



ORIGINAL RESEARCH PAPER

Otorhinolaryngology

A PROSPECTIVE OBSERVATIONAL COMPARATIVE STUDY FOR POST OPERATIVE RESULTS IN ENDOSCOPIC TYMPANOPLASTY V/S MICROSCOPIC TYMPANOPLASTY

KEY WORDS: Chronic suppurative otitis media, endoscopic tympanoplasty, microscopic tympanoplasty

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ABSTRACT

Objective: Chronic suppurative otitis media is a widespread disease in developing countries. Hence treating CSOM with surgical treatment by tympanoplasty is the commonest procedure in ENT practice. In this study we aim to study the advantages and disadvantages of microscopic and endoscopic tympanoplasty. This study also aims to compare the merits and demerits of microscopic and endoscopic tympanoplasty. **Subjects And Methods:** A Prospective observational study for endoscopic tympanoplasty and microscopic tympanoplasty was conducted on 102 patients of age 20-60 years attending OPD and admissions under the Department of otorhinolaryngology and M.Y.H Hospital, Indore. Subjects with dry central perforation due to CSOM were selected for microscopic tympanoplasty. Similar subjects were selected for Endoscopic tympanoplasty except those with tortuous anatomy of external ear canal. Patients with unsafe CSOM, SNHL, and active infection were excluded. **Results:** In our study majority (44%) of patients belonged to age group of 25-35 years. Most of the patients were having medium central perforation (MCP) (32%) followed by subtotal perforation (22.5%). Small central perforation (SCO) 19%, Large central perforation (LCP) 18%, Total perforation 10% respectively. According to quadrant involving perforation which is mainly AIQ, followed by Anterior superior quadrant (ASQ), Posterior inferior quadrant (PIQ) and posterior superior quadrant (PSQ). Mean operative time for Endoscopic tympanoplasty procedure was 56+/-15 mins with SD of 12.05 and for microscopic tympanoplasty procedure was 117.8+/- 20 mins with SD of 7.17 having a p value (0.0003) which was found to be significant. **Conclusion:** In our study, we have concluded that endoscopic tympanoplasty scores over microscopic tympanoplasty. Endoscopic tympanoplasty has helped patients achieve faster recovery, a shorter hospital stay, and a lower financial burden, which was especially helpful for developing countries like ours. Unlike the microscope, the endoscope is easily transportable and hence is ideal for use in remote places to conduct ear surgery camps.

INTRODUCTION

Since the introduction of tympanoplasty in the 1950s¹, a variety of surgical techniques have been developed and used to mend perforations in the tympanic membrane. Temporalis fascia and perichondrium remain the most widely used materials. Conventional microscopic tympanoplasty with a postauricular incision remains the most effective procedure for patients with chronic otitis media, especially in cases of anterior or large TM perforation as well as anterior bony overhang. This conventional procedure results in surgical scar and significant pain to the patient.

Minimally invasive otologic surgery has recently been developed along with endoscopic techniques. Endoscopic ear surgery, first tried in the 1990s², has become popular with anatomic and physiologic concepts. Advantages of endoscopic ear surgery compared to the conventional microscopic surgery include avoiding postauricular incisions, and mastoidectomies in securing the surgical view. Endoscopically, the typical transcanal approach is possible by elevating a tympanomeatal flap. This avoids other unnecessary incisions and soft tissue dissections. The

endoscopic approach also provides better visualization of hidden areas in the middle ear cavity including the anterior and posterior epitympanic spaces, sinus tympani, facial recess, and hypotympanum. Endoscopy-mediated procedures can decrease residual cholesteatomas and recurrences during surgeries for cholesteatoma removal.³

However, endoscopic surgery has several disadvantages. Only one-hand surgery is feasible with the endoscopic technique, which is less efficient; in a situation of massive bleeding, the endoscopic view could be stained by blood and continuing the procedure could be difficult. Furthermore, endoscopic instrument could make direct injury and thermal damage by light source.⁴

There has been lack of reliable data regarding the efficacy and functional outcome of endoscopic tympanoplasty as compared with conventional microscopic tympanoplasty. In this study, we evaluate and compare the results of hearing outcome, postoperative pain assessment, operation time, graft success rate, and surgical complications in patients who underwent endoscopic and conventional microscopic

tyimpanoplasty. The aim is to clarify the clinical benefit of endoscopic tympanoplasty compared to conventional microscopic surgery by an endaural or postauricular approach.

METHODS:

Type Of Study: Prospective observational study

Sample: 102 cases. The patients were divided in 2 groups. (51 cases for endoscopic tympanoplasty and 51 cases for microscopic tympanoplasty)

Duration And Place Of Study: The study was done from March 2022 to February 2023 in the Department of ENT, Maharaja Yashwantrao Holkar Hospital, Indore, India.

Inclusion Criteria

For Microscopic Tympanoplasty

- Subjects with dry, central perforation due to CSOM.
- Subjects with conductive hearing loss due to CSOM
- Age between 20-60 years
- Patients giving consent

For Endoscopic Tympanoplasty

- Subjects without tortuous anatomy of external ear canal without bony wall hanging.
- Subjects with dry central perforation due to CSOM or Trauma
- Subjects with conductive hearing loss due to CSOM or trauma
- Age between 20-60 years.

Exclusion Criteria

- Age below 20 years and above 60 years
- Patients with active infection of ear.
- Patient with unsafe CSOM and it's associated complications.
- Patients with SNHL
- Patients who didn't give consent

Data Collection:

- Relevant data collected using a Pre-structured proforma.
- Thorough examination with relevant investigation done to aid the diagnosis.
- Followed by appropriate surgical intervention and follow up.

RESULTS

In our study mean age group for the patients in Endoscopic tympanoplasty was 31.6 years and microscopic tympanoplasty was 32.6 years. Mainly people in age group between 25 years to 35 years of age commonly suffered from CSOM.

The study included 102 patients who are having symptom of ear discharge following treatment, patients ear become dry. Patient was having Medium Central Perforation (MCP) 32(31.4%) followed by Subtotal Perforation(STP) 23 (22.5%), Small Central Perforation (SCP) 19(18.6%), Large Central Perforation (LCP) 18(17.6%), Total Perforation (TP) 10(9.8%) respectively According to quadrant involving perforation which is mainly involving Anterior Inferior Quadrant (AIQ) followed by Anterior Superior Quadrant (ASQ), Posterior Inferior Quadrant (PIQ) & Posterior Superior Quadrant (PSQ). In our study mean operative time for Endoscopic tympanoplasty procedure was 56.13± 15 mins with SD of 12.05 and for Microscopic tympanoplasty procedure was 117.8 ± 20 mins respectively.

In our study postoperative pain was compared between the groups In our which shows mean Visual Analogue Score (VAS) for endoscopic tympanoplasty was 5.0 and microscopic tympanoplasty was 5.9 immediately post op pain after surgery, endoscopic tympanoplasty was 3.8 & microscopic tympanoplasty was 4.4 during 3-6 hours after surgery and

endoscopic tympanoplasty was 2.7 & microscopic tympanoplasty was 3.4 during pain after 1 day of surgery respectively.

In the study patients who underwent tympanoplasty divided graft uptake and graft rejected during the follow up. The graft uptake among endoscopic tympanoplasty group 49(96.1%) patients graft was accepted & 2(3.9%) patients graft was rejected compared to microscopic tympanoplasty group in which,46(90.2%) patients graft was accepted & 5(9.8%) patients graft was rejected respectively.

DISCUSSION

The study was conducted in a tertiary health care center from February 2019 to June 2020. A total of 102 patients were selected according to the inclusion criteria and involved in the study. Patients were divided into 2 groups: 51 patients for endoscopic tympanoplasty & 51 patients for microscopic tympanoplasty. Patients are selected randomly, fulfilling the criteria.

In our study, the mean age group for the patients in endoscopic tympanoplasty was 31.6 years & for microscopic tympanoplasty was 32.6 years. Also, studies made in 2015 by Patel et al it was found that most of the patients were in their 2nd or third decade of life.⁵

In our study postoperative pain was compared between the groups In our which shows mean Visual Analogue Score (VAS) for endoscopic tympanoplasty was 5.0 and microscopic tympanoplasty was 5.9 immediately post op pain after surgery, endoscopic tympanoplasty was 3.8 & microscopic tympanoplasty was 4.4 during 3-6 hours after surgery. Choi et al.⁶ also reported that patients who underwent endoscopic tympanoplasty experienced significantly less pain at the first day after surgery than patients who underwent microscopic tympanoplasty.

In our study, patients having medium central perforation (MCP) were In our 32 (31.4%) followed by subtotal perforation (STP) 23 (22.5%), small central perforation (SCP) 19 (18.6%), large central perforation (LCP) 18(17.6%), total perforation (TP) 10 (9.8%). Perforation mainly involving the anterior inferior quadrant (AIQ) followed by anterior superior quadrant (ASQ), posterior inferior quadrant (PIQ) & posterior superior quadrant (PSQ).

In our study mean operative time for endoscopic tympanoplasty procedure was 117.8 ± 20 mins having a p-value (0.0003) which was found to be significant and for microscopic tympanoplasty procedure was 56.13± 15 mins. In a study by Huang et al.,⁷ the mean operative time was 50.4 min among 50 patients who underwent endoscopic tympanoplasty, compared with 75.5 min for the microscopic approach.

In the study patients who underwent tympanoplasty divided graft uptake and graft rejected during the follow-up. The graft uptake among endoscopic tympanoplasty group 49(96.1%) patients graft was accepted & 2(3.9%) patients graft was rejected compared to microscopic tympanoplasty group in which,46(90.2%) patients graft was accepted & 5(9.8%) patients graft was rejected respectively. Hsu et al.⁸ also reported no significant differences in the graft success rates of in endoscopic tympanoplasty and microscopic tympanoplasty groups.

CONCLUSION

In our study, we have compared the merits and demerits of microscopic tympanoplasty (MT) and endoscopic tympanoplasty (ET). The CSOM prevalence among the specific age group and type of perforation was identified. The results between the endoscopic tympanoplasty group and microscopic tympanoplasty group which shows graft uptake

and hearing outcomes were comparable between both groups. Some of the difficult to visualize areas could be seen with the help of angled scopes like the round window niche, Eustachian tube orifice, incudo-stapedial joint. Postoperative pain and the cosmetic outcome was satisfactory among endoscopic tympanoplasty group. Hence, we conclude that endoscopic tympanoplasty scores over microscopic tympanoplasty. Endoscopic tympanoplasty has helped patients achieve faster recovery, a shorter hospital stay, and a lower financial burden, which was especially helpful for developing countries like ours. Unlike the microscope, the endoscope is easily transportable and hence is ideal for use in remote places to conduct ear surgery camps.

Loss of depth perception and one-handed technique are few disadvantages of the endoscope, but it can be dealt with by using a holder and with practice. Endoscope offers a greater technical advantage

In myringoplasty and it increases the feasibility by favoring the transacanal approach over the postauricular approach.

Table :1 Age Distribution OfThe Study Population (n=102)

	N	Mean
Group 1 Endoscopic Tympanoplasty	51	31.6667
Group 2 Microscopic Tympanoplasty	51	32.6863

Table 2: Distribution According To The Type Of Perforations

Size	(Group 1) Endoscopic Tympanoplasty		(Group 2) Microscopic Tympanoplasty		Total	
	N	%	N	%	N	%
Large Central Perforation	6	11.8	12	23.5	18	17.6
Medium Central Perforation	19	37.3	13	25.5	32	31.4
Small Central Perforation	9	17.6	10	19.6	19	18.6
Subtotal Perforation	14	27.5	9	17.6	23	22.5
Total Perforation	3	5.9	7	13.7	10	9.8
Total	51	100	51	100	102	200

Table 3: Distribution According To Operative Time

Mean operation time (min)	Group	N	Mean (in min)
	Group 1 endoscopic tympanoplasty	51	56.1373
	Group 2 microscopic tympanoplasty	51	117.8431

Table 4: Distribution According To Post Operative Pain

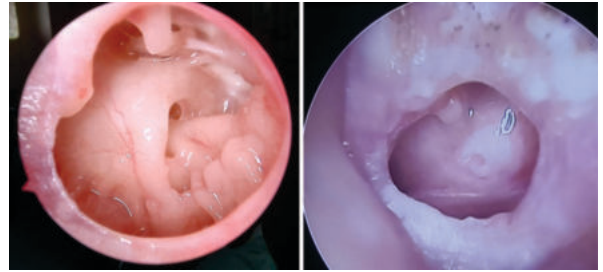
	Group	N	Mean (in min)
Immediate post op pain	Group 1 endoscopic tympanoplasty	51	5.0588
	Group 2 microscopic tympanoplasty	51	5.9804
Pain after 3-6 hours	Group 1 endoscopic tympanoplasty	51	3.8039
	Group 2 microscopic tympanoplasty	51	4.4902
Pain after 1 day of surgery	Group 1 endoscopic tympanoplasty	51	2.7451
	Group 2 microscopic tympanoplasty	51	3.4314

Table 5: Distribution According To Graft Uptake

Size	(Group 1) Endoscopic Tympanoplasty		(Group 2) Microscopic Tympanoplasty		Total	
	N	%	N	%	N	%
Graft Accepted	49	96.1	46	90.2	95	93.1

Garft Rejected	2	3.9	5	9.8	7	6.9
Total	51	100	51	100	102	200

Figures



Endoscopic view

Microscopic view

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