



The Effect of Ear Discharge and Age in Postoperative Graft Intake after Type I Tympanoplasty

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Abstract

Otological problem accounts for a large number of out-patient cases in the developing countries. Patients suffering from chronic suppurative otitis media of tubotympanic type with permanent perforation syndrome are handicapped not only because of hearing loss but also from recurrent otorrhea. The treatment for such patients is surgery that is tympanoplasty. So, it is important to find out the factors that influence the success of such surgery beforehand so that the result of such surgery is a success. In this study, we have selected pediatric population and wet ears to see if they have relationship with postoperative graft failure or not.

Keywords: Ear discharge; Pediatric tympanoplasty; Type I tympanoplasty

Introduction

According to American Academy of Ophthalmology and Otolaryngology subcommittee on conservation of hearing 1965 definition of Tympanoplasty is "a procedure to eradicate disease in the middle ear and to reconstruct the hearing mechanism with or without tympanic membrane grafting". Type I tympanoplasty or myringoplasty is the repair of perforated tympanic membrane. The perforation of tympanic membrane has negative impact in quality of life of the patient especially pediatric population so surgery is necessary in such population. Certain factors such as size of the perforation, site of perforation, status of the ear and age and the surgical technique influence the surgical outcome [1-5]. There is no one consensus for the minimum age for doing Type I tympanoplasty. To prevent disease progression, ossicular chain erosion, formation of cholesteatoma, avoid hearing loss in the speech development period, and allow swimming activities early in life [2,4,6,7]. Some surgeons prefer to do the surgery early, whereas some surgeons prefer to delay the operation because of the high incidence of upper respiratory tract infections during childhood, unpredictable eustachian tube function, immature immunity, possible spontaneous healing, and the possibility of preventing recurrent middle-ear infection because of the adequate ventilation allowed by tympanic perforation during the period of eustachian immaturity. So, not only age the selection of case also determines the success of Type I Tympanoplasty such as technique, Eustachian-tube function, and site and size of the perforation [8,9]. So, the consensus in supporting any one parameter has not been reported in any past studies.

Whether or not otorrhea influences tympanoplasty outcomes has long been debated. Many surgeons feel that a clean, dry ear free from infection is critical for graft uptake while some believe otorrhea plays little role in surgical success. We often give a course of antibiotics and allow the ear to become dry. Hospital visits and cost of medicines and cost of travel of such patient increases while waiting for the time to make their ear dry, so these patients may be lost in the follow up process only to come with the complications of CSOM. In this study we aim to see if age and otorrhea has any influence on Type I tympanoplasty outcome.

Aims and Objective

1. To determine if the age of the patient influence graft intake.
2. To determine if status of ear before surgery influence graft intake.

Materials and Methods

This was a prospective observational study carried out in the Department of Ear Nose and Throat, Sir Sunder Lal Hospital, Banaras Hindu University, Varanasi from September 2011 to June 2013. Total of 74 cases were taken. We then took the history of their present past complaints, their personal, family, medicine, past surgery history. Then we did their general physical examination

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and complete examination of Ear, Nose and Throat. The relevant details were recorded. The preoperative investigations with routine blood tests, serology was done. Audiological investigations like Pure Tone Audiometry (PTA), Impedance Audiometry, Eustachian tube function by tympanometry were done. Before taking to the operation theatre our findings were confirmed by otomicroscopy.

Inclusion criterion

1. Age more than 8 years.
2. History of ear discharge more than 3 months
3. Tympanic membrane (pars tensa) perforation

Exclusion criterion

1. Age less than 8 years
2. Congenital deformity
3. Mastoidectomy done
4. Severe systemic diseases

The entire patient underwent Type I Tympanoplasty under same setup and by same surgeon using postaural approach and temporalis fascia as graft material.

Then patients were followed up for at least 4 months during which period first visit was at 15 days period than 1 month after first visit then after 4 months. Graft uptake at the end of 4 months was taken as successful Type I Tympanoplasty.

Observations

There was total 74 patients with either bilateral or unilateral ear discharge and the maximum age group was 40 years.

Table 1 depicts that majority of cases of Chronic suppurative otitis media fall in age groups of 21 to 30 years with maximum percentage of 44% followed by 11-20 (31%) and 0-10 (20%).

Table 2 depicts that majority of the patients of CSOM 55% belongs to male gender and 45% female with male: female ratio of 1.24:1

Table 3 shows that majority of cases (92%) were of Hindu religion. Though religion has not been documented to be of any special significance, yet it may only be attributed to the demographic profile of the population which attended the OPD.

Table 1: Distribution of cases according to their age.

Age group (yrs)	Cases	
	No.	%
0-10	15	20
11-20	23	31
21-30	33	44
≥ 31	3	5
Total	74	100

Table 2: Distribution of cases according to their sex.

Sex	Cases	
	No.	%
Male	41	55
Female	33	45
Total	74	100

Table 3: Distribution of cases according to their religion.

Religion	Cases	
	No.	%
Hindu	68	92
Muslim	5	6
Christian	1	2
Total	74	100

Table 4: Age and Sex distribution in males.

Age in years	Male (n)	Percentage (%)
<10	9	22
11-20	10	24
21-30	20	49
≥ 30	2	5
Total	41	100

Table 5: Age and sex distribution in females.

Age in years	Cases of females	
	No.	%
<10	6	18
11-20	13	39
21-30	13	39
≥ 30	1	4
Total	33	100

Table 6: Status of ear and number of cases.

Status of ear	No. of cases	Percentage (%)
Dry	27	36
Discharging	47	64
Total	74	100

Table 7: Age and success rate for TYPE I tympanoplasty.

AGE	HEALED (%)	FAILED (%)	TOTAL (%)
<10 years	16 (87)	5 (13)	21 (24)
>10 years	45 (89)	8 (11)	53 (76)
Total	61 (89)	13 (11)	74 (100)

P value = 0.77

Table 8: Status of ear and percentage of postoperative graft intake.

Status	Successful (%)	Unsuccessful (%)	TOTAL (%)
Dry	21 (78)	6 (23)	27 (36)
Discharge	43 (91)	4 (9)	47 (64)
Total	64 (86)	10 (14)	74 (100)

P value = 0.09

Table 4 most males are in the age group of 21-30 that is 49% followed by the males in the age group 11-20 that is 24%.

Table 5 most females are in the age group of 11-30 that is 39% after which it is <10 years.

Table 6 most of the patient had discharging ear at the time of operation i.e., 64%. Only 36% had dry ear. The ear was taken dry if it was not discharging for at least 3 months.

Table 7 Type I Tympanoplasty was carried out in 74 patients aged between 08 years and 40 years. Out of 21 students that fell under age

less than 10 years, graft was intact in 16 patients i.e., 87% and 5 (13%) had failure. Similarly, out of 53 patients that fell under age more than 10 years 45 had intact graft i.e., 89% and 8 (11%) had perforation. The overall success rate in these two groups were 61 out of 74 i.e., 89% as mentioned in Table 7. The P value was 0.77 which was not significant that is there is no association between age and success rate. Age less than 10 years also has same success rate as age more than 10 years. So, operation can be done in age less than 10 years also comfortably.

Out of 27 dry ears 21 had successful graft intact i.e., 78% while 6 i.e., 23% had graft failure. Similarly, out of 47 discharging ear 43 ears had successful graft intake i.e., 91% and 4 had perforation i.e., 9% p value came out to be insignificant which means from our study it can be concluded that status of ear has no association with postoperative graft intake (Table 8).

Discussion

Chronic Suppurative Otitis Media (CSOM) starts in childhood¹⁰, as an acute infection of the middle ear, known as Acute Otitis Media (AOM), or as a sequel of less severe forms of otitis media (e.g., secretory OM) [10-13]. The infection mainly peaks around 2 years [14]. CSOM in children is likely to inhibit language and cognitive development because of its longer duration and greater severity as compared with AOM, as most children need louder auditory stimuli than adults to perform optimally if they are suffering from CSOM. So, these children have learning disabilities and poor scholastic performance [15,16].

Benefits of doing Type I Tympanoplasty in CSOM patients include prevention of aural discharge, improvement in hearing, ease of hearing aid usage and elimination of the need to take water precautions when showering, washing hair and swimming [17,18]. In addition, tympanoplasty has been suggested to protect against long-term middle ear damage by preventing the migration of squamous epithelium around the margins of the perforation with possible consequent cholesteatoma formation and long term ossicular damage [19].

Age is considered as one of the factors which influences the success rate. Reported success rates for pediatric Type I Tympanoplasty vary widely throughout the literature ranging from 35% to 92% [8,20]. Bluestone et al. published the lowest success rates in pediatric myringoplasty of 35% in 1979; their definition of success was stricter than others. They defined successful Type I tympanoplasty as ones in which ears that presented intact tympanic membranes with no evidence of Otitis Media with Effusion (OME), cholesteatoma or high negative pressure within a 12-to-24-month follow-up period. Two decades later, Yung et al. 2007 reported a similarly reduced success rate of 63% when stricter criteria of intact tympanic membrane with no evidence of OME, atelectasis, discharge, myringitis and stability of hearing were applied. They found in the younger children, good results were obtained in 54.5% and in the older children it was in 68.8% of patients. This difference was not statistically significant, and the authors concluded that patient age did not influence the surgical result of Type I tympanoplasty. Lau and Tos [21] reported a 92 percent graft-take rate in the pediatric age range, but this decreases to 64 percent if the cases with persistent otitis media or atelectatic tympanic membrane are considered failures.

On the other hand, one recent study carried out in 2007 was able to find out a correlation between patient age and successful tympanoplasty. Emir et al. reviewed 607 patients, both children and

adults, who underwent tympanoplasty for perforation. Children younger than 16 years old had a significant decrease in the success of the graft when compared with adults (82% compared with 89.5%, $P=0.049$). Yet children in this study actually had significantly better postoperative hearing in terms of closure of AB gap and hearing gain when compared with adults. This one study may suggest some association between patient age and successful tympanoplasty, but the mixed result is confusing.

Our study yielded anatomical success rate of 87% at the end of 4 months. We considered anatomical success as a stable eardrum, with no perforation or otorrhea. Ears that presented perforations, middle ear cholesteatoma were categorized as anatomical failures. This 87% success can be due to the selected case of children aged more than 8 years in whom eustachian tube has already matured and their immunity has also been improved than younger age group. We believe that it is important to standardize the criteria of anatomical success in order to be able to critically compare published results.

Whether or not otorrhea influences tympanoplasty outcomes has long been debated. Many surgeons feel that a clean, dry ear free from infection is critical for graft uptake while some believe otorrhea plays little role in surgical success. Uyar et al. [22] studied 41 children who had undergone tympanoplasty and analyzed multiple preoperative factors, including otorrhea. They found that dry ear preoperatively had significantly higher rate of graft uptake with good postoperative hearing. Uyar et al. [22], recommended medical management initially for discharging ears, only performing tympanoplasty when the ear is dry for 3 months. There are a number of studies that found to be contrary. Albera et al. [23], Onal et al. [24], and Chandrashekar et al. [25], all found that otorrhea seen preoperatively had no effect on the success of tympanoplasty. Caylan et al. [2], in their study of 51 cases, even found that operating in the setting of otorrhea led to a higher rate of success. This finding, however, is unusual, and perhaps unique in the otolaryngology literature. We found no significant association between discharging ear and success of graft uptake. These cases were most probably improved due to better surgical technique and graft tucking anteriorly in our cases and also due to the fact that good post operative care was given in terms of antibiotic selectivity and antihistaminic use which make the ear discharge sterile before and after surgery.

Conclusion

1. Age of the patient doesn't influence the graft uptake if they are above 8 years.
2. Wet ear does not influence the outcome of the graft intake.

References

1. Albu S, Babighian G, Tralbalzini F. Prognostic factors in tympanoplasty. *Am J Otol.* 1998;19(2):136-40.
2. Caylan R, Titiz A, Falcioni M, De Donato G, Russo A, Taibah AA. Myringoplasty in children: Factors influencing surgical outcome. *Otolaryngol Head Neck Surg.* 1998;118(5):709-73.
3. Juantegui M, Garin P, Gersdorff M. Myringoplasty: Anatomical and functional results with a three years follow up. *Rev Laryngol.* 1994;115:45-8.
4. Koch WM, Friedman E, McGill TJJ, Healy GB. Tympanoplasty in children. *Arch Otolaryngol Head Neck Surg.* 1990;116:35-40.
5. Podoshin L, Fradis M, Malatskey S, Ben-David J. Type I Tympanoplasty in children. *Am J Otol.* 1994;17:293-6.

6. Blanshard JD, Robson AK, Smith I, Maw AR. A long-term view of myringoplasty in children. *J Laryngol Otol.* 1990;104(10):758-62.
7. Gianoli GJ, Worley NK, Guarisco JL. Pediatric tympanoplasty: the role of adenoidectomy. *Otolaryngol Head Neck Surg.* 1995;113(4):380-6.
8. Bluestone CD, Cantekin EI, Douglas GS. Eustachian tube function related to the results of tympanoplasty in children. *Laryngoscope.* 1979;89(3):450-89.
9. Lin A, Messner A. Pediatric tympanoplasty: Factors affecting success. *Curr Opin Otolaryngol Head Neck Surg.* 2008;16(1):64-8.
10. Jahn AF. Chronic otitis media: Diagnosis and treatment. *Med Clin North Am.* 1991;75(6):1277-91.
11. Daly KA, Hunter LL, Levine SC, Lindgren BR, Giebink GS. Relationships between otitis media sequelae and age. *Laryngoscope.* 1998;108(9):1306-10.
12. Tos M. Causes of the disease. *Ann Otolaryngol Head Neck Surg.* 1990;99(4, Suppl 46):7.
13. Tos M. Sequelae of secretory otitis media and the relationship to chronic suppurative otitis media. *Ann Otol Rhino Laryngol.* 1990;99(4, Suppl 146):18-19.
14. Mahoney JL. Mass management of otitis media in Zaire. *Laryngoscope.* 1980;90(71):1200-08.
15. Teele DW, Klein JO, Chase C, Menyuk P, Rossner B. Otitis media in infancy and intellectual ability, school achievement, speech and language at age 7 years. *J Infect Dis.* 1990;162(3):658-94.
16. Teele DW, Klein JO, Rosner BA. Otitis media with effusion during the first three years of life and development of speech and language. *Pediatrics.* 1984;74(2):282-95.
17. Fisch U, May J. *Tympanoplasty, mastoidectomy and stapes surgery.* Thieme, New York. 1994.
18. Sheahan P, O'Dwyer T, Blayney A. Results of type 1 tympanoplasty and parental perceptions of outcome of surgery. *J Laryngol Otol.* 2002;116(6):430-34.
19. Tos M, Lau T. Stability of tympanoplasty in children. *Otolaryngol Clin North Am.* 1989;22(1):15-28.
20. Yoon TH, Park SK, Kim JY, Pae KH, Ahn JH. Tympanoplasty, with or without mastoidectomy, is highly effective for treatment of chronic otitis media in children. *Acta Otolaryngol Suppl.* 2007;558:44-8.
21. Lau T, Tos M. Tympanoplasty in children: An analysis of late results. *Am J Otol.* 1986;7(1):55-9.
22. Uyar Y, Keles B, Koc S, Oztürk K, Arbağ H. Tympanoplasty in paediatric patients. *Int J Paediatr Otolaryngol.* 2006;70(10):1805-09.
23. Albera R, Ferrero V, Lacilla M, Canale A. Tympanic perforation in myringoplasty: Evaluation of prognostic factors. *Ann Otol Laryngol.* 2006;115(12):875-9.
24. Chandrashekhar SS, House JW, Devgan U. Paediatric tympanoplasty. A10 year experience. *Arch Otolaryngol Head Neck Surg.* 1995;121(8):873-8.
25. Onal K, Uguz MZ, Kazikdas KC, Gursoy ST, Gokce H. A multivariate analysis of otological, surgical and patient- related factors in determining success in myringoplasty. *Clin Otolaryngol.* 2005;30(2):115-20.