

Original Research Article

Myringoplasty using temporalis fascia and its clinical outcome

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ABSTRACT

Background: Chronic suppurative otitis media is one of the common otological conditions in India for which patients seek advice from an otorhinolaryngologist. Various surgical modalities of treatment have been tried since ages, to eliminate the disease from middle ear cleft, with varying degrees of success rate. One such modality of treatment is myringoplasty. The aim of the present study was to assess the success rate of myringoplasty using temporalis fascia and to evaluate preoperative and postoperative hearing loss in patients with chronic suppurative otitis media.

Methods: Sixty adult cases of tympanic membrane perforation were included in the study. Myringoplasty was performed in all cases and hearing loss was compared both before and after surgery.

Results: Preoperatively 20 cases showed hearing loss at 16-25 dB, 26 cases at 26-40 dB, and 14 cases showed hearing loss at >40 dB. Graft uptake was successful in 50 patients (83.33%). Postoperatively definitive improvement of hearing was observed in 46 patients. The success rate of surgery in cases of dry ear with more than 6 months was 100%.

Conclusions: Outcome of myringoplasty does not depend on sex and site of perforation. Dry ear of duration greater than 6 months is a favourable prerequisite. Graft take up was impaired in cases of sclerotic mastoid and postoperative infection.

Keywords: Hearing loss, Myringoplasty, Perforation, Temporalis fascia, Tympanic membrane

INTRODUCTION

The term myringoplasty was introduced in 1878 by Berthhold, who successfully closed a perforation with full thickness skin graft.¹ There are different kinds of grafts available like autograft, homograft and heterograft. Various materials have been used in combination with a wide variety of surgical procedures in an effort to restore both the structure and function of tympanic membrane.² Grafts from mucous membrane, conjunctiva, fascia, vein, perichondrium, fat and connective tissue are used in myringoplasty.³ These procedures helped in improving hearing, but did not close the perforation. This prompted to develop a different method of repair, wherein epithelialization of perforated tympanic membrane was

promoted by Roosa using silver nitrate bead for cauterization of edge of tympanic membrane and Okuneff used trichloroacetic acid.^{4,5} House then advised full thickness graft taken from an area behind the ear. Because of poor success rate, the predilection to infection and development of flap cholesteatoma (epithelial cysts originating from hair follicles and glands in the graft) its use has been largely abandoned. Mesodermal grafts have low metabolic rate.⁶ They serve only as a super structure or scaffolding for growth of epithelium from adjacent ear canal wall and therefore form only a part of the membrane.⁷ The connective tissue graft is used to replace the missing fibrous elements of the drum and the squamous layer and the mucosa are allowed to regenerate over it. The rapidly growing squamous layer, carries

blood supply to the graft, during which time it is able to survive by tissue perfusion. The use of fresh autograft connective tissue such as vein or fascia avoids complications of storage and offers a greater degree of success.⁸ Temporalis fascia is the preferred autologous fascia because it has low metabolic rate, and good survival prospects and easy accessibility. No material has been shown to be superior in take up rate, to temporalis fascia which requires no assistance in its preliminary preparation and is considered by most surgeons to be the material of choice for myringoplasty.⁹

The present study aims to assess the success rate of myringoplasty using temporalis fascia and to evaluate preoperative and postoperative hearing loss in patients with chronic suppurative otitis media (CSOM).

METHODS

After obtaining ethical clearance, sixty adult cases of tympanic membrane perforation were taken up for the study. The cases were randomly selected from those attending outpatient Department of ORL of MGM Medical College and Lions Seva Kendra Hospital in Kishanganj District of Bihar during the period from July 2016 to June 2018. Patients of age group between 18-60 years of age with CSOM tubotympanic disease and with indications of dry ear of four weeks were included in the study. Patients of age less than 18 years or more than 60 years, unwilling to participate in the study and with perforation in only hearing ear and presence of cholesteatoma were excluded from the study.

Complete details of the patients were collected in the predesigned proforma. All the cases underwent myringoplasty using temporalis fascia and were assessed for hearing loss both before and after myringoplasty.

The collected data was tabulated and analysed using Microsoft Excel and presented in number and percentages.

RESULTS

Sixty adult cases of either sex underwent myringoplasty in this study. The age of the patients varied from 18 years to 47 years. Majority of them belongs to 18-27 years (43%). Females (60%) are more affected than males (40%) (Table 1).

Clinical findings were tabulated in Table 2. 44 patients had dry ear for a period of 1-6 months and 16 patients had dry ear for more than 6 months. Large perforation of tympanic membrane was noticed in 4 cases. Mixed damage of tympanic membrane perforation was seen in 8 cases. Mastoid cells were fully pneumatised in 20 cases and sclerotic type was noticed in 40 cases. In the study, tympanic membrane damage was small and medium in each 24 cases respectively.

Table 1: Demographic distribution of patients (n=60).

Demography	No. of patients	Percentage (%)
Age group (years)		
18-27	26	43
28-37	24	40
38-47	10	17
48-60	00	00
Sex		
Female	36	60
Male	24	40
Socioeconomic status		
Low	42	70
High	18	30

Table 2: Clinical findings in study participants (n=60).

Clinical characteristics	No. of cases	Percentage (%)
Period of dry ear		
<1 month	0	0
1-6 months	44	73.26
>6 months	16	26.74
Size tympanic membrane perforation		
Small	24	40
Medium	24	40
Large	4	6.67
Subtotal	8	13.33
Radiological findings		
Pneumatic	20	33.33
Sclerotic	40	66.67
Diploic	0	0
Preoperative hearing loss in decibels (dB)		
16-25	20	33.33
26-40	26	43.34
>40	14	23.33

In our study, hearing loss was estimated by pure tone average audiometry. 20 cases showed hearing loss at 16-25 dB, 26 cases at 26-40 dB, and 14 cases showed hearing loss at >40 dB.

Table 3: Postoperative hearing gain by pure tone average (n=60).

Hearing gain in decibels (dB)	No. of cases
<10	4
10-20	30
>20	12

After myringoplasty using temporal fascia as a graft, hearing assessment was done again postoperatively (Table 3). Definite improvement of hearing was observed in 46 patients. Four patients had an improvement of hearing at <10 dB. Thirty patients had hearing improvement at 10-20 dB and 12 patients had improvement at >20 dB.

Graft uptake was successful in 50 cases. Success rate of the surgery in terms of dry ear and radiology finding was presented in Table 4. The success rate of surgery in cases of dry ear with more than 6 months was 100% and 77% in cases with dry ear between 1-6 months. Radiologically the success rate of surgery was 100% in all pneumatic cases and 75% in sclerotic cases.

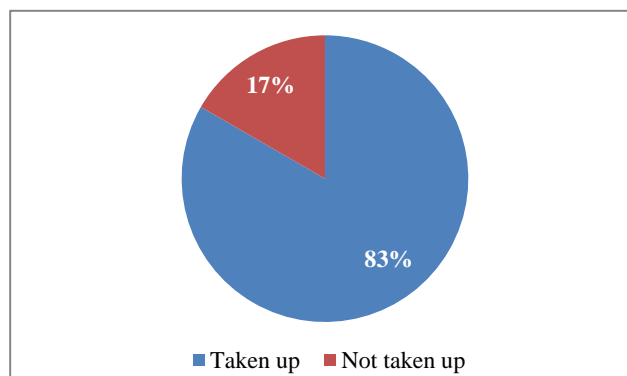


Figure 1: Status of graft uptake (n=60).

Table 4: Success rate of myringoplasty in study participants.

Observations	Success rate (%)
Radiological findings	
Pneumatic	100
Sclerotic	75
Diploic	0
Period of dry ear	
<1 month	0
1-6 months	77
>6 months	100

DISCUSSION

The present study was carried out in the Department of ORL, MGM Medical College AND L. S. K Hospital, Kishanganj, during the period between July 2016 to June 2018. In our study of 60 cases, the age of patient varied between 18 and 46 years. In our present study of 60 cases, we had 36 females and 24 males who underwent myringoplasty, with male to female ratio of 1:1.5, which is in contrast to previous studies Caye Thomasen (2007), in which male to female ratio was 1:0.36. Mathai in his study of 200 cases, the male to female ratio was 1:0.85.¹⁰

Browning et al states that there is a close relationship of chronic otitis media and low socio-economic group.¹¹ Higher incidence is because of poor general health, malnutrition and overcrowding. In the present study of 60 cases, 42 cases (70%) belonged to low income group. Low income group in our country is associated with ignorance and illiteracy, and the thus there is more prevalence of chronic otitis media in this group.¹²

In this study all the 60 underwent postauricular underlay temporalis fascia grafting, in which the graft take up was seen in 50 cases (83.33%). There were 10 cases of graft failure, and the most common cause for failure was post-operative infection, which was seen in 6 cases and 4 cases failed due to faulty technique. The reason behind the graft failure was similar to the findings of Glasscock et al.¹³

Postoperative hearing assessment was done all the cases. Definitive improvement of hearing was seen in 46 cases in the range of 10 to 20 dB. This was similar to the observations of Mathai et al.¹⁰

The success rate of myringoplasty depends on the duration of dry ear. In our study 100% success rate was seen in all cases with dry ear of more than 6 months. This was in corroboration with the findings of Fadi et al and Sharma et al in which the success rate was 84.6% and 85.72% respectively.^{14,15}

CONCLUSION

Findings of the study conclude that a dry ear of more than six months is favourable and has a better graft take up rate. Site of perforation does not have any effect on graft take up. Sclerotic mastoid inhibits graft take up. Postoperative infection and faulty surgical technique are might be the common reasons of graft failure. After discharging the case, a weekly follow up of three months is recommended along with maintenance of hygiene.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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