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Hearing Outcome Following Myringoplasty for CSOM: A Study of 60 Patients

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ABSTRACT

Introduction: The purpose of this study was to evaluate hearing outcome using temporalis graft in Tympanoplasty Type I for CSOM using Post aural approach.
Method: It included 60 patients with chronic suppurative otitis media (tubotympanic type) requiring only tympanic membrane repair with no ossicular reconstruction. Patients were assessed after 3 & 6 months for graft take and hearing evaluation.
Result: In our study of 60 cases, AB Gap closure of 16.04±6.40 dB & average air conduction improvement was 16.60±5.76 dB after 6 months of surgery.
Conclusion: Myringoplasty using temporalis fascia as graft done by postaural approach is an easy technique which gives a good improvement in hearing.

Key words: Myringoplasty, Tympanoplasty, CSOM, Hearing outcome.

INTRODUCTION

In early centuries, ear infection with complication was a life threatening condition. The introduction of antibiotics and use of operative microscope in surgical field were revolutionary advances in the control of disease. Chronic suppurative otitis media (CSOM) is still a major problem in our country. Tympanic membrane(TM) perforations lead to recurrent ear infections and hearing loss. [1]

Repair of tympanic membrane perforation was attempted since many years. Different techniques and different graft materials like temporal fascia, duramater and tragal perichondrium were used, [2] most accepted of which is the temporalis fascia, because of its qualities of low metabolic rate, requiring lesser blood supply and is more resistant to infection. [3]

Myringoplasty is an operation in which the reconstructive procedure is limited to repair of tympanic membrane perforation assuming that middle ear ossicles are functioning normally, Eustachian tube is patent and patient has a good cochlear reserve.

This study analysed hearing outcome using temporalis graft in myringoplasty for CSOM using Post aural approach.

MATERIALS & METHODS

This prospective study was conducted on 60 patients admitted with diagnosis of CSOM (tubotympanic type) who underwent myringoplasty using underlay temporal fascia graft by postaural approach for a period of 2 years (1.1.2014 to 31.12 2015).

Patients with chronic suppurative otitis media (CSOM) with tubotympanic type disease with dry ear (inactive) for more than 1 month, age more than 10yrs, only conductive hearing loss, no previous history of ear surgery were included for study. Patients having wet ear, mixed hearing loss, tympanosclerosis and ossicular chain disorder, cholesteatoma (atticoantral type of CSOM) or systemic disease like Diabetes mellitus, hypertension, tuberculosis etc. were excluded from study . Patients with history of nasal allergy, other nasal diseases, throat problems were appropriately treated before taking for ear surgery.

A detailed study of each patient including history, clinical examination, audiological evaluation using Pure Tone Audiometry (PTA), radiological examination (X-ray mastoid) and routine investigations were done.

Myringoplasty was done using temporalis fascia by post aural approach under general anesthesia. Postoperatively the patients were discharged on 4nd-5rd post-operative day. Systemic antibiotics and antihistaminics were routinely administered for 7 days. Analgesics were prescribed symptomatically. A decongested nasal drops was prescribed for 2-3 weeks. Meatal pack was removed after 3 weeks, neodrum was inspected, and patients were told to follow-up regularly at weekly intervals to note the uptake of graft for 3 months and 6 months. Surgical outcome of myringoplasty was measured on the basis of the condition of the graft taken or failure. Hearing improvement was assessed by closure of air -bone gap and Air threshold gain.

Data were analyzed using the chi-squared test and t-test on a statistical package (version 16.0; SPSS). A $P<0.05$ was the level of significance.

RESULTS

In our study out of 60 cases, 32 patients were male and 28 were female with age group varying between 12 to 50 years. The mean age of patients was 23.85 years. Incidence of bilateral ear discharge was seen in 20 cases of the cases. In patients with bilateral disease, the ear with more hearing loss and extensive disease was operated first. Unilateral ear discharge was present in 40 cases out of which, it was right ear in 28 cases & it was in left ear in 12 cases.

Our study showed an overall success rate of 90 % as far as the graft take was concerned, i.e. out of 60 cases, in 54 cases the perforation was closed on examination at the interval 6 months.

Table 1: Air Conduction Threshold level pre operative and post operative at 3rd & 6th months

Air conduction Threshold levels (in dB)	Pre Operative (no. of patients)	Post Operative (no. of patients)	
		(at 3rd Months)	(at 6th month)
0 – 25	0	23	51 (85%)
26 – 40	42 (70%)	37	9 (15%)
41 – 55	18 (30%)	0	0
Mean	39.16	26.77	22.55

In our study, preoperatively 42 patients had mild deafness (26-40 dB) and 18 patients had moderate deafness (16-25 dB). After 6th month of follow up post operatively, 85% cases were shifted to the 0-25 dB of hearing while 15% cases had 26- 40 dB (mild deafness).

Table 2 : Hearing gain

Air Thresholds level	Mean dB (n = 60)	P value
Pre Operative	39.16±2.82	<0.0001
Post Operative 3 months	26.77±3.48	
Post Operative 6 months	22.55±5.08	
Mean Air threshold level gain (3rd months)	12.38±3.86	
Mean Air threshold level gain (6th months)	16.60±5.76	

In our study, average pre-operative Air threshold in 60 cases of CSOM was 39.16±2.82 dB. Postoperatively, at 3th month and 6th month of surgery average Air threshold in 60 cases was 26.77±3.48 dB and 22.55±5.08 dB respectively. Hence, postoperatively at 6 month of surgery an average Air- thresholds gain of 16.60±5.76 dB was observed, which is significant.

Table 3 : Mean Air – Bone closure

Air Bone Gap	Mean dB (n=60)	P value
Pre Operative	28.24±3.58	<0.0001
Post Operative 3 months	16.44±3.83	
Post Operative 6 months	12.00±5.56	
Air- Bone closure (3rd Month)	11.82±4.93	
Air- Bone closure (6th Month)	16.04±6.40	

In our study average pre-operative Air-Bone gap in 60 cases of CSOM was 28.24±3.58 dB. Postoperatively, at 3th month and 6th month of surgery average Air- Bone gap in 60 cases was 16.44±3.83 dB and 12.00±5.56 dB respectively. Hence,

postoperatively at 6 month of surgery an average Air- Bone closure of 16.04±6.40 dB was observed, which is significant.

DISCUSSION

Myringoplasty is a simple, easy otologic surgery with good overall outcome. This procedure is done to prevent recurrent infection of the middle ear & to improve hearing.

Many studies have been carried out in the past regarding the success rates following type-I tympanoplasty utilizing temporalis fascia with underlay technique. The quoted success rate in various studies ranges from 80 to 95%. [4-7] Regarding anatomical outcome our graft uptake rate, with complete closure and healing of the tympanic membrane was 90%.

About the assessment of hearing various criteria have been used by different authors like closure of air-bone gap, improvement in hearing to socially adequate level, etc. Most of the authors consider that, the improvement in hearing by air conduction to 30 dB or closure of air-bone gap to within 20 dB or less as successful result.

In our study, we have used Air threshold gain and AB gap closure as a measurement of hearing improvement. Postoperatively at 6 month of surgery an average Air- thresholds gain of 16.60 ±5.76 dB & average Air- Bone closure of 16.04 ±6.40 dB was observed, which is significant. Meyer AG et al showed improvement in hearing (closure of air-bone gap to within 10 dB) in 84.9% cases of the underlay group. [8] Prasnsuk S et al. [9] in their study of 26 cases, noted that the mean preoperative pure tone average to be 20.1 dB, the mean postoperative pure tone average of 11.5 dB and thus the mean hearing gain of 8.6 dB. Yung MW et al. [10] in their study of 193 cases of Tympanoplasty, the mean pre operative while the mean postoperative air conduction average was 25 dB, thus average air conduction improvement was 10 dB.

CONCLUSION

Myringoplasty using temporalis fascia as graft done by postaural approach is an easy technique which gives a good improvement in hearing.

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