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ORIGINAL ARTICLE

Comparative Study of Myringoplasty Outcome with and without Cortical Mastoidectomy

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ABSTRACT

Introduction: *Chronic suppurative otitis media (CSOM) is an infection of the middle ear that is very common. It is mainly characterized by persistent perforation of the tympanic membrane, recurrent discharges from the ear, and hearing loss due to conduction. The study is designed to evaluate and analyze the results of myringoplasty along with cortical mastoidectomy versus those of myringoplasty alone.* ***Methods & Matetials:*** *This comparative study was conducted on 100 patients with tubotympanic chronic suppurative otitis media attending the ENT department at Specialized ENT Hospital of SAHIC, Dhaka from January 2025 to December 2025. Patients were randomly divided into two equal groups: Group A, which had 50 patients who underwent myringoplasty alone, and Group B, which had 50 patients who underwent myringoplasty with cortical mastoidectomy. Data were analyzed using SPSS version 25.0.* ***Result:*** *Both groups in the study of 100 patients were similar in terms of age and gender distribution. The two groups also had similar perforation size and site. There was no significant difference between the two groups in terms of graft uptake, which was high in both groups (86% for myringoplasty only vs. 90% with mastoidectomy). Hearing was improved in both groups, with a significantly greater air-bone gap closure found in the group that underwent mastoidectomy. (14.9 ± 4.6 dB vs. 11.8 ± 4.1 dB, p = 0.01). Postoperatively, most patients achieved a dry ear (82% vs. 88%), and minor complications were rare and comparable.* ***Conclusion:*** *Both myringoplasty, with or without cortical mastoidectomy, show high rates of graft uptake and satisfactory postoperative ear status in tubotympanic chronic suppurative otitis media. Although cortical mastoidectomy did not significantly enhance graft success or ear dryness, it was related to more hearing improvement.*

Keywords: *Myringoplasty, Cortical Mastoidectomy, Chronic Suppurative Otitis Media*

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INTRODUCTION

Chronic suppurative otitis media (CSOM) is a persistent inflammatory disorder of the middle ear cleft, which is identified by perforation of the tympanic membrane, a discharging ear that may be intermittent or persistent, and varying degrees of conductive hearing loss. Overcrowding, poor hygiene, limited access to healthcare, and delayed treatment-seeking behavior are the main causes of the disease, which makes it a serious public health problem, especially in developing countries [1]. The condition is one of the major causes of hearing-related disability and also results in impaired communication, poor quality of life, and educational and occupational disadvantages [2, 3]. The main surgical goals of treatment of CSOM are infection eradication, closure of the tympanic membrane perforation, restoration of middle ear function, and hearing improvement. Myringoplasty, which refers to the surgical repair of the tympanic membrane without ossicular reconstruction, is a standard treatment for tubotympanic CSOM patients who have an intact ossicular chain [4]. In fact, a successful myringoplasty would prevent recurrent infections and improve hearing results, consequently boosting the patient's quality of life. However, there is still discussion about the necessity of cortical mastoidectomy when done at the same time as myringoplasty. Cortical mastoidectomy is the removal of mastoid air cells that have been attacked by the disease in order to get rid of leftover infection, to improve ventilation of the middle ear, and to provide a good condition for graft uptake [5]. The advocates of the mastoidectomy and myringoplasty combination say that the pathology of mastoid air cells can be the source of infection; therefore, if this focus of infection is left untreated, the surgical results might be compromised. Nevertheless, several articles have cast doubt on the need for routine cortical mastoidectomy in cases of non-cholesteatomatous CSOM. Tawab et al. found that the difference in graft uptake and hearing improvement between patients who had myringoplasty only and those who had myringoplasty with cortical mastoidectomy was not statistically significant [6]. In these works, anatomical success and postoperative ear dryness rates were similar for both surgical approaches. Such findings indicate that mastoidectomy probably does not give any advantage in cases with a dry ear and inactive mucosal disease. On the other hand,

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some practitioners have found better audiological results when cortical mastoidectomy is included. Some articles have demonstrated that patients who underwent combined procedures had higher air, bone gap closure, and hearing gain, even though graft uptake rates did not differ [7,8]. More retrospective studies have suggested that mastoidectomy might be helpful in certain cases, for example, in cases with poorly pneumatized mastoids, or when a patient has recurrent ear discharge, or it is suspected that there is a mastoid disease [9]. Systematic reviews and comparative studies emphasize that there is a disagreement among experts about whether cortical mastoidectomy should always be performed when myringoplasty is done. Some studies are in favor of deciding cases individually, whereas others warn against extra mastoid drilling as it leads to increased operating time, raised costs, and carries risks of complications without any evident benefit [10]. The present study aims to compare the outcomes of myringoplasty with and without cortical mastoidectomy.

METHODS & MATERIALS

This is a comparative study carried out on 100 patients with tubotympanic chronic suppurative otitis media attending the ENT department at the Specialized ENT Hospital of SAHIC, Dhaka, from January 2025 to December 2025. The patients were randomly divided into two equal groups: Group A (n=50) was treated with myringoplasty alone, and Group B (n=50) was treated with myringoplasty plus cortical mastoidectomy. Preoperative evaluation included a thorough history, clinical examination, and audiological assessment with pure-tone audiometry for the determination of airbone gap. The size and site of the perforation were recorded, and only patients with inactive mucosal disease and intact ossicular chain were included in the study. All surgical operations were done under either general or local anesthesia following standard underlay or overlay grafting procedure with temporalis fascia. The first postoperative follow-up was at 4 weeks and then at 8 and 12 weeks, when graft uptake, hearing improvement, postoperative ear status, and complications were evaluated. The Data was entered and analyzed with the help of SPSS version 25.0 software. The continuous variables were presented as mean SD, and the categorical variables were given as frequency and percentage. Differences between the groups in continuous variables were tested by an independent t-test, and categorical variables were tested by chi-square. p-value <0.05 was taken as statistically significant.

RESULTS

The average age of patients in Group A was 29.8 8.4 years, and in Group B it was 30.6 9.1 years. Age distributions between the two arms were similar, with no significant statistical difference (p = 0.64). Male patients made up 56% of Group A and 52% of Group B, while females comprised 44% and 48%, respectively. The two groups had a similar sex makeup without any significant difference p = 0.68 (**Table I**)

Table – I: Demographic Distribution of Study Subjects (*n* = 100)

Parameter	Group A (n=50)	Group B (n=50)	p value
Mean age (years)	29.8 ± 8.4	30.6 ± 9.1	0.64
Male	28 (56%)	26 (52%)	0.68
Female	22 (44%)	24 (48%)	

The percentage of small, medium, and large perforations in Group A were 28%, 42%, and 30%, respectively, while in Group B the corresponding figures were 24%, 46%, and 30%. No statistical significance was found between the two groups regarding perforation size (p = 0.89). As for the perforation site, anterior perforations were noted in 36% of Group A and 40% of Group B, posterior perforations in 34% and 30%, and central perforations in 30% of both groups. The site distribution was also comparable p = 0.84 (**Table II**).

Table – II: Size and Site of Tympanic Membrane Perforation (*n* = 100)

Perforation Characteristics	Group A (n=50)	Group B (n=50)	p value
Small	14 (28%)	12 (24%)	0.89
Medium	21 (42%)	23 (46%)	
Large	15 (30%)	15 (30%)	
Anterior	18 (36%)	20 (40%)	0.84
Posterior	17 (34%)	15 (30%)	
Central	15 (30%)	15 (30%)	

Successful graft uptake was achieved in 43 patients (86%) in Group A and 45 patients (90%) in Group B. Graft failure occurred in 14% of patients undergoing myringoplasty alone and 10% of those undergoing combined surgery. Although the graft uptake rate was slightly higher in Group B, the difference was not statistically significant p = 0.54 (**Table III**).

Table – III: Graft Uptake Rate at 12 Weeks Postoperatively (*n* = 100)

Outcome	Group A (n=50)	Group B (n=50)	p value
Successful graft uptake	43 (86%)	45 (90%)	0.54
Graft failure	7 (14%)	5 (10%)	

The preoperative mean air–bone gap was 28.6 ± 6.2 dB in Group A and 29.1 ± 6.5 dB in Group B, with no significant difference (p = 0.71). Postoperatively, the mean air–bone gap improved to 16.8 ± 5.4 dB in Group A and 14.2 ± 4.8 dB in Group B. The mean air–bone gap closure was 11.8 ± 4.1 dB in Group A compared to 14.9 ± 4.6 dB in Group B. This difference was statistically significant p = 0.01 (**Table IV**).

Table – IV: Hearing Improvement (Air–Bone Gap Closure in dB) (*n* = 100)

Hearing Outcome	Group A (n=50)	Group B (n=50)	p value
Pre-op ABG (mean ± SD)	28.6 ± 6.2	29.1 ± 6.5	0.71
Post-op ABG (mean ± SD)	16.8 ± 5.4	14.2 ± 4.8	
Mean ABG gain	11.8 ± 4.1	14.9 ± 4.6	0.01

At 12 weeks postoperatively, a dry ear was achieved in 41 patients (82%) in Group A and 44 patients (88%) in Group B. Intermittent discharge was noted in 12% of Group A and 8% of Group B patients, while persistent discharge was present in 6% and 4%, respectively. The difference in postoperative ear status between the two groups was not statistically significant p = 0.39 (**Table V**).

Table – V: Postoperative Ear Status at 12 Weeks (*n* = 100)

Ear Status	Group A (n=50)	Group B (n=50)	p value
Dry ear	41 (82%)	44 (88%)	0.39
Intermittent discharge	6 (12%)	4 (8%)	
Persistent discharge	3 (6%)	2 (4%)	

Minor postoperative complications were observed in both groups. Wound infection occurred in 4% of Group A and 6% of Group B patients. Transient vertigo was reported in 2% and 4%, respectively. No cases of facial nerve injury or postoperative sensorineural hearing loss were observed in either group (**Table VI**).

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Table – VI: Postoperative Complications (*n* = 100)

Complication	Group A (n=50)	Group B (n=50)
Wound infection	2 (4%)	3 (6%)
Transient vertigo	1 (2%)	2 (4%)
Facial nerve injury	0	0
Sensorineural hearing loss	0	0

DISCUSSION

In the present study, the mean age of patients was 29.8 ± 8.4 years in Group A and 30.6 ± 9.1 years in Group B, with no statistically significant difference (p = 0.64). Male predominance was noted in both groups (56% in Group A and 52% in Group B). Tawab et al. reported a similar demographic pattern, with most patients in the third decade of life and a slight male predominance, and no significant demographic differences between comparison groups [6]. Jha et al. also found comparable age and sex distribution between myringoplasty-only and combined mastoidectomy groups [11]. In our study, medium-sized perforations were most common (42% in Group A and 46% in Group B), followed by large perforations (30% in both groups). Central perforations accounted for 30% in each group. Jha et al. observed a similar predominance of medium and large perforations, with central perforations being the most frequent site [11]. Gungguly et al. reported central perforations in 34%–38% of cases, with no intergroup difference [7]. Our study demonstrated graft uptake rates of 86% in myringoplasty alone and 90% with cortical mastoidectomy, with no statistically significant difference (p = 0.54). Tawab et al. reported graft success of 70% without mastoidectomy and 80% with mastoidectomy, also without statistical significance [6]. Mishiro et al. documented graft uptake rates of 90.5% and 89.2% in patients undergoing tympanoplasty with and without mastoidectomy, respectively [9]. These findings support our observation that routine cortical mastoidectomy does not significantly improve graft uptake in inactive CSOM. In our series, mean air–bone gap closure was 11.8 ± 4.1 dB in Group A compared to 14.9 ± 4.6 dB in Group B, with a statistically significant difference (p = 0.01). Tawab et al., however, reported hearing gains of 9.3 dB and 10.5 dB in their respective groups without significant difference [6]. Gungguly et al. also found slightly better hearing improvement in the mastoidectomy group (10.6 dB vs 8.5 dB), though not statistically significant [7]. Compared to these studies, our results indicate a more pronounced audiological benefit with mastoidectomy, possibly due to improved middle ear aeration or mastoid clearance in selected patients. A dry ear was achieved in 82% of patients in Group A and 88% in Group B at 12 weeks. Tawab et al. reported dry ear rates of 75% without mastoidectomy and 90% with mastoidectomy [7]. Jha et al. found dry ear rates exceeding 85% in both groups, without significant difference [11]. Our findings closely mirror these results, suggesting that postoperative ear dryness is largely independent of mastoidectomy in inactive disease. Minor complications in our study were low and comparable between groups, with wound infection rates of 4% in Group A and 6% in Group B, and no major complications. McGrew et al. similarly reported low complication rates and no increase in morbidity with mastoidectomy [10]. Mishiro et al. also observed no significant difference in complication rates between surgical approaches [9].

LIMITATIONS

The study sample was limited in size and the duration of follow, up was only 12 weeks, thus the evaluation of the long, term success of the graft and hearing results can be questioned. This piece of research was done in one center only, therefore the results may not be generalizable to the whole population. On the other hand, the study patients were only those with inactive tubotympanic CSOM and intact ossicles, so the results cannot be extended to cases that have an active infection, cholesteatoma, or ossicular chain defects.

CONCLUSION

Myringoplasty with or without cortical mastoidectomy results in high graft uptake rates and satisfactory post, operative ear status in tubotympanic chronic suppurative otitis media. On the other hand, the cortical mastoidectomy was not shown to significantly increase the graft success or ear dryness, however, the patients who had cortical mastoidectomy showed better hearing improvement compared to those who did not have cortical mastoidectomy.

RECOMMENDATION

According to the results, myringoplasty by itself can actually be capable of curing most patients with inactive tubotympanic CSOM resulting in high graft success and dry ear rates. Cortical mastoidectomy is a surgical method which needs to be kept selectively for those individuals who are likely to get significantly better hearing from it as it cannot be performed on all the cases.

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