OUTCOME OF MYRINGOPLASTY IN ACTIVE AND INACTIVE EARS IN TERMS OF GRAFT UPTAKE

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ABSTRACT

Objectives:

To determine whether the presence of aural discharge at the time of myringoplasty adversely affects successful graft uptake.

Materials and methods:

This prospective, comparative interventional study was done at department of Otorhinolaryngology - Head & Neck Surgery, National Academy of Medical Sciences, Bir Hospital, Kathmandu between May 2016 to May 2017 including 100 patients with chronic otitis media - mucosal type with or without mucoid ear discharge (50 in each group).The patients who presented with mucoid discharge (wet) or edematous middle ear mucosa were categorized into active ears(group –A) and those with no discharge and dry at least for 3 months categorized into inactive ears(group- B). All the patients were treated with (undergone)myringoplasty under local anaesthesia through permeatal approach. Otoscopic examination was carried out to assess the uptake of the graft. Success of myringoplasty was regarded if there was no residual perforation and there was no significant retraction of the graft. Successful uptake of the graft in both active and inactive ears were compared statistically.

Results:

Successful graft uptake was noticed in 74% patients of the active ear(wet) group and in 78% patients of the inactive ear(dry) group, and the difference was not found to be statistically significant (p value 0.81).

Conclusion:

Mucoid ear discharge is not a reason to postpone myringoplasty, as it has no adverse effect on the outcome of the operation in regards to graft uptake.

Keywords: Pure tone audiometry, Chronic otitis media, Myringoplasty

INTRODUCTION

Chronic otitis media (COM) can present with inactive(dry) and active (wet) ear. Myringoplasty is a common otological procedure indicated in mucosal type of chronic otitis media[1]. It is commonly being done for inactive mucosal type of chronic otitis media. Myringoplasty aims to close the tympanic membrane perforation to prevent recurrent otorrhea and create a sound-conducting mechanism in a well-aerated mucosa-lined middle ear cleft and maintain these achievements over time[2]. Myringoplasty was first introduced by Berthold[3] in 1878, who used a thick skin graft, while Wullstein and Zollner further developed the procedure using split skin graft[4].The aim of myringoplasty is to give the patient a dry, safe and functioning ear. Success rate in the range of 90% is frequently quoted in various studies. There are many factors which influence this success rate, including age of the patient, site and size of the perforation, duration of the ear being dry prior to surgery and the presence or absence of infection at the time of surgery[5]. Discharging ear at the time of surgery is one of them. The discharging ear presents to the otologist the dilemma of whether to operate on it or not. Various studies

suggest that ears that are discharging at the time of surgery have a lower success rate than those that are dry, and few studies suggests that an operation is less likely to be successful if the ear has been dry for a shorter period. However, other studies suggest that discharge at the time of surgery is not associated with a poorer outcome. Despite the uncertainty surrounding its effect on outcomes, some surgeons postpone surgery in patients with actively discharging ears. The aim of this study is to compare the outcome of myringoplasty in wet and dry ears.

Prior to the beginning of the study, consideration was given as to what would be a clinically significant difference between the two groups. As patients with actively discharging ears can be considered to gain more benefit from the surgery, it was decided that a difference in success rate of less than 5%(p value more than 0.05) was clinically insignificant, whereas a difference greater than this would be sufficient to make postponing the surgery until the ear was dry worthy of consideration.

METHODS AND METHODOLOGY

This prospective, comparative interventional study was done at department of otorhinolaryngology - Head & Neck Surgery, National Academy of Medical Sciences, Bir Hospital, Kathmandu between May 2016 to May 2017 after obtaining ethical clearance-from institutional review committee. Total 100 patients (ears)with chronic otitis media - mucosal type with or without mucoid ear discharge were taken for the study (50 in each group). Patients less than 8 years & more than 50 years, patients with total perforation or cholesteatoma, patients with active infection with purulent ear discharge, revision cases, patients with diabetes, uncontrolled hypertension, HIV infection, active tuberculosis were excluded from the study. Informed and written consent was taken in all the patients. Each ear was taken as a single case. The ears which had mucoid discharge or edematous middle ear mucosa but no active infection or purulent discharge were regarded as active ears (group-A)and with no ear discharge at least for 3 months were regarded as inactive ears(group- B). Pure tone audiometry was obtained within 1 week prior to surgery. These patients underwent myringoplasty under local anaesthesia through permeatal approach in all the cases. Tragal cartilage with single side perichondrium as a graft material was used. 10 days course of antibiotics with analgesics on demand was given. Antibiotic ear drops was started after ear pack removal. Patient were called for follow up on 2nd, 7th, 42nd day and at 3 months. Those patients who were lost for follow up were excluded from the study. Otoscopic examination was carried out to assess the uptake of the graft. Success of myringoplasty was regarded if there was no residual perforation and no significant retraction of the graft. The hearing evaluation was done 3 months after surgery by means of PTA. All the data so collected in the proforma were tabled and statistically analyzed using SPSS Version 21 software and appropriate statistical tool were used.

RESULTS

Successful raft uptake was seen in 37(74%) ears in group A and in 39 (78%) ears in group B, and the difference was not found to be statistically significant (p value, 0.81) (Table III). Failures in the active (wet) ear group were noticed in 13 ears, and 7 of them were due to anterior medialization of the graft, resulting in residual anterior perforation. Cause of failure seen in the other 2 ears of this group and was associated with upper respiratory infection. All of the failures in inactive (dry) group were associated with anterior medialization of the graft. One patient had profound sensory-neural hearing loss and another one had 60 dB of conductive hearing loss. Both ears belonged to the active (wet) ear group.

Table I: Showing gender distribution:

Variables	Male	Female	Total	P value
Active group	21	29		
Inactive group	30	20		
Total	51	49	100	0.84

Table II: Showing age distribution:

Variables	8-20 years	21-40	41 and above
Active group	18	17	15
Inactive group	20	27	3

Table III: Showing graft uptake(success):

Disease group	No of cases	Success	Graft Failure	Percentage of success	P -value
Inactive	50	39	11	78	0.81
Active	50	37	13	74	

DISCUSSION

It is a common belief that myringoplasty should be done in a totally dry ear to obtain a successful surgery. The uncertainty about the effect of wetness of the middle ear on the outcome of myringoplasty, encouraged us to investigate the results of myringoplasty in such patients and to compare it with the results of myringoplasty in dry ear. It is difficult to control all variables that play part in determining the outcome of myringoplasty.[10] In the present study, the variables were not taken into account because of lack of proven association between variables like age, sex, and site and size of the perforation with graft uptake in many studies. We used the same approach, graft material, and technique for both groups; so, we believe that both groups were broadly comparable. Patients with wet ear may present with ear discharge (mucoid or mucopurulent) or only edematous middle ear mucosa, and to make the group of wet ears homogeneous, we included only patients with mucoid ear discharge. The present study showed a graft uptake rate for myringoplasty of 78% in dry ears and 74% in wet ears and differences were not statistically significant. Our outcomes for both groups fall within the range of successful myringoplasty rates described in the literature in regards to graft intake (71%-96 %).[6] One big series conducted by Mills et al.[6] has reported a success rate of 82% and 83% for myringoplasty in active and inactive ears, respectively. A meta-analysis done by Vrabec et al.[7] considering the effect of otorrhoea on closure rate indicates that tympanoplasty on a discharging ear is as successful as in a dry ear. The two previously mentioned studies defined wet ear as an ear that is actively discharging and did not describe the nature of the discharge. In a comparative study, Nagle et al.[8] included only patients with mucoid discharge in the wet ear group and achieved a primary complete graft uptake rate of 88% and 74% in dry and wet ears, respectively. They did not find this difference to be statistically significant. Also, no statistical significance was found regarding hearing improvement between two groups. Contrary to our results, many studies have reported that a discharging middle ear at time of surgery influences the outcome of myringoplasty either positively or negatively. Gersdorff et al.[9] and Pignataro et al found a better outcome when operating on a dry ear, and both recommended medical treatment of discharging ears to control the inflammatory changes before myringoplasty. Interestingly, Pignataro et al.have concluded that among various studied factors that may affect the outcome of myringoplasty, a dry ear is the single most meaningful factor in the success of a graft. The duration of dryness of the ear before myringoplasty was one of several factors studied by Onal et al.to determine their influence on the outcome of the operation. They have reported that myringoplasty is more likely to be successful if the ear has been dry for a longer period. They found that whenever the ear is dry for less than 1 month before surgery, the success rate is 60%, and if the ear is dry for more than 1 month, the success rate increases to 82%, and the difference was statistically insignificant but close to the level of significance (p=0.067).

On the other hand, few studies revealed a positive effect of ear discharge on graft uptake. Caylan et al.[10] have reported better healing of the tympanic membrane after myringoplasty in a discharging ear and achieved a 100% success rate, while it was 75% in dry ears. They attributed such better results in discharging ears to the probable increase in the vascularity of the middle ear, which could have favored faster and better healing and graft uptake. Vijayendra et al.[11] conducted a histopathological study and found that the tympanic membrane of wet ears showed preservation of all layers of the epithelium, a higher number of inflammatory cells, and abundant blood vessels, while in totally dry ears, the tympanic membrane showed a single layer of epithelium, as well as scant or absent inflammatory cells and blood vessels. Due to these findings, they inferred that graft failure is more in totally dry perforations, and they recommended conversion of all tympanic membrane perforations in dry ears into subtotal perforations to remove the atrophic and avascular portion of the ear drum. Good vascularization or angiogenesis of the grafted material is one of the most important physiological factors for successful grafting in myringoplasty. Noh and Lee[12] evaluated the

vascularization time of the grafted temporalis fascia and tragal perichondrium in active and inactive mucosal chronic otitis media and found that there is no significant relationship between vascularization time of the graft and the status of middle ear mucosa (dry versus wet).

CONCLUSION

Mucoid ear discharge is not a reason to postpone myringoplasty, as it has no adverse effect on the outcome of the operation in regards to graft uptake.

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