A Study on Outcome of Myringoplasty

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Abstract

A cross sectional study was carried out from July 2004 to June 2006 at the department of ENT of SSMC and Mitford Hospital, Dhaka with the aim to assess the graft take rate as well as hearing improvement. This study included 60 patients those underwent myringoplasty operations by underlay technique with temporalis fascia graft. The age range of patients was 15-45 years. In this study graft take rate was 86.67% after 2 months. There was no gross difference in graft take in respect of sex. The pre operative and post operative hearing threshold is statistically significant which indicates improvement of hearing. Therefore, myringoplasty is a valid treatment modality for closing perforation of tympanic membrane, prevention of infection and improvement of hearing.

Keywords: Myringoplasty, hearing threshold, underlay technique.

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Introduction

In Bangladesh the incidence of Chronic Suppurative Otitis Media (CSOM) is very high because of poor socio-economic condition, overcrowding, poor nutrition and lack of health education.[1]

Among the two type of chronic suppurative otitis media (tubotympanic and attico-antral variety) tubotympanic variety is the commonest and is called safe as the risk of complication are less.[2] The name tubotympanic indicates disease is limited to Eustachian Tube and tympanic cavity and is always characterized by perforation in the tympanic membrane.

Hearing loss occurring from chronic suppurative otitis media is a burden to the individual and also to the family and entire society. The predominant hearing loss in tubotympanic disease is conductive in nature. There is a significant quantitative correlation between the size and the site of perforation and hearing loss. Small perforation (10% of the membrane) produce losses of 10-15 dB below 3 KHz. Large perforation produce severe hearing losses over the whole range particularly at higher frequencies, through these perforations the sound waves acts directly on the round and oval windows.

Myringoplasty is the operation specifically designed to repair or reconstruct the tympanic membrane. A successful myringoplasty controls recurrent infection, improves hearing, prevents tympanosclerosis and cochlear degeneration and hearing aid use. Myringoplasty has been suggested to protect the middle ear by preventing the progression of ossicular pathology and preventing choleasteatoma formation.[3]

The pre-requisites of myringoplasty are dry central perforation of tympanic membrane in CSOM, free from any pathological lesion in the external ear, middle ear and mastoid, functioning Eustachian tube and no systemic diseases like diabetes mellitus, hypertension etc.

At present, myringoplasty is a common in the otolaryngology department having microsurgical facilities. The present study aims at evaluating the surgical results of myringoplasty in selected patients with tympanic membrane perforation and assessing the factors potentially influencing their outcome.

Aims and Objectives

1. To asses the graft taking rate after myringoplasty.

2. To asses the hearing status after surgery.

Methods

This was a cross sectional experiment type of study and carried out in the department of Otolaryngology and Head-Neck Surgery, Sir Salimullah Medical College and Mitford Hospital, Dhaka from July 2004 to June 2006.

Purposive sampling from all consecutive patients of chronic suppurative otitis media (tubo-tympanic variety) admitted in ENT department of Sir Salimullah Medical College and Mitford Hospital, Dhaka, during the study period were selected for the study as per criteria has been described below. A total number of 60 patients were identified accordingly and were included in this study.

Results

Table-I:

Distribution of patients according to age and graft take rate (n=60)

Age range (years)	Number of patients	Percentage of patients	Number of graft taken cases	Percentage of graft taken cases
15-20	22	36.67	19	86.36
21-30	32	53.33	29	90.62
31-40	4	6.67	3	75.00
41-45	2	3.33	1	50.00

Table II:

Socio-economic condition of the patients (n=60)

Socio-economic condition	Number of patients	Percentage
Poor class	4	6.67
Middle class	48	80.00
Upper class	8	13.33

Table III:

Distribution of patients according to ear involvement and graft take rate (n=60)

Ear involvement	Number of patients	Percentage of patients	Number of graft taken cases	Number of graft taken cases
Unilateral	38	63.33	33	86.84
Bilateral	22	36.67	19	86.36

Table IV:

Distribution of patients according to size of perforation and graft take rate (n=60)

Size of perforation	Number of patients	Percentage of patients	Number of graft taken cases	Percentage of graft taken cases
Small size perforation	8	13.33	8	100
Medium size perforation	37	61.67	32	86.49
Sub total perforation	15	25.00	12	80.00

Table V:

Distribution of patients according to site of perforation and graft take rate (n=60)

Site of perforation	Number of patients	Percentage of patients	Number of graft taken cases	Percentage of graft taken cases
Posterior (Behind the umbo)	6	10	6	100
Central (Around the umbo)	45	75	36	86.67
Anterior (In front of umbo)	9	15	7	77.78

Table VI:

Overall result of operations (n=60)

Tympanic membrane	Number of patients	Percentage of patients
Primary take (intact and mobile tympanic membrane)	52	86.67
Graft failure:-	8	13.33
a) Post operative infection	4	6.67
b) Re perforation	4	6.67

Table VII:

Hearing result of operations (n=60)

A) Hearing status before and after operations (n=60)

Number of patients	Average pre-operative air conduction threshold	Average post-operative air conduction threshold
22	26.80 dB	19.10 dB
32	32.40 dB	20.30 dB
04	34.50 dB	23.80 dB
02	40.50 dB	28.70 dB

B) Overall hearing results:

	Mean dB
Pre-operative air conduction threshold	33.55
Post-operative air conduction threshold	22.97
Improvement of air conduction threshold	10.58

C) Distribution of patients according to hearing improvement or not

Hearing improvement or not	Number of patients	Percentage of patients
Hearing improvement	41	68.33
No hearing improvement	19	31.67

Discussion

In this study, age range of patient were from 15 years to 45 years with a mean age of 24 years. Patients age has generally been considered as an influencing factors for surgical outcome. In this study maximum success rate was found within the age group of 21-30 years (90.62%) followed by 15-20 years. Similar results were observed by Vrabec et al.[4] In this study the graft take rate was 86.67% (52 out of 60) and the graft failure was 13.33% (8 out 60). The take rate was more than Kotecha et al.[5] The cause may be due to the fact that the most of the operations were done by experienced hand and there were less infection. The graft take rate was similar to Fisch (86%).[6,7]

In this study most of the patient of CSOM had unilateral involvement. In case of bilateral involvement, myringoplasty was done only in one ear in one sitting. Graft take rate was 86.84% in case of unilateral disease and 86.36% in case of bilateral disease, a difference that was not statistically significant.

With regard to the role of size of perforation, medium size perforations were the commonest in our study. Success rate was more in case of small (100%) and medium size perforation (86.49%) than that of subtotal perforations (80%). Similar result were also reported by Sade et al.[8]

The site of perforation statistically affect outcome in our series as has previously been reported by others.[9,10] Central perforations were the commonest. Success rate of posterior perforations (100%) are more than central (86.67%) and anterior perforations (77.78%). Our finding of higher rate of surgical failure in anterior perforation in comparison to posterior perforation, may be due to the more limited vascularization of the anterior part of ear drum and due to limited access to this perforation.[11]

Surgical approach depends on dimension of external auditory canal, site of perforations as well as surgeon option. In this study

myringoplasty was done through post auricular (86.67%) and per meatal (13.33%) approaches. No significant difference was found between these two approaches which was also found by Kotecha at el.[5]

The mean pre-operative air conduction threshold in the study cases were 33.55 dB. While the mean post-operative air-conduction threshold after two months were 22.97 dB with a mean audiological improvement of 10.58 dB. The improvement was observed within frequency range of 250-1000 Hz. Post operative hearing was improved in only 41 cases (68.33%) and in 19 cases no hearing improvement was found. This hearing gain was more than Doyle at el.[12] The cause may be due to the fact that our cases had least tympanosclerosis, middle ear scarring or graft thickening. No sensori-neural hearing loss was observed after surgery. In some successful cases, hearing was not improved significantly after surgery despite the tympanic membrane healed perfectly and the middle ear remain aerated. Sheehy and Anderson stated that in most cases of CSOM even though the ossicular chain may appear normal there is some factors of scar tissue around the ossicular chain that prevents total restoration of hearing.[13]

The overall success rate was 86.67% (52 out of 60). Out of 8 graft failure patients, 4 cases due to post operative infection and 4 cases due to re-perforation which were caused by some predisposing factors like chronic tonsillitis, chronic rhino-sinusitis, chronic pharyngitis etc. For statistical analysis of pre operative and post operative hearing threshold, paired 't' test was applied. The 'p' value of 't' test was <0.01 which is statistically significant, that means there is a difference between pre operative and post operative hearing threshold which indicates significant improvement of hearing.

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