



A PROSPECTIVE OBSERVATIONAL COMPARATIVE STUDY FOR POST OPERATIVE RESULTS IN ENDOSCOPIC VERSUS MICROSCOPIC TYMPANOPLASTY

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ABSTRACT-

OBJECTIVES- Endoscopes are increasingly being used in middle ear surgery as an adjunct to or replacement for the operative microscope. The superior visualization of hidden areas and a minimally invasive transcanal approach to the pathology are some of the endoscope's advantages. The aim of this review is to compare the surgical outcomes of a totally endoscopic transcanal approach with a conventional microscopic approach for tympanoplasty in patients with chronic otitis media (COM) in order to establish if endoscopic tympanoplasty could be a better alternative to microscopic tympanoplasty also we compare the advantages and disadvantages of endoscopic tympanoplasty and microscopic tympanoplasty

SUBJECT AND METHODS- A Prospective observational study for endoscopic tympanoplasty and microscopic tympanoplasty was conducted on 100 patients , 50 in each group of age group between 18 to 60 years attending ENT OPD and admissions under DEPARTMENT OF OTORHINOLARYNGOLOGY AND GMH HOSPITAL REWA. Subjects with dry central perforations due to csom mucosal type was selected for microscopic tympanoplasty. Similar subjects was selected for endoscopic tympanoplasty. Patients those with unsafe csom, SNHL, active infections, and discharge was excluded.

RESULTS- In our study 55 percents patients belongs to 25-40 years of age. Most of the patients have medium sized perforation (40%) followed by large central preforation (25%), small central perforation (20%) , subtotal perforation (15%) respectively. According to quadrants involving perforation which is mainly AIQ, followed by Anterior superior quadrant (ASQ), Posterior inferior quadrant (PIQ) and posterior superior quadrant (PSQ). Mean operative time was 50+/-15 minutes for endoscopic tympanoplasty and 90+/- 15 miutes for microscopic tympanoplasty

CONCLUSIONS- 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.

INTRODUCTIONS-Since the introduction of tympanoplasty in the 1950s, 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 1990s, has become popular with anatomic and physiologic concepts. Advantages of endoscopic ear surgery compared to the conventional microscopic surgery include avoiding postauricular incisions, 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. 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. 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 microscopic tympanoplasty. 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: 100 cases. The patients were divided in 2 groups. (50 cases for endoscopic tympanoplasty and 50 cases for microscopic tympanoplasty)

Duration And Place Of Study: The study was done from november 2023 to october 2024 in the Department of ENT, Gandhi Memorial Hospital, Rewa India.

Inclusion Criteria

For Microscopic Tympanoplasty –

Subjects with dry, central perforation due to CSOM.

Subjects with conductive hearing loss due to CSOM

Age between 18-60 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 18-60 years.

Exclusion Criteria -Age below 18 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 age mean age group for endoscopic tympanoplasty 36.98 years and microscopic tympanoplasty was 28.44. Many people between 25 to 40 years commonly suffered from CSOM.

The study included 100 patients who are having symptom of ear discharge following treatment, patients ear become dry. Patient was having Medium Central Perforation (MCP)40%, followed by Large Cental Perforations (LCP) 25%, Small Central Perforations (SCP) 20% and Subtotal perforations !5%

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 50± mins and for Microscopic tympanoplasty procedure was 90±15mins 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 5.8immediately post op pain after surgery, endoscopic tympanoplasty was 3.5 & microscopic tympanoplasty was 5.0 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(98%) patients graft was accepted & 1(2%) patients graft was rejected compared to microscopic tympanoplasty group in which,45 (90%) patients graft was accepted & 5(10%) patients graft was rejected respectively.

DISCUSSION- The study was conducted in a tertiary health care center from november 2023 to october 2024. A total of 100 patients were selected according to the inclusion criteria and involved in the study. Patients were divided into 2 groups: 50 patients for endoscopic tympanoplasty & 50 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 36.98 years & for microscopic tympanoplasty was 28.44years 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. 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 5.8 immediately post op pain after surgery, endoscopic tympanoplasty was 3.5 & microscopic tympanoplasty was 4.5 during 3-6 hours after surgery.

Choi et 6 al. 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 40 % followed by large central perforations(LCP) 25%, small central perforation (SCP)20%,subtotal perforations 15%.

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 50+/-15 mins having a p value (0.0003) which was found to be significant and for microscopic tympanoplasty procedure was 90+/-15mins.

In a study by Huang et al., 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(98%) patients graft was accepted & 1(2%) patients

graft was rejected compared to microscopic tympanoplasty group in which,45(90%) patients graft was accepted & 5(10%) patients graft was rejected respectively.

Hsu et al. also reported no significant differences in the graft success rates

CONCLUSION-

In our study, we have compared the advantages and disadvantages 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 Of The Study Population (n=100)

	N	MEAN
GROUP 1 ENDOSCOPIC TYMPANOPLASTY	50	36.98
GROUP 2 MICROSCOPIC TYMPANOPLASTY	50	28.44

Table 2: Distribution According To The Type Of Perforations

SIZE	(Group 1) Endoscopic Tympanoplasty		(Group 2) Microscopic Tympanoplasty		Total	
	N	%	N	%	N	%
LCP	14	28	11	22	25	25
MCP	18	36	22	44	40	40
SCP	8	16	12	24	20	20
SUBTOTAL PERFORATIONS	10	20	5	10	15	15
TOTAL	51	100	51	100	100	100

Table 3: Distribution According To Operative Time

MEAN OPERATIVE TIME	GROUP	N	MEAN(IN MIN)
	Group 1 endoscopic tympanoplasty	50	50+/-15 MINS
	Group 2 microscopic tympanoplasty	50	90+/- 15 MINS

Table 4: Distribution According To Post Operative Pain

	GROUP	N	MEAN IN MIN
IMMEDIATE POST OPERATIVE PAIN	GROUP 1 ENDOSCOPIC TYMPANOPLASTY	50	5
	GROUP 2 MICROSCOPIC TYMPANOPLASTY	50	5.8
PAIN AFTER 3-6 HRS	GROUP 1 ENDOSCOPIC TYMPANOPLASTY	50	3.5
	GROUP 2 MICROSCOPIC TYMPANOPLASTY	50	5.0
PAIN AFTER ONE DAY OF SURGERY	GROUP 1 ENDOSCOPIC TYMPANOPLASTY	50	2.7
		50	3.4

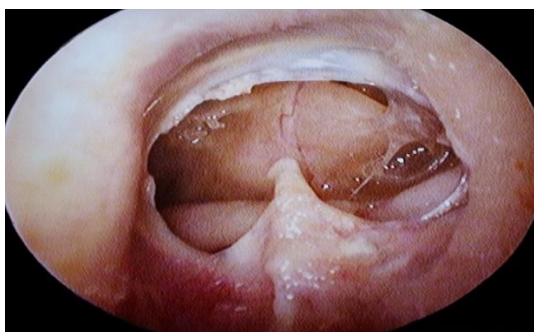
Table 5: Distribution According To Graft Uptake

SIZE	GROUP 1 ENDOSCOPIC TYMPANOPLASTY	GROUP 2 MICROSCOPIC TYMPANOPLASTY	TOTAL
GRAFT ACCEPTED	49 (98%)	45(90%)	94(94%)
GRAFT REJECTED	1(2%)	5(10%)	6(6%)

FIGURES -ENDOSCOPIC VIEW OF TYPPANIC MEMBRANE PERFORATION



MICROSCOPIC VIEW OF TYMPANIC MEMBRANE PERFORATION



GRAFT ACCEPTED AFTER ENDOSCOPIC TYMPANOPLASTY



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