

Comparative Evaluation of Factors Associated with Success of Tympanoplasty in Rural Population

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ABSTRACT

Introduction: otitis media is commonly occurring condition in Indian subcontinent. Symptoms associated with otitis media such as discomfort, otorrhea; hearing loss, pain cause great personal suffering. Tympanoplasty is the treatment of choice for repair of tympanic perforations. The aim of present study is to establish the success rate of tympanoplasty in chronic otitis media and to determine factors that could interfere with its success.

Material and Methods: A total of 40 patients of otitis media reported to the department, institute during the year 2016 and underwent tympanoplasties. History, physical examination of all the patients presenting with the signs and symptoms were taken. Audiogram, nasofibroscope was done to examine any perforation of tympanic membrane. Transmeatal or retroauricular tympanoplasties were done and graft was used for repair correction. The results were arranged and analysed by SPSS software.

Results: Transmeatal technique was followed in 17 patients (42.5%) and in 12.5% patients retroauricular technique was used. Fascia was used as graft in 37.5% of patients. Approximately 40.76% of patients had months free of otorrhea after perforation repair and only 8.91% patients were otorrhea free after months after no repair of perforations. The difference was statistically significant. The technique, type of graft used and the site of access were not statistically significant during perforation closure.

Conclusion: According to our study time of otorrhea was a significant factor responsible for success.

Keywords: Fascia, Otitis media, Retroauricular, Transmeatal

INTRODUCTION

Various important surgeries in the past lead to the present state of art in otology. Even with these advancements otitis media is a major health concern among public. Various symptoms associated with otitis media such as discomfort, otorrhea; hearing loss, pain cause great personal suffering.¹ Otitis media is basically chronic infection of part or whole of middle ear cleft. It is a kind of inflammatory process that leads to irreversible tissue damage. It is of 2 types non cholesteatomatous chronic otitis media which is characterised by absence of cholesteatoma and cholesteatomatous chronic otitis media which is characterised by presence by cholesteatoma.¹

Various factors are responsible for chronic otitis media like patient factors, surgeon factors and environmental factors. These factors are dynamic and keep on changing with time.² Three stages of treatment and control of otitis media have been established; among them are preoperative, surgical treatment and postoperative follow up. In this article we will be focussing on the surgical aspect. Surgery is based on tympanoplasty with or without tympanic membrane reconstruction. Banzer in 1640 was the first to attempt tympanic membrane repair using pig's bladder.³ Tympanoplasty underwent drastic evolution with

time, fascia, skin grafts were then used for reconstruction.^{4,5} Now days, various techniques have been used to obtain better results like overlay tympanoplasty⁵, underlay tympanoplasty⁶ and overunderlay tympanoplasty.⁷ The aim of present study was to establish the success rate of tympanoplasty in chronic otitis media and to determine factors that could interfere with its success.

MATERIAL AND METHODS

A total of 40 patients of otitis media reported to the Department of Pharmacology, RIMS, Ranchi, during the year 2016 and underwent tympanoplasties. History, physical examination of all the patients presenting with the signs and symptoms were taken. Audiogram, nasofibroscope was done to examine any perforation of tympanic membrane. Patients were also asked about the onset of ear of disease, onset of otorrhea, any past otologic surgeries and number of ear infections per year. Any history of smoking or nasal complaints was also noted. Ethical clearance from institutional review board and informed consent from the subjects were taken before the start of study.

Perforation size i.e. percentage of area perforated, its location and borders and associated presence or absence of inflammation was established by otoscopic examination. Any pathology in the nasal mucosa that could interfere with the proper functioning of Eustachian tube was assessed by nasofibroscope.

Procedure

Tympanoplasty was carried out under GA and same surgeon operated all the techniques. Inlay technique was used in cases where perforations were less than 40% and in others underlay approach was used. Transmeatal approach was used in case the perforation borders were visible, otherwise retroauricular incision was used.

Via	Transmeatal		Retroauricular
Graft type	Inlay	Underlay	Underlay
Fascia	0	10	5
Cartilagem	7	0	0
Total	7	10	5

Table-1: Technique and type of graft used in patients with total repair

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	Age	Time w/o otorrhea	Disease time in year	Infections/year	% perforations	GAP preoperative	GAP postoperative
PR	27.22	40.76	13.65	4.32	36.40	25.21	24.75
NPR	26.41	8.91	12.21	5.86	44.34	20.06	3.11
P value	>0.05	<0.05	>0.05	>0.05	>0.05	>0.05	<0.05

Table-2: Factors that may influence tympanic membrane perforation repair

Transmeatal technique

Lignocaine with adrenaline (1:40,000) was infiltrated in the posterior wall of external auditory meatus. Perforation borders were scraped and tympanosclerotic plates were removed. A longitudinal incision was given at 6 and 12 O clock position in meatus followed by transverse incision joining both at 5-7 cm away from tympanic membrane. Tympanic meatal flap was detached. Gelfoam was filled in the tympanic cavity up to the perforation height. After that graft was placed such that its borders were inside the perforation. External auditory meatus was filled with gauze soaked in antibiotic cream and external dressing was applied.

Retroauricular technique

Lignocaine with adrenaline (1:40,000) was infiltrated in the retroauricular region. Incision was given upto the subcutaneous tissue in the retroauricular groove followed by detachment of the flap. Incision was then given at the osteocartilagenous junction of external auditory meatus skin. After that the procedure is same as transmeatal. The incision was closed layer by layer and an external dressing was applied. Intravenous antibiotics and analgesics were given for 3 days followed by 5 days of oral medications. Post operative follow up was done at 7, 14, 21, 35, 70 and 120 days. If there was any recurrence of the perforation then the procedure was repeated.

STATISTICAL ANALYSIS

The results were arranged in a tabulated form and analysed by SPSS software. Chi square test, t test and Mann Whitney tests were used for analysis.

RESULTS

Out of total of 40 patients, 60% were females and 30% were males. The mean age was 26+/- 9 years. Majority of perforations were seen on right side (63%) and 47% were seen on left side. 76.2% perforations were located in the anteroinferior quadrant and the average size of perforation was 37.8%. 58% patients presented with more than 5 ear infections per year. 8 patients (20%) had family history of hearing loss and 40% had episodes of otorrhea in family.

Table 1 depicts the technique and graft used in patients. Transmeatal technique was followed in 17 patients (42.5%) and in 12.5% patients retroauricular technique was used. Fascia was used as graft in 37.5% of patients.

Table 2 depicts the factors that could influence tympanic membrane perforation repair. Approximately 40.76% of patients had months free of otorrhea after perforation repair and only 8.91% patients were otorrhea free after months after no repair of perforations. The difference was statistically significant. The technique, type of graft used and the site of access were not statistically significant during perforation closure. The difference between bone conduction and air conduction in tonal audiometry was statistically significant between the perforation

repair and non perforation repair group in the post operative period.

DISCUSSION

Otitis media is a commonly occurring disease in Indian nation. Majority of people suffer from its consequences. According to Hippocrates "acute pain of ear with strong fever was the most dreaded." Early surgery was considered as the only life saving option.⁸ Tympanoplasty is a frequently performed procedure for the correction of tympanic perforation. The history of tympanic membrane perforation dates back to 1640 when Benzer tried to repair with pig's bladder.³ Success rates of tympanoplasty varies from 75- 98% in literature.⁹

Many factors are found to influence the success of tympanoplasty like age, surgical skills, presence of associated comorbidities and ET dysfunction.¹⁰ According to Bhat e ranit⁹ factors that influence success of perforations are age, perforation location and size, ET condition, type of graft and status of middle ear mucosa. But according to a study by Enmett JR¹¹ on evaluating the role of age in the success of tympanoplasties, he concluded that age does not alter tympanoplasty results. A good pre and post operative examination, patient's general and metabolic condition affects its success.

Condition of Eustachian tube was considered an important factor in some studies like those conducted by Dubin et al.¹² In our study; technique and type of graft used did not play any role in predicting the success of tympanoplasty. In a study by Doyle et al¹³ in 1972, underlay technique gave better healing and fewer complications. It is quick and easy to perform and is an ideal technique for small and easily visible perforations. It had certain disadvantages like the middle ear space was reduced and chances of adhesions increased in the presence of gel foam. These disadvantages are overcome with the use of overlay technique. The success rate in our study was 82% which was comparable to various other studies conducted in the past.

CONCLUSION

Various factors are implicated for the success of tympanoplasties. According to our study time of otorrhea was a significant factor responsible for success.

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