

Original Research Article

Comparison of efficacy of myringoplasty in dry and wet ears in chronic otitis media of tubotympanic type

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ABSTRACT

Background: The objective of the study was to compare the outcome of myringoplasty in dry and wet ears in tubotympanic type of chronic otitis media (COM) with respect to graft uptake and hearing improvement.

Methods: This is a prospective study done in department of ENT Bangalore Medical College and Research Institute during the study period of November 2014 to May 2016, wherein a total of 60 patients of tubotympanic type COM with 30 cases each of dry and wet ears, aged 15-60 years were included. The hearing impairment was assessed and recorded by pure tone audiometry (PTA). After obtaining informed written consent the patients underwent myringoplasty (temporalis fascia graft, underlay technique). Microbiological examination of discharge in wet ears was done and histopathology of the excised remnant TM analyzed in both groups. Both groups of patients were followed up for 3 months and assessed for graft uptake and hearing improvement. PTA was repeated at 3 months postoperatively.

Results: Our study included 60 patients of tubotympanic type of COM with 30 cases each with dry and wet ears who underwent myringoplasty. Majority of our patients were in second decade in both the groups. There was slight female preponderance in our study with male to female ratio of 0.93:1. Discharge from ears in wet ears was mucoid in consistency and were culture negative. Histopathology of excised remnant TM in wet ears revealed evidence of inflammatory cells and vascularization within stroma of fibroblasts while these were absent in dry ear cases. The overall successful graft uptake following myringoplasty was 88.3% with 86.7% for wet ears and 90% for dry ears with no statistical significance (p value of 0.688>0.05) between the two groups. With respect to hearing improvement post-operatively there was significant hearing improvement in both the groups when compared to preoperative hearing with a mean hearing gain (dB) of 3.43±2.81 in wet ear cases to 3.85±3.05 in dry ear cases, but when compared between the two groups, there was no significant statistical difference (p value of 0.582>0.05).

Conclusions: The outcome is equally good for myringoplasty in dry and wet ears in tubotympanic type of chronic otitis media with respect to graft uptake and hearing improvement.

Keywords: Chronic otitis media, Tubotympanic, Dry ear, Wet ear, Pure tone Audiometry, Myringoplasty

INTRODUCTION

Chronic otitis media 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, associated with a non-intact

tympanic membrane (e.g. perforation) and discharge which is present for 2 weeks or longer.¹

Chronic otitis media is classified based on presence or absence of middle ear inflammation and production of discharge into Active and Inactive COM 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 a good cochlear reserve. The success rate of myringoplasty is reported to be around 95%.³

It is often advocated to perform myringoplasty on dry ears⁴ and many studies support the same. 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 better results. They base their arguments on the findings of histological examination of remnant tympanic membrane which showed better vascularity and presence of inflammatory cells in COM of active type compared to 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 tubotympanic type of chronic otitis media.

METHODS

This prospective study was conducted in the department of ENT at Sri Venkateshwara ENT Institute, Victoria Hospital and Bowring and Lady Curzon Hospital attached to Bangalore Medical College and Research Institute, Bangalore, during the study period of November 2014 to May 2016. The study included a total of 60 patients of tubotympanic type of COM, aged between 18-50 years. Patients were divided into 2 groups of 30 each with wet (Group 1) and dry (Group 2) ears in tubotympanic type of COM. Patients with atticointral type of COM, with sensorineural hearing loss and patients with history of ear surgery were excluded.

After obtaining informed written consent they underwent myringoplasty (temporalis fascia graft, underlay technique). Both the groups were statistically comparable with respect to age and sex. Preoperative audiological evaluation by pure tone audiometry (PTA) and 3 months post-operative PTA was performed for all the patients. Microbiological examination of discharge in wet ears was done and histopathology of the excised remnant TM analyzed in both groups. The results obtained during the study were statistically analyzed using OpenEpi software version 3.03 and SPSS Version 20.0.

RESULTS

In this study, maximum patients with COM were in second decade in both the groups with mean age of patients with wet ears was 30.53±6.91 years (range 19–45 years) and in patients with dry ears was 30.03±8.10 years (range 18–50 years) (Figure 1). There is slight female preponderance (53.3%) in group 1 (wet ear) while group 2 (dry ear) had equal (50%) sex preponderance (Figure 2).

In group 1 (wet ear) right and left ear involvement was seen in 12 (40%) and 14 (46.6%) patients respectively while 4 (13.4%) patients had bilateral COM (Figure 3). In group 2 (dry ear), right and left ear involvement was seen in 13 (43.3%) patients each while 4 (13.4%) patients had bilateral COM (Figure 4).

Microbiological examination in wet ears showed discharge being mucoid in consistency and sterile on culture and sensitivity testing.

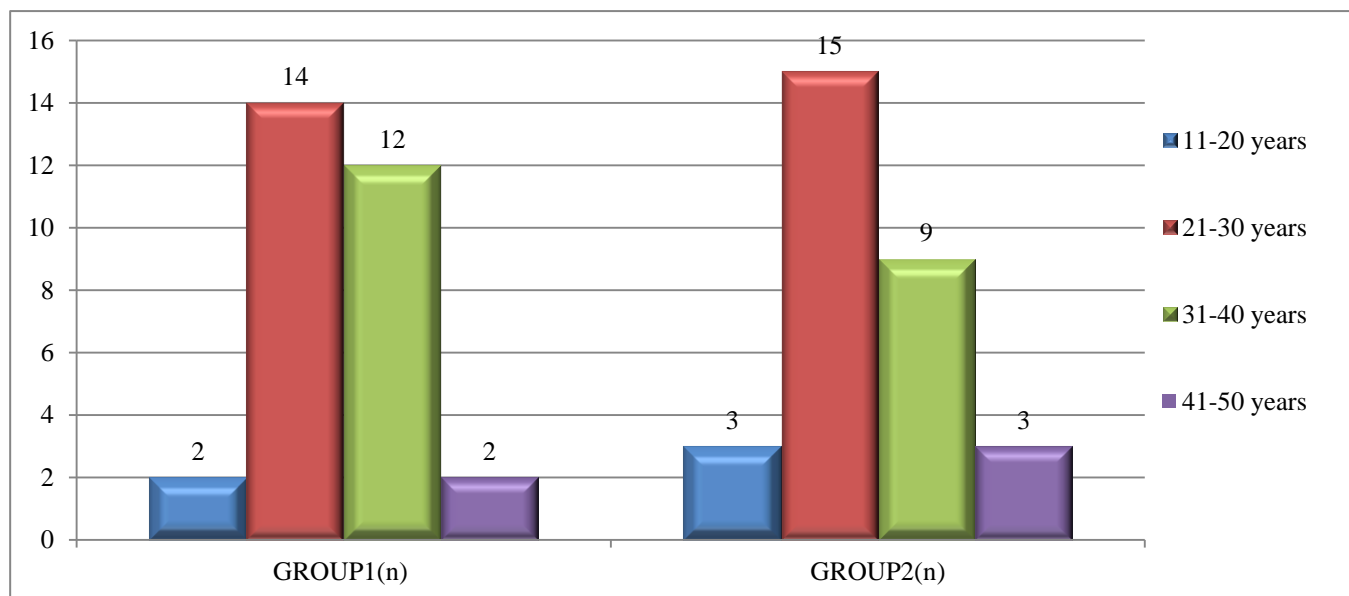


Figure 1: Bar graph showing age distribution.

Margins of tympanic membrane freshened during myringoplasty were sent for histopathological examination in all the cases and the excised remnant TM

in wet ears (group 1) showed evidence of inflammatory cells and vascularization within stroma of fibroblasts while these were absent in dry ears (group 2).

After 3 months of follow up for graft uptake, group 1 (wet ears) and group 2 (dry ears) had a success rate of 86.7% and 90% respectively as shown in Table 1. However there was no statistical significance (p value of

0.688>0.05) found on comparing both groups with respect to graft uptake. Graft failure was seen in 4 patients (13.3%) of active COM and 3 patients (10%) of inactive COM after 3 months of follow up (Table 1).

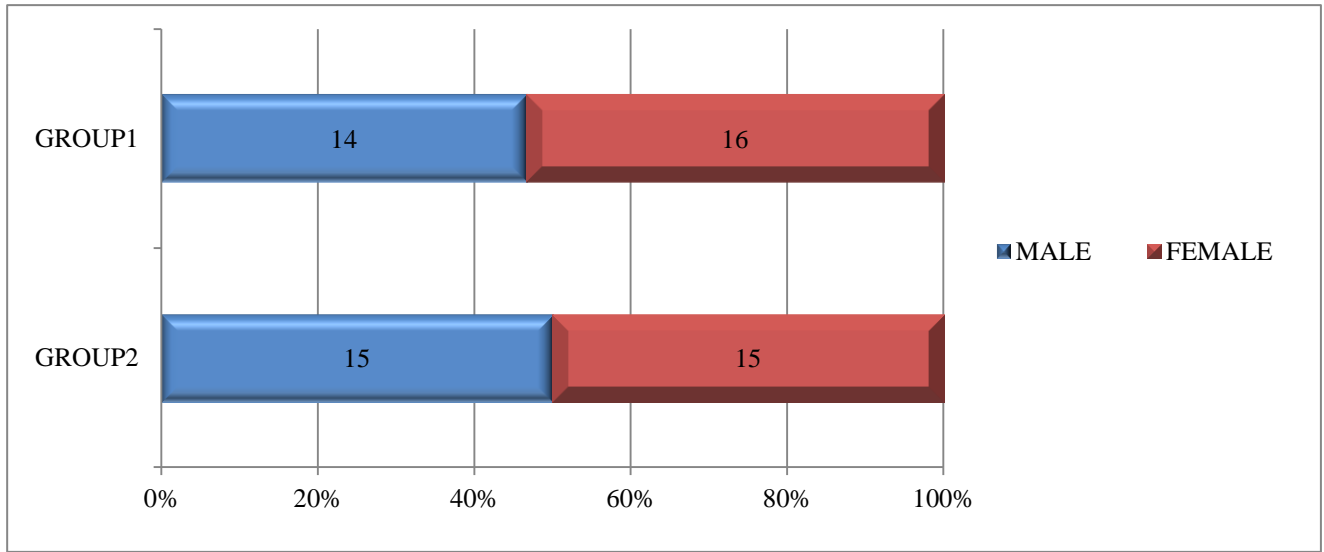


Figure 2: Graph showing gender distribution.

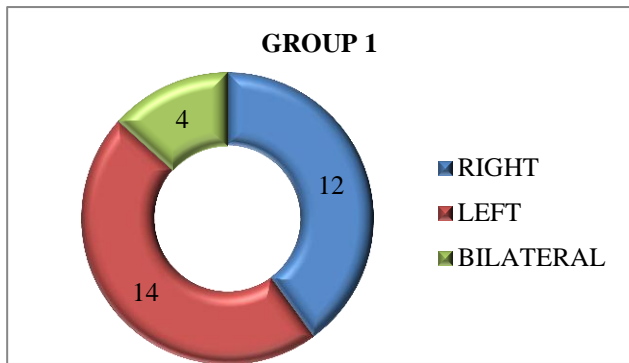


Figure 3: Side affected in wet ears.

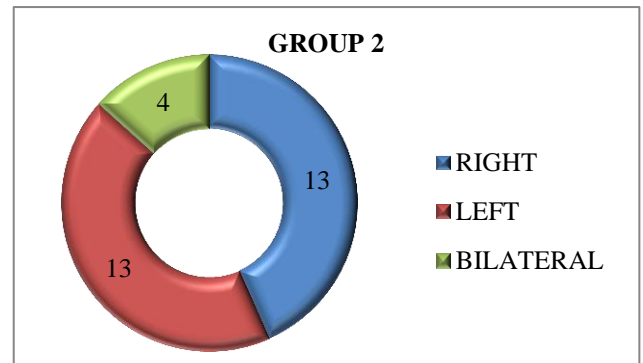


Figure 4: Side affected in dry ears.

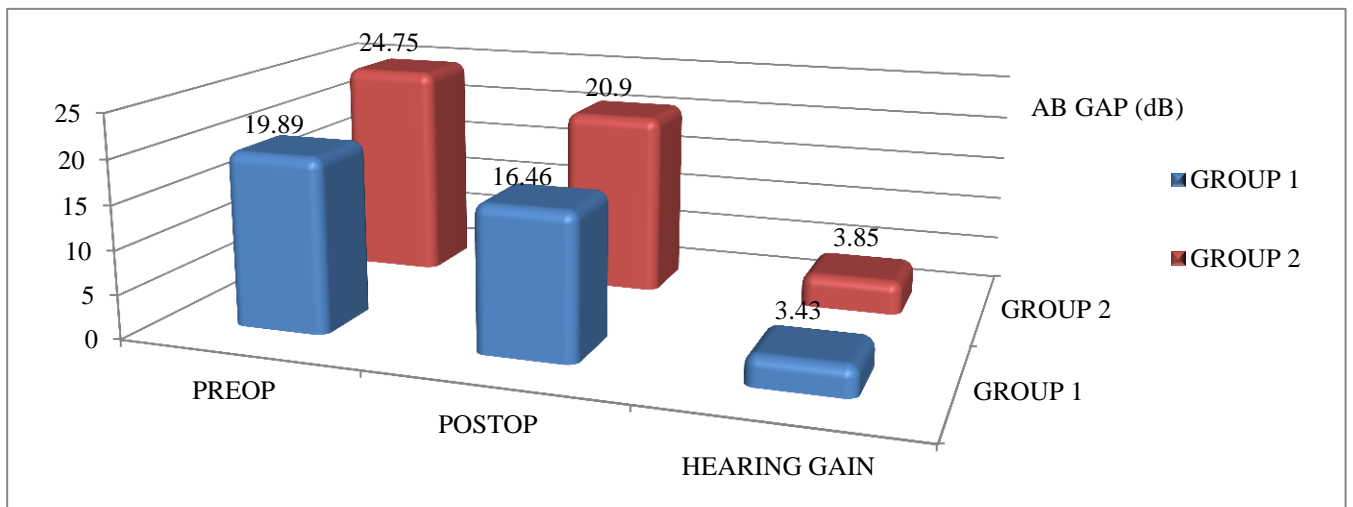


Figure 5: Graph showing comparison of hearing gain.

On audiological examination, in patients with wet ears the preoperative air bone gap (AB gap) was 19.89 dB and postoperative AB gap was 16.46 dB with a mean hearing gain of 3.43 dB. In patients with dry ear, the preoperative air bone gap (AB gap) was 24.75 dB and postoperative AB gap was 20.9 dB with a mean hearing gain of 3.85 dB (Figure 5). There was significant hearing improvement post-operatively in both the groups which was statistically significant ($p < 0.05$). When hearing improvement was compared between two groups, there was no significant statistical difference (independent sample test).

Table 1: Graft uptake rate.

Graft uptake	Wet ears n (%)	Dry ears n (%)
Yes	26 (86.7%)	27 (90%)
No	4 (13.3%)	3 (10%)
Total (n)	30	30

DISCUSSION

Myringoplasty is one of the most commonly performed procedures in otology with graft success rates of 90% to 97%, reported in literature.⁶ Several studies done in past have reported good results with myringoplasty with regard to hearing improvement and graft uptake. Various factors influencing the success rate of this procedure have been discussed in the literature. In this study, we compared two groups (30 cases in each group) of patients of COM of tubotympanic type, group 1 with wet ears and group 2 with dry ears who underwent myringoplasty.

Majority of patients in this study were in their second decade of life in both the groups. Nagle et al observed a similar finding wherein majority of cases presented in the second decade.⁷ 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 (M:F =0.93:1) in our study which is comparable to study by Nagle et al wherein female preponderance was observed with male to female ratio was found to be 0.85:1.36.⁷

On considering the side of involvement in tubotympanic COM, perforation was more common on left side (51.9%) with 8 patients having bilateral COM. Nagle et al observed perforation to be common on right side (42%) and with bilateral presentation in 18% of their cases.⁷

Microbiological examination in wet ears showed discharge being mucoid in consistency and sterile on culture and sensitivity testing. Eighty seven percent of patients with wet ears had successful graft uptake after 3 months of follow up in our study. 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 take rate which is comparable to our study.^{7,8}

Histopathology of excised remnant TM in wet ears showed evidence of inflammatory cells and vascularization within stroma of fibroblasts while these were absent in dry ears which is similar to other studies who have postulated that vascularity and inflammation in cases of active COM has influence on graft uptake.^{5,9}

In this study the overall success rate in graft uptake following myringoplasty was 88.3%, with 86.7% in wet ears and 90% in dry ears. It was observed that there was no statistical significance (p value of $0.688 > 0.05$) between the 2 groups in relation to graft uptake. Other studies comparable to this study have shown that presence of ear discharge at the time of surgery has no significant bearing on the results of myringoplasty.^{7,9-12} A comparison of graft uptake of this study with other studies is given in Table 2.

Table 2: Comparison of graft uptake in various studies.

Study by	No. of cases (n)	Graft uptake (%)		P value
		Wet ear	Dry ear	
Nagle et al. ⁷	100	74	88	0.07
Shankar et al. ⁹	70	80	88	0.5
Mills et al. ¹⁰	268	82	83	0.9
Dhar et al. ¹¹	100	84	96	0.09
Hosny et al. ¹²	84	87	90.4	0.6
Present study	60	86.7	90	0.688

Mean hearing gain observed in wet and dry ears were 3.43 dB and 3.85 dB respectively. There was significant hearing improvement postoperatively in both the groups which was statistically significant ($p < 0.05$) while on comparing hearing improvement between two groups, there was no significant statistical difference ($p = 0.582 > 0.05$).

Our study is comparable to the study by Nagle et al on 100 patients observed a statistical p value of 0.85 ($p > 0.05$) which was insignificant with respect to hearing improvement.⁷ Hosny et al in their study noted mean postoperative hearing gain of 10.3 ± 6.43 dB in wet ears while 11.2 ± 7.8 dB in dry ears with statistical p value of 0.635 ($p > 0.05$) and thus concluded that discharge has no

adverse effect on outcome of myringoplasty with respect to hearing gain which is similar to our study.¹²

CONCLUSION

On comparing between the two groups, p value is insignificant for both, graft uptake and hearing improvement, showing that the presence of discharge at the time of surgery does not interfere with the results of myringoplasty. Based on above observations we conclude that the outcome is equally good for myringoplasty in active and inactive mucosal type of chronic otitis media with respect to graft uptake and hearing improvement

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Conflict of interest: None declared

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

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