

Original Research Article

Myringoplasty in wet and dry ears: an observational study in a tertiary care center

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ABSTRACT

Background: Chronic otitis media is the most common cause of hearing impairment in the developing countries with serious effects. The aim of the study was to compare the outcome of myringoplasty in dry and wet ears in tubo-tympanic type of chronic otitis media (COM) with respect to graft uptake and hearing improvement.

Methods: This is an observational study done in the department of ENT, Mamata medical college, Khammam, during the study period of September 2019 to February 2021 on 40 patients of tubo-tympanic type COM. On simple random basis selected patients underwent myringoplasty by underlay technique. All patients were evaluated during post-operative follow-up.

Results: In our study, majority of patients were in the age group of 26 to 45 years with slight female preponderance, with male to female ratio (0.73:1). In our study, the successful graft uptake was seen 90% in dry ears and 85% in wet ears, which seems to be not significant in difference. With respect to hearing improvement, post-operatively there was significant improvement in both the groups, when compared to pre-operative hearing. The maximum improvement in average hearing threshold after surgery, in dry ears with large perforation (12.66dB) and in wet ears with small central perforation (12.44dB) was almost equal.

Conclusions: In this study, the success rate of graft uptake and hearing improvement is found almost equal in dry and wet ears by using underlay technique of myringoplasty.

Keywords: Chronic otitis media, Tubo-tympanic, Dry ear, Wet ear, Myringoplasty

INTRODUCTION

Chronic otitis media (COM) is a common disease encountered in ENT practice. WHO definition of the term chronic otitis media (COM) is a stage of ear disease in which there is chronic infection of the middle ear cleft, i.e., eustachian tube, middle ear and mastoid air cell system associated with a perforation in the tympanic membrane and discharge which is present for 2 weeks or longer.¹ Chronic otitis media (COM) is classified based on the presence or absence of middle ear inflammation and production of discharge into active and inactive chronic otitis media, respectively.² Myringoplasty is a

reconstructive procedure which is limited to repair of tympanic membrane perforation after ascertaining that the middle ear ossicles are intact, eustachian tube is patent and patient has good cochlear reserve. The success rate of myringoplasty is reported to be around 95%.³

Usually, surgeons perform tympanoplasty on ears with active drainage after drying the ear, but in many cases, this is practically impossible because the discharge from the ear is continuous despite receiving medical treatment.⁴ While, some authors report that, ear discharge has no effect on success rate and on the contrary some studies conclude that myringoplasty in wet ears have been better results.

They based their arguments on the findings of histological examination of remnant tympanic membrane which showed better vascularity and presence of inflammatory cells in chronic otitis media (COM) of active type comparative to chronic otitis media (COM) of inactive type.⁵ Thus, the discharging ear presents the otologist with a dilemma whether to operate on wet ear or not. Hence, this study was conducted to compare the outcome of myringoplasty in dry and wet ears in tubo-tympanic type of chronic otitis media (COM).

METHODS

This study was conducted at the department of ENT, Mamata medical college, Khammam. This observational study was conducted during the period of September 2019 to February 2021 on total 40 patients suffering with chronic otitis media (COM) of mucosal type. All these patients were allocated into two groups, each consists of 20 patients, in which group 1 belong to dry ear group and group 2 belong to wet ear group. The patient allocation was done by simple random selection.

The patient with chronic otitis media (COM) of mucosal type were diagnosed based on history taking, clinical examination, pure tone audiometry and X-ray examination of mastoids were selected. A predesigned proforma was used to record the relevant information such as patient data, clinical findings and investigation reports. One day before operation patients were admitted to the hospital and written informed consent was taken in all cases.

All the patients underwent underlay technique myringoplasty under general anesthesia. Post-operatively all patients were evaluated for graft uptake by examination under microscope and hearing impairment by pure tone audiometry at third month follow-up.

The data was analyzed by Statistical package for social sciences (SPSS) computer software.

Inclusion criteria

All cases of chronic otitis media (COM) of mucosal type. Age group between 15 years to 55 years. Both the sex. Patients with small, medium, large and sub-total type of perforations. Patients with mucoid or mucopurulent ear discharge where the discharge is sterile.

Exclusion criteria

Total and attic perforations and squamosal type of chronic otitis media (COM). Patients having chronic otitis media (COM) with complications and revision ear surgeries.

RESULTS

In this study, majority of patients were in the age group of 26-45 years in both groups that is wet and dry ears (Table 1). In this study, there was female preponderance and male

to female ratio is 0.73:1 (Table 2). In dry ear group, 11 patients (55%) presented with left ear chronic otitis media (COM) and 9 patients (45%) with right ear chronic otitis media (COM). In wet ear group, 8 patients (40%) presented with left ear chronic otitis media (COM) and 7 patients (35%) presented right ear chronic otitis media (COM) and 5 patients (25%) presented with bilateral chronic otitis media (COM).

Table 1: Age distribution intervals in the study group (n=40).

Age group (years)	Wet ear (n=20) N (%)	Dry ear (n=20) N (%)
15-25	3 (15)	2 (10)
26-35	8 (40)	10 (50)
36-45	5 (25)	5 (25)
46-55	4 (20)	3 (15)
Total	20 (100)	20 (100)

Table 2: Sex distribution among the patients in the study group (n=40).

	Male	Female	Total
Dry ears	8	12	20
Wet ears	9	11	20

Table 3: Graft uptake in the dry ears (n=20).

Type of perforation	No. of patients	Graft taken N (%)	Graft not taken N (%)
Small	4	4 (20)	-
Medium	6	6 (30)	-
Large	7	6 (30)	1 (5)
Subtotal	3	2 (10)	1 (5)
Total	-	18 (90)	2 (10)

Table 4: Graft uptake in the wet ears (n=20).

Type of perforation	No. of patients	Graft taken N (%)	Graft not taken N (%)
Small	4	4 (20)	-
Medium	10	8 (40)	2 (10)
Large	3	2 (10)	1 (5)
Subtotal	3	3 (15)	-
Total	-	17 (85)	3 (15)

Microbiological examination in wet ear showed discharge being mucoid in consistency and sterile on culture and sensitivity test. In wet ears, the excised remnant tympanic membrane on histopathological examination showed evidence of inflammatory cells and vascularization within stroma of fibroblasts while they were absent in dry ears.

In our study, the successful graft uptake was seen in 90% in dry ears and 85% in wet ears (Table 3 and Table 4).

Table 5: Hearing improvement in dry ears (n=20).

Type of perforation	Number of patients	Average PTA threshold	
		Before surgery	3 months after surgery
Small	4	31.22 dB	24.4 dB
Medium	6	45.66 dB	34.33 dB
Large	7	50.66 dB	38 dB
Subtotal	3	56.4 dB	52.7 dB

Table 6: Hearing improvement in wet ears (n=20)

Type of perforation	Number of patients	Average PTA threshold	
		Before surgery	3 months after surgery
Small	4	30.66 dB	18.22 dB
Medium	10	48.32 dB	42 dB
Large	3	41.33 dB	40 dB
Subtotal	3	51.22 dB	50.66 dB

In both the groups, post-operatively there is significant hearing improvement. In dry ear group, the average gain in threshold of hearing is 8.63 dB and in wet ear group, the average gain in threshold of hearing is 5.16 dB. Patient with large perforation have shown maximum improvement in average hearing threshold after surgery (12.66 dB) in dry ear (Table 5). Patient with small central perforation have shown the maximum improvement in average hearing threshold after surgery (12.44 dB) in wet ears (Table 6).

In dry ear group, size of perforation adversely affected the post-operative graft uptake but in wet ear group, size of perforation was found to be adversely affecting the post-operative hearing improvement but not graft uptake.

DISCUSSION

Myringoplasty is one of the most commonly performed procedures in otology with graft success rate of 90% to 97%, reported in literature.⁶ In this study, we compared two groups (20 cases in each group) of patients of chronic otitis media (COM) of tubo-tympanic type, group 1 with dry ears and group 2 with wet ears who underwent myringoplasty.

Majority of patients in this study were in their second and third decades of life in both the groups. The early presentation may be due to increased awareness to health issues and difficulty in hearing affecting the work efficiency, leading patients to seek early medical intervention.

There is slight female preponderance (Male: female = 0.73:1) in our study which is comparable to study by Nagle et al where in female preponderance was observed with male to female ratio was found to be 0.85:1.³⁶⁷

In our study we found that, as the duration of discharge increases, chances of hearing improvement and graft uptake were less. This association was found when the duration of discharge was more than 5 years in dry ears. In wet ear group, increased chance of graft uptake and improvement in hearing was noticed when the duration of the discharge was less than 5 years.

In our study 85% of patients with wet ears had successful graft uptake after 3 months of follow-up. Nagle et al and Bunzen et al found no influence of the condition of the ear at the time of surgery on the subsequent graft uptake which is comparable to our study.^{7,8}

In our study, the successful graft uptake following myringoplasty was seen in 90% in dry ears and 85% in wet ears. It showed that there was no significant difference between two groups regarding graft uptake.

In many studies, it has been shown that hearing improvement will occur after myringoplasty.⁹⁻¹¹ The graft failure rate is more in totally dry perforation than in wet central perforation mainly because of avascularity of tympanic membrane in a totally dry perforation.¹²

In our study, hearing improvement was noted in 18 patients (90%) in dry ear group and 17 patients (85%) in wet ear group. It explained that no significant difference was found between the two groups with respect to hearing improvement.

In our study, pre-operative long standing hearing impairment more than 5 years adversely affected the post-operative hearing gain, both in dry and wet ear groups.

In dry group, size of the perforation adversely affected the post-operative hearing improvement and graft uptake. This can be due to reduced vascularity to the margins of the perforation. In wet group, size of the perforation was found to be adversely affecting the post-operative hearing improvement but not with respect to graft uptake.

It is found that dry and wet ear can give equal results on removal of the necrotic margins of the remnant tympanic membrane and by anterior tucking of the graft.¹³

Our study had some limitations. As we conducted this study in a tertiary care center were there were limited resources and the sample size was smaller. So with larger sample size and increased study duration the observations would be better.

CONCLUSION

Our study showed that, the success rate of graft uptake and post-operative hearing improvement were almost equal in both dry and wet ears after myringoplasty. However, further studies with larger sample size is needed.

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

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