Original Research Paper

Volume-9 | Issue-2 | February-2019 | PRINT ISSN - 2249-555X

Otolaryngology

# A COMPARATIVE STUDY BETWEEN ENDOSCOPIC MYRINGOPLASTY AND CONVENTIONAL MICROSCOPIC MYRINGOPLASTY IN MUCOSAL TYPE OF CHRONIC OTITIS MEDIA

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**ABSTRACT** Chronic otitis media (COM) has been an important cause of middle ear disease since prehistoric times. **Tympanoplasty** refers to any operation involving reconstruction of tympanic membrane and/or the ossicular chain. **Myringoplasty** is a tympanoplasy without ossicular reconstruction.

**Aim :** To evaluate the efficacy of endoscopic myringoplasty in comparison to conventional myringoplasty.

**Objectives:** To study the outcome of Endoscopic Myringoplasty in comparison to conventional Microscopic Myringoplasty in terms of Graft uptake & improvement of hearing after two month, to determine the advantage and disadvantage of both the methods & to assess the complications of both the methods .

Sixty(60) cases of clinically diagnosed Mucosal type of Chronic otitis media with dry central perforation were included in this study, among which 30 underwent conventional microscopic myringoplasty and rest 30 were managed by Endoscopic Myringoplasty . Hearing improvement was assesed by PTA and post operative follow up was also done. Our study conclues Endoscopic approach took less operative time and had less post operative pain and better cosmetic result.

**KEYWORDS :**

## INTRODUCTION:

COM equates with the classic term chronic 'suppurative' otitis media (CSOM) that is no longer advocated as COM is not necessarily a result of 'the gathering of pus'. it is classified as- Inactive (mucosal) COM, Inactive (squamous) COM, Active (mucosal) COM, Active (squamous) COM & Healed COM (Tympanosclerosis or healed perforation) .[1]

**Tympanoplasty** refers to any operation involving reconstruction of tympanic membrane and/or the ossicular chain. **Myringoplasty** is a tympanoplasy without ossicular reconstruction. The concept of Tympanoplasty was evolved with **Wullstein** and **Zollner's** paper [2,3]

Inspite of several technical advancements in operative microscope, basic limitation could not be resolve [4]. **Mer and collegue** introduced middle ear endoscopy in 1967, since then endoscopes getting popularity in middle ear surgeries [5]

Various approaches of tympanoplasty have been given such as: post auricular, endaural, transcanal and Endoscopic approach. Endoscopic approach resulted in decreased incidence of residual and recurrence during surgeries of cholesteatoma removal.[6-9]

Overlay technique of tympanoplasty was not giving persistent outcomes. Later, **Shea** and **Tabb** evolved underlay technique wherein the graft was placed under the tympanic membrane remnant[10-12]. Most widely used underlay graft is temporalis fascia and sometimes perichondrium with success rate of 80 to 90% in patients treated with primary tympanoplasty with microscopic approach. [13] However both the procedures comes with certain advantage and limitations.

## MATERIALS AND METHODS:

After taking approval from ethical committe, 60 patients were selected for this study and divided into two groups. 30cases for conventional microscopic study and 30 for endoscopic aim to evaluate the efficacy of endoscopic myringoplasty in comparison to conventional myringoplasty study from 1 st june 2018 to 31 st december 2018 In the Department of Otorhinolaryngology, Tripura Medical College And DR. BR Ambedkar Memorial Teaching Hospital.

## INCLUSION CRITERIA

1. Dry Non-discharging ear.
2. Patients with tympanic membrane perforation due to COM.
3. Demonstrable conductive hearing loss.

## EXCLUSION CRITERIA:

1. Patients with active discharge.
2. Patients with Mastoiditis & cholesteatoma.
3. Patients with Sensoryneural hearing loss.
4. Large Perforation.
5. Tympanosclerosis.
6. Revision cases.

The selected patients were evaluated Clinically & audiologically by PTA, then 50% of patients fulfilling the inclusion criteria is operated by Endoscopic Myringoplasty procedure and another 50% by conventional Microscopic Myringoplasty under LA. The patients were discharged on 7th post operative day and follow-up started after 15 day, after 1 month and 2 months. Then the results of endoscopic compared with microscopic procedure.

**Operative Procedure:** All the patients were operated under local anesthesia (xylocaine 2% with 1:100,000 adrenaline) and intravenous sedation.

In group 1; microscopic approach was used with postauricular approach . The temporal muscle fascia was harvested at the beginning of the operation, and the "underlay" graft was placed medial to the malleus.

In Group2; an endoscopic approach was used and rigid otoendoscopes (2.7 mm and 4.0 mm) were used for this approach. After freshening the margins of the tympanic membrane perforation, an incision was made laterally in the posterior and inferior parts of the external auditory canal (about 5 to 10 mm from the tympanic membrane). A tympanomeatal flap was elevated, and the middle ear cavity was visualized. A piece of temporalis fascia graft was harvested by separate small incision given in scalp after shaving small area of scalp.

**RESULT :** In our study average time taken in conventional microscopic surgery was 110 minutes (range 80-140 min) where in case of endoscopic surgery it was 100min (range 80-120 min) ,Table 1.

In microscopic group 3 out of 30 patients of require canaloplasty, while no patient in Endoscopic group required this procedure . Post operative complication like wound gap was 10% (3/30) in microscopic group. Post operative pain was less in Endoscopic group (3.33%); Table 2.

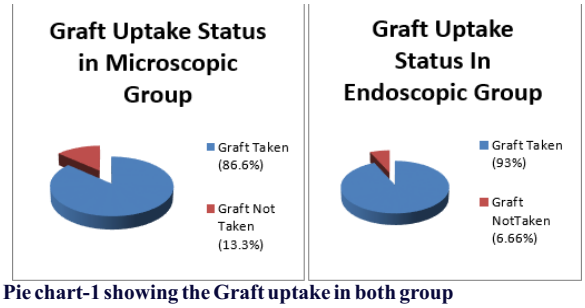
***Table 1: Time taken in surgery***

| Time (Min) | Microscopic Group | Endoscopic Group |
|---|---|---|
| 80 - 100 | 10 | 21 |
| 101 - 120 | 20 | 09 |
| 120 -140 | 00 | 00 |

***Table 2 : Post operative complications***

| complications | Microscopic Group | Endoscopic Group |
|---|---|---|
| Wound Gap | 03 (10%) | 02(6.66%) |
| Infection | 02(6.66%) | 02(6.66%) |
| Post Auricular Pain | 03(10%) | 01(3.33%) |
| Assymmetry of pinna | 01(3.33%) | 00(0%) |
| Stenosis of Ear | 00(0%) | 00(0%) |

In Endoscopic group 28 out of 30 (93.3%) patients had successful graft uptake after 2months.In Microscopic group 4/30 patients graft was not taken (14%) but in Endoscopic myringoplasty only 2/30 (6.66%) patients graft was not taken (Pie chart 1).




**Pie chart-1 showing the Graft uptake in both group**

**Table 3 : Hearing improvement**

| Average Conductive hearing loss | Microscopic Pre Operative | Group Post Operative | Endoscopic PreOperative | Group Post Operative |
|---|---|---|---|---|
| 0 – 10 | 00 (0%) | 05 (16%) | 00 (0%) | 07 (23.3%) |
| 11 – 20 | 03 (10%) | 23 (76.6%) | 05 (16%) | 21 (70%) |
| 21 – 30 | 15 (50%) | 02 (6.66%) | 17 (56.6%) | 02 (6.66%) |
| 31 – 40 | 12 (40%) | 00 (0%) | 08 (26.6%) | 00 (0%) |

The post operative hearing as shown in Table 3 & average hearing gain in microscopic group was 12 dB and 13 dB in endoscopic group.

In all patients in the Endoscopic group rated as excellent their cosmetic outcome. But in microscopic group 12 patients rated excellent cosmetic result, 16 patients rated satisfactory, and 2 patients rated as poor.

## DISCUSSION :

The primary goal of any grafting technique in tympanoplasty is to produce a thin, conically shaped, vibrating membrane resembling the original eardrum as close as as possible. Tympanic membrane perforations can occur at any age. But is most common between 15-30 years.[14] In our study patients age ranges from 20-35years.

While operating the patients with microscope, tortuousity of the external auditory canal (EAC) and bony overhang hampers the view of the deeper structures. In such conditions canalplasty becomes mandatory. In our study 3 out of 30 patients required canalplasty (10%) in microscopic group. Endoscope can easily go through the curvy EAC. These observations was also made in two separate studies by and **lijima N *et al***[15]. As per the authors **Mether R**[16], wide angled endoscopes give better visualisation of deeper structures. In endoscopic approach it is difficult to manage at the time of excessive bleeding as surgeon's one hand is only available to operate. **Khan *et al*** [17] innovated, two handed technique to limit this problem. Endoscopes provide monocular vision, which leads to loss of depth perception*(19)*. So surgeons need to be extra careful while close to vital structures and positioning of the graft. **Yadav *et al*** [18] study, about the endoscopic assisted myringoplasty concluded it to be equally effective, less morbid, very cost effective in small perforations, but not so effective in large perforations.

The complication rate shown for underlay technique has been claimed to be lower by **Glasscock *et al*** [19]ranging from 6-10%. **Harugope et al** [20], in their study found that average operating time during microscopic myringoplasty is 106 minutes (80-135min range) and in endoscopic group it takes 128 minutes(90-180 min range). In our study Microscopic group had average operating time of 110minutes and 100 minutes in case of Endoscopic group. **Yadav et al** [18] study showed 40 out of 50 patients had an intact Tympanic membrane in the 8 th post operative week, amounting to success rate of 80%. **Lade *et al*** [21] showed air-bone gap pre and post operatively in endoscopic group was 28.5 and 18.13 dB respectively, which in microscopy group was 32.4 and 16.9 dB respectively. Hearing Improvement in our study was 12 dB in microscopic and 13 dB in Endoscopic group. Our study demonstrated 86.6% graft uptake in Microscopic group and 93% in Endoscopic group. Patients undergoing endoscopic tympanoplasty has more desirable cosmetic result than microscopic tympanoplasty, which correlates with our study. Endoscope is easily transportable, hence ideal for use in ear surgery camps.

## CONCLUSION:

Endoscopic technique of Myringoplasty can give similarresult as Microscopic technique in terms of graft uptake and hearing improvement. But in terms of cosmesis and post operative recovery Endoscopic approach give better result. Also Endoscopic technique provides less operating time and better visualisation of operative field along with opportunity for correction of other associated anatomical abnormalities in the same sitting.

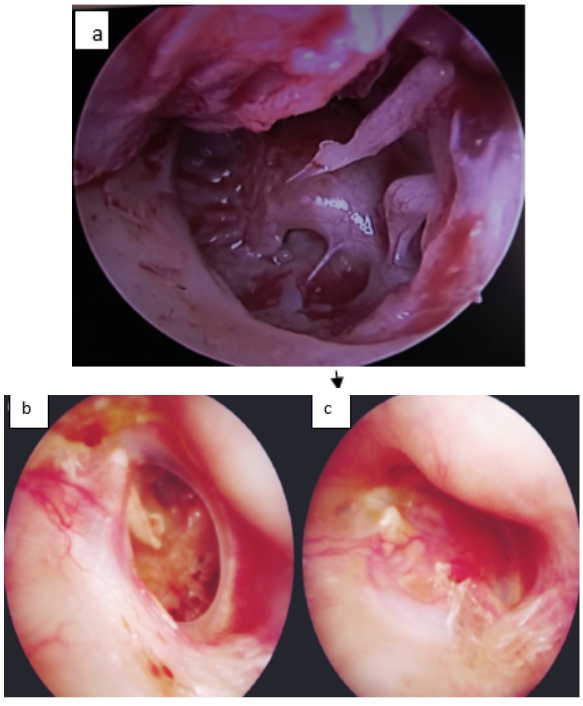



**Fig-a-**endoscopic myringoplasty showing denuded malleus and I-S joint after tympanomeatal flap elevation , b-Preoperative dry central perforation ,c-Graft uptake after 2 month.

## REFERENCES:


1) Hamilton J. Chronic otitis media in childhood. In: Glesson M(ed.). ScottBrown's Otorhinolaryngology Head and Neck Surgery, 7th ed. Vol. l. Britain: Hodder Arnold Publications, 2008. p. 928-64.
2) Wullstein H. Tympanoplasty: the fundamentals of the concept. Clin Otolaryngol Allied Sci. 1978;3(4): 431 -5.
3) House H, House W, Tabb H, Wullstein H, Zollner F. Panel on myringoplasty methods. Arch Otolaryngol. 1963;78:296-304.
4) Glasscock and Shambaugh. "Tympanoplasty", In Glasscock and Shambaugh, Surgery of the Ear 5th edition, chapter, 2003; 16:350–370.
5) El-Guindy A. Endoscopic transcanal myringoplasty. The Journal of Laryngology and Otology. 1992;106:493–5.
6) Ayache S, Tramier B, Strunski V. Otoendoscopy in cholesteatoma surgery of the middle ear: what benefits can be expected? Otol Neurotol. 2008 Dec;29(8):1085-90.rotol. 2011Apr;32(3):4336.
7) Thomassin JM, Korchia D, Doris JM. Endoscopic-guided otosurgery in the prevention of residual cholesteatomas. Laryngoscope. 1993 Aug;103(8):939-43
8) Good GM, Isaacson G. Otoendoscopy for improved pediatric cholesteatoma removal. Ann Otol Rhinol Laryngol. 1999 Sep;108(9):893-6.
9) Shea JJ. Vein graft closure of ear drum perforation. J Laryngol Otol. 1960;74:358.
10) Mclaurin JW, Raggio TP, Tabb HG. A technique of tympanoplasty. Preservation of the bony canal wall. Use of vein grafts. Laryngoscope. 1961;71:116-30.
11) Tabb HG. Experience in transcanal and post auricular myringoplasty. Tran Pac Coast Oto Ophthalmol Soc Arnn Meet. 1968;52:121 –5.
12) Dornhoffer JL. Hearing results with cartilage tympanoplasty. Laryngoscope. 1997Aug;107(8):1094- 9.
13) Sengupta A, Basak B, Ghosh D, Basu D, Adhikari D, Maity K. A Study on Outcome of Underlay, Overlay and Combined Techniques of Myringoplasty. Indian J Otolaryngol

Head Neck Surg. 2011;64:63–6.
14) Shaikh AA, Shiraz MA, Salman O, Shaikh M, Rafi T. Outcome of tympanoplasty type 1 by underlay technique. JLUMHS. 2009;8(1):80-4.
15) Usami S, Iijima N, Fujita S, et al. Endoscope-assisted Myringoplasty. Otorhinolaryngology. 2001;63:287– 90.
16) Raj A, Meher R. Endoscopic transcanal myringoplasty– A study. Indian Journal of Otolaryngology and Head and Neck Surgery. 2001;53:47–9.
17) Khan MM, Parab SR. Endoscopic cartilage tympanoplasty: A two-handed technique using an endoscope holder. The Laryngoscope. 2015;126:1893–8.
18) Yadav S P S, Aggarwal N, Julaha M, Goel A. Endoscopic assisted myringoplasty. Singapore Med J.2009;50(5):510.
19) Glasscock and Shambaugh. "Tympanoplasty", In Glasscock and Shambaugh, Surgery of the Ear 5th edition, chapter, 2003; 16:350–370.
20) Harugope A, Mudhol R, Godhir. A comparative study of endoscopic assisted myringoplasty and microscopic assisted myringoplasty. Ind J otorhinolaryngol Hea 2008; 60(4): 298-303
21) Lade H, Choudhary SR, Vashishth A, endoscopic vs microscopic myringoplasty: a different perspective. Europ Arch otorhinolaryngol 2014 jul; 271(7): 1897-1902.