

Effect of Common Comorbidities on the Success Rate of Myringoplasty

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Abstract

Objective: The aim of the study was to study the effect of common comorbidities on the success rate of myringoplasty.

Materials and Methods: A retrospective evaluation of the 40 patients who have undergone myringoplasty for different sizes of central perforation with pure conductive hearing loss of <60 dB were done. Both males and females of age 15–60 years were included in the study. The comorbidities studied were hypertension, diabetes and nasal allergy. Temporalis fascia was used as the graft and grafting was done by underlay technique. Patients were followed up for 6 months. The influence of various comorbidities was assessed by comparing the rates of graft take up and graft retraction.

Results: Among the 40 patients we selected, the majority were in the age group of 30–45 years. We had 7 (17.5%) patients with diabetes mellitus and during the follow-up at 6 months, 28.6% of failure and 14.3% of retractions were observed. (significance?) Among the 9 (22.5%) patients who were hypertensives, we did not find any graft failure. 17 (42.5%) patients had a nasal allergy. We found failures in 23.5% by 6th month and retractions in 17.6%. *P* value was calculated and was found to be statistically not significant.

Key words: Myringoplasty, Allergic rhinitis, Chronic otitis media, Hearing loss

INTRODUCTION

Chronic otitis media are the inflammation of the middle ear cavity that causes permanent damage to the tympanic membrane such as perforation, tympanosclerosis, atelectasis, and retraction pocket. It results either from eustachian tube dysfunction with poor aeration of middle ear space or can be from trauma to tympanic membrane. Eustachian tube dysfunction causes recurrent episodes of acute otitis media which leads to a persistent middle ear infection or chronic inflammations.^[1]

Perforation of pars tensa causes hearing loss of varying degrees. It depends on the involvement of the different

quadrants of the tympanic membrane, and the size of perforation varies from the small, medium, large, and subtotal perforation. Hearing loss caused by the tympanic membrane perforation can be up to 60 dB.^[2]

The perforation can be corrected by a surgical procedure which aims in the repair of the tympanic membrane perforation. This surgical procedure is called Type 1 tympanoplasty or myringoplasty. Myringoplasty aims at the repair of the perforation, improvement of hearing and protects the middle ear and inner ear from external factors such as pathogens or water entry or increased air pressure. The routinely used method of closure is using temporalis fascia, and the surgical technique of grafting is by underlay or overlay technique.^[2-7]

Various factors are to be considered for a successful myringoplasty. In our study, we are investigating the effect of age, systemic diseases such as diabetes mellitus and hypertension, nasal pathologies such as deviated nasal septum and nasal allergy with the outcome of the surgery.

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MATERIALS AND METHODS

A retrospective study of the 40 patients who have undergone myringoplasty for different sizes of central perforation with pure conductive hearing loss of <60 dB was done. Both males and females were included in the study.

The pre-operative assessment included a thorough clinical examination of ear nose and throat and otoscopic examination to record the site and size of perforation. All findings were confirmed with a Carl Zeiss microscopic examination. Hearing loss was graded into mild (25–35 dB), mild-moderate (36–45 dB), and moderate-severe (45–60 dB). Patients were grouped based on whether they had no comorbidities, diabetes, hypertension, or nasal allergy. Diagnostic nasal endoscopy was done to assess the nasal anatomy. X-ray of paranasal sinuses was taken. Those patients with foci of infection in the upper respiratory tract which influence the patency of Eustachian tube were treated. Cortical mastoidectomy was done in patients with sclerotic mastoid to ensure a patent aditus and facilitate middle ear aeration. Wet ears were made dry with antibiotics for at least 6 weeks before surgery. Informed and written consents were obtained before surgery.

All patients were operated under general anesthesia. The temporalis fascia was used as a graft in all cases which was harvested through an extended post aural incision or a separate 2 cm incision in the temporal region of the scalp after infiltrating with 2% lignocaine and 1:100,000 adrenalin.

Myringoplasty was done either through a post aural approach or transcanal approach depending on the width of the external auditory canal (EAC).

A cortical mastoidectomy is done in cases with a sclerotic mastoid and aditus patency is ensured. This facilitates aeration of the middle ear and aids in the proper healing of the graft.

All patients were given a mastoid dressing.

Post-operative Care

All patients were kept in the post-operative intensive care unit for 24 h. Patients were kept nil per oral for 4 h postoperatively. IV fluids, IV antibiotics, and IV analgesics were given. Mastoid dressing changed on the 1st post-operative day.

Patients were discharged on the 3rd post-operative day. All patients received antibiotic, analgesic, decongestants, and antihistamines for 1 week. Steroid nasal spray and mast cell stabilizers were continued in those patients with nasal

allergy. Patients were advised not to cough, strain or sneeze, and keep ears dry. All patients were instructed to avoid air travel and swimming for 1 month.

Postural suture removal was done on the 7th post-operative day. Antibiotic ear drops were continued to facilitate dissolution of gel foam and to promote healing. All patients were called for regular follow-up. The gel foam in the EAC suctioned out by 3rd week if persisting. On the 4th week, the graft was assessed for perforation or retraction. The same was done after 3 months and 6 months. Pure tone audiometry (PTA) was done at the end of the 6th month to assess the hearing.

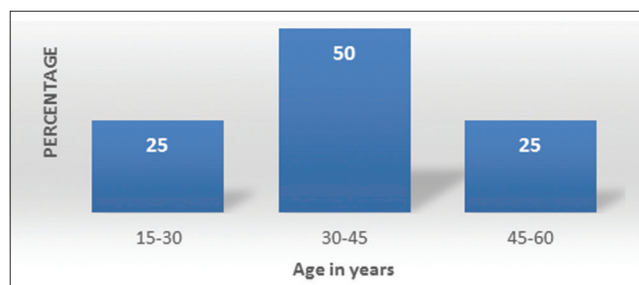
RESULTS AND DISCUSSION

Patients between 15 and 60 years of age were included in the study. Patients were observed for 6 months for the take up of graft. Most of the patients were middle age group and they showed a good graft uptake [Table 1 and Graph 1].

A total of 40 patients, 7 had diabetes, 9 had hypertension, and 17 had a nasal allergy. The percentage distribution is as shown in Table 2.

Diabetes mellitus was present in 7 (17.5%) patients. We did not find any graft failure during the 1st month as patients at the time of surgery were put on insulin for better control of their diabetes. All patients also received systemic and local antibiotics in the immediate post-operative period. During the evaluation at a 6th month, failure of 28.6% and retraction of 14.3% were seen [Tables 3 and 4]. We observed this rise in failure rate probably due to the increased susceptibility to infection due to various reasons such as elevated blood sugar, suppressed immunity, and poor microvascular circulation which delays healing and elevates the failure rate or retraction of graft.

Among the 40 patients, 22.5% had hypertension, but none of them had graft failure [Table 5]. We observed an increase in bleeding during the surgery but was suitably controlled with local vasoconstrictors. During the immediate post-operative period, such patients required strict and close



Graph 1: Graphical representation of age.

Table 1: Age distribution of the study population

Age	Frequency (%)
15–30	10 (25.0)
30–45	20 (50.0)
45–60	10 (25.0)
Total	40 (100.0)

Table 2: Distribution of patients with diabetes mellitus, HTN, and nasal allergy

Factors	Absent	Present
Diabetes mellitus	33 (82.5)	7 (17.5)
HTN	31 (77.5)	9 (22.5)
Nasal allergy	23 (57.5)	17 (42.0)

HTN: Hypertension

Table 3: Percentage distribution of graft uptake in diabetic patients in the 1st month

T2DM	Follow-up at 1 month		Total n (%)
	Graft intact	Graft failure	
Absent	32 (97.0)	1 (3.0)	33 (100.0)
Present	7 (100.0)	0 (0.0)	7 (100.0)

$\chi^2=0.218$, $df=1$, $P=0.641$. T2DM: Type 2 diabetes mellitus

Table 4: Percentage distribution of graft uptake in diabetic patients in the 6th month

T2DM	Follow-up at 6 months			Total n (%)
	Graft intact	Graft failure	Graft retracted	
	n (%)	n (%)	n (%)	
Absent	26 (78.8)	4 (12.1)	3 (9.1)	33 (100.0)
Present	4 (57.1)	2 (28.6)	1 (14.3)	7 (100.0)

$\chi^2=0.693$, $df=2$, $P=0.707$. T2DM: Type 2 diabetes mellitus

monitoring of blood pressure to avoid any collection in the middle ear. We did not find any increased failures over the 6 months observation period [Table 6].

Nasal allergy was present in 17 (42.5%) patients. In the 1st month, none of them showed graft failure. During this period patients had good control of nasal allergy with medication. Over a period of 3–6 months, we observed a rise in failure probably because in spite of medications patients developed exacerbations of nasal symptoms and this lead to poor middle ear ventilation. By 3rd month failure was 11.8% and by 6th month it raised to 23.5%. We also observed a retraction in fascia graft among 17.6% of patients. However, the difference observed was not found to be statistically significant [Tables 7 and 8]. Cabra and Moñux found a success rate of 64% in the patients subjected to fascia tympanoplasty.^[8]

Table 5: Percentage distribution of graft uptake in hypertensive patients in the 1st month

HTN	Follow-up at 1 month		Total n (%)
	Graft intact	Graft failure	
	n (%)	n (%)	
Absent	30 (96.8)	1 (3.2)	31 (100.0)
Present	9 (100.0)	0 (0.0)	9 (100.0)
Total	39 (97.5)	1 (2.5)	40 (100.0)

$\chi^2=0.298$, $df=1$, $P=0.585$. HTN: Hypertension

Table 6: Percentage distribution of graft uptake in hypertensive patients at 6th month

HTN	Follow-up at 6 months			Total n (%)
	Graft intact	Graft failure	Graft retracted	
	n (%)	n (%)	n (%)	
Absent	24 (77.4)	5 (16.1)	2 (6.5)	31 (100.0)
Present	8 (88.9)	0 (0.0)	1 (11.1)	9 (100.0)

$\chi^2=1.766$, $df=2$, $P=0.413$. HTN: Hypertension

Table 7: Percentage distribution of graft uptake in nasal allergic patients at 1st month

Nasal allergy	Follow-up at 1 month		Total n (%)
	Graft intact	Graft failure	
	n (%)	n (%)	
Absent	22 (95.7)	1 (4.3)	23 (100.0)
Present	17 (100.0)	0 (0.0)	17 (100.0)
Total	39 (97.5)	1 (2.5)	40 (100.0)

$\chi^2=0.758$, $df=1$, $P=0.384$

Table 8: Percentage distribution of graft uptake in nasal allergic patients at 6th month

Nasal allergy	Follow-up at 6 months			Total n (%)
	Graft intact	Graft failure	Graft retracted	
	n (%)	n (%)	n (%)	
Absent	19 (82.6)	3 (13.0)	1 (4.3)	23 (100.0)
Present	10 (58.8)	4 (23.5)	3 (17.6)	17 (100.0)
Total	29 (72.5)	7 (17.5)	4 (10)	40 (100.0)

$\chi^2=0.776$, $df=2$, $P=0.678$

CONCLUSION

Among the 40 patients selected for the study, 50% of them were in the middle age group. We had 17.5% of patients with diabetes mellitus who underwent myringoplasty and during the follow-up, at 6 months 28.6% had graft failure and 14.3% had graft retractions. Among 22.5% of hypertensives, we did not find any graft failure. 42.5% of patients had a nasal allergy. We found graft failure of 23.5% by the 6th month and graft retraction of 17.6%. However, the increased rate of graft failures in both diabetics and those with nasal allergy were found to be not statistically significant. A limitation of

this study is the small number of patients for each group. Further studies using larger groups of patients are needed for a better understanding of the effects of various diseases on the success rate of tympanoplasty.

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