

Cartilage Tympanoplasty in Atelectatic and Adhesive Otitis Media: Our Experience in a Tertiary Care Hospital

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ABSTRACT

Introduction: Adhesive otitis media is a type of chronic otitis media, the development of which is essentially influenced by disturbed ventilation of the middle ear. Anatomic and some other predisposing factors may play a part in the origin of this disease. Study aimed to find the efficacy and outcome of cartilage tympanoplasty in patients with grade 3 and 4 parastensa retraction. (atelectatic and adhesive otitis media).

Material and Methods: This study was conducted in the department of ENT and HNS Govt Medical College Srinagar. A total of 25 patients with grade3 and 4 retraction were included in this study. In all patients otoscopic examination, Pure Tone audiometry (PTA), impedance audiometry and oto-endoscopic examination / EUM (Examination under Microscope) was done. Proper consent was taken from all patients included in this study.

Results: Cartilage Tympanoplasty is an effective method of treating grade3 and 4 parastensa retraction in adhesive otitis media patients. In our study we found less recurrence of adhesion at 9 months followup with better compliance and improvement in hearing. Out of 25 patients, 23 (92%) patients had intact tympanic membrane, better hearing outcome at 9 months follow-up. However in 2(8%) patients, among them one had displaced cartilage, another had no hearing improvement at 9 months follow up.

Conclusion: Cartilage tympanoplasty is a better surgical option for treating atelectatic and adhesive otitis media, with better outcome of hearing, patient compliance and less failure rate in terms of recurrence of disease⁷. Cartilage used as reconstruction gives good tensile strength and prevents recurrence of disease in terms of retraction.

Keywords: Adhesive, Atelectasis, Cartilage, Otoscopy, Pars Tensa, Retraction, Tympanoplasty

INTRODUCTION

Otitis media is a persistent disease of mucoperiosteal lining of middle ear cleft. It often causes severe destruction and irreversible sequelae, involving the tympanic membrane, ossicles and the temporal bone. It manifests clinically as discharge and deafness of variable severity. Otitis media is subdivided into active or inactive depending on the presence or absence of infection, and mucosal or squamous depending on the involvement of middle ear mucosa or squamous epithelium of tympanic membrane. Retraction Pockets^{1,2,3} are known to be the precursors of cholesteatoma⁴ formation and have to be strategically treated. The impairment of ventilation between the Eustachian tube and the aditus is an important factor in the pathogenesis of retraction pocket formation, therefore, maintaining or re-creating the ventilation pathways will

lead to a better outcome. Retraction pockets can involve both paras-tensa³ as well paras-flacida of the tympanic membrane. The tympanic membrane retractions have been divided into grades by Sade's classification. The surgical plan¹ should be based on the location of the retraction pocket^{1,2} in order to have a better exposure and to remove it completely.^{5,6} Earlier various methods had been defined for treating such retractions but proved disastrous to the patient in terms of hearing, cholesteatoma formation and mastoid aeration. Various studies used different graft materials in treating retractions of the ear drum with various success rates. One of the most important factors in determining the type of surgery is the presence of mastoid air cells. In sclerotic mastoids there is impaired ventilation, therefore creating small cavities as in cortical mastoidectomy improves the ventilation and thereby reduces recurrence of disease, but at the same time preserving the mucosa which is known to be the lungs for the middle ear is important. Retraction pocket especially in the postero superior quadrant is commonly invaded by granulation tissue, visualization and eradication of the disease from this area is critical. The study was conducted to find the efficacy and outcome of cartilage tympanoplasty in patients with grade 3 and 4 paras-tensa retraction (atelectatic and adhesive otitis media).

MATERIAL AND METHODS

This study was conducted in the Department of ENT and HNS, Govt. Medical College Srinagar during a period of 16 months from September 2016 to January 2018. Proper consent was taken from all patients, after explaining the nature of the disease and the surgical procedure.

Inclusion Criteria

- Patients with type3,4 paras-tensa retractions.(atelectatic and adhesive otitis media)
- Patients in the age group between 18 and 65 years.
- Patients who agree to come for follow-up.

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Exclusion criteria

- Patients less than 18 years or greater than 65 years of age.
- Clinically unsafe ears i.e. with cholesteatoma, intracranial complication, malignant or tubercular ear disease.
- Previously operated patients.
- Patients who do not agree to come for follow up postoperatively.

All 25 patients included in this study were having grade 3 and grade 4 paras-tensa retraction^{1,7,2,3} with no evidence of cholesteatoma. All patients underwent necessary ENT examination and investigations including Pure Tone audiometry, Impedance audiometry followed by Oto-endoscopic and microscopic examination (EUM). Post-auricular approach was used in all patients and conchal cartilage was used for reconstructing the tympanic membrane with or without ossicular reconstruction. Follow up examination was done at 1st week, 3rd week, 6 months and 9 months. Otoscopic and otoendoscopic examination was done on each visit. PTA was done at 6 months of follow up. Detailed history regarding the improvement in symptoms was sought from all patients.

RESULTS

In our study total of 25 patients were included. Male patients

Gender	No. of Patients	Percentage
Male	9	36
Females	16	64

Table-1: Gender distribution

Type of retraction	Total	Male	Females
Grade 3	6 (24%)	4 (66%)	2 (34%)
Grade 4	19 (76%)	6 (32%)	13 (68%)

Table-2: Grades of Retraction in Paras-Tensa

Symptoms	Improved	Not improved	Total
Heaviness/ fullness of ears	24	1	25
Decreased hearing	17	1	18
Headache	10	2	12
Otalgia	3	Nil	3
Severe itching	5	2	7
Combination of fullness and decreased hearing	23	2	25

Table-3: Symptom improvement in the postoperative period

were 9 and females were 16. Age of patients included was 18 above and less than 65 years.

Table 1 depicts the gender distribution of patients. There were 9 male and 16 female patients in this study.

Table 2 depicts the grades of retraction of the pars tensa. There were 6 patients with grade 3 retraction, among which 4 patients were males and 2 patients were females, whereas there were 19 patients with grade 4 retraction, among which 6 patients were males and 13 patients were females.

Table 3 shows improvement in the symptoms in the postoperative period. The symptom of Heaviness / Fullness of ears was improved in 24 patients, while as 1 patient did not show improvement. Among the 18 patients with decreased hearing, 17 patients showed significant improvement in hearing, whereas in 1 patient there was no improvement in hearing. Headache improved in 10 out of 12 patients. Otalgia was relieved in all the 3 patients. Itching was relieved in 5 out of 7 patients. Aural fullness combined with decreased hearing was improved in 23 out of 25 patients.

Table 4 depicts the severity of hearing loss in patients with Grade III and IV retraction in the postero superior quadrant of pars tensa. Among the 6 patients with Grade III retraction, 5 patients had 25 – 40 dBHearing loss, whereas 1 patient had more than 40 dBHearing loss. Among the 19 patients with Grade IV retraction, 13 patients had 25- 40 dBHearing loss, whereas 6 patients had more than 40 dBHearing loss.

Table 5 shows the mean improvement in hearing in the postoperative period. The mean hearing loss was 33.3 ± 4.2 db and the mean improvement in hearing was 11.2 ± 3.22 db.

DISCUSSION

The main purpose of treating retraction pocket (grade3,4) is not only to reduce long term complications like ossicular erosion, cholesteatoma formation⁴, sclerosis of mastoid but also to improve the quality of life of patients in terms of relief of symptoms and mental agony associated with it. In early grades of retraction Valsalva maneuver does improve the symptoms if done properly and regularly. In grade 3 retraction the tympanic membrane is not adherent to promontory and moves on valsalva. In grade 4 retraction tympanic membrane is attached and adherent to promontory with no moment on valsalva maneuver. Surgical correction of grade3,4 retraction using cartilage graft for tympanoplasty not only helps in the relief of overall symptoms but also improves the quality of life and reduces recurrence. In our study we found male female ratio of 1:1.7 with females affected more than males, however grade 3 retraction was more common in males

Grade	Hearing loss 25- 40dB (n=25) No. of patients (percentage)	Hearing loss more than 40dB (n=25) No. of patients (percentage)	Total No. of patients (percentage)
Grade III	5(83.3%)	1 (16.6%)	6(24%)
Grade IV	13(68.4%)	6(31.5%)	19(76%)

Table-4: Hearing loss (A-B gap) in grade III and grade IV posterior superior retraction

Decreased hearing in patients	Mean decrease in hearing	Mean improvement post-operative
18	33.3 ± 4.2 db	11.2 ± 3.22 db

Table-5: Mean improvement in hearing post-operative

(66%) and grade 4 retraction was more in female group (68%). All patients were symptomatically better in terms of fullness of ears, decreased hearing, headache, otalgia and itching. Cartilage (choncal) was used in all 25 patients with well take up of the graft as seen in the follow-up at 6 and 9 months. In 24(96%) patients there was no recurrence of retraction. However in one case there was displacement of cartilage on follow-up. In patients with grade 3 retraction 83.3% patients had hearing loss less than 40dbHL while in patients with grade 4 retraction 68.4% patients had less than 40 dbHL and 31.5% patients had more than 40 dbHL. Mean preoperative hearing loss was 33.3 ± 4.2 db with significant improvement postoperatively (p value < 0.001).

The incidence of retraction pockets was found to be 24% and 76% respectively of grade III and IV of Sade's³ classification. However, in the study conducted by Borgstein J (2007)⁸ had reported the incidence of retraction as 28% and 23% respectively in grade III and IV retractions. This difference may be due to his study group consisted of children in contrast to our study group which had only adults. We observed a moderate conductive hearing loss of 25-40dB in 68-83% patients with Grade III and IV retraction pockets. Retraction of both pars tensa and pars flaccid a of tympanic membrane^{1,7,2} have a high impact on the quality of life of patients. Higher the grade of retraction more severe the symptoms and more adverse the impact on quality of life of patients. Most of the patients with earlier grades of retraction especially grade 1, 2 need proper follow-up and valsalva. Cartilage tympanoplasty proved better alternative to conventional temporalis fascia graft tympanoplasty in terms of hearing outcome and patient compliance along with less chances of recurrence. So cartilage tympanoplasty proves better for retraction type of otitis media. Surgical correction of grade 3,4 retraction using cartilage as graft for tympanoplasty proved better in terms of hearing and less disease recurrence.³

Pitfalls

We did not include patients of age less than 18 years which could have highly affected outcome. Eustachian tube patency tests were not done nor any tubal patency procedure was done, which again could have an effect on the outcome. Attic retractions were not included in this study.

CONCLUSION

Surgical management of Adhesive otitis media is a challenging problem in otolaryngology practice. In this study we concluded that cartilage tympanoplasty is an effective modality of treatment for atelectatic and adhesive otitis media with respect to hearing outcome, relief of symptoms and improvement in the quality of life of patients.

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