

**OUTCOME OF MYRINGOPLASTY WITH AND WITHOUT CORTICAL
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ABSTRACT

Background: The management of chronic otitis media has witnessed a profound change over the last century. Development in microbiology and availability of better antibiotics together with emphasis on preserving hearing has further modified the approach to its management. Well trained, experienced otologists currently remain divided as to the importance of mastoidectomy in the treatment of uncomplicated otitis media. The use of mastoidectomy as a means to establish drainage of a complicated infection of the ear sparks little controversy. **Objective:** The aim of the study was to compare the graft take rate and hearing improvement of uncomplicated tympanic membrane perforations with myringoplasty alone and when combined with mastoidectomy. **Methods:** This was interventional and observational type of cross-sectional study. Purposive samplings of the central perforation and tubotympanic disease patients admitted in Dhaka Medical College Hospital were enrolled for study. Sample size was 60. Detail demographic data were collected from the informant and recorded in structured case record form. Clinical examination and relevant investigation were done meticulously. All collected questionnaire checked very carefully to identify the error in the data. Data processing work consist of registration schedules, editing computerization, preparation of dummy table, analyzing and matching of data. **Result:** Present study included 60 patients who were divided randomly into two groups; group 1 (myringoplasty alone) included 30 patients and Group 2 (myringoplasty with cortical mastoidectomy) also included 30 patients. Overall demographic features of 60 patients are shown in Table 1. In the study, the maximum incidence was in the age group 12-30 years 43(71.6%), with mean age of the patient was 27.6 ± 7.52 years. Male and female ratio was 1.85:1. Large numbers of respondents came from urban area (51%), and patients of poor class 27(45.0%) comprising the major percentage of the patients, no significant differences was found between groups with respect to age & gender. Preoperatively, in both the groups, majority of cases had AB gap >25 dB (n=12; 40% in Group I and n=11; 36.6% in Group II). Mean AB gap in Group I was 23.7 ± 6.3 as compared to 23.5 ± 6.9 dB in Group II. Statistically, this difference was not significant either for categorical difference (p=0.315) or for mean difference (p=0.076) between the two groups. **Conclusion:** Chronic suppurative otitis media (CSOM) of tubo-tympanic type is typically a persistent disease of the middle ear cleft, clinically manifesting with deafness and discharge. The management of CSOM safe type includes control of middle ear and mastoid infection with appropriate medical line of therapy, eradication of septic foci followed by closure of tympanic membrane perforation.

INTRODUCTION

Auditory sensation is one of the vital sensations for existence. When such a great sensation is lost, life naturally loses its charm. Our country, being a developing nation with poor socio-economic status, chronic diseases of ear accounts for significant number of population. Chronic suppurative otitis media is a common disease encountered in everyday practice of otolaryngologist and it can at times be troublesome to achieve a totally dry ear and to improve the patients hearing.^[1]

Myringoplasty is a procedure used to repair a tympanic membrane perforation, without the need to examine the

middle-ear. The procedure should be limited to patients who satisfy all of the following four criteria: 1) Relatively small central perforation of the tympanic membrane, 2) Translucent tympanic membrane, 3) No middle ear diseases is present of suspected 4) Hearing is within normal limits.^[2]

Tympanoplasty, also called eardrum repair, refers to surgery performed to reconstruct a perforated tympanic membrane (eardrum) or the small bones of the middle ear. Eardrum perforation may result from chronic infection or, less commonly, from trauma to the eardrum.^[3] Other theory suggests that cortical mastoidectomy adjunct with tympanoplasty type-I, has no significant effects on

surgical outcome in any condition of dry or wet ear in tubotympanic variety of CSOM.^[4]

A prospective study where 40 patients with CSOM were recruited. Twenty patients underwent simple myringoplasty alone and 20 patients underwent myringoplasty with cortical mastoidectomy. Result shows no significant difference in graft uptake between the myringoplasty alone group (70%) and cortical mastoidectomy group (80%) ($P=0.7$). There was no significant difference in ear dryness between the myringoplasty alone group (75%) and cortical mastoidectomy group (90%) ($P=0.4$). Mastoidectomy performed in non-cholesteatomatous CSOM gives no statistically significant benefit over simple myringoplasty as regards graft success rate and dryness of the middle ear with comparable hearing outcome.^[5]

As far as graft take up rate is concerned, several studies results are comparable e.g. who observed success rate 75% and 7.6% for myringoplasty alone group as compared to 82.85% and 82.8% respectively for myringoplasty with cortical mastoidectomy group.^[6]

Most of the studies above have reported between 70 to 80% for Myringoplasty alone and between 80 to 90% for myringoplasty with cortical mastoidectomy.^[7] However, none of the studies was able to depict a statistically significant difference between two groups. In another study, mean AB gap correction in two groups was 9.75 ± 5.99 and 10.13 ± 6.65 respectively for myringoplasty alone and myringoplasty with cortical mastoidectomy have also shown that gap closure was higher for Myringoplasty with cortical mastoidectomy as compared to myringoplasty alone.^[8,9]

AIM AND OBJECTIVE

The aim of the study was to compare the graft take rate and hearing improvement of uncomplicated tympanic membrane perforations with myringoplasty alone and when combined with mastoidectomy.

MATERIAL AND METHODS

Study design: Interventional and observational type of cross-sectional study.

Place of study: Department of Otolaryngology, Dhaka Medical College Hospital, Dhaka.

Study periods: Six months (5th April 2016 to 4th

October 2016).

Sampling: Sample was selected from the population by purposive sampling technique.

Sample size: Duration of current study was 06 months. As this is a learning study and time is only 6 months so total 60 cases were taken.

Research materials: All the data were recorded in a preformed structured questionnaire.

Selection criteria

Inclusion Criteria

1. Age: more than 12-years old.
2. Central perforation.
3. Tubotympanic disease

Exclusion Criteria

4. Less than 12 years.
5. Marginal or attic perforation.
6. Cholesteatomatous ear.
7. Associated Otitis externa (OE).

Data collection procedure

A hospital based prospective, cross-sectional study. Total 60 patients were included for study. All patients were age more than 12-years admitted with complaints of central perforation and tubotympanic disease in Department of Otolaryngology, Dhaka Medical College Hospital, Dhaka after careful history taking, thorough general and systemic examination and appropriate investigations fulfilling inclusion and exclusion criteria.

Data analysis

Socio-demographic and clinical variables: Data for socio-demographic and clinical variables were obtained from all participants by the use of a pre-designed and easily understandable questionnaire. The socio-demographic variables studied- age, sex, place of residence and occupation. Socioeconomic levels were determined by occupation, household's income and expenditure. After collection of all information, these data were checked, verified for consistency and edited. After editing and coding, the coded data directly entered into the computer by using SPSS version 6. Data cleaning validation and analysis was performed using the SPSS/PC software, Graph and chart are by MS excel. The result was presented in tables in Graph. A "P" value <0.5 considered as significant.

RESULTS

Table 1: Demographic characteristics of the patients (n=60)

Age	Frequency		Total
	Male (n= 39)	Female (n= 21)	
12-30	29(24.35%)	14(66.6%)	43
31-50	8(20.51%)	4(19.04%)	12
>50	2(5.12%)	3(14.28%)	5
Mean±SD	27.6 ± 7.52		

The study included 60 patients who were divided randomly into two groups; group 1 (myringoplasty

alone) included 30 patients and Group 2 (myringoplasty with cortical mastoidectomy) also included 30 patients.

Overall demographic features of 60 patients are shown in Table 1. In the study, the maximum incidence was in the age group 12-30 years 43(71.6%), next to it was 31-50

year age group 12(20.0%). Mean age of the patient was 27.6 ± 7.52 years.

Table 2: Distribution of patients according to residence (n=60)

Residence	Frequency	Percentage
Rural	24	40.0
Urban	31	51.6
Sub-urban/slum	5	8.33

Table showed area of residence of the patients. Large numbers of respondents came from urban area (51%),

followed by rural area (40.0%) and sub-urban/slum area (8.33%).

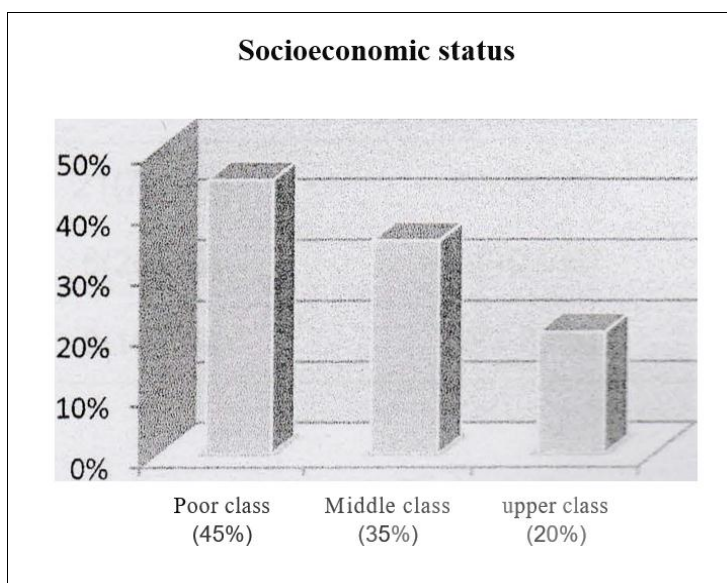


Figure- 1: Socioeconomic status (SES) of study population (n=60)

Among the patients the poor class 27(45.0%) comprising the major percentage of the patients, which

is followed by middle class 21(35.0%) and remaining are upper class 12(20.0%).

Table 3: Distribution of patients according to treatment modality (n=60)

Age (years)	Frequency		p-value
	Myringoplasty Alone	Myringoplasty with cortical mastoidectomy	
12-30	21(70.0%)	22(36.6%)	
31-50	6(20.0%)	6(10.0%)	
>50	3(10.0%)	2(3.33%)	

All groups were comparable with respect to the demographic and operational factors. No significant

differences were found between group with respect to age and gender.

Table 4: Distribution of the patients according to pure tone audiogram finding (n=60)

Variable	Number of patients			
	Group-I (Myringoplasty Alone)		Group-II (Myringoplasty with cortical mastoidectomy)	
15-20 dB	8(26.6%)	17(56.6%)	10(38.4%)	15(50.0%)
20-25 dB	10(38.4%)	8(26.6%)	9(30.0%)	9(30.0%)
>25 dB	12(40.0%)	5(16.6%)	11(36.6%)	6(20.0%)

Preoperatively, in both the groups, majority of cases had AB gap >25 dB (n=12; 40% in Group I and n=11; 36.6% in Group II). Mean AB gap in Group I was

23.7 ± 6.3 as compared to 23.5 ± 6.9 dB in Group II. Statistically, this difference was not significant either for categorical difference (p=0.315) or for mean

difference ($p=0.076$) between the two groups. Postoperatively, overall, majority of patients had an AB gap of 15 and 20 dB (56.6% in group-I and 50% in

group- Mean AB gap of Group I was 18.2 ± 9.7 dB as compared to 20.9 ± 8.3 dB in Group II.

Table 5: Evaluation of Air-bone (A-8) gap in study subject (n=60)

A-8 gap	Frequency		p-value
	Group-I (Myringoplasty Alone)	Group-II (Myringoplasty with cortical mastoidectomy)	
Preoperative	23.7 ± 6.3	23.5 ± 6.9	0.810
Postoperative	18.2 ± 9.7	20.9 ± 8.3	
A-8 gap diff.	-5.5 ± 9.8	-2.6 ± 6.8	

Average A-B gap preoperative was 23.7 ± 6.3 in group-I, whereas it was 23.5 ± 6.9 in group -II. Average A-B gap 3 months postoperative in group-II was 18.2 ± 9.7 , whereas it was 20.9 ± 8.3 in group-II. There was no statistically significant difference between group I and group II regarding A-B gap difference pre- and postoperative. The p-value is .810206. This result is not significant at $p < .05$.

DISCUSSION

Myringoplasty is an operative procedure, in which the reconstructive procedure is limited to repair of tympanic membrane perforation.^[10] Implicit in the definition is that the ossicular chain is intact and mobile, and the middle ear is disease free. There are a number of studies in the literature highlighting the advantages and disadvantages of performing mastoidectomy in the surgical treatment of mucosal type of chronic otitis media.^[11] Present study included 60 patients who were divided randomly into two groups; group 1 (myringoplasty alone) included 30 patients and Group 2 (myringoplasty with cortical mastoidectomy) also included 30 patients. Overall demographic features of 60 patients are shown in Table 1. In the study, the maximum incidence was in the age group 12-30 years 43(71.6%), with mean age of the patient was 27.6 ± 7.52 years. Out of 60 cases (65.0%) cases were male and (35.0%) were female. Male and female ratio was 1.85:1. Large numbers of respondents came from urban area (51%), and patients of poor class 27(45.0%)> comprising the major percentage of the patients, which is followed by middle class 21(35.0%) and remaining are upper class 12(20.0%). All groups were comparable with respect to the demographic and operational factors. No significant differences were found between groups with respect to age & gender. All findings are accordance with result of other study.^[12] Age is an important non- mastoid factor influencing the outcome of Myringoplasty. Failure of Myringoplasty in children is attributed to Adenoid, Eustachian tube dysfunction, upper respiratory infections and surgical difficulty due to narrow external ear canal etc. ENT surgeons by performing a corrective surgery for chronic otitis media can change the lifestyles of the patient profoundly. The medical line of management only can lessen the severity of the symptoms.^[13]

Findings are consistent with other findings, Kawatra R et al reported similar result as preoperatively in both the groups, majority of cases had AB gap >25 dB ($n=22$; 55% in Group I and $n=31$; 77.5% in Group II). Mean AB gap in Group I was 24.50 ± 6.28 as compared to 26.88 ± 5.51 dB in Group II. Statistically, this difference was not significant either for categorical difference ($p=0.315$) or for mean difference ($p=0.076$) between the two groups.^[14]

A Retrospective study of patients at tertiary referral hospital revealed that, hearing gain in decibel (dB) in tympanoplasty group was 7.64 and in tympanoplasty combined with cortical mastoidectomy was 8.84. Graft uptake was 76% in tympanoplasty group and 88% in tympanoplasty combined with cortical mastoidectomy. Hearing improvement, graft uptake and clinical improvement were statistically incomparable in 2 groups. Combining cortical mastoidectomy with tympanoplasty will not give additional benefits in terms of hearing gain, disease clearance and graft uptake.^[15]

Our result shows average A-8 gap preoperative was 23.7 ± 6.3 in group-I, whereas it was 23.5 ± 6.9 in group-II. Average A-8 gap 3 months postoperative in group-II was 18.2 ± 9.7 , whereas it was 20.9 ± 8.3 in group-II. There was no statistically significant difference between group I and group II regarding A-8 gap difference pre- and postoperative. The p-value is .810206. This result is not significant at $p < .05$.

Graft success rates were 70% in group-I and 80%> in group-II with chi-square statistic is 0.8. The p-value is 0.371093. There was no statistically significant difference between groups ($p < .05$). Dry ears-3 months postoperatively-were 77% in patients of group-I with myringoplasty alone and 90% in group-II with myringoplasty and mastoidectomy with chi-square statistic is 1.92. The p-value is 0.165857. This result is not significant at $p < .05$. Present study demonstrated that ear dryness and Graft uptake success rate was favorable in group-II patients.

In a prospective randomized study amongst total of 80 patients, findings show overall success rate was 77.5%. It was higher in dry ear (87.5%) as compared to wet ear

(67.5%) and this difference was significant statistically. On evaluating odds of failure for wet ear, it was observed that group 1 had higher odds of failure for wet ear as compared to that of group 2. In both myringoplasty alone or with cortical mastoidectomy, failure rates were higher in wet as compared to dry ears, however odds of failure in wet cases were much higher in myringoplasty alone group as compared to myringoplasty with cortical mastoidectomy.^[16]

Our study revealed that graft success rates were 70% in group-I and 80% in group- II. There was no statistically significant difference between the two groups. Dry ears -3 months postoperative-were 77% in patients with myringoplasty alone (group-I) and 90% in the group with myringoplasty with mastoidectomy (group-II) without significant difference between both groups. Tawab H et al shows in their study graft success rates were higher in group 2 (80%) than group 1 (70%). Dry ears postoperative were 75% in patients with myringoplasty and 90% in the group with myringoplasty and mastoidectomy.^[17] Along with our results, Sheehy in 1985 recommended performing simple cortical mastoidectomy routinely for all tympanoplasties because it is "good practice" and because "it's better to be safe than sorry."^[18]

CONCLUSION

The management of the CSOM, currently, includes control of middle ear and mastoid infection medically followed by surgical closure of the tympanic membrane perforation. Many factors contribute to the failure of the Myringoplasty and it still remains a point of controversy whether a perforation should be repaired by Myringoplasty alone or in association with cortical mastoidectomy. Infection is an important cause of graft failure and can result in hidden mastoid disease. Mastoidectomy is an effective means of pneumatizing mastoid air cell system as well as eradicating the mastoid source of infection. The study proves that Myringoplasty along with simple mastoidectomy in selected cases gives better result than Myringoplasty alone.

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