ORIGINAL RESEARCH

Temporalis fascia versus Tragal perichondrium: A comparative study of outcome as graft material in tympanoplasty

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ABSTRACT
Background: Chronic otitis media is an inflammatory process in the middle ear space that result in long term or more often permanent changes in the tympanic membrane including- atelectasis, tympanosclerosis, retraction pocket formation or cholesteatoma. The primary symptom of chronic otitis media is conductive hearing loss but the patient can also present with otalgia, otorrhea, aural fullness, pulsatile tinnitus and otorrhagia. According to the American Academy of Ophthalmology and Otolaryngology Subcommittee on conservation of hearing (1965), Tympanoplasty is a procedure to eradicate disease in the middle ear and to reconstruct hearing mechanism with or without tympanic membrane grafting. **Methods:** This comparative study was carried out in the Department of Otorhinolaryngology, ASCOMS. About 50 patients (31 males; 19 females) were selected. These patients were divided randomly into 2 groups. Group-1 (25 patients) underwent tympanoplasty using temporals fascia graft and Group-2 (25 patients) underwent tympanoplasty using tragal perichondrium. Post operatively patients were assessed for complications at 1st month, 2nd month and 3rd month. Audiological (A-B Gap on PTA) and otoscopic examination was done to compare hearing improvement and healing of perforation. **Results:** Graft was taken up better in Group-1 (92.5%) as compared to Group-2 (87.5%). Hearing improvement was assessed by air-bone gap on PTA which was better in Group-2 as compared to Group-1 but it was not significant statistically. **Conclusion:** From our study, we suggest temporalis fascia has better graft uptake while the hearing improvement is equal in both the groups.

INTRODUCTION

Chronic otitis media is an inflammatory process in the middle ear space that result in long term, or more often permanent changes in the tympanic membrane including- atelectasis, dimer formation, perforation, tympanosclerosis, retraction pocket formation or cholesteatoma. The primary symptom of Chronic otitis media is conductive hearing loss but the patient can also present with otalgia, otorrhea, aural fullness, pulsatile tinnitus and otorrhagia.

According to the American Academy of Ophthalmology and Otolaryngology Subcommittee on Conservation of hearing 1965 definition, Tympanoplasty is a procedure to eradicate disease in the middle ear and to reconstruct the hearing mechanism with or without tympanic membrane grafting.The term tympanoplasty was first introduced in 1953 by Wullstein to describe the surgical techniques for the reconstruction of the middle ear hearing mechanism that had been impaired or destroyed by chronic ear disease.

Two goals of Tympanoplasty:-

a) To achieve a dry ear by eradicating the middle ear disease

b) Hearing improvement by closure of any tympanic membrane perforation by graftingand/or ossicular reconstruction.

Autologous graft materials include skin[1], tragal perichondrium[2,3], vein[4], temporalis fascia[5], cartilage[6,7,8,9,10], fascia lata, fat. The preference of material varies according to their ease of harvesting, viability, graft uptake, hearing improvement and preparation time. However due to anatomic proximity, translucency, low basal metabolic rate, temporalis fascia is the most preferred graft material. Cartilage perichondrium is much preferred in case of eustachian tube dysfunction, total perforation as this is much tougher and easily neovascularized and therefore provide mechanical stability and necessary stiffness to

avoid retraction and reperforation. The present study compared tragal perichondrium with temporalis fascia as graft material in type 1 tympanoplasty done in cases of tubotympanic type of chronic otitis media.

METHODS

This prospective hospital-based study was conducted on 50 patients at Acharya shri chandercollege of medical sciences and hospital, sidhra during May 2022 to April 2023. A detailed history and clinical examination were done on all patients of chronic otitis media according to the proforma. The cases were divided randomly into 2 groups of 25 each, Group A with temporalis fascia as graft material and Group B with tragal perichondrium.

INCLUSION CRITERIA

a) Patients with chronic otitis media, tubotympanic or mucosal type
b) Age group 20-60 years
c) Operating ear should be dry for at least 6 weeks
d) Pure conductive hearing loss of up to 40 dB

EXCLUSION CRITERIA

a) Patient not willing for surgery
b) Age <20 years and >60 years
c) Patients with active discharge
d) Patients with atticoantral type of chronic otitis media
e) Patients with tubotympanic type of otitis media but with sensorineural hearing loss.

SURGICAL PROCEDURE

Patients underwent surgical procedure in general anaesthesia. Intravenous pantoprazole and antibiotic were given pre operatively. Local infiltration with lignocaine and adrenaline (1:90,000) was given in the post auricular area, tragus and in all four quadrants of the external auditory canal.

All patients were given postauricular incision 5mm behindthe pinna but for the tragal perichondrium[11,12,13], an additional 2mm incision was also given in the medial aspect of the most prominent part of the tragus. The perichondrium is harvested in continuity from both the surfaces of the cartilage and the cartilage was reposited back[14,15].

The skin and subcutaneous tissue excised, the periosteum was elevated. The tympanomeatal flap was elevated and the margins of the perforation were freshened. Ossicular mobility was confirmed and the graft was placed in underlay technique. Gel foam was placed in middle ear to support the graft. The tympanomeatal flap was reposited back and the periosteum layer was sutured by vicryl followed by suturing of the skin and mastoid dressing.

Post operatively patient was given analgesic, antibiotics, antihistamines. Mastoid dressing was changed next day and patient was discharged. Sutures were removed after 7 to 10 days. Patients were called after 1 week for first follow up and then at two to three week interval for 6 months.

Success was defined as ear drum closure with no residual perforation and hearing improvement was defined as air-bone gap of less than 15 dB.

Statistical analysis was done and the results were expressed as advised by the statistician and other appropriate statistical methods were applied where ever necessary. P- value <0.05 was considered statistically significant.

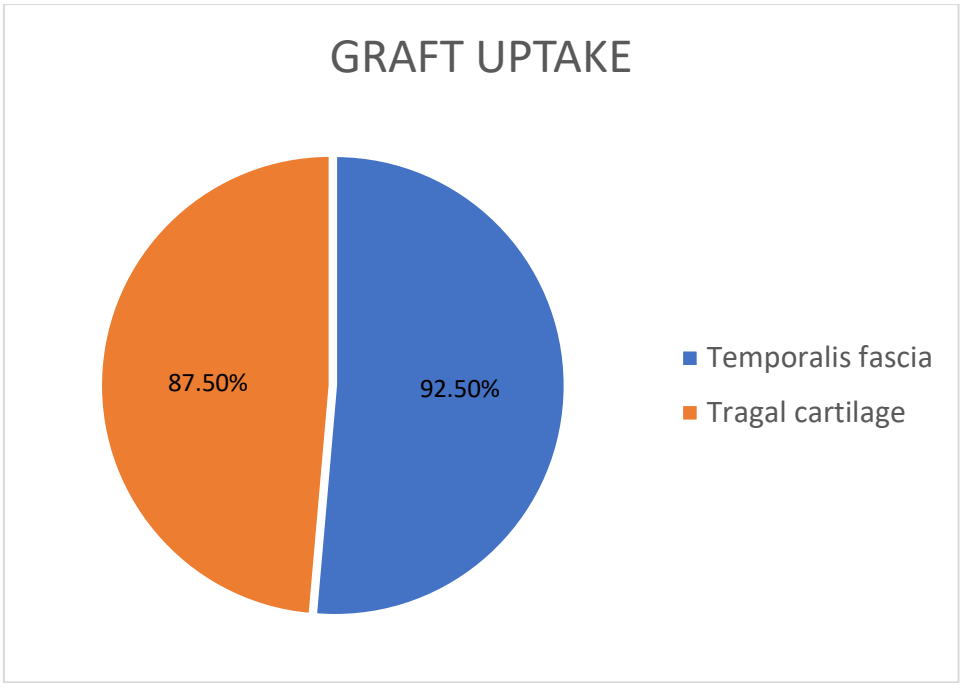
RESULTS

It was a comparative randomized study which was performed in 50 patients for a duration of 1 year from May 2022 to April 2023. The age of the patients ranges from 20-60 years with mean age35.4.

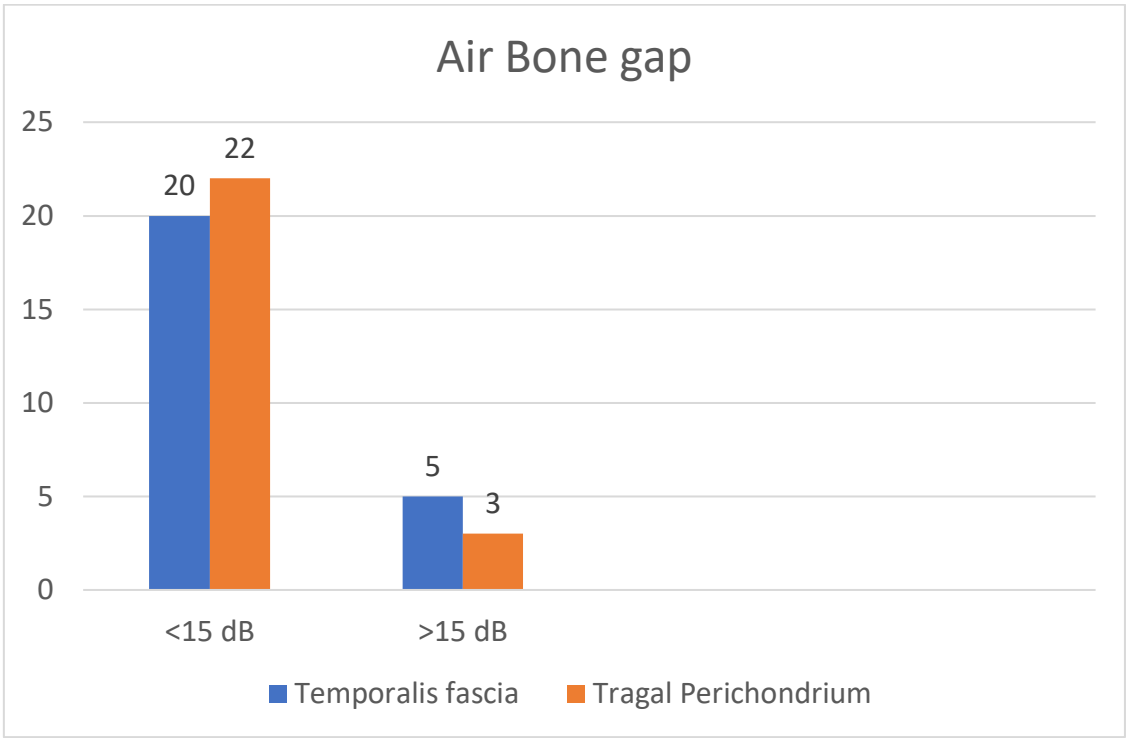
The male to female ratio was 1.6:1.

Gender	No. of patients	Percentage
MALE	31	62%
FEMALE	19	38%
TOTAL	50	100%

Graft uptake rate was better in case of patients with temporalis fascia (92.5%) as graft material as compare to tragal perichondrium (87.5%) but this was not statistically significant.



The hearing improvement i.e.,air bone gap of < 15 dB was 80% in Group A patients and 88% in Group B patients. The hearing improvement was better in case of patients with tragal perichondrium as graft material but this difference was not statistically significant.



Both the materials were excellent graft material for repair of the perforated tympanic membrane.

DISCUSSION

Otitis media is a term used to describe any inflammatory disease of the mucous membrane lining the middle ear cleft. It can be due to multiple interrelated factors including infections, eustachian tube dysfunction, allergy and barotrauma[11]. Chronic otitis media is classified into tubotympanic/mucosal/safe type in which there is central perforation and atticoantral/squamosal/unsafe type in which there is involvement of pars flaccida and marginal type of perforation. Tympanoplasty is the main surgical procedure done in tubotympanic type of disease to restore sound protection for the round window by constructing a closed, air containing

middle ear against the round window membrane and restores sound pressure transformation for the oval window by connecting a large tympanic membrane or substitute membrane with the stapes footplate via either an intact or a reconstructed ossicular chain[16].

In this study we have compared the results of tragal perichondrium and temporalis fascia grafts used for the repair of tympanic membrane perforation using underlay technique. Both the tragal perichondrium and temporalis fascia are accessible near the operative site, available in adequate amount, have excellent contour, can be thinned down and possess excellent survival capacity. Both being mesodermal in origin, they are free from the possibility of post operative cholesteatoma.

In a study conducted by Gibb using temporalis fascia and tragal perichondrium as graft material the percentage take up rate was 87.5%. Strahan achieved graft uptake rate of 87%. But in our study, the graft uptake rate of temporalis fascia was 92.5% and of tragal perichondrium was 87.5%. Hearing improvement was better in cases of patients with tragal perichondrium (88%) as graft as compared to temporalis fascia graft (80%).

Goodhill achieved near 100% success rate with tragal perichondrium. Strahan study showed 86% graft uptake rate with tragal perichondrium. Strahan achieved 82% restoration in hearing using temporalis fascia. J.Evid study showed air bone gap (<15 dB) was 83.33% with temporalis fascia and 76.66% with tragal perichondrium.

CONCLUSION

We conclude from this study that both the graft materials were equally effective in repairing the tympanic membrane perforation and restoration of the hearing mechanism. Both the materials are mesodermal in origin so prevent the risk of occurrence of iatrogenic cholesteatoma. Hence both these materials are excellent viable autograft materials.

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