ORIGINAL ARTICLE

Results of Myringoplasty in Chindren: A Comparison with an Adult Population

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ABSTRACT

Objective: To find out validity of myringoplasty in children by comparing its anatomical and functional results with adult myringoplasty.
Study Design: A descriptive cross sectional study
Place and Duration of Study: Department of Otolaryngology and Head and Neck Surgery at a tertiary care teaching hospital in Rawalpindi from January 2007 to December 2010.
Materials and Methods: A total of 89 patients having dry central tympanic membrane perforation of various sizes secondary to chronic tubotympanic suppurative otitis media were included in the study. The patients were divided in two groups. First group comprised of children upto the age of 14 years whereas those above the age of 14 years were included in second group. Myringoplasty was performed in all patients with temporalis fascia utilizing underlay technique. The two groups were compared regarding graft success rate and hearing improvement at the end of 6 months of follow up.
Results: Out of 89 patients included in the study, 37 (41.6%) belonged to child group whereas 52 (58.4%) were included in adult group. Among 37 patients in child group, 34(91.8 %) had successful graft take at the end of 6 months of follow up whereas 47 (90.3 %) patients out of 52 in adult group had successful graft. Average air bone gap closure of 13.5 dB was noted in child group whereas in adult group it was 12.5 dB. The difference between graft success rate and average air bone gap closure was found to be statistically insignificant (P>0.05).
Conclusion: Results of myringoplasty in paediatric and adult age group are comparable in terms of graft success rate and hearing improvement.

Key words: *Myringoplasty, tympanic membrane, paediatric, middle ear*

Introduction

Myringoplasty in adults is now considered to be well established and rewarding procedure with high success rate[1] but controversy still surrounds the advisability of tympanic membrane repair in children.[2] The main concern regarding paediatric myringoplasty is that the child has an increased susceptibility to upper respiratory tract infections and eustachian tube dysfunction as compared to an adult leading to recurrent middle ear infection.[3] This may jeopardize the results of tympanic membrane grafting.Moreover, tympanic membrane perforation may favor the child with poor eustachian tube function as it provides ventilation to middle ear resulting in decreased likelihood of development of effusion in it.[4,5] If tympanic membrane grafting is done in these children with poor tubal function, negative pressure will develop in middle ear resulting in graft medialization or retraction minimizing the benefits of surgery. All these reservations about paediatric myringoplasty appear to be valid but we must take into account the effects of recurrent middle ear infections and decreased hearing associated with tympanic membrane perforation. Childhood is a period of active learning and socialization.[6] Impaired hearing at this stage of active intellectual growth can be detrimental to child education and socialization.[6] At the same time, repeated infections in the middle ear will further damage the hearing

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mechanism.

In this study, we tried to solve the controversy regarding advisability of paediatric myringoplasty by comparing the results of tympanic membrane grafting in children to that of adults.

Materials and Methods

This study was conducted at the Department of Otolaryngology and Head & Neck surgery at a tertiary care teaching hospital in Rawalpindi during the period of January 2007 to December 2010. A non probability purposive sampling technique was adopted by including all patients coming to outpatient clinic of our department with dry central tympanic membrane perforation secondary to chronic tubotympanic suppurative otitis media, irrespective of age and gender. A detailed history was taken and thorough ear nose throat examination was done. All patients were examined under otomicroscope and findings were recorded in a pre-designed performa. The information obtained was age and sex of patient, duration of disease, size of tympanic membrane perforation, status of middle ear mucosa and ossicles, previous ear surgery and nasal complaints. Patients with chronic rhinosinusitis, prior ear surgery, atticoantral type of disease were excluded from the study. Pure tone audiometery with air and bone conduction threshold was done in all patients. Patients selected according to the above mentioned criteria were divided in two groups according to age. First group comprised of children up to the age of 14 years and the second group consists of patients above 14 years of age. All the patients underwent myringoplasty under general anesthesia using post aural approach and underlay technique of tympanic membrane grafting. Post operative antibiotic cover was given for 5 days. Patients were discharged on second postoperative day and were followed up after three weeks when bismuth iodoform paraffin paste pack was removed from the external auditory canal. Status of graft (full take or failure) was noticed on that visit. They were then followed up at monthly interval for up to at least 6 months. During that period, they were observed for graft success. At the end of 6 months of follow up, pure tone audiogram with air and bone conduction thresholds was repeated. Both groups of patients were compared in terms of graft success rate (anatomical gain) and hearing improvement (functional gain). Graft take was defined as full, intact healing of tympanic membrane graft at 6 months postoperatively. Hearing improvement was reviewed as the change in air-bone gap at the end of six months follow up period. Gap change was defined as the difference between the pre and postoperative air-bone gap. Air-bone gap was calculated as the average difference between air conduction and bone conduction at 0.5, 1 and 2 kHz. Results were statistically analyzed using SPSS version 10.0. Chi square test was performed to find out the difference between graft success rates of both the groups. Pre and postoperative air-bone gap change in dB between the two groups was analyzed by using t test. Statistical significance was accepted as $p<0.05$.

Results

A total of 89 patients fulfilled the inclusion criteria between January 2007 to December 2010. Thirty seven of them, up to the age of

14 years, were included in child group whereas 52 having more than 14 years of age were included in adult group. Demographics of both the groups are shown in Table I.

Average follow up duration was 8.8 months (range 6 to 29 months). Graft success rates and hearing improvement (air-bone gap closure in successful graft) in both the groups are shown in Table II. The difference between graft success rate and air-bone gap closure in two groups were found to be statistically insignificant (P >0.05).

Overall hearing improvement was noted in all patients of both groups except those who met with graft failure.

Table-I: Demographics of Child and Adult Group

	Child Group	**Adult Group**
Total No. of Patients in each group	37 (41.6%)	52 (58.4%)
Male	19 (51.4%)	16 (30.8%)
Female	18 (48.6%)	36 (69.2%)
Mean Age (Years)	13	28.5
Age Range (Years)	6 to 14	15 to 57
Average Duration of Disease (Years)	7.6 (1 to 13	12.5 (0.5 to 35)
Size of Tympanic membrane perforation	Small = 3 Medium = 25 Large = 9	Small = 1 Medium = 32 Large = 19

Table-II: Graft Success Rates and Air Bone Gap Closure in Both Groups

	Child Group ***n* = 37**	**Adults Group** ***n* = 52**
Graft Success rate	34 (91.8%)	47 (90.3%)
Average Air-Bone gap closure (dB)	13.5 (Range 5 to 33.3	12.5 (Range 3 to 24)

Discussion

Myringoplasty in children is still a controversial issue. Although a number of studies appeared in literature on this subject in the recent past but opinions still differ on this subject. In the present study, we tried to solve this controversy by comparing the results of paediatric myringoplasty with that of same procedure in the adults. We obtained graft success rate of 91.8% in children between the ages of 6 to 14 years. Comparable graft success rate (90.3%) were achieved in adult patients (> 14 yrs) utilizing the same underlay technique and graft i.e., temporalis fascia. The difference between graft success rates was statistically not significant. These results are similar to certain other studies in which adult and pediatric myringoplasty results were compared .[7]

In literature, we find wide variations between the graft success rates of paediatric myringoplasty ranging from 35 to 100%.[8,9,10,11] One local study reported graft success rate of 72.96% at six months of follow up in a study of thirty cases of paediatric myringoplasty in children less than 18 years of age.[12] Another study reported graft success rate of 88% at one year of follow up, in 100 cases of myringoplasty performed in children less than 14 years of age.[13] In another study of 231 cases of paediatric myringoplasty, 93.5% graft success rate was achieved at one year of follow up.[14]

Few studies reported delayed perforations reducing the overall initial success rate. In one study, overall graft success rate of 87% was reported with 3 years of follow up whereas in another with longer follow up period, 80.5% graft success rate was reported in 41 cases of peadiartic Myringoplasty. The mean follow up period in that study was 39 months.[9] We reported 91.8% graft success rate in children at 6 months of follow up. We suggest studies with long term follow up of at least three years to evaluate the issue of delayed graft failures in paediatric myringoplasty.

The functional results of paediartic myringoplasty are not only promising but are also comparable to same procedure in adults. All of our patients in both child and adult group had hearing improvement after the surgery except those with graft failures. We noted an average air-bone gap closure of 13.5 dB and 12.5 dB in child and adult group respectively. The difference in air bone gap closure in both groups was statistically insignificant. These results showed that the functional results of paediatric and adult myringoplasty are comparable. This view is shared by number of other studies reported in literature.[13,15]

We believe that the results of our study may be of considerable importance in resolving the controversy of paediatric myringoplasty in favor of early surgical intervention. This will confer considerable benefits to children with tympanic membrane perforation in terms of improved hearing and decrease in number of recurrent ear discharge, which in turn leads to better overall academic and intellectual performance and socialization. In spite of our study results, we suggest that further studies should be carried out with larger number of patients and longer follow-ups to resolve the controversy regarding paediatric myringoplasty.

Conclusion

The success rate of myringoplasty in

children is comparable to that of same in adults both in terms of anatomical and functional gains.

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