



## A COMPARATIVE STUDY OF MICROSCOPIC MYRINGOPLASTY VS ENDOSCOPIC MYRINGOPLASTY IN TUBOTYMPANIC CSOM

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**ABSTRACT** Medical science is an ever evolving field as advent of newer technologies and better technique continues. Chronic suppurative otitis media is a very common middle ear disorder where patient presents with middle ear discharge and hearing loss of varying degree. Myringoplasty or type 1 t-plasty is a very common middle ear surgery performed for CSOM at mostly all centres across the country. Our study compares results and benefits of endoscopic permeal myringoplasty with that of microscopic postaural myringoplasty. In total 40 patients were randomly divided into two groups of 20 each. In the first group endoscope was used for myringoplasty while in second group microscope was used to perform myringoplasty. The graft material in both the cases was temporalis fascia. The preoperative and postoperative audiogram, graft uptake and average time taken was compared in both the cases. In our study success rate was almost equal in both the techniques. In terms of morbidity and post operative recovery endoscopic myringoplasty gave better results.

**KEYWORDS :** Endoscopic Myringoplasty, Microscopic Myringoplasty, CSOM, Permeal, Postaural.

### INTRODUCTION

Ear, nose and throat were considered blind alleys but the introduction of microscope revolutionised ear surgeries. The basic optical properties of microscope remained the same for the last 30 years.

The basic limitation of an optical microscope could not be overcome despite of major technical advancements.<sup>2</sup> The first otoendoscopy was done by Mer and colleagues who introduced middle ear endoscopy in 1967, since then they are increasingly used for middle ear surgeries.<sup>3</sup> Initially, the use of endoscope was restricted to sinonasal surgeries but now the surgeons have extended their surgical horizons to ear, larynx and skull base.<sup>4</sup>

Myringoplasty is conventionally done by either a post aural incision also called Wilde's incision or endaural incision using an operating microscope but with the rigid endoscopes they are done permeal. Other surgeries like tympanoplasty, ossiculoplasty, myringotomy, stapedotomy and grommet insertion can also be done permeal by endoscopic technique.<sup>6,7</sup> Both the techniques have some obvious advantages and disadvantages. It is the need of the hour that a comparative study between endoscopic permeal myringoplasty and postaural microscopic myringoplasty be carried out as there are only a few comparative study available and there is paucity of data on endoscopic myringoplasty. The present study aims to compare both the techniques on the following aspects like hearing gain, time taken, morbidity and hospital stay and outline their advantages and disadvantages.

### MATERIALS AND METHODS

The present comparative study was carried out in our clinical setup between September 2015 and September 2016 on 40 patients. Written and informed consent was taken from all the patients included in our study. 40 patients with central perforation were selected and were randomly divided into two groups of 20 each. All the patients underwent the procedure in local anaesthesia and were operated upon by a single surgeon. First group patients were operated endoscopically while second group patients were operated microscopically. Temporalis fascia was used as graft material in both the cases. Follow up period for our patient was six months ie first follow up after 7 days, then 15 days and thereafter three months and six months. The preoperative and post operative audiograms, graft uptake and time taken was compared in both the groups.

### INCLUSION CRITERIA

- Patients with central perforation with dry ear for atleast 3 months
- Patients with conductive hearing loss less than 40 db

### EXCLUSION CRITERIA

- Wet ear or discharging year (active) or history of atleast 3 months
- Hearing loss more than 40 db

- Previously operated patient with residual perforation
- Patient with sensorineural hearing loss or mixed hearing loss
- Patients with secondary cholesteatoma or middle ear granulation

### SURGICAL PROCEDURE

All the patients underwent surgery under local anaesthesia. The patient is given premedication with 1 ampoule fortwin, phenergan and glycopyrrolate. The external auditory canal is anaesthetised using 2% lignocaine with 1 in 200,000 adrenaline injection. Temporalis fascia graft is extracted and allowed to dry.

In endoscopic myringoplasty, 0 degree 4 mm rigid endoscope was used for surgery. The edges of the perforation are freshened using a sickle knife. A circular knife is used and a curvilinear incision is made from 11 o'clock to 2 o'clock position 5mm away from the annulus in the bony external auditory canal. The tympanomeatal flap is elevated till annulus and middle ear reached. The malleus is bared of any mucosa, the incudostapedial joint mobility is checked and graft is placed over the malleus by overlay technique. The tympanomeatal flap is repositioned and bits of gelfoam is kept over the flap.

In microscopic myringoplasty, a post aural or wilde' s I n00c0 QSDEision is given after local infiltration. The EAC is exposed, the pinna is retracted using a mollisons retractor and then the same steps as in endoscopic t plasty are followed.

All the patients who have undergone endoscopic t plasty are discharged on the same day while patients with microscopic myringoplasty are discharged next day. Antibiotics, analgesics, decongestants are prescribed for a period of 7 days and then recalled for follow up. The follow up period was 1 week, 2 week, 1 month and 3 months.

### RESULTS

In the present study, in the first group ie endoscopic group out of 20 patients, 11 were female and 9 were male. The average age in this group is 26 years. In the microscopic group out of 20 patients, 10 were male and 10 were female. Average age was 28 years. In the endoscopic myringoplasty group after 15 days of surgery ie follow up period of two weeks 14 had intact eardrum and by 1 month after surgery 16 had intact ear drum. After 3 months also the number of patients with intact tympanic membrane was 16 and 4 patients had residual perforation. In the four patients who had failure, all presented with post operative infection and irregular follow up. We did not loose any patient in follow up probably because of better communication facilities and short follow up period. In the microscopic tympanoplasty group after the second week of surgery 13 patients had intact ear drum while after one month of surgery 17 had intact ear drum. At the end of 3 months follow up 17 patients had intact tympanic membrane. 3 patients who had residual perforation developed post operative infections and were

irregular in their follow up. The success rate in first group was 80% while in second group it was 85%.

In the endoscopic myringoplasty group, average pre operative AB gap was 30-35 db in 15 patients and 35-40 db in 5 patients. All the 16 cases of graft uptake had a mean pure tone AB gap of 33.36 db pre operatively. All the 16 patients who had a graft uptake in this group had AB gap of 19.2db. The failures did not show any marked improvement in AB gap.

In the microscopic tympanoplasty group pre operative AB gap was 30-35 db in 12 patients and 35-40 db in 8 patients. All the 17 cases of graft uptake had a mean pure tone AB gap of 34.2db pre operatively and at the end of 3 month follow up had a mean pure tone AB gap of 19.6 db. Hence in both the cases post operative AB gap after 3 months was <20 db.

In the endoscopic myringoplasty, no patient required bony canaloplasty while in the microscopic tympanoplasty 2 patients required bony canaloplasty due to canal wall bulge.

The average time taken for surgery was less in endoscopic group ie 1 hour as compared to microscopic group ie 2 hours.

## DISCUSSION

Rigid endoscope was first developed by Hopkins.<sup>8,9</sup> True rod lens provided wider viewing angle and excellent resolution and brightness.<sup>10</sup> The use of endoscope was initially restricted to nose in ENT, but later on otoendoscopy took over and now it is used both in micro ear and laryngeal surgeries. The result as per graft uptake between endoscopic and microscopic techniques are comparable.

The added advantages of endoscopic myringoplasty are

- It gives an intoto view of the tympanic membrane without the need of manipulation of patients head or the microscope.
- The operative field is wide so viewing of hidden structures like posterior pocket, facial recess and hypotympanum is possible.
- The time duration of surgery is reduced, post operative pain and overall hospital stay is also reduced.

Disadvantage is single handed surgical technique, which makes the manoeuvre at times cumbersome, magnification is limited, there is loss of depth perception and needs proper surgeon training in handling the endoscope.<sup>11,12</sup>

There was no need of canaloplasty in case of canal wall bulge, no post operative scar, lesser operative time and hospital stay. The results after both the procedures are comparable, the graft uptake in endoscopic technique is 80% while in the microscopic group it is 85%. The AB gap closure is 19.2db in the endoscopic group while in the microscopic group it is 19.6db. The above results are consistent with study carried out by Satyawati Mohinder et al in 2008<sup>4</sup>. The study conducted by Ahmed E L Guindy also showed graft uptake of 91.7% by endoscopic group and AB gap was closed to less than 10db. He used endoscope along with the manometer to evaluate the tubal function before ear surgery<sup>8</sup>. As the endoscope brings surgeons eye to the tip of the scope, and whole of tympanic membrane in one frame, there is no need of manipulation of the patients head and meatoplasty can be avoided.<sup>13</sup> Same observations were made by Tarabichi and Usami et al<sup>14,15</sup>

Thus patients undergoing endoscopic tympanoplasty early recovery, less post operative pain and morbidity.<sup>16</sup> Endoscope is also easy to carry and can be used in surgical camps.

Hemostasis is very important while performing endoscopic procedures as blood soils the tip of the endoscope and obscures the vision of the surgeon. Endoscopes provide a monocular vision, hence depth perception is lost so one needs to be extra careful when close to vital structures.<sup>2</sup>

Other comparative studies also showed similar graft uptake results as in table 1

## CONCLUSION

The endoscope is easy to carry, gives a wider view, is easy to negotiate through external auditory canal and gives a magnified view. The permeal access avoids the post auricular scar, the operative time is less and hospital stay is less. Endoscope being portable is easy to carry

in camps. The results of endoscopic and microscopic tympanoplasty are almost comparable with the endoscopic procedure having some clear advantage over the microscopic one so in the long run the endoscopic technique can replace the microscopic one provided the surgeon is well trained to handle the endoscope and its limitations such as monocular vision and lack of depth perception.

**TABLE 1 COMPARISON OF GRAFT UPTAKE IN DIFFERENT COMPARATIVE STUDIES**

STUDIES	GRAFT UPTAKE RATE(%)	
	ENDOSCOPIC TECHNIQUE	MICROSCOPIC TECHNIQUE
PRESENT STUDY	91.67	93.3
RAJ ET AL (5)	90	85
HARUGOP ET AL(1)	82	86
PATEL ET AL(13)	68.18	68.18

## REFERENCES

1. Harugop AS, Mudhol RS, Godhi RA(2008). A comparative study of endoscope assisted myringoplasty and microscope assisted myringoplasty. Indian J Otolaryngol Head Neck Surg 60;290-302
2. Glasscock ME, Shambaugh GE(2003). Tympanoplasty In: Glasscock and Shambaugh, surgery of the ear, 5th edition pp350-370
3. EL Guindy A (1992), Endoscopic transcanal myringoplasty, J Laryngol Otol 106:493-495
4. Mohindra S, Panda NK(2010) Ear Surgery without microscope, is it possible. Indian J Otolaryngol Head and Neck surg 62(2):138-141
5. Raj A, Meher R(2001) Endoscopic transcanal myringoplasty- a study, Indian J Otolaryngol head neck surg 53(1):47-49
6. Kakehata S, Futa K, Sasaki A, Shinkawa H(2006). Endoscopic transtympanic tympanoplasty in the treatment of conductive hearing loss: early results. Otol Neuro 27(1):14-19
7. Buckingham RA(1963) endoscopic otophotography. Laryngoscope 73:71-74
8. EL-Guindy A(1993) Endoscopic transcanal myringoplasty J laryngol Otol 106:493-495
9. Mc Kennan KX (1993) Endoscopic second look mastoidoscopy to rule out residual epitympanic -mastoid cholesteatoma Laryngoscope 103:810-814
10. Kennedy DW (1997) Endoscopic sinus surgery. Otolaryngol Clin N Am 30:313-330
11. Fry TL, Newton DF(1979) Otoscopy and photography. Ann Otolaryngol 88:771-773
12. Konrad HR et al (1979) Paediatric otoscopy and photography of the tympanic membrane. Otolaryngol 105:431-433
13. Patel J Aiyer RG, Gajjar Y, Gupta R, Raval J, Suthar PP (2015) Endoscopic tympanoplasty vs microscopic tympanoplasty in tubotympanic CSOM: a comparative study of 44 cases. Int J Res Med Sci 3(8):1953-57
14. Tarabichi M(1999) Endoscopic middle ear surgery. Ann otol Rhinol Laryngol 108:39-46
15. Usami S, Iijima N, Fujita S et al (2001). Endoscopic assisted myringoplasty. Otorhinolaryngol 63:287-2901
16. Quraishi MS, Jones NS (1995) Daycare myringoplasty using tragal perichondrium. Clin Otolaryngol 20:12-14