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TO ASSESS THE OUTCOME OF ENDOSCOPIC INTERLAY TYMPANOPLASTY IN TERTIARY CARE CENTER

Otolaryngology

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ABSTRACT

Background: Chronic otitis media is an inflammatory process in middle ear cleft which is treated by a common otological procedure tympanoplasty to reconstruct the tympanic membrane and to restore sound-conducting mechanism. Rigid endoscope in transcanal interlay tympanoplasty has significant advantage as it provides magnified, and wide angle view, with better success rate and postoperative hearing gain. The **Aims and objectives** were to assess the outcome of endoscopic interlay tympanoplasty, in terms of graft uptake, hearing improvement and rate of complications in cases of inactive mucosal chronic suppurative otitis media.

Methods: This prospective study was conducted for 1 year at our institution in 50 patients having conductive hearing loss with dry, central perforation. All patients underwent transcanal endoscopic interlay tympanoplasty and were followed up for 3months to determine the graft uptake, hearing improvement and rate of complications.

Results: Graft uptake rate in the present study was found to be 98% with residual perforation as a complication in 2% patients and no other complications were encountered. Post operatively air bone gap (ABG) after 12 weeks found to be < 20 dB ABG in 84% patients.

Conclusion: Endoscopic interlay tympanoplasty is a effective method with high success rate both in terms of graft uptake as well as post operative hearing improvement and can be implemented in all cases of inactive mucosal COM.

KEYWORDS

Endoscopic Tympanoplasty, Interlay, Air bone gap, Graft uptake

INTRODUCTION:

Chronic otitis media (COM) is persistent inflammation that causes irreversible changes in the mucosa of middle ear and mastoid cavity[1]. Perforation of the tympanic membrane is most commonly the result of chronic ear disease. However, it can also result from various forms of trauma, which includes iatrogenic and direct physical injuries, burns, scalds and pressure effects[2]. Most of these perforations heal spontaneously, whereas the remaining long-standing perforations that lead to recurrent ear discharge need tympanoplasty[3]. Tympanoplasty is a procedure done to repair the defect in the tympanic membrane after eradicating all the disease in the middle ear cleft with or without reconstruction of ossicular chain[4]. It was introduced by Berthold and further developed by Wullstein and Zollner[5]. In literature many surgical techniques of tympanoplasty are described. To name a few most commonly used techniques are underlay, interlay, overlay, sandwich and double breasting techniques [6-8]. In Underlay tympanoplasty, graft is placed below all the three layers. Thus there are chances of residual epithelium, graft medialization and anterior blunting[9]. Interlay technique has many advantages upon the underlay technique, where the graft is kept in between the mucosal and fibrous layers which eventually grow to close the perforation. Thus prevents medialization and lateralization of the graft and also any reduction of the middle ear space. It also decreases operating and healing time, There are very less chances of residual epithelium and anterior blunting and has > 90% graft take up rate[10-12].

Microscopes have been used effectively in otological practice since ages and the use of endoscopes was limited to endonasal and sinus surgeries. However, in recent past, endoscopes were gradually introduced into otological practice, because of better visualization of the hidden areas of middle ear[13].

AIM:

To assess the outcome of endoscopic interlay tympanoplasty.

OBJECTIVES:

To assess the graft uptake rate and hearing improvement by interlay technique. To study complications associated with interlay technique.

MATERIALS & METHODS

This prospective study was conducted on 50 Patients at Sri Siddhartha medical college, Tumkur, from March 2020 to March 2021, with 18–60 years age group, having conductive hearing loss with dry, central perforation for 3 months were included in this study. Ethical clearance was obtained from institutional ethical committee. Patients with Squamosal COM and who were undergoing revision surgeries were excluded from the study. A Proforma was used to collect all the relevant data from the patients with written informed consent. The selected patients were subjected to detailed history taking, clinical examination, audiological tests and other relevant investigations. All of them underwent type I endoscopic tympanoplasty by interlay method using temporalis facia graft and were followed up for 3 months to determine the graft uptake, hearing improvement and rate of complications.

Surgical Technique:

· All the cases underwent surgery under local anesthesia by transcanal approach, using 0-degree rigid endoscopes (outer diameter, 4 mm and length, 18cms) using temporalis fascia, which was harvested by a small 2 cm incision in post aural region. Under endoscopic guidance horizontal incision placed 5mm lateral to annulus covering 3/4th of circumference of external auditory canal and tympanomeatal flap was elevated with superiorly based vascular strip. Once the level of annulus was reached the fibrous annulus was elevated from the tympanic ring and fibro squamous layer alone was separated leaving behind the mucosal layer. Middle ear was then inspected for ossicular continuity, eustachian tube orifice and round window reflex was confirmed. Temporalis fascia graft was placed on the mucosal layer of tympanic membrane under the handle of malleus. Tympanomeatal flap was then repositioned and external auditory canal filled with gelfoam and dressing done .

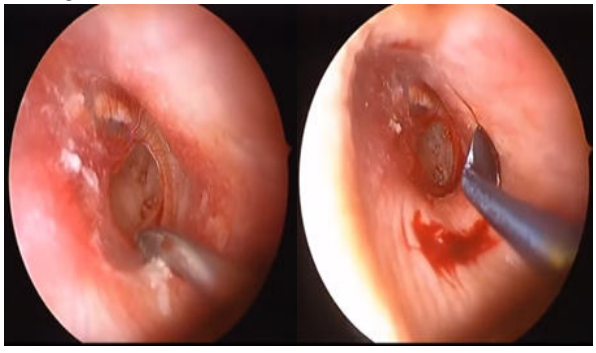

Fig 1: Freshening margins of perforation.

Fig 2: Circumferential incision

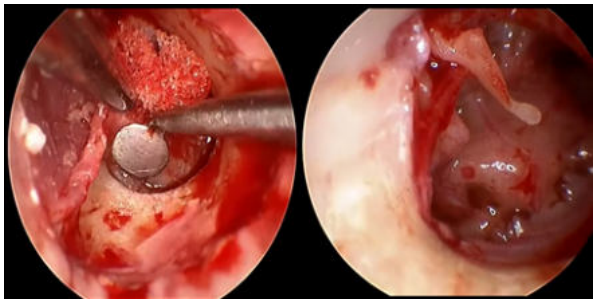

Fig 3: Tympanomeatal Flap Elevation

Fig 4: Middle Ear View After Flap Elevation

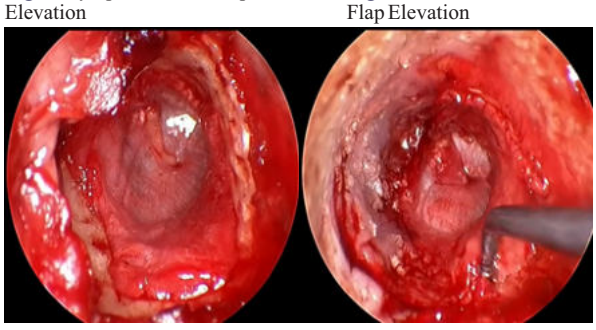

Fig 5: Temporalis Facia Graft Placement.

Fig 6: Tympanomeatal Flap Repositioning

Postoperative Follow-up

All patient were put on systemic antibiotics. After 1-week postoperatively, post aural stitches were removed and were followed up at 2nd , 3rd weeks as well as 2 months, 3 months and underwent endoscopy and audiometry at 3 months postoperatively.

Fig 7: Graft Uptake At The End Of 3 Months

RESULTS:

Age And Gender Distribution:

The present study comprised of total 50 patients of which 24(48%) were male and 26(52%) female. The age of patients ranged from 18 to 60 years, and maximum number of patients were in the age group of 31 to 40 years. Majority of cases were on the left side.

Preoperative And Postoperative PTA:

The preoperative ABG was between 11-20 dB in 10 (20%) patients, 21–30 dB in 26(52%) patients and 31–40 dB in 14(28%) patients.

At the end of 3 months the post operative ABG was reduced to <10 dB in 16(32%) patients, 11- 20 dB in 27(54%) patients and 21-30dB in 5(10%) patients >30dB in 2(4%) (Table 1).

Table 1:

ABG	No.of patients(n) preoperatively	No.of patients(n) postoperative
</=10	0	16(32%)
11-20	10(20%)	27(54%)
21-30	26(52%)	5(10%)
31-40	14(28%)	2(4%)

Graft Uptake Rate:

Post operatively graft accepted in 49(98%) patients while graft rejection was observed in 1(2%) patients at the end of 3 months.

Fig 8. Graft uptake rate

Complications:

1(2%) cases had residual perforation of the tympanic membrane following episode of upper respiratory tract infection .(Table 2)

Table 2: Complications

Complications	Number Of Patients	Percentage
Graft medialisation	0	0
Graft lateralisation	0	0
Graft Perforation/ Rejection	1	2%
Post aural wound infection	0	0
Partial flap necrosis	0	0
Granular myringitis	0	0

DISCUSSION:

In the present study of total 50 patients, 24(48%)male and 26(52%)were female and maximum number of patients were in the age group of 31 to 40 years with majority of cases were on the left side.

In the present study, preoperative air-bone gap (ABG) was 11- 20 dB in 10 (20%) patients, 21–30 dB in 26(52%) patients and 31–40 dB in 14(28%) patients. At the end of 3 months the post operative mean ABG was reduced, the postoperative ABG changing to <10 dB in 16(32%) patients, 11-20 dB in 27(54%) patients and 21-30dB in 5(10%) patients and >30dB in 2(4%) patients.

Singh et al. showed 11–20 dB ABG closure in 63% cases, 21–30 dB ABG closure in 24 % cases and > 30 dB ABG in 13% cases[14].

Lee et al. reported in their study that postoperative ABG <10 dB in 80.4% cases, 10 - 20dB in 13%, 21-30dB in 5.6 %, and >30 dB in 0.9 % cases which was comparable to our study[15].

In the present study, we have recorded a graft uptake rate of 98%, which is slightly higher than the success rate (96%) reported by Guo et al on 53 patients and Patil et al on 100 patients[11,12].

Jain S et al studied 500 cases and reported the success rate of 96.6% which is comparable to our results[7]. Our results were also comparable to Kawatra et al and Komune et al who in their respective studies reported the success rate to be 93.3% and 94.2%[8,10] respectively.

Karhuketo et al studied the endoscopic assisted myringoplasty in 30 ears with different sized perforation and they achieved success rate of 80% and ABG closure of less than 10db in 90% of ears[16].

Furukawa et al studied 25 ears and observed that overall success rate

was 84.0%. The mean preoperative ABG was 15.6 dB which reduced to 5.3 dB post operatively with ABG of <10 dB in 88.0% cases which was comparable to our study[17].

In the present study of 50 patients, complication took place in 1(2%)patient, who developed residual perforation due to acute suppurative otitis media following an episode of upper respiratory tract infection, which was comparable to the studies done by and Lee et al and Mishra et al[15,18].

CONCLUSION:

Endoscopes offer a great technical advantage in performing tympnoplasty with extended view of operative field. Endoscopic transcanal interlay tympanoplsty with superiorly based tympanomeatal flap is an effective technique and has high success rate both in terms of graft uptake as well as post operative hearing improvement. The complications are less as compared to other techniques, also endoscopic approach to middle ear and tympanoplasty has given a new perspective to otologists. It gives a good cosmetic outcome and less postoperative morbidity. Therefore, endoscopic tympanoplasty should be preferred over the conventional microscopic approach and it is a novel and preferred technique, which could be implemented in all cases of dry chronic otitis media.

REFERENCES:

1. Sharma N, Sharma P, Goyal VP, Sharma KG. Interlay versus underlay type 1 tympanoplasty: a comparative study of the techniques in 100 cases. Int J Otorhinolaryngol Head Neck Surg. 2019;5:64-8.
2. Kawatra R, Maheshwari P and Kumar G (2014): A comparative study of the techniques of myringoplasty – Overlay, underlay & interlay. IOSR J Dent Med Sci; 13:12-16.
3. Gladstone HB, Jackler RK and Varav K (1995): Tympanic membrane wound healing. An overview. Otolaryngologic Clinics of North America; 28(5):913-932.
4. Athanasiadis-Sismanis A (2010): Tympanoplasty: tympanic membrane repair. In: Gulya AJ, Minor LB, Poe DS (eds) Glasscock-Shambaugh surgery of the ear, 6th edn. Peoples Medical Publishing House, Shelton, pp 465–488.
5. Berthold E. Overlay myringoplasty. Wier Med Bull. 1878;1:627–627.
6. Shea JJ. Vein Graft Closure Of Eardrum Perforations. J Laryngol Otol. 1960;74(6):358–362.
7. Gupta R, Jain S, Gupta N, Roy A. Interlay Type I tympanoplasty in large central perforations: Analysis of 500 cases. Indian J Otol. 2017;23(1):32–32.
8. Kawatra R, Maheshwari P, Kumar G. A Comparative study of the techniques of Myringoplasty - Overlay Underlay & Interlay. IOSR J Dent Med Sci. 2014;13 (12):12–16.
9. Kartush JM, Michaelides EM, Becvarovski Z, LaRouere MJ. Over-Under Tympanoplasty. Laryngoscope. 2002;112(5):802–807.
10. Komune S, Wakizono S, Hisashi K, Uemura T. Interlay Methodfor Myringoplasty. Auris Nasus Larynx. 1992;19(1):17– 22.
11. Guo M, Huang Y, Wang J. Report of Myringoplasty with interlay method in 53 ears perforation of tympani. Lin Chuang Er Bi Yan Hou Ke Za Zhi. 1999;13(4):147–156.
12. Patil BC, Misale PR, Mane RS, Mohite AA. Outcome of Interlay Grafting in Type 1 Tympanoplasty for Large Central Perforation. Indian J Otolaryngol Head Neck Surg.
13. Prajapati BJ, Patel ND, Rai S. Endoscopic transcanal tympanoplasty: a case series. Int J Otorhinolaryngol Head Neck Surg. 2018;4:717-20.
14. Singh BJ, Sengupta A, Das S, Ghosh D, Basak B (2009) A comparative study of different graft materials used in myringoplasty. Indian J Otolaryngol Head Neck Surg 61:131–134.
15. Lee P, Kelly G, Mills RP (2002) Myringoplasty: does the size of the perforation matter? Clin Otolaryngol Allied Sci 27:331–334.
16. Karhuketo TS, Ilomäki JH, Puhakka HJ. Tympanoscope-Assisted Myringoplasty. ORL. 2001;63:353-8.
17. Furukawa T, Watanabe T, Ito T, Kubota T, kakehata S. Feasibility and advantages of transcanal endoscopic myringoplasty. Otol Neurotol. 2014;35(4):140-5.
18. Mishra P, Sonkhya N, Mathur N (2007) Prospective study of 100 cases of underlay tympanoplasty with superiorly based circum- ferential flap for subtotal perforations. Indian J otolaryngol Head Neck Surg 59:225–228.