

ORIGINAL RESEARCH ARTICLE

SURGICAL OUTCOME OF MYRINGOPLASTY WITH AND WITHOUT CORTICAL MASTOIDECTOMY IN CHRONIC OTITIS MEDIA MUCOSAL INACTIVE TYPE

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ABSTRACT

Background: Chronic otitis media is usually complicated due to perforation of tympanic membrane and ultimately leading to hearing loss. The objective of this study was to compare the results of myringoplasty alone with myringoplasty with cortical mastoidectomy in COM (Chronic Otitis Media) mucosal inactive type in terms of graft uptake.

Methods: This was a descriptive, prospective, qualitative type of study. A total of thirty patients of COM mucosal inactive type were included in the study of which 15 patients were selected alternatively for myringoplasty alone while another 15 patients were selected for myringoplasty with cortical mastoidectomy. Pure tone audiometry was done within 1 week prior to surgery. Graft uptake was assessed after 6 weeks and results were compared within and between the groups using Chi-square test.

Results: Graft uptake rate of myringoplasty alone and myringoplasty with cortical mastoidectomy done using temporalis fascia graft and underlay technique was same 86.66% (n=26) and failure rate was 13.33% (n=4). The graft take was higher 88.9% (n=8) in small perforation worsened in medium (85%) and then in subtotal perforation (79%). Graft uptake rate was highest in central perforation (86.9%) followed by posterior perforation (84.6%) and least in anterior perforation (77.7%). Mean age of presentation was 27.7 years, ranging from 15 to 60 years. Most common approach was permeal in myringoplasty and postaural in case of myringoplasty with cortical mastoidectomy.

Conclusions: The graft uptake rate myringoplasty alone are comparable to those of myringoplasty with cortical mastoidectomy. The choice of surgery is based on surgeon's preference.



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INTRODUCTION

The prevalence of COM varies around the world, affecting 30% of North Americas Eskimos, 4-6% of African population and less than 1% individuals in US and UK.^{1,2} Poverty, ignorance, crowded living conditions due to large family, poor sanitation, lack of personal and environmental hygiene are some of the main factors for the prevalence of COM.^{3,4,5} Myringoplasty is a surgical procedure for closure of perforation of pars tensa of tympanic membrane.^{6,7}

There has been a clinical impression that lack of an aerating mastoid at the time of initial myringoplasty may be a significant source of failure in patients with COM mucosal type, so cortical mastoidectomy along with myringoplasty has been preferred surgery for many surgeons.⁸⁻¹³ This study aimed to compare the success rate of myringoplasty alone against myringoplasty with cortical mastoidectomy combined.

METHODS

This prospective, comparative, cross-sectional study was

conducted from September, 2016 to August, 2017 for a duration of one year. Ethical clearance was received on Mar 11, 2016 from Institutional Review Committee (IRC) of National Medical College, Birgunj. Patients aged between 15-60 years with COM mucosal type with dry tympanic membrane perforation presenting in ENT- Head and Neck Surgery OPD were included. Detailed history, general physical examination, ear examination with otoscope and tuning fork test with 512 Hz was done. Examination under microscope was done before surgery. Pure tone audiometry using MAICO-52 Audiometer was performed within 1 week before surgery and at 6-8th week after surgery by trained audiologist. Myringoplasty with and without cortical mastoidectomy was performed by the consultant ENT surgeons after assigning them to these two groups. Data entry was done in Microsoft Excel and Epidata and data analysis was done by SPSS version 20.

RESULTS

A total of 30 patients were included in this study. Out of them, 15 underwent myringoplasty alone (shortened to "Mplasty alone" in following texts and graphs) while other 15 underwent

myringoplasty with cortical mastoidectomy (shortened to “with cortical mastoidectomy” in following text and graphs). Out of 30 patients, female population was 66.66% (n=20) and male population was 33.33% (n=10). Out of 15 patients who underwent myringoplasty alone, female population was 53.3% (n=8) and male population was 46.7% (n=7). Out of 15 patients who underwent myringoplasty with cortical mastoidectomy, female population was 80% (n=12) and male population was 20% (n=3)

Table 1: Gender distribution of patients (n = 30)

Sex	Myringoplasty alone Number(%)	Myringoplasty with cortical mastoidectomy Number(%)
Female	8 (53.3)	12 (80)
Male	7 (46.7)	3 (20)
Total(N)	15 (100)	15 (100)

Of the total 30 patients, 13.33% (n=2) had both ears involved by the disease. In the patients undergoing myringoplasty alone, left ear was involved in 53.33% (n=8) and right ear in 33.33% (n=5) cases. Similarly, in cortical mastoidectomy, 60% (n=9) had left ear and 40% (n=6) right ear involvement respectively

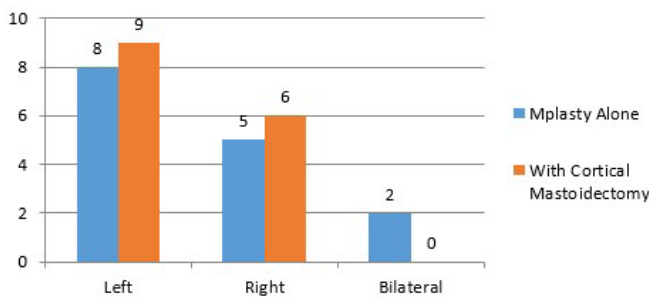


Figure 1: Laterality of ear involved

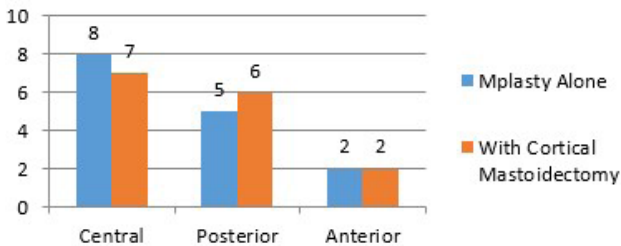


Figure 2: Site distribution of tympanic membrane perforation

Table 4: Rate of healing of TM in relation to size of perforation in case of myringoplasty alone (on left) and myringoplasty with cortical mastoidectomy (on right)

Size of perforation		N		Healed n ₁		Failed n ₂		Healed Percent %		Failed Percent %	
		Myplasty Alone	With Cortical Mastoidectomy	Myplasty Alone	With Cortical Mastoidectomy	Myplasty Alone	With Cortical Mastoidectomy	Myplasty Alone	With Cortical Mastoidectomy		
Size of perforation	Medium	8	7	8	6	0	1	53.33	40	0	6.66
	Small	5	6	5	6	0	0	33.33	40	0	0
	Subtotal	2	2	0	1	2	1	0	6.66	13.33	6.66
Total		15	15	13	13	2	2	86.66	86.66	13.33	13.32

Fisher exact test p=0.892

Similarly, out of 15 cases undergoing myringoplasty with cortical mastoidectomy, small perforation 40% (n=6), medium sized perforation 40% (n=6) and subtotal perforation 6.66%

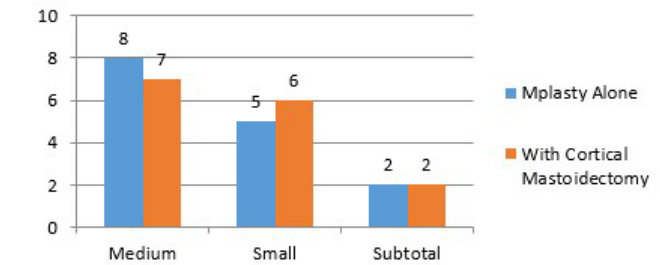


Figure 3: Distribution of patients based on size of perforation of tympanic membrane

Out of total 15 cases that underwent myringoplasty alone, 66.66% (n=10) were done through permeal approach while 33.33% (n=5) were done by post aural approach. But for all 15 cases with cortical mastoidectomy, post aural approach was chosen.

Table 2: Approach of surgery

Approach	Myringoplasty alone Number (%)	Myringoplasty with cortical mastoidectomy Number (%)
Permeal	10 (66.67)	-
Postaural	5 (33.33)	15 (100)
Endaural	-	-
Total(N)	15 (100)	15 (100)

Out of total 30 operated ears, 86.66% (n=13) had complete closure of tympanic membrane perforation in both group. In 13.33% (n=2) patient, there was residual perforation and even complete graft failure in both groups.

Table 3: Rate of graft uptake

Graft status	Myringoplasty alone Number (%)	Myringoplasty with cortical mastoidectomy Number (%)
Taken	13 (88.66)	13 (88.66)
Failure	2 (13.33)	2 (13.33)
Total(N)	15 (100)	15 (100)

Out of 15 operated cases in patient with myringoplasty alone, 5 cases (33.33%) had a small perforation and 8 cases (53.33%) had medium size perforation that healed successfully. 2 cases (13.33%) had subtotal perforation both of which failed.

(n=1) healed successfully. On the other hand, one case each with median and sub-total perforation failed to heal.

Out of 15 operated cases in patients with myringoplasty alone, 8 had a central perforation out of which 53.33% (n=8) cases healed successfully 5 had posterior perforation out of which 33.33% healed successfully and 2 (13.33%) had anterior perforation both of which failed to heal.

Similarly, out of 15 cases in patient with myringoplasty with

cortical mastoidectomy 7 had central perforation out of which 6(40%) healed successfully and 1(6.66%) failed with residual perforation. 6 (40%) had posterior perforation all of which healed successfully. There were 2 anterior perforation out of which 1(6.66%) healed successfully and 1(6.66%) failed to healed with residual perforation.

Table 5: Rate of healing of TM in relation to site of perforation in case of myringoplasty alone (on the left) and myringoplasty with cortical mastoidectomy (on the right)

Site of perforation		N		Healed n ₁		Failed n ₂		Healed Percent %		Failed Percent %	
		8	7	8	6	0	1	53.33	40	0	6.66
	Central	8	7	8	6	0	1	53.33	40	0	6.66
	Posterior	5	6	5	6	0	0	33.33	40	0	0
	Anterior	2	2	0	1	2	1	0	6.66	13.33	6.66
	Total	15	15	13	13	2	2	86.66	86.66	13.33	13.33

Fishers exact test: P=0.894

DISCUSSION

This study was done to assess the graft uptake rate and overall surgical outcome based on various types of pars tensa perforation after myringoplasty alone and myringoplasty with cortical mastoidectomy.¹⁴ In both types of surgeries, temporalis fascia graft was used to patch tympanic membrane perforation.¹⁵ A total of 30 patients between the ages of 15-60 were included in the study. Out of this, 15 patients underwent myringoplasty alone while other 15 underwent myringoplasty with cortical mastoidectomy. It was surgeons' preference as well as anatomical condition of the ear that dictated the choice of approach for myringoplasty. Post-aural approach was used in narrow external auditory canal and when there was difficulty visualizing the anterior margin of perforation. Post-aural approach was also used in patients who underwent myringoplasty with cortical mastoidectomy.

Out of a total 15 patients who underwent myringoplasty alone, 53.3% (n=8) were female and 46.6% (n=7) were male. The female to male ratio was 1.25:1. Out of 15 patients undergoing myringoplasty with cortical mastoidectomy, 80% (n=12) were female and 20% (n=3) were male. This shows that more female patients were operated than males. But it cannot be presumed that female are more prone to chronic otitis media. In this study, the graft uptake rate achieved in both case myringoplasty alone and with cortical mastoidectomy was 86.66% (n=13) which is more or less similar to global average.¹⁶

The effect of age on graft take was not statistically significant (p=0.782). The healing rate in the age group of 15-20, 21-25, 26-30 in both case was 75-100% (n=30), while in other age group, it was up to 66.6%. Compared to younger children, adults have better graft uptake translating to successful surgery.¹⁷ This is due to low incidence of upper airway infections and better eustachian tube function as well as relative maturity of the immune system in adults as compared to younger children.¹⁸

In our study of 30 patients, only 2 cases had bilateral ear disease out of which 1 underwent myringoplasty and another underwent myringoplasty with cortical mastoidectomy. Similar

study done by Robert K Jackler has reported 25% ear having bilateral disease.¹⁹ This shows that the chance of having disease in both ears is low.

This study shows that the patient undergoing myringoplasty alone had central perforation in as many as 53.66% of the cases followed by 33.33% of population having posterior perforation. The least number of patients had an anterior perforation (13.33%). Similarly in case of cortical mastoidectomy, incidence of central perforation was 46.66%, posterior perforation in 40% and anterior perforation in one (13.33). The finding is similar to that of other authors.

Graft uptake rate also varied according to site of perforation. The uptake rate was highest in central perforations (53.33%), then in posterior perforation (33.33%) and least in anterior perforation in cases of myringoplasty. Similarly, in cases of cortical mastoidectomy, graft uptake rate in central as well as posterior perforation was 40% each and 6.66% in anterior perforation. In this study, the effect of the site of perforation on graft take was significant (p=0.892) in accordance with other authors.

In our study, in myringoplasty alone the presence of a medium sized perforation was highest (53.33%) followed by small perforation (33.33%) then subtotal perforation (13.33%). Similarly in case of myringoplasty with cortical mastoidectomy, medium sized perforation was highest (46.66%) followed by small perforation (40%) then subtotal perforation (13.33%). The rate of graft uptake in case of cortical mastoidectomy was highest in small sized perforation (40%) and then in medium sized perforation (40%) and least in subtotal perforations (6.66%). There was no statistically significant differences in graft take between the groups. (p=0.892).

In this study, permeatal approach was used in 66.6% and post aural approach in 33.7% cases in myringoplasty while in cortical cases, all patient underwent postaural approach. The rate of graft uptake was higher in those where permeatal approach was used (53.33%), than those in which postaural approach was used (33.3%). This might be because the post aural approach

was used in the ear with anterior and large perforations. The finding was not statistically significant. ($p=0.461$)

CONCLUSION

The results of this study conclude that there is no difference in the graft uptake rate with myringoplasty alone and myringoplasty without cortical mastoidectomy. Since, myringoplasty with cortical mastoidectomy is an extensive surgery, it takes prolonged duration of time to complete surgery

and the risk of complications are increased causing morbidity. In view of similar results, myringoplasty alone is recommended as surgery of choice for Chronic Otitis Media (COM) mucosal type for it is a limited surgery, lesser time consuming with fewer complications and morbidities.

CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

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