complication of cholesteatoma and chronic ear surgery. Early management with the appropriate technique is mandatory. The preoperative facial nerve grade, the duration of symptoms, and the intraoperative findings, including the location and type of facial nerve injury are the main factors to consider. A multidisciplinary approach in a Facial Paralysis Unit is the key to achieve the best results for a particular patient.

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## Cholesteatoma Management in the XXI Century (N773)

**ID: 773.2**

### Preventing Cholesteatoma

Presenting Author: **Manuel Jesús Manrique Rodríguez**

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*Learning Objectives:* Summary abstract presentation in the session: "Cholesteatoma management in the XXI century".

Nowadays health and technological development allow for prevention strategies in order to reduce cholesteatoma incidence.

This session is titled "Cholesteatoma management in the XXI century". Attention will be addressed to present an algorithm to prevent the development of a cholesteatoma.

Starting point will be Eustachian tube obstructive dysfunction how to evaluate and treat it so as to reduce chronic disease in middle ear. If eardrum perforation or atelectasia occur, what is the expected attitude to prevent cholesteatoma. Novel technologies and knowledge will be shown to explain its role preventing cholesteatoma.

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## Cholesteatoma Management in the XXI Century (N773)

**ID: 773.3**

### Cholesteatoma in children: Actual situation

Presenting Author: **Jaime Marco**

Jaime Marco

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*Learning Objectives:* Cholesteatoma surgery is always in the edge for different decisions but when the disease takes place in children the situation is critical in many instances; preservation of hearing, surgical approach, surgical technique and diagnostic tools.

We will be presenting you, based upon our experience, the actual situation that cholesteatoma in children faces regarding diagnosis, surgical approach and results.

68 consecutive cases of cholesteatoma in children have been studied 71% underwent a closed technique and 29% an open technique. The most frequent clinical symptom was otorrhea and hearing loss (54%) followed by otorrhea (28%). 50% of the cases had an attic perforation and 26% a posterior marginal perforation. 83% of the cases had an sclerotic or diploic mastoid. The contralateral ear was normal in 70% of the cases. In the cases of cholesteatoma the mucosa was hiperplasic or polipoid in 92%. Cholesteatoma extended to attic in 79%, antrum 58%, posterior recess 38% and to mastoid 23%. The ossicles were damaged in 92% of the cases, being the incus the most frequently involved (70%). Residual or recurrent cholesteatoma appeared in 37% of the cases of closed surgery and 12% of the cases of open surgery. Recurrence of the cholesteatoma took place between 1 and 2 years postsurgery in 75% of the cases.

A critical review of the literature is made regarding diagnostic tools, recurrences in relation with open or closed techniques, functional results and a discussion about wether to perform single or second look surgery in closed techniques.

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## Cholesteatoma Management in the XXI Century (N773)

**ID: 773.4**

### Diffusion MRI in cholesteatoma control. Advantages and pitfalls

Presenting Author: **Constantino Morera**

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