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COMPARATIVE STUDY OF FAT VERSUS TRAGAL PERICHONDRIUM IN SMALL CENTRAL PERFORATION OF THE TYMPANIC MEMBRANE

Otorhinolaryngology

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ABSTRACT

Aim: To compare the outcome of graft uptake and hearing status of the patient with a small central tympanic membrane perforation undergoing myringoplasty under local anaesthesia (LA). **Methodology:** The study was conducted on 30 patients with small central perforation either due to trauma or chronic suppurate otitis media, safe type. The sample was divided into two equal groups. Each group consists of 15 patients, in Group A fat from ear lobule was used as graft and Group B where tragal perichondrium was used as graft. The operation was performed under LA after taking informed consent from the patients. Post-operative follow-up was done at 1 and 3 months. **Results:** Out of the 15 patients in group A, 14 patients had successful graft uptake and 1 patient was unsuccessful i.e. 93% success rate. Out of the 15 patients in group B, all patients had successful graft uptake i.e. 100%. In the assessment of hearing improvement, the mean hearing improvement in group A and group B was 8.2db and 12.7db respectively. **Conclusion:** In our study, we see that both the graft materials provided good results. However, tragal perichondrium was better in terms of graft uptake and hearing gain. However the ease of surgery was better in fat graft.

KEYWORDS

Myringoplasty, Fat, Tragal perichondrium.

INTRODUCTION

Tympanic membrane (TM) perforations, even if they are small in size can result in middle ear infections and hearing loss in the long-term. Entry of water into the ear should be restricted for patients with TM perforation. Myringoplasty, a surgical procedure, is used to treat TM perforation. A graft is positioned to serve as a scaffold for the growth of epithelium. Myringoplasty surgery is mostly done to stop recurrent middle ear cavity infection. There may also be improvement in hearing. Different tissue grafts are used for this purpose like temporalis muscle fascia, cartilage, cartilage- perichondrium composite, perichondrium, fat and venous graft.[1] Specifically, fat grafts and tragal perichondrium were used in this study. Ringenberg was the first one who reported the use of fat as a graft in tympanoplasty. Success rate of repairing of the perforation ranged between 76 and 100% reported by a lot of study.[2] In patients with long-standing, dry, small central TM perforations, this study compares the outcomes of fat and tragal perichondrium myringoplasties.

AIM

a) To compare the outcome of graft uptake between tragal perichondrium and fat graft in small central TM perforation

b) To asses the hearing improvement of the patient after surgery

MATERIALS AND METHODS

Between June and November 2022, a prospective study was carried out. Patients were carefully selected for the trial based on the following criteria: a small, dry, central TM perforation; present for at least 6 months; and no ossicular or mastoid disease. Trauma or chronic suppurative otitis media (CSOM) (safe type) were the cause of the TM perforation. Examination under microscope and Pure Tone Audiometry was done in all the cases before putting for myringoplasty. The study did not include patients with sensorineural hearing loss or mixed hearing loss.30 patients in total were enrolled in the trial. The patients were equally divided into two groups: group A, which included 15 patients for fat myringoplasty, and group b, which included 15 patients for tragal perichondrium myringoplasty. Following a discussion of the available alternatives, all patients provided their informed consent after being fully informed about the treatment procedure. Myringoplasty was carried out in all the cases by a transcanal approach under local anaesthetics (LA).

Microscopic examination, otoscopy and pure-tone audiometry(PTA) were used to study the healing of perforation, hearing improvement, and complications. After one month and again after three months following surgery, post-operative audiometric evaluations were conducted. Thereafter, the patients were advised to come for follow up at three-month intervals. The patients were instructed to keep their ears dry. The following three weeks postoperatively anti-histaminic were continued.

Inclusion Criteria:

a) Small, central, dry perforation.
b) Perforation present for at least 6 months.
c) Conductive Hearing Loss in Pure Tone Audiometry

Exclusion Criteria:

a) Ossicular or mastoid pathology.
b) Patients with mixed hearing loss or sensorineural hearing loss.

RESULTS AND OBSERVATION:

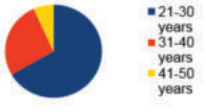
Age Distribution:

The study was carried out in 30 patients with age range from 21- 50 years

Table 1: Age Distribution Of Patients

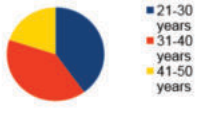
Age	Group A	Group B
	Number of cases	Number of cases
21-30	10	6
31-40	4	6
41-50	1	3

Figure



1: Age distribution of patients in Group A

Figure



2: Age distribution of patients in Group B

Sex Distribution:

Table 2: Sex Distribution Of Patients

Sex	Group A	Group B
Male	5	6
Female	10	9

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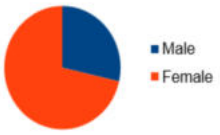
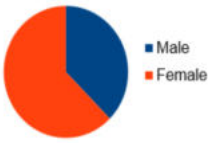


3: Sex distribution of patients in Group A

Figure



4: Sex distribution of patients in group B

Socioeconomic Status Distribution:

Table 3: Socio-ecomonic Status Distribution Of Patients

Socio- economic status	Group A	Group B
Upper	-	-
Upper Middle	-	-
Lower Middle	4	5
Upper Lower	-	-
Lower	11	10

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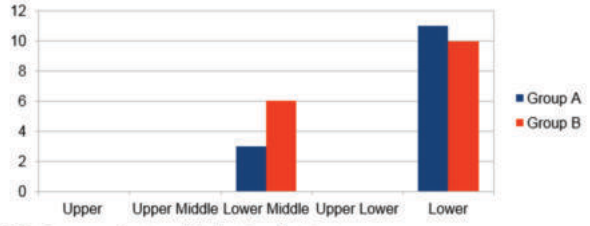


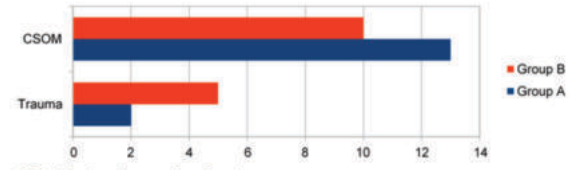
5: Socioeconomic status distribution of patients

Cause Of TM Perforation:

Table 4: Cause Of Tympanic Membrane Perforation

Mode of Perforation	Group A	Group B
Trauma	2	5
CSOM (safe type)	13	10

Figure



1: Distribution of cause of perforation

Side Of Involvement:

Table 5: Distribution Of Side Involvement

Side	Group A	Group B
Right	8	8
Left	6	7
Bilateral	1	0

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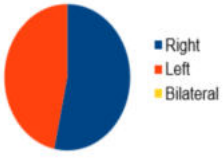
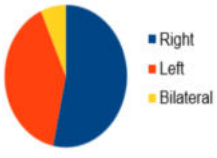


7: Distribution of side of involvement in Group B

Figure



8: Distribution of side of involvement in Group A

Pre-op Conductive Hearing Loss:

Table 6: Degree Of Hearing Loss In Patients

Degree	Group A	Group B
Mild	14	14
Moderate	1	1
Moderately Severe	-	-
Profound	-	-
Total	-	-

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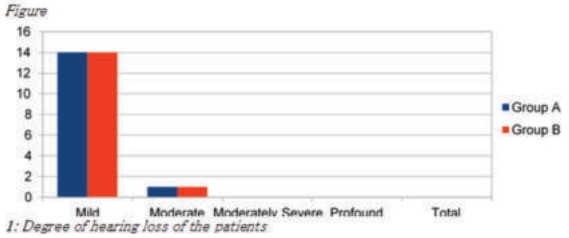


1: Degree of hearing loss of the patients

Graft Uptake:

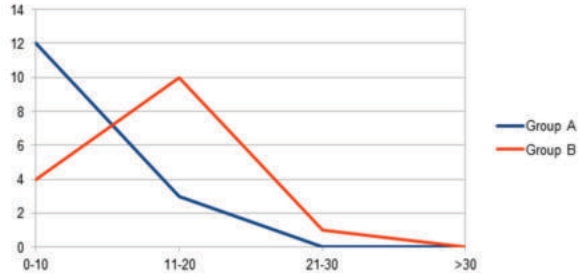
Table 7: Uptake Of Grafts In Patients

Graft uptake	Group A	Group B
Yes (intact)	14	15
No (perforated)	1	-

Air Bone Gap:

Table 8: Air Bone Gap Of The Patients

	Group A			Group B		
Hearing level (in dB)	Pre-OP AB gap	Post-OP AB gap	AB gap closure	Pre-OP AB gap	Post-OP AB gap	AB gap closure
0-10	-	2	12	-	3	4
11-20	1	3	3	1	10	10
21-30	5	7	-	7	2	1
>30	9	3	-	7	-	-



Out of the 15 patients in group A, 14 patients had successful graft uptake and 1 patient was unsuccessful i.e. 93% success rate. In group B, all had successful graft uptake i.e. 100%

In the assessment of hearing improvement, the mean hearing improvement in group A and group B was 8.2 dB and 12.7db respectively.

DISCUSSION

Tympanic membrane perforations can be repaired with the quick and uncomplicated myringoplasty technique. However, there is a lot of variation worldwide in both surgical technique and its results. In patients early timely myringoplasty had good chances of restoring function with the potential for reducing further complications and deterioration.[4]

In our study, the average age of the patients was 31.6 years, with a predominance of females constituting about 66.67%. In 76.67% of case the cause of perforation was infective where as in 23.33% it was due to trauma. In a study by Balaguer García R. et al.[7] otorrhea was the cause of perforation in 97.3%, and 6.3% was tympanic trauma. Nanda. et al. [9] 24 patients (60%) had history of infection chronic suppurative otitis media whereas remaining 16 patients (40%) had traumatic etiology.

In our study we use fat and tragal perichondrium grafts as they are easy to harvest and have a minimal visible scar hence better cosmetic results. We observed that both the graft materials provided good results with 93% successful graft uptake in group A(fat graft) and 100% successful graft uptake in group B(tragal perichondrium graft). Similar studies by Kanotra S. et al.[6] showed graft uptake of 93.3% in butterfly cartilage graft myringoplasty and 83.3% uptake of fat graft myringoplasty. In a study by Alvarez S. J. et al.[8] In their study found graft uptake in 60% cases to be good and 40% cases to ba regular using fat graft. Using tragal perichondrium 75 % cases had good results, 18.75% had regular results.

The mean hearing improvement observed in group A and group B was 8.2db and 12.7db respectively. Similar results were seen in studies by Dursun, E. *et al.*[3] in which the hearing improvement was 8.4 dB (2.15

dB) and 10.2 dB (2.03 dB) in the fat and perichondrium group respectively.

No serious complication was encountered in the present study.

CONCLUSION

In our study, we see that both the graft materials provided good results. The procedure performed is simple can be done under local anaesthesia with promising results. It can be done on an out patient basis. The grafts can be harvested easily with minimal scar to the patient hence better cosmetically. In our study, tragal perichondrium was better in terms of graft uptake and hearing gain. However the ease of surgery was better in fat graft.

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