

FINAL SURGICAL OUTCOME AND AUDIOLOGICAL RECOVERY OF HEARING LOSS IN POSTOPERATIVE MYRINGOPLASTY IN CHILDREN WITH CSOM: OUR RESULTS

A. Siva Kumar¹

¹Associate Professor, Department of ENT, Aarupadai Veedu Medical College, Kirumampakkam, Pondicherry.

ABSTRACT

BACKGROUND

Tympanoplasty is a common procedure done in adults for the treatment of chronic suppurative otitis media (CSOM) but less commonly done in children. There are different views expressed in the literature regarding indications, inclusion criteria and factors controlling the final surgical outcome.

The aim of this study is to analyse the preoperative status, otological, audiological status and final surgical outcome of children undergoing Myringoplasty.

MATERIALS AND METHODS

Fifty two children aged between 8 and 17 years with CSOM tubotympanic type were included and otoscopy, audiometry done to evaluate the preoperative status. All the children were excluded for adenotonsillitis, sinus pathology and allergic diseases. All the children were subjected to Myringoplasty. Two years followup done and audiological and surgical uptake of graft evaluated and analysed.

RESULTS

Males were 34 (65.38%) and females were 18 (34.62%) with a male to female ratio of 2.88. The mean age was 14.2±2.4. There was large central perforation in 71.15% and medium 15.38% of children. There was <40 dB in 11.53% and >40 dB in 88.46% children. The surgical outcome was 92% success in 8 to 12 years age and 97% in 13 to 17 years age.

CONCLUSIONS

Tympanoplasty type 1 (Myringoplasty) when performed in properly selected cases with indications of hearing loss is a valid surgical procedure in treating CSOM or traumatic perforation.

KEYWORDS

CSOM, Tubotympanic, PTA, Graft, Perforation, Tympanic Membrane.

HOW TO CITE THIS ARTICLE: Kumar AS. Final surgical outcome and audiological recovery of hearing loss in postoperative myringoplasty in children with CSOM: Our results. J. Evid. Based Med. Healthc. 2017; 4(4), 209-211. DOI: 10.18410/jebmh/2017/40

BACKGROUND

Tympanoplasty is the repair of tympanic membrane with or without ossicular reconstruction in patients in whom there is conductive deafness due to perforation of tympanic membrane and ossicular damage.¹ Tympanoplasty is performed less frequently in children than in adults due to various factors^{2,3,4} such as inherent problems of surgery due to the age, persistence of auditory tube dysfunction, anatomical problems and due to higher incidence of upper respiratory infections.^{5,6,7,8} But if performed it also has many benefits like avoidance of cholesteatoma progressing from a retraction pocket, prevention of intracranial and extracranial complications and it improves hearing which is very crucial in paediatric age of learning speech and skills.

Financial or Other, Competing Interest: None.
Submission 06-01-2017, Peer Review 08-01-2017,
Acceptance 10-01-2017, Published 12-01-2017.
Corresponding Author:
 Dr. A. Siva Kumar,
 Associate Professor, Department of ENT,
 Aarupadai Veedu Medical College,
 Kirumampakkam, Pondicherry-607402.
 E-mail: drsivakumar63@gmail.com
 DOI: 10.18410/jebmh/2017/40



Myringoplasty is a type 1 tympanoplasty where it is done in patients where there is no ossicular chain damage. The present study aims to analyse the different indications of myringoplasty in children and the factors playing role in the audiological benefits and healing following surgery in children aged below 17 years.

MATERIALS AND METHODS

The present study is a prospective cross-sectional study conducted in the Department of ENT, Aarupadai Veedu Medical College Hospital, Kirumampakkam, Pondicherry wherein children attending the department with CSOM were selected. The period of study was between March 2013 and Feb. 2015. The total paediatric patients attending the hospital for different ENT diseases were 7920, out of which the children with ear discharge were 2059 (26%). 52 (2.52%) children were taken up for surgery among these and the remaining were treated by medical management. The age of the children considered was between 8 and 17 years.

Inclusion Criteria

1. Children with CSOM, tubotympanic type with dry central perforation and conductive hearing loss were included. 2.

Children with hearing loss above 40 dB were included. 3. Children with traumatic perforation without history of ear discharge were included.

Exclusion Criteria

1. Children with CSOM tubotympanic type, active disease were not included. 2. Children with hearing loss below 40 dB were not included. 3. Children with CSOM and complications, cholesteatoma were not included.

There were 4 children undergoing bilateral ear surgery (Myringoplasty). The surgical outcome was defined as total intake of the graft, auditory gain of more than 15 dB in postoperative audiograms (Air conduction calculated on 500, 1000, 2000 KHz) after 3 months. Demographic data was recorded in a printed proforma used by all surgeons in the department where in the age, sex, economic status, type of CSOM, duration of discharge, type of CSOM, condition of tympanic membrane and perforation, adenoids, tonsillar enlargement, allergy status, sinus status were recorded. All the children were subjected to pure tone audiometry and pure tone average (PTA) of 500, 1000, 2000 KHz was obtained. Children with hearing loss in air conduction (AC) were segregated. All the children were

operated under general anaesthesia after obtaining consent and standard operative procedure of post-aural approach, temporalis fascia graft, underlay technique, total 360° elevation of tympanomeatal flap were adopted. Ethical committee clearance was obtained from the institute and necessary consent from the parents was obtained regarding the study. Standard statistical methods were used to analyse the data.

OBSERVATIONS AND RESULTS

The number of patients included in the study was 52. 20 (38.47%) children were between the age group of 8-12 and 32 (61.53%) were in the age group of 13 and 17 years. The mean age was 14.2±2.4. Number of male children were 34 (65.38%) and female were 18 (34.62%) with a male to female ratio of 2.88. Among the 52 children, 37 (71.15%) belonged to poor socioeconomic group and the remaining 15 (28.84%) were of middle income group. CSOM was observed in 44 (84.615) and traumatic perforation was in 15 (15.38%) of children. The status of tympanic membrane showed a large central perforation in 37 (71.15%) and medium size perforation in 15 (15.38%) of children (Table 1).

Age Groups	Gender		Economic Status		Type of Ear Disease		Status of Tympanic Membrane & Perforation	
	Male	Female	Poor	Middle Income	CSOM	Traumatic	Large Central	Medium Size
8- 12 Yrs. 20 (38.47%)	10 (50%)	10 (50%)	16 (80%)	4 (20%)	17 (85%)	3 (15%)	15 (75%)	5 (25%)
13-17 Yrs. 32 (61.53%)	24 (75%)	08 (25%)	21 (65.6%)	11 (34.3%)	27 (84.35)	5 (25.6%)	22 (68.7%)	10 (31.3%)

Table 1. Showing the Demographic Data and Type of CSOM (n=56)

Pre-operative assessment showed adenotonsillitis in 4 (7.69%) which was treated before taking up for surgery and absent either due to previous surgery or suo moto in 48 (92.31%) of the children. Similarly, allergy was present in 5/52 (9.61%) and absent in 47/52 (90.39%). Sinus pathology was present in 3/52 (5.76%) and absent in 49/52 (94.23%), (Table 2). Preoperative AC audiometry showed PTA below 40 dB in 6/52 (11.53%) and above 40 dB in 46/52 (88.46%). The postoperative results showed gain in AC audiometry following less than 15 dB in 4/52 (7.69%) and more than 15 dB in 48/52 (92.31%). The graft uptake was 92% in the children aged 8 to 12 years and 97% in children aged 13 to 17 years (Table 2).

Age Groups	Adeno-Tonsillitis		Allergy Status		Sinus Pathology		Pre-OP PTA		Post OP PTA Gain		Graft Uptake
	Yes	No	Yes	No	Yes	No	<40 dB	>40 dB	>15 dB	<15 dB	
8- 12 Yrs. 20 (38.47%)	1	19	2	18	1	19	3	17	18	2	92%
13-17 Yrs. 32 (61.53%)	3	29	3	29	2	30	3	29	30	2	97%

Table 2. Showing the Preoperative Status of Children and Results (n=52)

DISCUSSION

CSOM is a common ENT disease occurring in children and accounts for hearing loss in addition to other diseases like Glue ear, traumatic perforation and Eustachian tubal dysfunction. Hearing loss in children affects the cognitive functions and delays speech and other skills in the school.⁹

The results of tympanoplasty in different centres show a varied success rate in the literature.^{1,10,11} The difference in results may be due to different inclusion and exclusion factors applied in these studies.^{2,12} Majority of authors consider this surgery in children presenting symptoms of otorrhoea and hearing loss as was done in the present

study.^{1,6,9} As there are definite criteria developed regarding age for Tympanoplasty (Myringoplasty) this results in confusion among professionals and parents for whom it is difficult to decide to give consent.¹³ Few authors^{1,14,9,8,2} found no correlation between the age and surgical results; but most of them opine that older the age better are the results.^{15,5, 6,16,17,3,4,18} Their argument is that smaller perforations would heal spontaneously, upper respiratory tract infections become less common in elderly children, eustachian tube dysfunction resolves with advancing age.^{4,18} Hence, surgery in paediatric age should be performed with caution. For Castro¹ and Velepíc,¹⁹ the minimal age is 7 years and they found no difference in results between older children. Kessler,⁶ Knapik,⁹ and Halim¹⁶ found higher incidence re-perforation when performed under 6 years. They are of the opinion that tubal dysfunction and lower immunity in younger ages are the cause for re-perforations. Kuma,² Singh,⁶ and Koch²⁰ found that children over 8 years had better outcome than others. In the present study, the youngest child was 8 years old with higher anatomical and audiological success rate (92%) and in children aged between 13 and 17 the success rate was 97%. These results are in agreement with the study of al Khtoum⁴ where surgery was performed in 12–14 age groups. Final outcome of myringoplasty depends upon many factors and one among them is duration of followup, which varied in different studies from 6 to 12 months.^{1,9, 21} In this study, the followup period was 2 years. Another factor is adenoidectomy which is mentioned for success of myringoplasty and associated with low re-perforation rate.²² In the present study, 92.30% of children had either undergone adenoidectomy or had none at all. The surgical outcome varied from 92% to 97% in these children. Ribeiro² found that previous adenoidectomy in children older than 10 years was an independent predictor of functional success, probably due to normal tubal function without adenoid hypertrophy.

CONCLUSION

Tympanoplasty type 1 (Myringoplasty) when performed in properly selected cases with indications of hearing loss is a valid surgical procedure in treating CSOM or traumatic perforation.

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