

Learning Objectives: 1-Understand advantages of endoscopic otologic surgery for eliminating residual disease. 2-Understand advantages of endoscopic otologic surgery for re-establishing ventilation. 3-Understand limitation of endoscopic otologic surgery.

Introduction: Although it has been 15 years since the introduction of operative endoscopy to ear surgery in the form of exploration of old mastoid cavities¹, there is presently tremendous variations in thoughts and practice across the globe on the role of the endoscope in cholesteatoma surgery.

Literature Review: There are increased numbers of citations on this subject especially in the last 5 years. These reports have focused on four patterns of application of operative endoscopy in ear surgery, the first and the oldest report revolve around exploration of old mastoid cavities using the endoscope with endoscopic removal of recurrent disease.¹ The second is examination of the mastoid cavity through a stab postauricular incision.² The third is the use of transcanal endoscopic evaluation and removal of disease from the sinus tympani during traditional combined tympanomastoidectomy.³⁻⁴ The fourth is the use of transcanal endoscopic approach as the primary access to the cholesteatoma within the middle ear and the use of traditional postauricular mastoidectomy only to address the disease within the mastoid cavity proper.⁵

Best Practice Summary:

- 1- There is little evidence in the literature, beyond the cohorts reported by the initial authors 16 years ago, to support the use of the endoscope in exploring old cavities or through a stab wound in the postauricular area.
- 2- Transcanal Endoscopic Access to disease within the sinus tympani in combination with traditional combined tympanomastoidectomy should be incorporated into the routine management of cholesteatoma.
- 3- Exclusive transcanal endoscopic approach to the middle ear as the primary surgical method of removal of cholesteatoma has been reported increasingly in the literature, but more data is needed to compare outcome to traditional accepted surgical treatment of cholesteatoma.

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Updates in the surgical managements for cholesteatoma (N845)

ID: 845.1

Revision surgery after canal wall down tympanomastoidectomy

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Learning Objectives: The aim of this study is to investigate causes and treatment results of revision surgery cases performed after CWD tympanomastoidectomy.

Canal wall down (CWD) tympanomastoidectomy may be an appropriate choice for the successful removal of cholesteatoma in the middle ear, attic, and mastoid cavity. However, it sometimes needs some revision surgeries. The aim of this study is to investigate causes and treatment results of revision surgery cases performed after CWD tympanomastoidectomy. From Jan 2010 to Dec 2015, among 276 patients who underwent CWD tympanomastoidectomy, cases requiring revision surgery were enrolled in this study. Six cases of staged operations and 18 patients who were not followed up more than 6 months were excluded in this analysis. Using medical records, demographics of subjects, causes of revision surgery, operation name, and postoperative results were investigated retrospectively. Patients were divided into 2 groups according to whether they had got an intact canal wall mastoidectomy as the initial surgery. Among 252 patients, 18 (7.1%) needed revision surgeries due to postoperative problems excluding staged operations and minor procedures. Male to female ratio was 6:12 and left to right ratio 10:8. Residual cholesteatoma was found in 3 cases (1.2%) and they were removed in sinus tympani (2 cases) and malleus handle (1 case) successfully. There was no more cholesteatoma recurrence after revision surgery. Tympanoplasty or myringoplasty was performed in 15 cases (6.0%) and the perforation of tympanic membrane was healed in all cases. Revision ossiculoplasty due to prosthesis extrusion was done in 1 case (0.4%). Final postoperative outcomes showed no statistical significance between two groups ($p > 0.05$). Revision surgeries after CWD tympanomastoidectomy showed a low incidence and good postoperative outcomes. However, regular and careful examinations after initial surgery should be emphasized to avoid revision surgery.

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Updates in the surgical managements for cholesteatoma (N845)

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Subtotal petrosectomy: Long term surgical results in managing chronic ear disease

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Learning Objectives:

Objectives: To investigate the long term surgical results of subtotal petrosectomy, a retrospective study of the patients with chronic otitis media who underwent subtotal petrosectomy with or without cochlear implantation was performed.

Subjects & Methods: Twenty nine patients (14 men and 15 women, mean age 61.5 years, SD 8.7 year) who received subtotal petrosectomy by one surgeon between April 2004 and December 2015 were included in this study. Ten patients underwent simultaneous or sequential cochlear implantation for the hearing rehabilitation depending on the active

inflammatory condition of their middle ear. In all cases, after complete eradication of the pathology, mastoid cavity was obliterated with abdominal fat followed by double layered external auditory canal obliteration with special cosmetic concern. Surgical outcomes of this procedure were analyzed.

Results: Middle ear inflammation and cholesteatoma were completely managed with this surgical technique. None of the patients showed the inflammatory symptoms of otorrhea or other early inflammatory complication after the surgery. Cochlear implant was successfully placed and active electrodes were fully inserted in all of the 10 patients. Only one patient showed the delayed extrusion of the ball electrode to the obliterated ear canal which was successfully managed by replacement of extruded ball electrode with conchal cartilage reinforcement under local anesthesia. Postoperative quality of life during the medical interview revealed the highly satisfied status of subtotal petrosectomy from both disease eradication and cosmetic viewpoints.

Conclusion: Subtotal petrosectomy seems to be very safe, effective and even cosmetically acceptable procedure for the deafened patients with chronic otitis media whether accompanying cochlear implantation is planned or not.

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Updates in the surgical managements for cholesteatoma (N845)

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Atticosinoplasty for early cholesteatoma management

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Learning Objectives:

Objective: These days surgery rates for early cholesteatoma and residual or recurrent cholesteatoma are increasing. For this matter, Prof. Keehyun Park suggested a surgical technique called 'atticosinoplasty' to mediate early cholesteatoma. Thus, we analyzed the adequacy and applicability of atticosinoplasty as a treatment for early cholesteatoma comparing with other surgical techniques.

Materials & Methods: One hundred seventy two patients who underwent atticosinoplasty (n = 72) or canal wall up mastoidectomy (n = 73) in Ajou University Hospital (Suwon, Korea) between 2002 and 2014 were enrolled in this study. Patients with less than 12 months of follow up period were excluded from this study. During the follow up, post-operative physical examination and audiometry were performed including temporal bone CT in necessary cases. Based on these data, recurrence and re-operation rate, pre- and post-operative hearing levels, and hearing gain were compared between both groups.

Results: The atticosinoplasty technique includes the removal of cholesteatoma through atticotomy or posterior sinusectomy, removal of incus and malleus, transmeatal endoscopic exploration, ossicle reconstruction and wall reconstruction

with cartilage. There was no significant difference of hearing gain (PTA) between the atticosinoplasty group (44/72 patients) and the CWUM group (47/73 patients). Decrease of air-bone gap was detected in 61% (44/72) patients in the atticosinoplasty group and in 64% (47/73) in the CWUM group ($p > 0.05$). Revision mastoidectomy was performed in 3 (4.2%) in the atticosinoplasty group and in 4 (5.4%) in the CWUM group. However, revision ossiculoplasty was done less in the atticosinoplasty group (7, 9.7%) rather than the CWUM group (18, 24.6%) ($p < 0.05$).

Conclusion: Atticosinoplasty can be considered as an effective surgical technique for the treatment of early cholesteatoma, resulting in low recurrence rate and improved hearing.

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Updates in the surgical managements for cholesteatoma (N845)

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Endoscopic management of cholesteatoma

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Learning Objectives: Endoscope is widely accepted instrument for minimally invasive surgical approach for many clinical field. The main benefits of endoscopic management for cholesteatoma surgery are preserving the normal anatomical structure with complete removal of disease in the complicated middle ear structure. There are two aspects of endoscopic cholesteatoma surgery: totally transcanal endoscopic surgery vs. endoscope as an adjuvant instrument. Though totally transcanal endoscopic ear surgery (TEES) can provide wide surgical view without destruction of normal anatomical structures, it has disadvantage of one hand surgery with two instrument in relatively narrow ear canal. Surgical time for the TEES is longer than in microscopic surgery, especially for the beginners. We use the endoscope for every cholesteatoma surgery as an adjuvant instrument for microscopic surgery. With combined approach from both transcanal and transmastoid approach, we use the endoscope of 45 and 70 degree for inspection of blind spot in the middle ear cavity, and remove the remnant or residual cholesteatoma with intact canal wall. The chances of canal wall down approach were reduced dramatically with this methods. This technique is very useful especially for adhesive middle ear disease, attic cholesteatoma and congenital cholesteatoma. We will present the cases of adhesive middle ear disease, attic and congenital cholesteatoma with this endoscope as an adjuvant for microscopic surgery.

Endoscope is widely accepted instrument for minimally invasive surgical approach for many clinical field. The main benefits of endoscopic management for cholesteatoma surgery are preserving the normal anatomical structure with complete removal of disease in the complicated middle ear structure. There are two aspects of endoscopic cholesteatoma surgery: totally transcanal endoscopic surgery vs. endoscope