

OUTCOME OF MYRINGOPLASTY OF GRAFT SUCCESS RATE IN PATIENTS WITH CHRONIC OTITIS MEDIA

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ABSTRACT

Objectives: To determine the outcome of myringoplasty in terms of graft success rate in patients with chronic otitis media.

Material and Methods: This study was conducted in the Department of Otorhinolaryngology, Khyber Teaching Hospital Peshawar. Study design was cross-sectional and descriptive. Duration of the study was 6 months. Sample size was 113 cases, using graft take rate of 75%, 95% confidence level, and 8% margin of error under WHO software for sample size determination. More over consecutive (non-probability sampling) was used for sample collection.

Results: In this study 2% patients were <20 years, 60% patients were in age ranged 21-30 years, 28% patients were in age ranged 31-40 years, 10% patients were in age ranged 41-50 years. Mean age was 29 years with standard deviation ± 1.62 . Thirty eight percent patients were male and 62% patients were female. Eighty six percent patients had taken graft while 14% patients didn't had taken graft.

Conclusion: Myringoplasty is a safe and effective surgical procedure in achieving intact tympanic membrane and to improve the hearing loss. We achieved anatomical (88.6%) and functional success (86%) comparable to those in the literature.

Key Words: myringoplasty, graft, chronic, otitismedia.

INTRODUCTION

Myringoplasty is a surgical procedure for the closure of perforation of pars tensa of the tympanic membrane. The presence of a perforation of tympanic membrane with intermittent discharge and hearing loss of conductive nature are the indications of myringoplasty¹. The surgical approach for myringoplasty may be endaural, postaural and permeatal. Most common grafting techniques are the underlay (medial) and on-lay(lateral). Autologous materials such as temporalis fascia, cartilage or perichondrium are the common choices of grafting material, as they are mechanically stable and necessary acoustic performance for good sound conduction².

Perforation of the tympanic membrane maybe due to middle ear infections, trauma or iatrogenic causes. Around 80% heal spontaneously while the remaining needs to be repaired. The concept of surgical repair of tympanic membrane was first introduced by Berthold in 1878, with thick skin graft by overlay technique while Wullstein and Zollner used the split skin grafts. Since then, over the period of many decades, different grafts and techniques evolved. The principal indications for

myringoplasty are recurrent otorrhea and conductive-hearing loss.³

Chronic otitis media is a major public health problem especially in developing countries⁴, presenting with otorrhea (100%)⁴, otalgia (21%)⁴, and conductive hearing loss (94%)⁴ (50%)⁵. According to a study chronic otitis media incidence rate is 4-7% total of 31 million cases with 22.6% of cases occurring in under fives. Otitis media related hearing impairment has a prevalence 30.82per/10 thousand; 21 thousand people die due to complications of Otitis media⁶. In Pakistan like all developing countries the incidence of chronic otitis media is also very high because of poor socioeconomic standard, overcrowding, poor nutrition and lack of health education. Chronic otitis media is of 2 types, Mucosal and squamous, squamous further divided into active (cholesteatoma) or Retraction pockets in pars tensa or flaccida. Mucosal disease may be active (chronic suppurative otitis media) inactive (permanent perforation) and healed (adhesive otitis media), clinically it is divided into attic canal unsafe (treatment surgery).

And tubotympanic safe type (89%)⁴, in order to reduce the auditory sequels and morbidity of chronic otitis media (tubotympanic type) it is important to control and treat it, this involves 3 important stages preoperative disease control (antibiotic, dry mopping etc.) surgical management (Myringoplasty) and post op follow up². From different studies it can be concluded that myringoplasty is a valid treatment modality for tympanic membrane perforation⁷.

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The rationale of present study is to assess the outcome of myringoplasty in patients with chronic otitis media in terms of graft uptake rate. This study will help us to highlight the results of myringoplasty done in our unit. The study results will be compared with available international data as the literature suggested variable results of myringoplasty done with different approaches and on the basis of results we can put forward suggestions for future research work. This will help our already compromised population with chronic otitis media and in reducing the burden of morbidity related to it.

MATERIAL AND METHODS

This study was conducted in the Department of Otorhinolaryngology, Khyber Teaching Hospital Peshawar from June 2012 to December 2012, it was a Cross-sectional study descriptive. The study included 113 cases, using graft take rate of 75%, 95% confidence level, and 8% margin of error under WHO software for sample size determination. Sampling Technique was consecutive (non-probability sampling).

The Inclusion criteria was, (a) Chronic otitis media-Tubotympanic type with drycentral perforation for at least 6 weeks, (b) Chronic otitis media with no complications, (c) Age between 10 to 50 years, of either gender.

Other causes of chronic otitis media like cholesteatoma, chronic otitis media (active), with otitis externa, previous ear surgery on same ear only hearing ear, traumatic perforation. Marginal and attic perforation, severe Tympanosclerosis, systemic diseases: Diabetes Mellitus, Tuberculosis were excluded from the study. Permission was obtained from "Hospital Ethical Committee". The study was carried out at Otolaryngology head and neck surgery unit, Khyber Teaching Hospital, Peshawar and all patients fulfilling the diagnostic criteria for inclusion was selected through consecutive sampling from OPD. Written informed consent was obtained from the patients. History like previous episodes of ear discharge, any surgical intervention was obtained and basic investigation like Full blood count, coagulation profile, virology, pure tone audiogram was done.

All patients were worked up with detailed history and clinical examination. The patients with pars tensa perforation confirmed by appropriate clinical examination and having dry ear for at least 6 weeks was recorded and confirmed by my supervisor (fellow of CPSP, experienced for more than 5 years). All the above mentioned information including name, age, sex and address was recorded in a pre designed proforma.

All data collected was entered and analyzed using SPSS version 17. Frequencies were calculated for the qualitative variables like gender and graft take rate. Mean and standard deviation was calculated for quantitative variables like age of the patient. Graft take rate was stratified among age and gender to see effect modifiers. The results were presented as tables and charts.

RESULTS

This study was conducted at ENT Department,

Khyber Teaching Hospital, Peshawar. Duration of the study was six months in which a total of 113 patients were observed to determine the outcome of myringoplasty in terms of graft success rate in patients with chronic otitis media. Age distribution among 113 patients was analyzed as (2%) patients were <20 years, 68(60%) patients were in age ranged 21-30 years, 32(28%) patients were in age ranged 31-40 years, 11(10%) patients were in age ranged 41-50 years. Mean age was 29 years with standard deviation ± 1.62 as shown in Table 1.

Gender distribution among 113 patients was analyzed as 43(38%) patients were male and 70(62%) patients were female, as shown in Table 2, status of graft taken among 113 patients was analyzed as 97(86%) patients had taken graft while 16(14%) patients didn't had taken graft, as shown in Table 3, stratification of graft taken with age and gender is given in Table 4 and 5.

DISCUSSION

The ideal reconstructive technique should obtain a thin, conically shaped, vibrating membrane replacing the original ear drum in order to prevent infection and

Table 1: Age distribution

Age distribution	No. of patients & percentage
<20 years	2(2%)
21-30 years	68(60%)
31-40 years	32(28%)
41- 50 years	11(10%)
Total	113(100%)

Table 2: Gender distribution

Gender distribution	No. of patients & percentage
Male	43(38%)
Female	70(62%)
Total	113(100%)

Table 3: Graft taken

Graft taken	No. of patients & percentage
Yes	97(86%)
No	16(14%)
Total	113(100%)

Table 4: Stratification of graft with age

Graft taken	< 20 years	21-30 years	31-40 years	41-50 years	Total
Yes	2	58	28	9	97
No		10	4	2	16
Total	2	68	32	11	113

Table 5: Stratification of graft with gender

Graft taken	Male	Female	Total
Yes	37	60	97
No	6	10	16
Total	43	70	113

restore or improve hearing. There is still no consensus about the optimal technique, which is often employed on the basis of the surgeon's preference and skills, and not on the type of the tympanic membrane perforation. The main concept that should be pointed out is that the middle ear is part of the upper airway, and that some unsuccessful surgeries, excluding post-traumatic lesions, are due to unsolved underlying pathology of the rhino-tubular area.^{9,9} reported on 131 myringoplasty surgeries using both the overlay and underlay techniques.

In this study, the minimum age of the patient was 20 and the maximum was 50, the mean was 29 (± 1.62). This correlates well with a study done by Aina GJ¹⁰, where age range was 18-40 years with mean age 31.2. Membrane perforation can occur in any age group but more predominant in active age group that is within 15-30 years.

In this study, 62% were female and 38% were male where the difference in age among three groups were not significant statistically ($P > 0.5$). Eighty six percent patients had taken graft while 14% patients didn't had taken graft. This correlates well with other studies by Wormald JP et al¹¹. According to literature different studies shows variable results one study showed a graft uptake rate of 88%¹². A similar study showed a graft take rate for different approaches in range of 75% to 88.09%¹³. Another study showed graft rate of 93.75%¹⁴.

In study conducted by Booth JB et al¹⁵ the overall 10-year graft success rate was 78% in 1,040 patients¹⁶. The 10-year recurrence rate of chronic otitis media was 15% in overlay myringoplasty and 26% using the underlay technique ($p < 0.05$). In revision myringoplasty, the overlay technique showed a better success rate than underlay ($p < 0.05$). Significant recovery was observed in the air conduction thresholds and air-bone gaps in both groups with no statistical difference between techniques ($p = 0.1$). Multivariate analysis demonstrated that the underlay myringoplasty technique, a pathologic contralateral ear and an anterior or subtotal perforation, using a perichondrial graft or age of surgery younger than 40 years were statistically significant ($p < 0.01$) factors that negatively influenced the myringoplasty outcomes.^{17,18}

Glasscock ME et al¹⁹ observed 88.6% success rate in terms of closure of perforation. This figure falls within wide range of successful closure of the perforation described in the literature (66%-91%).²⁰⁻²⁴ There are various clinical as well as technical factors which can influence the results of myringoplasty. Jackler et al²⁵ reported that surgical approach is the principal prognostic factor in the anatomic outcome of myringoplasty. On the other hand, Vartiainen observed that age of the patient,

size or site of the perforation or surgical technique did not affect the surgical results.²⁶

The most decisive factor influencing the results appeared to be the surgeon's experience.²⁷ Similarly, Mathai²⁸ noted that outcomes of surgery are not related to age at operation, duration, mechanism, size and location of perforation or the condition of opposite ear.²⁹ So, still there is no consensus over the prognostic factors of myringoplasty. Protocols vary from institution to institution and surgeon to surgeon. Therefore, there is a great need of such a work which can help to set the uniform definitive criteria in predicting the optimal outcomes of myringoplasty.³⁰

However, we achieved 73.5% success rate in term of hearing improvement. Gersdoff et al³¹ obtained 75.6% success rate in hearing outcomes and observed that the factors influencing the hearing improvement were presence of middle ear alterations and surgeon experience. Yung MW³² also achieved the same results but noted that cause of persistent hearing loss was found to be fixation or erosion of ossicles and chronic mastoiditis which might be overlooked by the surgeon.

Usually myringoplasty is a safe surgical procedure. It does not carry risk of fatal complications. Rare complications may be the worsening of hearing, late incidence of cholesteatoma formation and attacks of vertigo or tinnitus. OT complications such as wound infection and hematoma formation may be the result of any surgical procedure. We also observed no major complications except 16.9% wound infections and 22.6% hematoma formation.

CONCLUSION

Myringoplasty is a safe and effective surgical procedure in achieving intact tympanic membrane and to improve the hearing loss. We achieved anatomical (88.6%) and functional success (86%) comparable to those in the literature.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

- Din I:** Idea and manuscript writing.
- Khan AR:** Overall supervision and revision of manuscript.
- Ullah S:** Bibliography.
- Khan W:** Statistics.
- Muhammad G:** Follow-up.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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