

EVALUATION OF MYRINGOPLASTY IN DRY AND WET EARS

Srinivasa.V¹, B.Asma Tarannum¹, Asjan Basheer^{*}, Sriram.G², Divine Jude Dantes³, Saumya David⁴

ABSTRACT:

Objectives: This study compared the graft acceptance rate and hearing improvement in patients who underwent myringoplasty for chronic otitis media. **Methods:** A prospective study was conducted in the department of Otorhinolaryngology, Vinayaka Mission's Medical College and Hospital, Karaikal, Puducherry, India. 48 patients with COM were selected. Among them, 24 had dry ear and 24 had wet ear mucoid discharge. All patients underwent myringoplasty and temporalis fascia was used as graft in all the patients. Patients were followed up for atleast 3 months. Pure tone audiometry was done preoperatively and also postoperatively after 3 months. The graft uptake rate and the hearing improvement were compared between the two groups. **Results:** The graft acceptance rate was 83.33% in both dry and wet ear groups. There was no statistically significant difference between both the groups. The hearing improvement was also compared between the two groups. There was no statistically significant difference in the hearing improvement after surgery between the two groups. **Conclusion:** The presence or absence of mucoid ear discharge during the surgery does not interfere with the outcome of the surgery. It does not affect the rate of graft uptake or does not affect the hearing improvement post surgery.

Keywords: dry ear, wet ear, myringoplasty, chronic otitis media, graft uptake

Introduction

Chronic suppurative otitis media (CSOM) has still remained a major health problem in our country and is characterized by recurrent ear discharge, a permanent perforation in the tympanic membrane and also impairment of hearing. It is a more common cause of hearing impairment in rural population. Poor socioeconomic status and poor nutritional status are responsible for higher incidence of CSOM in developing countries. Tympanoplasty can be done to repair the perforation of tympanic membrane. This gives the benefits of prevention of ear infection, elimination of need to take water precautions and also improvement in hearing. Type I Tympanoplasty i.e Myringoplasty is one of the most common procedures among various surgeries for CSOM.¹

Materials and methods

Study is done for the selected patients who underwent myringoplasty in the Department of Otorhinolaryngology at Vinayaka Mission's Medical College and Hospital, Karaikal for a period of 2 years. 48 Patients were selected according to the inclusion and exclusion criteria and relevant informations were recorded. Among these, 24 patients had dry ear and 24 patients had wet ear. **Inclusion criteria** 1. All cases of Chronic Otitis Media which includes

Inactive and Active mucosal type. 2. Age group between 15yrs to 45yrs involving both the sexes. 3. Patients with central perforations 4. Patients with mucoid ear discharge as wet ear
Exclusion criteria: 1. Total and Attic perforations and Squamosal Type of Chronic Otitis Media 2. Patients having Chronic Otitis Media with Complications 3. Patients with previous ear surgeries 4. Purulent discharge 5. Otomycosis.

After thorough clinical, radiological and audiological assessment, all the patients underwent endo-meatal myringoplasty under general anaesthesia with temporalis fascia graft by underlay technique.

Patients were on antibiotics, analgesics and antihistamines and the suture removal was done on 7th post-op day and ear pack was removed on 10th post op day. Patients were followed up regularly on at 2, 4, 8 and 12 weeks post operatively. During each visit graft uptake was assessed and post operatively complications if any were addressed accordingly. Pure tone audiometry was performed 3 months post operatively. Pre operative and post operative hearing was assessed and compared.

Myringoplasty was considered as primary outcome variable. Type of ear was considered as Primary explanatory variable. All Quantitative variables were checked for normal distribution within each category of explanatory variable by using visual inspection of histograms and normality Q-Q plots. Categorical outcomes were compared between study groups using Chi square test. For normally distributed Quantitative parameters the mean values were compared between study groups using independent sample t-test (2 groups). The change in the quantitative parameters, before and after the intervention was assessed by paired t-test (In case of two time periods). P value < 0.05 was considered statistically significant. IBM SPSS version 22 was used for statistical analysis.(1)

1. BDSS Corp. Released 2020. coGuide Statistics software, Version 1.0, India: BDSS corp.

Results

A total of 48 subjects were included in the final analysis.

Table 1: Comparison of Type of Ear with Side of Tympanic membrane perforation (N=48)

Side of Tympanic Membrane perforation	Type of Ear		Chi square value	P value
	Dry Ear (N=24)	Wet Ear (N=24)		
Left	5 (20.83%)	9 (37.50%)	1.68	0.6422
Right	17 (70.83%)	13 (54.17%)		
Bilateral	2(8.34%)	2(8.34%)		

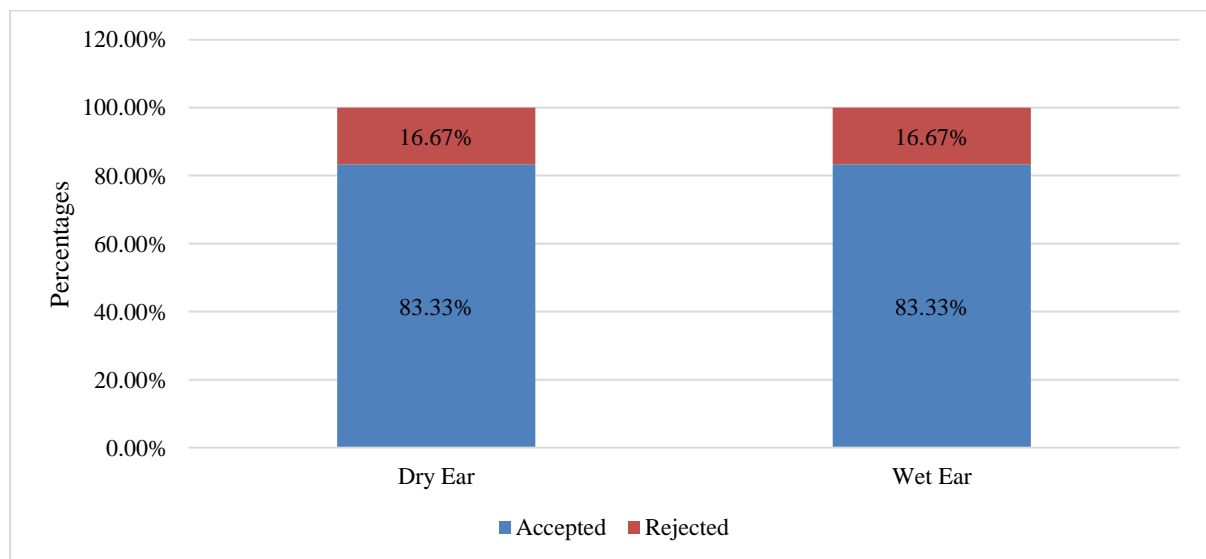
There is no significant difference in side of tympanic membrane perforation among the two groups (P value 0.6422) (Table 1)

Table 2: Comparison of PTA with Type of Ear (N=48)

Pure Tone Audiometry	Type of Ear (Mean \pm SD)		P Value
	Dry Ear (N=24)	Wet Ear (N=24)	
Pre -op Pure Tone Audiometry (Decibels hearing loss)	31.76 \pm 4.71	31.00 \pm 5.42	0.6069
Post-op Pure Tone Audiometry (Decibels hearing loss)	19.56 \pm 9.96	17.95 \pm 9.15	0.5641

There is no significant difference in pre and post- op pure tone audiometry among the two groups (P value >0.05) (Table 2)

Figure 1: Stacked bar chart for Comparison of Graft status in both the groups. (N=48)



There is no significant difference in graft uptake in the two groups (P value 1.000) (figure 1)

Discussion

Graft uptake in relation to dry and wet ear: In our study, the successful graft uptake following myringoplasty was seen in 83.33% in dry ear and 83.33% in wet ear with no statistical significance ($X^2 = 1$ $p > 0.05$) between the two groups in relation to graft uptake.

In a study by Yasuo Mishiro et al., graft success rates for dry ear was 90.7% and for the discharging ear it was 90.0% following Myringoplasty.² Anita Krishnan et al., observed that the chances of tympanic membrane graft giving way was more in inactive ears though the percentage is not statistically accurate because of the smaller number analyzed in this group. But hearing improvement in ears where the graft has survived is the same irrespective of whether the ear is dry or wet during surgery.³

Hatice Emir et al., found that the status of the operated ear whether dry or wet at the time of the surgery did not influence the graft success rate.⁴ They found that the most significant factor influencing the results appeared to be the surgeon's skills and experience. S.K. Nagle et al., observed complete graft uptake in 44 cases (88%) with dry ear and 37 cases (74%) in wet ear.⁵

In 1987, Ophir et al., in their study on myringoplasty in pediatric population reported a success rate of about 79%.⁶ In their study, they say that the outcome of surgery cannot be related to the presence or absence of chronic otitis media in the untreated ear, the status of operated ear (whether dry or wet) or doing adenoidectomy before myringoplasty. In 1999, a study conducted by Raj et al., observed that the patient with wet ear undergoing myringoplasty showed primary closure of perforation in 84% of patients.⁷

Booth et al., conducted an analysis of failed myringoplasty cases and stated that the preoperative presence of a dry ear did not affect the surgical success rates.⁸ Glasscock et al., reviewed about 1556 tympanic membrane graft cases, and gave an opinion that an ear did not have to be dry to achieve a good result.⁹ Anita Krishnan et al., found that the graft uptake in cases who underwent tympanoplasty 1 was 50% for wet ear and 78% in dry ear.³

In another study, it is stated as – It is generally accepted that the physiological state of the middle ear at the time of myringoplasty has a direct bearing on the graft uptake rate. So the ear should be completely dry and free from infection at the time of operation as in ideal conditions.⁸ EeroVartianen et al., found in their series that there was no significant difference in the failure rate between dry and wet ear, but the occurrence of an adhesive ear drum was significantly greater when a tympanoplasty was performed on an ear with discharge rather than on a dry ear.¹⁰

Hearing improvement in relation to dry and wet ear: In our study, hearing improvement is noted in 20 patients (83.33%) in dry ear group and 20 patients (83.33%) in wet ear. There was no statistical significance ($X^2 = 1$ $p > 0.05$) was found on comparing both groups with respect to the hearing improvement. Hatice Emin et al found that the post operative hearing gain was 47.3% in dry ears while it was 40.7% in wet ears.⁴

Benjamin D et al found that the post operative hearing gain for dry and wet ear was not statistically significant.¹¹ Tos M observed that more than 10 dB hearing gain is seen in 87% in dry ear group and 66% in wet ear group.¹² Raj et al observed hearing improvement in 68% of patients undergoing myringoplasty in wet ear.⁷ Blakley et al found that, in ears with persistent infection, the hearing outcome after myringoplasty surgery depended more on the hearing levels prior to surgery.¹³ EeroVartianen et al., observed that the status of the ear prior

to surgery whether dry or wet did not significantly affected the improvement of mean air-bone gap in the pure tone audiometry.¹⁰

Conclusion

In dry ear group, successful graft uptake of 83.33% was obtained while in the wet ear group, successful graft uptake of 83.33% was obtained. There is no statistically significant difference in the graft uptake between the two groups as the p-value is $p > 0.05$.

Postoperatively hearing improvement was observed in all patients with successful graft uptake in both groups. Hearing improvement was seen in 83.33% patients in each group. The p-value is > 0.05 and is not statistically significant.

The very fact that the p-value being insignificant in the graft uptake rate and hearing improvement shows that the presence or absence of discharge does not interfere with the result of Myringoplasty.

Acknowledgements

We wish to express our gratitude to the Dean and Ethical Committee of our institution for permitting us to conduct the study. We extend our heartfelt gratitude to our families for their support. We thank our audiologist Mr. Sathish and Anaesthesia department for extending their wholehearted support and encouragement. Last but not the least we thank all the study participants for their kind cooperation.

Conflict of interest

There were no conflicts of interest.

Funding sources

No funding was received for conducting this study.

***Corresponding Author : Asjan Basheer , email: azzjan@gmail.com**

Department of Otorhinolaryngology, Vinayaka Mission's Medical College and Hospital, (Deemed-to-be University) Karaikal, Puducherry, India.

References

1. Sudhir V Bhise, P M Hippargekar, Sonali S Kamble, Dnyaneshwar Rohe. Comparative study of type I tympanoplasty in dry and wet ear. MedPulse International Journal of ENT. August 2017; 3(2): 10-13.
2. YasuoMishiro. MasafumiSakagumi, Yoshifuri Takahashi, Tadashi Kitahora, HirorhiKajikawe. Eur Arch Otorhinolaryngol 2001;258:13-15
3. Anita Krishnan, E. K. Reddy, ChandrakiranC,Nalinesh K M, Jaganath PM. Tympanoplasty with and without cortical mastoidectomy-A comparative study 2002;54(3):195-198.

4. Emin H, Ceylan K, Kzilkaya Z, Gocmen H, Uzunkulaoglu H, Samim E. Success is a matter of experience ; type 1 tympanoplasty. *Eur Arc Otorhinolarygol* 2007;264:595-99.
5. Nagle SK, Jagade MV, Gandhi SR, Pawar PV. Comparative study of outcome of type 1 tympanoplasty in dry and wet ear. *Indian J Otolaryngol Head Neck Surg* 2009April-June;61:138-140.
6. Ophir D, Porat M, and Marshak G. Myringoplasty in pediatric population. *Arch Otolaryngol Head Neck Surg* 1987; 113(12):1288-1290.
7. Raj A, Tripathi V. Review of patients undergoing wet myringoplasty. *Indian J Otology* 1999; 3:134-136.
8. Booth JB. Myringoplasty : the lesson of failure. *J Laryngolotol* 1974;88:1223- 36
9. Glasscock ME. Jackson CG, Nissen AJ, Schwaber MK. Post auricular under surface tympanic membrane grafting : a follow up report. *Laryngoscope* 1982;92:718-27.
10. Vartainen E, Karja J, Korjalainen S, Harma R. Failures in myringoplasty. *Arch Otolaryngol* 1985;242:27-33
11. Benjamin D, Webb. Efficacy of tympanoplastywithoutmastoidectomy for chronic suppurative otitis media *Arch otolaryngol Head and Neck Surg* 2008;134(11):1155-1158.
12. M Tos. Results of tympanoplasty*Actaotolaryngol*1973;75:286-287.
13. Blakley BW. Kim S, Vanlamp M. Preoperative hearing predicts postoperative hearing. *Otolaryngol Head Neck Surg* 1998; 118:559-63.