



MYRINGOPLASTY: SURGICAL OUTCOME AND HEARING IMPROVEMENT IN TERTIARY CARE HOSPITAL

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ABSTRACT Myringoplasty is one of the commonly performed otologic surgery. Myringoplasty is surgical repair of the tympanic membrane. There are various indications for the myringoplasty, mostly to stop recurrent otorrhea, improve hearing and for social reasons. The aim of our study was to evaluate surgical outcome of myringoplasty in terms of graft uptake and hearing improvement in tertiary care hospital. **METHODS:** It is a prospective observational study conducted in tertiary care hospital from June 2022 to December 2022. All patients underwent underlay myringoplasty under local anesthesia by single surgeon. The preoperative PTA of patients were compared with postoperative PTA. ABG closure was also calculated. Graft take-up was evaluated at 1 and 3 months. **RESULTS:** The 96 patients underwent myringoplasty of which 52% were females and 48% were males with mean age of 39.5 years. The graft uptake rate was 97% and average improvement in AC after surgery was 10dB. The average ABG closure after surgery was 8db at 3 months. **CONCLUSION:** Myringoplasty is a safe otologic surgical procedure which helps the patients to have a dry ear and improve hearing. Myringoplasty have shown high success rate in terms of graft uptake, AC improvement and ABG closure in tertiary care center.

KEYWORDS : Myringoplasty; hearing improvement; graft uptake.

INTRODUCTION:

Myringoplasty is common otologic procedure and refers to surgical repair of the tympanic membrane.¹ There are various reasons for the tympanic membrane perforations like acute otitis media, chronic otitis media, traumatic, iatrogenic (ventilation tube) etc. Patients with central perforation presents to ENT clinic with ear discharge or reduced hearing but sometimes can be asymptomatic. In most patients undergoing myringoplasty, common indications are recurrent otorrhea, hearing loss and social reasons like desire to swim without having to waterproof the ear.² The myringoplasty is considered successful when the graft is taken up, perforation is closed and there is improvement in the hearing.

The aim of this study was to evaluate the surgical outcome in terms of graft uptake and hearing improvement in terms of improvement in air conduction (AC) and closure of air bone gap (ABG) in patients undergoing myringoplasty in tertiary care hospital.

METHODS AND MATERIALS:

It is a prospective observational study conducted in tertiary care hospital in West Bengal from June 2022 to December 2022. A total of 96 patients were included in the study.

Patients above the age of 14 years with dry central perforation (no ear discharge for more than 1 month) with conductive hearing loss were included in the study. Patients with cholesteatoma, ossicular chain erosion, revision cases, who needed mastoidectomy and with sensorineural hearing loss were excluded of the study.

In the study all patients underwent myringoplasty under local anesthesia by single surgeon (except in patients who are apprehensive and in children). The underlay myringoplasty was performed via post-aural approach and temporalis fascia was used as grafting material.

In all patients hearing was assessed with pure tone audiogram (PTA) preoperatively. Both air conduction (AC) and bone conduction (BC) was assessed. Hearing was measured in 0.5, 1, 2, 4kHz. PTA was performed postoperatively at 3 months. The AC improvement or deterioration and closure of air bone gap (ABG) was assessed and noted. The surgery was considered success if the neotympanum is intact at 1 month and 3 months.

RESULTS:

The gender distribution in the 96 patients who underwent myringoplasty was 52% females and 48% males. The mean age was 39.5 years (14-65 years).

The success rate in terms of graft uptake at 3 months in our study was 97% (out of 96 patients 93 had successful graft uptake). The average

preoperative AC on PTA was 30 dB, whereas the postoperative AC on PTA was 20 dB, so the average improvement in AC was 10 dB (which was statistically significant, $p < 0.001$) (Table 1). Hearing deterioration following myringoplasty was not seen in any case in our study. The average preoperative ABG was 20 dB which was improved to 12 dB post operatively. The average ABG closure in our study was 8dB (Table 2).

Table 1: Hearing improvement in AC pure tone audiogram after myringoplasty.

Average preoperative AC	30dB
Average postoperative AC	20dB
Average improvement in AC	10dB

Table 2: ABG closure on pure tone audiogram after successful myringoplasty.

Average preoperative ABG	20dB
Average postoperative ABG	12dB
Average ABG closure	8dB

DISCUSSION:

The term myringoplasty was first used by Berthold, he also described the freshening the margins. In 1950 Wullstein and Zollner used the split skin graft and improved the success rate of myringoplasty. Though the success rate were improved, the skin grafts were associated with high rates of reperforation and cholesteatoma. Various graft materials were described in coming years, more popular amongst them is temporalis fascia (described by Heerman in 1958).

The patients undergo myringoplasty for one or more of the following reasons, recurrent otorrhea, reduced hearing and for social reasons. The success rate in terms of closure of perforation and hearing improvement have improved over years as the understanding, instrumentation and surgical techniques have improved.

The overall closure rate of perforation in our study was 97%. Three patients had reperforation of the graft. The success rate according to Sarkar S et al was 60-99% in adults and was poorer in children at 35-94%. The poor outcomes in children were associated with poor Eustachian tube function and recurrent upper respiratory tract infection.³ In our study, the follow up was for 3 months, as it is reasonable time to resolve postsurgical changes. The study conducted by Nardone et al in 1000 adult patients undergoing myringoplasty showed fall in success rates as time passed. The success rate at 1 year was 85%, which was dropped to 78% at 10 years.⁴

Limitation of our study was shorter follow up period of 3 months. There are various factors which play role in successful reconstruction

of tympanic membrane perforation like age of the patient, size of the perforation, opposite ear status and surgeon experience, which were not taken into account in our study. The average hearing improvement in AC was 10 dB and average ABG closure in our study was 8dB. The outcomes of our study were comparable with other studies. The study conducted in UK by J S Phillips et al showed hearing gain of 9.14dB.⁵ A study conducted by A Pfammatter showed closure of ABG with mean residual ABG of 8dB in 80% of cases.⁶ There was no hearing deterioration following successful myringoplasty in our study. Hearing loss following myringoplasty and its implication for the informed consent was studied by J Bewick et al and found that 3.74% cases had hearing loss of >10dB and 23.53% experienced reduction in hearing threshold.⁷

Myringoplasty has high rates of closure of perforation and hearing improvement in terms of improvement in AC and closure of ABG.

CONCLUSION:

Myringoplasty is a safe and effective surgical procedure, which helps the patients to get rid of recurrent otorrhea and have a dry ear and also improve the hearing. Our study has shown high success rate in terms of graft uptake, closure of perforation and hearing improvement over follow up period of 3 months.

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