

Original Research Article

## A Retrospective Study of Tympanoplasty in Urban North Indian Pediatric Patients

**Dr. Deepti Pandey**

Consultant, Otorhinolaryngology, SRLNM Charitable Hospital, Varanasi, UP, India

**\*Corresponding author**

Dr. Deepti Pandey

Email: [drdpbent@gmail.com](mailto:drdpbent@gmail.com)

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**Abstract:** Retrospective evaluation of medical records, of 41 pediatric patients, who underwent type I tympanoplasty, for isolated unilateral ear drum perforation, at the city charitable hospital, was done. Anatomical correction of perforation and recovery from hearing loss were superior in older children (>12 year age). Children under 6 years of age are likely to suffer reperforation. Size and site of perforations did not significantly affect surgical success.

**Keywords:** tympanoplasty; hearing loss; CSOM; tympanic perforation.

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### INTRODUCTION

Type I tympanoplasty is repair of tympanic membrane perforation when ossicular chain is intact. The operation poses difficulties in children who have high prevalence of respiratory infection and eustachean tube dysfunction. Nevertheless, the procedure has merit of preventing complications of otitis media and improving auditory function. The later is crucial to proper linguistic development in children. There continues debate, over the right age for tympanoplasty and other technical and clinical issues. Some of these aspects are considered, in present retrospective review of patients' medical records, with reference to outcome of the operation.

### PATIENTS AND METHOD

Medical records of <15 year old patients, who underwent, primary type I tympanoplasty without mastoidectomy, during 2 year period from Jan 2014 to Dec 2015 at the SRLNM charitable hospital, Varanasi, were reviewed. Only patients with unilateral tympanoplasty were included. Cases with adenoidectomy/ tonsillectomy and cholesteatoma or other ear surgery were excluded. Such data on 41 cases was available. The study protocol was approved by local ethical committee, with a commitment to confidentiality of patients' personal identity. Each case record was scrutinized for age, gender, tympanic perforation site and its size. Perforations spanning over

one fourth of the eardrum area were considered large. Anterior and posterior location was defined relative to the handle of malleus.

All the patients had tympanoplasty by post auricular approach and underlay technique. Anatomical success of operation was, in attaining healthy graft and normal ear drum anatomy by final follow up, 6 months post surgery. Preoperative and postoperative auditory function tests, at final 6 month post-op follow up, were analysed for the tone thresholds. Reduction of air-bone gap to less than 10dB, calculated on frequencies 500Hz, 1000Hz and 2000Hz was criterion of successful hearing improvement. The study is descriptive with both qualitative and quantitative variables. Chi square test was used to evaluate qualitative variable.

### OBSERVATIONS AND RESULTS

There were 14 males and 27 females. Their age ranged between 7 years to 15 years, with median age 14 years. Most patients had otorrhea (n=37) and hearing loss (n=34). Conductive hearing loss was found by pure tone audiometry in 35 cases and a mixed hearing loss in 6 cases. Perforation closure was attained in 38 patients, while, 3 patients carried residual perforation after surgery. Hearing improvement occurred in 28, while, in the rest 13, hearing deteriorated further. Detailed outcome profile per demographic criteria is presented in table 1.

**Table 1: Factors affecting postoperative outcomes**

S. No	Factor		Hearing Improvement		p	Anatomical Success		p
			(n) yes	no		(n) yes	no	
1.	gender	Male	10	4		12	2	
		Female	18	9		26	1	
2.	Age (years)	< 12	2	3	0.05	4	1	0.05
		> 12	26	10		34	2	
3.	Site of perforation	Posterior	8	4		9	3	
		Anterior	4	2		6	0	
		Subtotal	9	5		14	0	
		Inferior	1	1		2	0	
		central	6	1		7	0	
4.	Hearing loss	Conductive	24	10	0.05	33	2	
		mixed	3	3		5	1	

Children >12 year age had better audio logical and anatomical outcome. As regards, perforation location, poorer outcome was associated with posterior location, both in anatomical and functional measures. Children with conductive hearing loss, had obliteration of air-bone gap attainment in 25 of 35. Those with mixed hearing loss attained AB gap abolition amongst half only.

**DISCUSSION**

Results are supportive of the prevailing notion that better hearing improvement and anatomical success for tympanoplasty is attained in older children [1]. Children < 6 year age, are likely to incur reperforation, following tympanoplasty, on account of immature eustachian tube and immunity [2-4]. Eustachian tube dysfunction, with nasal obstruction is major risk factor for otitis media [5]. In the study, large subtotal tympanic perforation also attained good outcome of operation. Generally, large size may be expected to pose difficulty in grafting and poor outcome [4]. However, some others too, did not get proof for such adverse impact of size of fault [6, 7].

In present study, ABG closure was similar for perforations located anterior or posteriorly on TM. Similar findings are reported in some other studies [3, 8, 9]. The post operative audio logical success criteria are yet not standardized. Singh [9], evaluated, air conduction improvement while others evaluated, both air conduction and speech reception thresholds [10]. Currently, ABG improvement is most relied upon [3]. ABG reduction ranges between 7.6dB and 12.6dB and hearing improvement between 61% and 93% [3, 9]. In this study hearing improvement was evaluated as rate of closure of ABG. Tympanoplasty yielded good functional and anatomical results in cases with sequel of chronic otitis media and older children exhibit relatively better improvements.

**REFERENCES**

1. Skotnicka B, Hassmann-Poznańska E; [Myringoplasty in children--success factors]. *Otolaryngol Pol.* 2008; 62(1):65-70.
2. Kessler A, Potsic WP, Marsh RR; Type 1 tympanoplasty in children. *Arch Otolaryngol Head Neck Surg.* 1994; 120(5):487-90.
3. Knapik M, Saliba I; Pediatric myringoplasty: a study of factors affecting outcome. *Int J Pediatr Otorhinolaryngol.* 2011; 75(6):818-23.
4. Halim A, Borgstein J; Pediatric myringoplasty: postaural versus transmeatal approach. *Int J Pediatr Otorhinolaryngol.* 2009; 73(11):1580-3.
5. Pelikan Z; Role of nasal allergy in chronic secretory otitis media, *Curr Allergy Asthma Rep.* 2009; 9(2):107-13.
6. Koch WM, Friedman EM, McGill TJ, Healy GB; Tympanoplasty in children. The Boston Children's Hospital experience. *Arch Otolaryngol Head Neck Surg.* 1990; 116(1):35-40.
7. Gaslin M, O'Reilly RC, Morlet T, Mc Cormick M; Pediatric cartilage interleave tympanoplasty. *Otolaryngol Head Neck Surg.* 2007; 137(2):284-8.
8. Uyar Y, Keleş B, Koç S, Oztürk K, Arbağ H; Tympanoplasty in pediatric patients. *Int J Pediatr Otorhinolaryngol.* 2006; 70(10):1805-9.
9. Singh GB, Sidhu TS, Sharma A, Singh N; Tympanoplasty type I in children--an evaluative study. *Int J Pediatr Otorhinolaryngol.* 2005; 69(8):1071-6.
10. Black JH, Hickey SA, Wormald PJ; An analysis of the results of myringoplasty in children. *Int J Pediatr Otorhinolaryngol.* 1995; 31(1):95-100.