A Comparative Study of Outcomes in Endoscopic and Microscopic Type-1 Tympanoplasty for Tubotympanic CSOM

Dr. Navin Agrawal[1], Dr. S.K. Gupta[2], Dr. Chhavi Agrawal[3], Dr. Urvashi Singh[4]*, Dr. Raksha Wadhwani[5], Dr. Sonakshi Kapoor[6], Dr. Akshita Bhargav[7].

DOI Number: 10.14704/NQ.2022.20.13.NQ88055 **Neuro Quantology 2022; 20(13):409-411**

INTRODUCTION

Chronic suppurative otitis media (CSOM) is defined as chronic mucoperiosteal inflammation of middle ear cleft and mastoid antrum which presents as ear discharge or otorrhea through a permanent tympanic membrane perforation for a period of more than 3 months. [1].

Tympanoplasty is an operation to eradicate disease in the middle ear and to reconstruct the hearing mechanism, with or without tympanic membrane grafting.

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 [2].

Endoscopic ear surgery, first tried in the 1990s, has become popular with anatomic and physiologic concepts [3].

AIM:

A Comparative study of Outcomes in Endoscopic and Microscopic tympanoplasty in Tubotympanic CSOM.

OBJECTIVES:

- To compare the outcomes of the above two procedures in terms of-
  - Duration of procedure
  - Success of graft acceptance
  - Improvement of hearing (A-B gap closure)
  - Pre op Ab Gap

STUDY CENTRE:

Department of E.N.T, Index medical college, Hospital & Research Centre, Indore (M.P.)

STUDY DESIGN:

Prospective crossectional observational study with a sample size of 100 patients.

INCLUSION CRITERIA:

1. Patients above 15 years of age of either sex having Tubotympanic CSOM
2. Patients with ear dry for at least 6 weeks (inactive or quiescent disease).
3. Patient with tympanic membrane perforation due to Tubotympanic CSOM.
4. Patient with tympanic membrane perforation with conductive or mixed hearing loss.
5. Patients with small or medium or large

***Corresponding Author:** Dr. Urvashi Singh
Address: [1]Professor & Hod, Department Of Otorhinolaryngology, Imchrc, Indore
[2]Professor, Department Of Otorhinolaryngology, Imchrc, Indore
[3]Associate Professor, Department Of Otorhinolaryngology, Imchrc, Indore
*[4, 5, 6] Pg Resident 3, Department Of Otorhinolaryngology, Imchrc, Indore
[7]Pg Resident 1, Department Of Otorhinolaryngology, Imchrc, Indore
Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest
Received: **Accepted:**

6. Central perforations.

EXCLUSION CRITERIA:

1. Patients with active discharge
2. Patients with age less than 15 years
3. Patients with total central perforations
4. Patients with unsafe disease

MATERIAL & METHOD:

A) History taking
B) Clinical evaluation both General and ENT examination
C) Investigations
D) Surgical procedure
E) Follow up Questionnaires were administered to the patients and the information were obtained including socio-demographic character Istics, symptoms experienced, duration of symptoms, recurrent Sino-nasal symptoms

These patients underwent ENT examinations like oto-endoscopic examination, tuning fork tests, EUM, x-ray mastoid and PTA. PTA was performed in a soundproof booth, using MAICO MA 42 audiometer.
The study comprised of following 2 groups

1. Group-A : Patients in this group were operated by Endoscopic tympanoplasty by trans canal approach by underlay technique using a 0 degree and 30 degrees HD rigid otoendoscope of 2.7mm diameter and 100 mm length, coupled with camera head of OLYMPUS-MAJ-1910(E) and monitor.

2. Group-B: Patients in this group were operated by microscopic tympanoplasty by post-aural approach by underlay technique using Carl-Zeiss S100/OPMI pico operating microscope.

Graft materials were Tragal/Conchal Cartilage with perichondrium in both the groups. We used the cartilage with perichondrium graft by Cartilage island graft technique. Patients were assigned alternately to either group. Intraoperative time duration of surgery and postoperative outcomes such as success of graft acceptance and improvement in hearing (A-B gap closure) were observed and compared between the 2 groups.

Follow –up

- On post- op day 2 check dressing were done, on day 7 post-op sutures were removed.
- Patients were followed up at 1week, 3week, 6weeks, and 12weeks for graft condition and post-op PTA was done at 6weeks.
- After taking written informed consent, pre operatively injection of tetanus toxoid 0.5 ml intramuscular was given, lignocaine sensitivity test was done.

OBSERVATION AND RESULTS:

Comparing Operative Time between Group 1 and Group 2

OPERATIVE TIME (MIN)	MICROSCOPIC TYMPANOPLASTY	ENDOSCOPIC TYMPANOPLASTY	TOTAL	P VALUE
≤90	14	39	53	
>90	36	11	47	0.024
TOTAL	50	50	100	
AVERAGE OPERATIVE TIME	98.16±8.34	89.05±11.15		0.002

Comparing Post- Op Graft Condition between Group 1 and Group 2

Post- Op Graft Condition	Microscopic Tympanoplasty	Endoscopic Tympanoplasty	Total	P value
Successful Graft Take-Up	43	46	89	0.218
Residual Perforation	7	4	4	0.126
Total	**50**	**50**	**100**	

Comparing Pre-Op A-B Gap between Group 1 and Group 2

Pre-Op A-B Gap (in dB)	Microscopic Tympanoplasty	Endoscopic Tympanoplasty	Total	P Value
≤15	0	0	0	
16 - 25	25	23	48	
26 - 40	22	25	47	0.428
41 - 55	3	2	5	
Total	**50**	**50**	**100**	

Comparing A-B Gap Closure with Post- Op Graft Condition between Group 1 and Group2

A-B Gap Closure	Microscopic Tympanoplasty			A-B Gap Closure	Endoscopic Tympanoplasty		
	Successful Graft Take Up	Residual perforation	Total		Successful Graft Take Up	Residual perforation	Total
≤15dB	33	7	40	≤15dB	38	4	42
16-25dB	10	0	10	16-25dB	8	0	8

DISCUSSION

In our Study the comparison of Post- Op Graft Condition between Group 1 and Group 2. It was found that out of 89 patients who had Successful Graft Take- Up, both groups Endoscopic Tympanoplasty (n=46) as well as Microscopic Tympanoplasty groups (n=43) have similar Successful Graft Take- Up as revealed by the insignificant p value of 0.218. The present study revealed that majority of the patients in Microscopic Tympanoplasty group had Pre-Op

Ab Gap (In dB) of 16-25 (n=25) followed by 26-40 (n=22) whereas in Endoscopic Tympanoplasty group majority had Pre-Op Ab Gap (In dB) between 26-40 dB (n=25) followed by 16-25 (n=23). Mohindra et al (2010) studied endoscope assisted surgeries and reported a preoperative air bone gap of 22.24 dB [74] . Patel et al (2015) observed perioperative air bone gap of 22.24 dB in Microscopic Tympanoplasty group and 25.37 dB in Endoscopic Tympanoplasty group. The comparison of operative time between Group 1 and Group 2. It was found that in Microscopic Tympanoplasty majority had operative time > 90 min. (n=36) whereas in Endoscopic Tympanoplasty majority had operative time ≤90 Mins (n=39). Which highlights that operative time is less in Endoscopic Tympanoplasty compared to Microscopic Tympanoplasty. Average operative time was significantly less in Endoscopic Tympanoplasty (89.05±11.15) as compared to Microscopic Tympanoplasty (98.16±8.34) as revealed by the significant p value of 0.002. That means endoscopic technique has an advantage of less operative time than microscopic technique.

Guru Mani S et al concluded that the graft uptake was found to be slightly better in microscopic surgery as compared to endoscopic tympanoplasty. Ravneet R et al concluded that both the technique provides equivalent results of graft uptake. Rig zing C. Dadul et al concluded that the graft uptake was 85% in endoscopic tympanoplasty surgery as compared to 82.9 % in microscopic tympanoplasty surgery.The comparison of A-B Gap Closure with Post- Op graft condition between Group1 and Group 2. It was found that in the Microscopic Tympanoplasty group, out of 40 patients with A-B Gap Closure ≤ 15dB, 33 had Successful Graft Take-Up and all the patients with A-B Gap Closure between16-25 had Successful Graft Take-Up. Similarly in the Endoscopic Tympanoplasty group, out of 42 patients with A-B Gap Closure ≤ 15dB, 38 had Successful Graft Take-Up and all the patients with A-B Gap Closure between 16-25 had Successful Graft Take-Up.

CONCLUSION

Based on Outcomes there is no significant difference was observed in between the conventional microscopic tympanoplasty and transcanal endoscopic tympanoplasty. This concludes that the transcanal endoscopic tympanoplasty can achieve similar results as that of microscopic technique with added advantage of less operative time although the time required for the surgery depends on the experience of the surgeon in that technique. Endoscopic technique has a longer learning curve than microscopic technique.

- Microscope offers three-dimensional image and both the hands are free in this technique, on the other hand, the endoscope offers excellent view of difficult to see areas using angled endoscope and ease of changing magnification and area of view by simply rotating the endoscope and moving in and out.
- Endoscopic technique causes less trauma to tissues as no postauricular incision is required. So in present study, it can be concluded that Endoscope is useful in cases of chronic otitis media without cholesteatoma with equal success rate with added advantage of postoperative pain relief and less operative time.

References

Wright D, Safranek S. Treatment of otitis media with perforated tympanic membrane. Am Fam Physician. 2009 Apr 15. 79(8):650, 654.

Thomassin JM, Duchon-Doris JM, Emram B, Rud C, Conciatori J, Vilcoq P. Endoscopic ear surgery: initial evaluation. *Ann*

Otolaryngol Chir Cervicofac. 1990;107(8):564–70.

Thomassin JM, Korchia D, Doris JM. Endoscopic-guided otosurgery in the prevention of residual cholestea tomas. *Laryngoscope.* 1993 Aug;103(8):939–43.