MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2025.1.94.97

Role of Endoscope in the Management of Retro Tympanic Cholesteatoma

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ABSTRACT

To evaluate role of endoscope in management of Retro tympanic Cholesteatoma. Prospective study. Data of mastoidectomy procedure done with microscope and endoscope at department of ENT, FAAMCH from 1ST December 2020 to 1st December 2022 were taken into account. Data were collected on gender, age, clinical presentation, type of surgery and site of cholesteatoma. A total of 67 patients between 15-58 years undergone mastoidectomy procedures in ENT department, FAAMCH, between 1st December 2020 and 1st December 2022. 41 patients underwent canal wall down mastoidectomy with endoscope and microscope, 10 patients underwent Intact Canal Wall Mastoidectomy with endoscope and microscope. 16 patients were operated with endoscope only. In 10 patients using microscope Intact Canal Wall Mastoidectomy was done and Retro tympanic Cholesteatoma and Retro tympanic Granulation were seen in 2 and 1 patient respectively. Then endoscope was used and Retro tympanic Cholesteatoma and Retro tympanic Granulation was seen in 5 and 2 patients respectively. Canal Wall Down Mastoidectomy was done in 41 patients using microscope and Retro tympanic Cholesteatoma and Retro tympanic Granulation was seen in 15 and 7 patients respectively. Using endoscope in same patients Retro tympanic Cholesteatoma and Retro tympanic Granulation was then seen in 20 and 9 patients respectively. Use of endoscope during cholesteatoma surgery will immensely help us to complete its removal. Presently most surgeon use endoscope as adjunct to microscope. Advantage of endoscope is its ability to visualize the hidden areas specially the retro tympanum.

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Key Words
Evaluate role of endoscope, retro tympanic, clinical presentation, cholesteatoma and retro tympanic granulation

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Received: 28 September 2024
Accepted: 29 October 2024
Published: 13 December 2024

Citation: Dr. Taufeequl Islam, Dr. Bijit Kr. Saikia, Dr. Jyotirmoy Phookan, Dr. Utpal Sarma, Dr. Jenius K. Barman, Dr. Rakesh Talukdar and Dr. Keshav Upadhyaya, 2025. Role of Endoscope in the Management of Retro Tympanic Cholesteatoma. Res. J. Med. Sci., 19: 94-97, doi: 10.36478/makrjms.2025.1.94.97

INTRODUCTION

Surgical microscope brought a revolution in the surgery of the temporal bone by magnifying and illuminating the limited confines of the anatomically complex temporal bone. Classically Microscopic. Surgical procedures on the temporal bone are divided into canal wall up or canal wall down based on the preservation of the posterior canal wall. The benefit of two-handed surgery, binocular vision imparting better depth perception is advantageous over the endoscope. However, the straight line visualization of the microscope imparts blind spots[6] which can however be visualized with the endoscope. Over the course of time the knowledge on endoscopic instrumentation and techniques have greatly improved. Use of endoscope to complement microscope is one such advancement in aetiologic surgery[1]. Coupled with High definition camera system, angled and straight endoscopes, we achieve higher magnification, wider views, precise location of disease, looking Around Corners, visualization of hidden areas with light delivery closer to area of interest[2]. In middle ear, endoscope triumphs microscope in affording clear visualization of hidden areas of retrotympanum, anterior epitympanum, protympanum besides mesotympanic structures along with better understanding of ventilation pathways with resultant benefit in surgical outcome[3]. We aimed to evaluate the feasibility of using endoscopes in treatment of retro tympanic Cholesteatoma.

MATERIALS AND METHODS

The study was conducted in the Department of ENT, FAAMCH from December, 2020 to December, 2022. A total of 67 patients were operated endoscopically or in combination with microscope for cholesteatoma in the middle ear cleft. The details of each visit of the patient was recorded and detailed otoscopic examination of the patient was done along with audiometric evaluation. High resolution CT scan of the temporal bone was performed. Patients were explained about the procedure to be undertaken and proper consent were obtained before the surgery. All the surgeries were performed by TI (first author). Endoscopic technique used 4mm diameter 0 and 30 degree angled endoscopes along with cold led light delivery system and HD camera system. Ossicular Reconstruction in cases requiring it were done with tragal cartilage or remodeling of ear ossicles. Temporalis fascia graft was used for reconstruction of the drum. Patients were discharged on the 3rd post operative day. Stitches were removed on day 10. Follow up of patients were done after 6 weeks, 3 months and 6 months time.

RESULTS AND DISCUSSIONS

Out of 67 patients, 45 were males and 22 were females. Median age was 32 years (15-58). 3 of the patients had signs of intra cranial complications. No patient had facial paralysis at the time of presentation. Endoscopic assisted intact canal wall mastoidectomy was done in 10 patients and 41 patients underwent endoscopic assisted canal wall down mastoidectomy. 16 patients were operated with endoscope alone. (Table 2). 28 patients had ossicular discontinuity which was corrected. Tragal cartilage for correction was used in 19 patients whereas remodeling of ear ossicles was done in 9 patients. The mean surgical time was 130±25 minutes. On the 3rd month follow up, graft uptake rate was 100 %. 5 patients had recurrent disease after 6 months which was repeated. The endoscopic assisted search for pathologies in both canal wall down mastoidectomy and intact canal wall mastoidectomy are outlined in (Table 3). 24 patients were seen to have a sclerosed mastoid.

Table 1: Out of 67 Patients, 45 Were Males and 22 Were Females. Median Age was 32 Years (15-58). 3 of the Patients had Signs of Intra Cranial Complications. No Patient had Facial Paralysis at the Time of Presentation

Sl no	Clinical Diagnosis	No of Patients	Percentage
1	CSOM with cholesteatoma without Intra cranial complication	42	62.68%
2	CSOM with cholesteatoma with aural polyp	11	16.41%
3	CSOM with Intra cranial complication	3	4.48%
4	CSOM with Mastoid abscess	11	16.43%

Table 2: Endoscopic Assisted Intact Canal Wall Mastoidectomy was Done in 10 Patients and 41 Patients Underwent Endoscopic Assisted Canal Wall Down Mastoidectomy. 16 Patients Were Operated with Endoscope Alone

Sl no	Procedure	No of Patients	Percentage
1	Canal wall down mastoidectomy with endoscope	41	61.24%
2	Intact canal wall mastoidectomy with endoscope	10	14.93%
3	Endoscope only	16	23.83%

Table 3: The Endoscopic Assisted Search For Pathologies in Both Canal Wall Down Mastoidectomy and Intact Canal Wall Mastoidectomy are Outlined

Sl no	Procedure	No of Patients	Site of Pathology	No of Patients
1	Intact canal wall mastoidectomy without endoscope	10	RTC	2
			RTG	1
	With endoscope	10	RTC	5
			RTG	2
2	Canal wall down mastoidectomy without endoscope	41	RTC	15
			RTG	7
	With endoscope	41	RTC	20
			RTG	9

RTC-Retro tympanic cholesteatoma

RTG-Retro tympanic granulations

Primary acquired cholesteatoma usually is a manifestation of retraction of the tympanic membrane that occurs when the sac advances into the tympanic

cavity proper and then into its extensions such as the sinus tympani, the facial recess, the hypo tympanum and the attic[3,4]. Surgical failure with postauricular approach seems to occur within tympanic cavity which is difficult to reach. Residual disease and recurrence are the main problems regarding attic cholesteatoma removal. The narrowest segment of the ear canal limits the view during microscopic surgery and direct visualization of the objects in front prevents from having a peripheral vision[3]. These limitations can be overcome with the help of an endoscope[5]. The endoscopic technique however has a learning curve with surgical experience and skill playing a major part[6]. The direct viewing of the monitor during endoscopic surgery can cause dissociation of the visual and motor axis and poor depth perception. Direct trauma from endoscope can occur to the tip to ossicles, dehiscent 7th nerve and low lying tegmen[7]. Heating of the endoscopic tip can potentially cause thermal injury[8-10]. Light intensity should be kept below 50 percent at all times[11]. The two approaches of intact canal wall and canal wall down mastoidectomy still remains as the mainstay of cholesteatoma management. Advantages associated with intact canal wall approach are better preservation of middle ear anatomy, simpler postoperative care and maintenance and allowing aquatic activities in postoperative period[19]. However, often high rates of residual rates are seen therefore, requiring strict follow up and second look surgery to rule out recurrence[20]. Initially endoscopes were used only during second look procedures, however now it is used as an adjunct to microscope in visualizing and removing pathology from difficult to reach sites by microscope[17,18]. Use of intraoperative endoscopy helped us to identify the sites of cholesteatoma better than using microscope singly. Use of intraoperative endoscopy significantly reduces the incidences of residual cholesteatoma from 47-6% as seen by Thomassin[12]. Significant reduction in morbidity of second look procedure, enhanced visualization of residual disease and reduced operating time was stated by Youssef and Poe[13]. The mean surgical time was 130+-25 minutes which is comparable to literature[14]. Complications following cholesteatoma surgery are few and rare which includes temporary (2%-5%) and permanent facial palsy (<1%), dizziness (3%-15%), worsening of hearing (5%-10%) and abnormal taste sensation (25%-40%)[15,16]. However no major complications were found during our study.

CONCLUSION

Endoscopic ear surgery singly or in combination with microscope can be considered as an effective method in eradicating cholesteatoma from the middle ear cleft. Better visualization of hidden areas, better tissue preservation, better understanding of ventilation pathways are advantages conferred by the use of endoscopes and hence is an excellent choice for minimally invasive middle ear cleft surgery.

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