



ENDOSCOPIC MYRINGOPLASTY/TYPE 1 TYMPANOPLASTY: A STUDY

KEYWORDS

Myringoplasty, Type 1 Tympanoplasty, Endoscopic, Microscopy.

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ABSTRACT

BACKGROUND : Myringoplasty/Type 1 Tympanoplasty is a commonly performed surgical procedure usually done with microscope. Endoscope is being widely used to perform many ENT surgical procedures and now these are gaining importance in Ear surgeries.

AIM : The present study discusses our experience of Myringoplasty/Type 1 Tympanoplasty using an endoscope.

METHODS AND MATERIAL : In this series 60 cases with CSOM who attended our ENT outpatient clinic were selected. We report the results of these 60 myringoplasties/Type 1 Tympanoplasties performed using endoscope.

RESULTS AND CONCLUSIONS : Our study reveals that results of myringoplasty/Type 1 Tympanoplasty performed using endoscope are more or less similar to that of myringoplasty performed using microscope.

INTRODUCTION

Chronic suppurative otitis media has been traditionally described as a chronic inflammation of part or the entire middle ear cleft comprising of Eustachian tube, the tympanic cavity, the mastoid antrum and all the pneumatized spaces of temporal bone associated with perforation of the tympanic membrane and otorrhoea. Myringoplasty is a surgical procedure performed to close tympanic membrane perforation and Type 1 Tympanoplasty allows to inspect middle ear cavity and clearing any adhesions there. The operating microscope made significant advances in middle ear surgery possible for a period of almost 5 decades, but the drawback was unobservable blind angles in the middle ear cavity and a magnified image along a straight line only. The Endoscope provide magnified image with good resolution and corners of middle ear cavity can be visualized with minimal effort. Even difficult areas in the middle ear cleft like sinus tympani can be visualized better with an endoscope when compared with microscope.

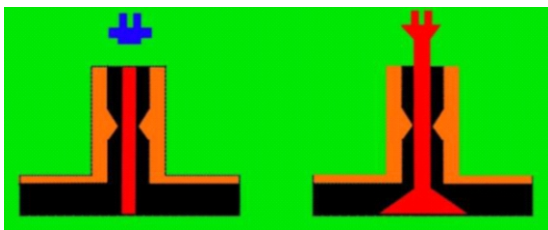


Fig. 1: Showing the Magnified Line of Vision in an Endoscope

MATERIALS AND METHODS

In this series 60 cases with CSOM who attended our ENT Outpatient were selected.

1. A thorough history, clinical examination and investigations were carried out.
2. The patients who were presented with ear discharge were treated for a minimum period of 10 days and surgery was taken up after 6 weeks.
3. Pure-tone audiometry was performed for all these patients preoperatively. All of them had 30–40 dB conductive hearing loss. Post-operatively, pure-tone audiometry is performed 6 weeks after surgery.

Inclusion Criteria

1. Patients aged between 15-50 years of both sexes were included.
2. Patients with CSOM of mucosal type having dry ear for 6 weeks.
3. Patients with demonstrable degree of conductive deafness were chosen (at least 30 dB pure tone average)

Exclusion Criteria

1. Patients with narrow external auditory canal.
2. Patients with other surgical/Medical contraindications.

PROCEDURE

All these patients underwent surgery under local anaesthesia. The patient is premedicated with intramuscular injections of 1 cc Fortwin and 1 cc Phenergan. The external auditory canal is then anaesthetized using 2% xylocaine mixed with 1 in 10,000 adrenaline injection at 3-o clock, 6-o clock, 9-o clock and 12-o clock positions at bony cartilaginous junction. A curvilinear incision of 3 cm given in the supra-auricular region and temporalis fascia graft is harvested and allowed to dry.

Step I

Freshening the margins of perforation – Margins of the perforation is freshened using sickle knife or angled pick al so as to break the adhesions formed between the squamous margin of the ear drum with that of the middle ear mucosa. This is followed by scraping of under surface of the tympanic membrane round the perforation.

Step II

Elevation of tympano-meatal flap. Using a drum knife, a curvilinear incision is made about 4 mm lateral to the annulus. This incision extends between the 1-o clock, 3-o clock and 7-o clock positions in the left ear and 11-o clock, 9-o clock and 5-o clock positions in the right ear. The flap is slowly elevated away from the bone of the external canal up to the level of annulus.

Step III

Elevation of the annulus and incising the middle ear mucosa. The annulus is gradually lifted from its rim. As soon as the annulus is elevated, a sickle knife is used to incise the middle ear mucosal attachment with the tympano-meatal flap at the level of posterior spine just above the chorda, carefully avoiding damage to Chordatympani.

Step IV

Freeing the tympano-meatal flap from the handle of malleus. The tympano-meatal flap is freed from the handle of malleus by sharp dissection of the middle ear mucosa with sickle knife.

Step V

Placement of graft (Underlay technique). A properly dried temporalis fascia graft of appropriate size is introduced through the ear canal. The graft is gently pushed under the tympano-meatal flap, which has been elevated. The graft is kept under the handle of malleus. The

tympo-meatal flap is repositioned in such a way that it covers the free edge of the graft, which has been introduced. Success of myringoplasty/Type 1 tympanoplasty was assessed both subjectively and objectively.

Subjective Indicators Include

1. Hearing improvement.
2. Absence of ear discharge.

Objective Indicators are

1. Otoendoscopic evidence of healed perforation.
2. Improvement in hearing threshold demonstrated by performing pure tone audiometry.

Success rate of endoscopic procedure was compared with that of various studies performed using microscopic approach.

RESULTS

A prospective clinical study with 60 patients undergone endoscopic myringoplasty/type 1 tympanoplasty were undertaken.

1. Age and Sex Distribution

The most common age group with CSOM was 21-30 years. There were 33 (55%) male and 27 (45%) female patients.

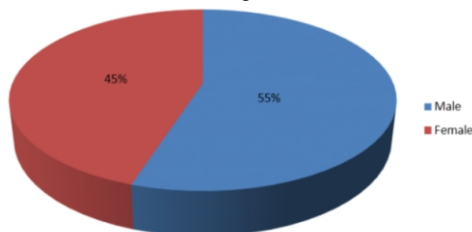


Fig. 2: Showing Sex Distribution

2. Socioeconomic Status

Most of the patients 40 (66%) are from low socioeconomic status.

3. Third Week after Surgery

49 (81.7%) patients out of 60 had intact ear drum.

4. Sixth Week after Surgery

53 (88.3%) patients out of 60 had intact ear drum with dry ear.

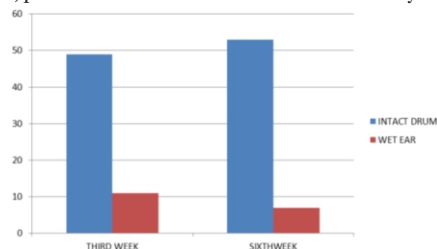


Fig. 3: Graph showing Objective Reports of a Total of 60 Patients who Underwent Endoscopic Myringoplasty/Type 1 Tympanoplasty

5. Hearing Improvement: Preop Audiometry showed

- A. 39 (65%) patients had 30-35 dB hearing loss
- B. 21 (35%) patients had 35-40 dB hearing loss

Post-op Audiometry: 51 (85%) patients after endoscopic Myringoplasty/Type 1 tympanoplasty had a pure tone hearing average of 25-30 dB. In 9 (15%) patients, improvement in air conduction threshold is not seen.

DISCUSSION

Myringoplasty/Type 1 tympanoplasty is defined as repair of tympanic membrane perforation & middle ear adhesions. It is commonly performed surgical procedure done using microscope. Endoscopic ear surgery employs very similar techniques to those of standard

microscopic ear surgery, but with different approach to the middle ear and to middle ear pathology. Endoscopes provide an excellent magnified image with good resolution, which can be achieved by just getting the endoscope closer to the field. With minimal effort, corners and recesses of middle ear can be seen. Endoscopic procedure fulfils the criteria of minimally invasive surgical procedure. Perhaps the greatest disadvantage in this technique is the one-handed nature of endoscopic ear surgery. The endoscope is held in the non-dominant hand, while the opposite hand undertakes the majority of the surgery. But when analyzed, the function of the non-dominant hand during traditional microscopic surgery is usually concerned with holding a suction and removing blood from the operative field, while the dominant hand still undertakes the majority of the delicate surgery. Given that an endoscopic approach is considerably less traumatic than a standard microscopic approach to the middle ear, there is usually far less bleeding and as a result the need for suction is reduced considerably.

This prospective clinical study done on 60 patients undergone endoscopic myringoplasty/Type 1 tympanoplasty. Males had higher preponderance for CSOM, when compared to females. Prominence of males (55%) seen in our study was also supported by Kangsanarak et al (1993), Singh and Maharaj (1993) and Sriyanon et al (1984). However, Shamboul KM (1992) reported predominance of females.

The disease was commonly seen in low and middle socioeconomic groups in 2nd to 3rd decade of life in our study. According to Moustafa et al (2009), patients in the first three decades of life from low socioeconomic group were more commonly associated with complications, but there was no sex preponderance. In our study 49 (81.7%) patients had intact ear drum by third week without ear discharge and by the end of sixth week 53 (88.3%) had healed membrane with dry ear. Post-operatively, 51 (85%) patients had a pure tone hearing average of 25-30 dB by the end of sixth week and in 9 (15%) patients, improvement in air conduction threshold is not seen. Our outcomes fall within the range of successful Myringoplasty/Type 1 tympanoplasty rates done with microscope described in the literature as regards to graft intake (71%-96%), 6,7 and post-operative hearing improvement (72%-97%), 6,8,9

CONCLUSION

We conclude that the results of endoscopic Myringoplasty/Type 1 tympanoplasty are comparable with that of microscopic surgery. Even though the learning curve is a little steep, it is worthwhile exploring this option due to the obvious advantages.

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