

OUTCOME OF ENDOSCOPIC TYMPANOMASTOIDECTOMY IN TUBOTYMPANIC TYPE OF CHRONIC SUPPURATIVE OTITIS MEDIA – AN INSTITUTIONAL EXPERIENCE

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ABSTRACT

An Observational Study was undertaken at Department of Otorhinolaryngology, AIMSR from Jan 2020 - August 2021. The aim of this study was to observe the outcome of endoscopic tympano-mastoidectomy for tubotympanic type of CSOM. All the patients attending ENT OPD at AIMSR within the age group of 11-60 years, irrespective of sex with tubotympanic CSOM either unilateral or bilateral were included in this study. In our study of 50 patients, 40 patients had graft uptake after disease clearance and 8 had failure of graft uptake without chronic otorrhoea and 2 had failure with chronic otorrhoea. Through this study we concluded that Endoscopic Tympano-mastoidectomy for tubotympanic type of CSOM is an excellent technique for complete removal of disease especially from inaccessible areas of middle ear cleft.

Key words: Tympanoplasty, Temporalis fascia, Endoscopic Tympanomastoidectomy, Pure tone audiometry, Impedence audiometry.

INTRODUCTION

Chronic otitis media (COM) is an inflammatory process of the mucoperiosteal lining of the middle ear cleft that often results in partial or total perforation of the tympanic membrane, leading to conductive hearing loss with either continuously or intermittently mucoid, mucopurulent or purulent ear discharge through a permanently perforated TM for more than two months.¹ The prevalence of CSOM in the world is 65–330 million people, with 60% of whom experiencing hearing loss, according to WHO. The incidence rate is 9 cases out of 100,000 population.² The high incidence of CSOM is influenced by the etiology and the pathogenesis of the CSOM itself. There are several influencing factors, such as anatomy or physiology dysfunction, infection, allergy, or patient's factor including immunity, gender, and poor-socio economic status coupled with poor personal hygiene, and lack of advanced health care facilities with overcrowding at work and home environment and others.³

Our current study goes above and beyond these techniques by utilizing the nasal endoscope trans-meatally i.e. through the ear canal. The trans-meatal utilization of endoscope has multiple advantages. It not just gives higher amplification and detailed view of all the structures of the middle ear cleft including mastoid yet additionally provides exact localization of the infection. It is fantastic for representation of the blocked off zones of the middle ear, which was impossible with the microscopes, as light conveyance is closer to the zone of interest. The utilization of endoscope permits less bone expulsion with the sole motivation behind it being visualization due to its wide point of vision. It consequently permits safeguarding of precious mastoid mucosa permitting better mastoid air circulation and reclamation of normal physiology of the middle ear. Accordingly, our current study on utilization of endoscopes in otology for treatment of tubotympanic CSOM will not just provide assistance in better comprehension of the normal anatomical and physiological systems of middle ear cleft but also the help in elucidation of infection pathology thus dictating the best approach for removal of the same.

Aim: To study the outcome of endoscopic tympanomastoidectomy in tubotympanic type of chronic suppurative otitis media.

MATERIAL AND METHODS

Setting: Tertiary Care Hospital

Duration: 1 year and 6 months (1 year of data collection and 6 months of followup) from approval of the Research Committee and Institutional Ethics Committee, Adesh University.

Type of study: Observational Prospective study.

Subject: All the patients presenting to the ENT OPD, AIMSRS with tubotympanic CSOM meeting the inclusion criteria.

Sample size: All the patients presenting to the ENT OPD, AIMSRS with tubotympanic CSOM within a period of 1 year from the approval of Research committee and Institutional Ethics Committee, Adesh University, Bathinda.

Place: Department of Otorhinolaryngology and Head Neck Surgery.

Inclusion criteria: Patients presenting to the ENT OPD at AIMSRS, Bathinda with

1. Age 11-60 yrs.
2. Sex: Male and Female.
3. Tubotympanic type of Chronic Suppurative Otitis Media [DRY]
4. Unilateral or Bilateral disease.

Exclusion criteria:

1. Revision Mastoidectomies.
2. Active mucopurulent discharge.
3. Patient with unsafe or squamosal/Atticoantral type of disease.
4. Patients with intracranial complications of CSOM.
5. Patients with external and middle ear abnormalities (congenital or acquired).
6. Patients with SNHL.
7. Medically and surgically unfit patients.
8. Patients unwilling to take part in the study.
9. Patients lost to follow up.

RESULTS

The study consists of 50 patients with tubotympanic chronic suppurative otitis media who were analysed taking into consideration a number of parameters.

The following are the observations made during our study:

In our study patient age varied from 11 yrs. to 40 yrs. as shown above in table. The maximum incidence was 43 percent in the third decade than 31 percent in second decade and followed by 26 percent in the fourth decade. The mean age in this study was 24 years.

In our study the most common symptom encountered was otorrhoea in 86% patients for which we managed conservatively and managed, followed by impaired hearing in 82%. Otagia and tinnitus were seen in 17 % and 11.5 % patients respectively. Vertigo was seen in 11.5% patients.

In our study 46% patients had CSOM in the active stage with persistent ear discharge. 42 % patients presented with occasional discharge and 11.5% presented with no discharge, we treated conservatively for discharging ear for 3 weeks before operating.

44/50 patients presented with complaints of discharge. Out of these 44 patients, 39 presented with some degree of hearing impairment. As shown in table longer duration of otorrhoea more is the severity of the disease and more the hearing impairment.

In our study complete visualization of the tympanic membrane without any manipulation was possible in 50% of the cases and visualization after manipulation was possible in 34% of the cases. However partial visualization even after manipulation was seen in 17% cases.

18 patients showed perforation in more than one quadrant and out of these 11 patients (22%) showed medium size while 7 patients (14%) showed total perforation.

In 55% of the cases the diseased ear showed retracted pars tensa with the TM. 14% patients showed same side central perforation and 31% showed normal TM. On the contralateral side retraction was noticed in 40% of the cases, perforation in 9% and about 51% had normal TM. Out of 50 cases B/L sclerosis was noted in about 31% and U/L sclerosis on the affected side in 37%. B/Lly Pneumatized mastoid was noted in 26%. The cavitory mastoid diagnosed in only 6%.

Pure CHL implies > 25db air conduction loss and A-B gap > 20db and in the mixed variety the bone conduction loss > 25db and A-B gap > 20db. In our study 66% showed Pure conductive hearing loss and 33% showed mixed hearing loss.

The disease was seen extending to the attic and aditus as well in 26% of the cases, spreading further to mastoid antrum in 26 % of the cases and involving both the posterior mesotympanum and aditus ad antrum was seen in 40% of the cases.

On the basis of extent of the disease different surgical procedures were used, 100% cortical mastoidectomy with tympanoplasty.

While assessing the post-operative graft uptake it was observed that successful graft uptake was seen in 94% cases while graft uptake was unsuccessful in 6% cases after 6 months of follow up. At routine follow ups of 1, 3 and 6 months it was observed that the chances of graft uptake decreased as the post op time period increased ($p < 0.05$).

While assessment of post op chronically discharging ear it was observed that only 2% of the cases had chronic discharge at 6 month follow up period. The above table shows that chronically discharging ear is negatively associated with post operative time period ($p < 0.005$). As time progresses the rate of chronically

Degree of hearing improvement is from 10-14dB in 36% of cases and 15-19 dB in 34% of the cases and 20-25 dB in 2% of the cases and 25- 30 dB in 1% of the cases at the end of the study period. When the degree of hearing improvement was compared at 1, 3 and 6 months follow up it was observed that endoscopic tympan mastoidectomy had a positive effect on post operative degree of hearing improvement ($p \text{ value} < 0.05$).

DISCUSSION

The management of CSOM is one of the most challenging tasks in otologic surgery as the chances of residual disease and the morbidity of the conventional procedures involved in treatment are high. With incorporation of endoscopes in the otologic field much of the recidivism and morbidity of the procedures has been reduced.

As stated by Takahashi (2000) middle ear pressure is maintained by two routes, the Eustachian tube and the middle ear mucosal gas exchange. Ventilation through Eustachian tube is quick and active mechanism that helps in adapting to transient fluctuations in middle ear pressure. The middle ear mucosal gas exchange is passive and constant phenomenon, that functions even during sleep v/s the Eustachian tube which closes during sleep, helps in continuous maintenance of middle ear pressure. In our present study apart from the eradication of disease and reconstruction of the middle ear much importance has been given to the preservation of middle ear cleft mucosa and restoration of ventilation of middle ear and mastoid.

Jacob and Sade (1992) stated that CSOM ears usually possess poorly pneumatized or non-pneumatized temporal bones, in our study about 67% of our patient had sclerosed mastoid, that reduces the middle ear buffering capacity.

In our study we have not used silicon sheets in any of the patients instead we used cartilage in the middle ear to augment the myringoplasty versus Takashi in 2000 who used tympanostomy tube in patients and 0.5mm silicon sheets in the tympanic cavity and found no significance in the recovery of mastoid aeration with tympanostomy tubes.

Advantages of the cartilage tympanoplasty is that it helps in restoration of the middle ear air space enabling the drainage of blood clot and other collection from attic, aditus, antrum, anterior epitympanum via the middle ear into the Eustachian tube to the pharynx. The tympanic membrane gets perforated when cartilages other than handle of malleus comes into direct contact with it but in cartilage tympanoplasty where the composite cartilage placed between the ossicular graft and tympanic membrane overcomes this disadvantage.

So far in our 6 month follow up we have not encountered any residual, recurrent disease just 1 chronically discharging ear, also the healing time (period for complete epithelization of cavity) was also less in 27 \pm 10 days compared to Takahashi 2000 where it was 31.5 \pm 19 days. All our procedures were done exclusively with endoscopes where the need for bone removal for accessing is less compared to the Takahashi (2000) procedures which were done exclusively with microscopes, excessive bone and mucosal.

CONCLUSION

1. The success of Tympanoplasty in terms of graft uptake and hearing improvement is better in patients with lesser duration of disease, less pre-operative Air bone gap and with medium sized perforations when compared to subtotal perforations.
2. The success of Cortical mastoidectomy with type I tympanoplasty in terms of graft uptake and hearing improvement is better in patients with lesser duration of disease and less pre-operative Air bone gap. The results are better with medium sized perforations when compared to subtotal perforations and in patients with disease free mucosa of mastoid antrum.
3. In post-operative evaluation of patients with unilateral hearing loss, application of Belfast rule of thumb enables the actual hearing benefit of the patient.

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