

Original Research Article

A comparative study of the outcomes of temporalis fascia graft versus tragal perichondrium graft in type 1 tympanoplasty in our experience

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Received: 08 October 2017

Revised: 26 October 2017

Accepted: 27 October 2017

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ABSTRACT

Background: COM causes considerable morbidity with ear discharge, conductive hearing loss and complications. Type 1 tympanoplasty is a surgical procedure which intends improves the hearing and quality of the life. Comparison of the outcomes will help to determine the merits or demerits of a particular graft.

Methods: The study was conducted in the department of ENT, SMVMCH, Pondicherry from April 2015 to April 2017. A detailed history taking, thorough clinical examination done for these patients. PTA was done before the procedure, post operatively at 3rd month. Hearing improvement analysed using different parameters like type of graft used, hearing gain, graft uptake; the data collected was tabulated and subjected to statistical analysis.

Results: All the patients had COM, mucosal type, with conductive hearing loss of <40 dB. 23 patients underwent type 1 tympanoplasty by underlay technique using temporalis fascia, 19 patients using tragal perichondrium. There was no significant difference in total hearing gain at 3rd month and graft uptake between temporalis fascia and tragal perichondrium.

Conclusions: This study compared the outcomes of temporalis fascia and tragal perichondrium graft with respect to hearing gain and graft uptake. Tragal perichondrium graft equally effective as temporalis fascia graft in terms of hearing gain and graft uptake.

Keywords: Chronic suppurative otitis media, Temporalis fascia, Tragal perichondrium, Type 1 tympanoplasty

INTRODUCTION

The tympanic membrane perforation is one of the common clinical conditions encountered in ENT practice. It can result from various causes including infections like acute or chronic otitis media, trauma etc. closure of tympanic membrane perforation is essential to prevent recurrent infections and restore hearing. Type 1 tympanoplasty is performed when ossicular chain is intact, using various graft materials like full thickness skin graft, Pedicled skin grafts, split skin graft (Wullestein 1952 and Zollner 1953), vein graft, Fascia grafts and Perichondrium.^{1,2} Each of these grafts material has its advantages and disadvantages over each other.

This study was done to compare the outcomes of temporalis fascia and tragal perichondrium as graft materials in type 1 tympanoplasty, which can help to determine the merits and demerits of a particular graft.

METHODS

Study design: Comparative study

Sample size: 42 patients presenting with tympanic membrane perforation.

Sampling method: Simple random sampling.

Study place and period

Patient attending the department of ENT of Sri Manakula Vinayagar Medical College and Hospital, Madagadipet, Pondicherry from April 2015 to April 2017.

Inclusion criteria

All the patients presenting with chronic otitis media with tympanic membrane perforation of age group where tympanoplasty is advisable.

Exclusion criteria

Patients with ossicular discontinuity, sensorineural hearing loss, recurrent cases and malignancy are excluded from this study.

A written informed consent was taken from all patients included in the study. A detailed history taking, thorough clinical examination was done. Patient underwent routine blood investigations. In all patients X-ray mastoid schuller’s view was taken. Pure tone audiometry was done once before the surgery, then post operatively at 3rd month.

Operative procedure

General anaesthesia along with local infiltration of 2% lignocaine with adrenaline used.

For group 1 patients, to harvest temporalis fascia graft a post auril William wilde’s incision was done. In group 2, for tragal perichondrium a 1.5 cm long incision over medial surface of tragus was made. Soft tissue was dissected and tragal perichondrium was harvested from the anterior surface of tragal cartilage.

Cortical mastoidectomy performed and type 1 tympanoplasty done under microscopy by underlay technique. Aural pack was placed, which was removed after 3 weeks.

Regular follow up was done every week for first 3 weeks, later at 6th week, 3rd month and 6th month. Patients were assessed for hearing improvement using PTA and for graft uptake using otoscopy.

Data analysis

The data collected was tabulated and subjected to statistical analysis using SPSS software version 16.0. unpaired ‘t’ test was done to compare the mean (±SD). Chi square test was used to compare the proportion. P value <0.05 was considered to be statistically significant.

RESULTS

Among 42 cases included in this study, 20 patients were male and 22 patients were female. Age of the patient

varied from 13 yrs to 66 yrs, majority of the patients belonging to the age group of 15-25 years.

Group 1 (temporalis fascia) included 23 patients in whom temporalis fascia was used as graft material. Group 2 included 19 patients with tragal perichondrium as graft material.

Table 1: Graft materials used in different type of perforation.

Perforation	Temporalis fascia	Tragal perichondrium
Small	8	7
Large	10	9
Subtotal	5	3

In our study, temporalis fascia as a graft used in small perforation in 8 patients, large perforation in 10 patients, subtotal in 5 patients. Tragal perichondrium used in 7 small perforations, 9 large central perforations and 3 subtotal perforations (Table 1).

Table 2: Pre op air bone gap for each group.

Group	No. of patients	Mean pre op AB gap
Group 1 (temporalis fascia)	23	34.99 (±5.75 db)
Group 2 (tragal perichondrium)	19	33 (±7.58 db)

Table 3: comparison of post op air bone gap for both groups.

Group	3 rd month AB gap	P value
Group 1 (temporalis fascia)	17.75 (± 5.54 db)	0.80
Group 2 (tragal perichondrium)	10.35 (±5.84 db)	

In our study there was no statistically significant mean A-B gap among patients in group 1 and group 2 as the p value was 0.80 (Table 2 and 3).

Table 4: Graft uptake for both groups.

Group	Pre op perforation	Graft uptake
Group 1 (temporalis fascia)	23	22
Group 2 (tragal perichondrium)	19	17

In our study graft uptake after three months in temporalis fascia 95.65%, in tragal perichondrium 89.5% (Table 4).

In our study one failure in temporalis fascia and 2 failures in tragal perichondrium used in type 1 tympanoplasty. In

tragal perichondrium failure occurred in large central perforation and subtotal perforation. In small perforation tragal perichondrium gave 100% success rate in our study

DISCUSSION

All the patients had COM, mucosal type, with conductive hearing loss of <40 dB. 23 patients underwent type 1 tympanoplasty by underlay technique using temporalis fascia, 19 patients using tragal perichondrium.

Tragal perichondrium, temporalis fascia are accessible near operative site, available in adequate amount and contour, can be thinned down and possess excellent survival capacity. Thus they fulfil all the criteria of ideal graft tissue. Being mesodermal in origin, they are free from the possibility of post-operative cholesteatoma.¹

In this study, majority of patients had large central perforations 19, 15 patients had small central perforation, subtotal perforation least in number. In the study by Nishanthkumar et al, on ascertaining the size of tympanic membrane perforation, it was observed that out of 64 ears, 6 having small tympanic membrane perforation, 9 having large central perforation, 21 having subtotal, 28 having moderate perforation.³⁻⁵

There was no statistically significant difference in mean air bone gap at 3rd month post-operative follow up between temporalis fascia and tragal perichondrium in our study.

A study by Dhabolkar et al temporalis fascia achieved a graft uptake of 84%, and satisfactory hearing improvement in 76% of the patient.⁶ Tragal perichondrium achieved a success rate of 80% graft uptake and 75% hearing gain, these data's are comparable with no statistical significance of difference between them. Our study observed results similar to them.

In a comparative study of underlay and overlay technique of myringoplasty done by Singh et al graft take up rate was found to be the same (93.3%).⁷ Our study observed similar results with underlay technique with both temporalis fascia and tragal perichondrium graft.

In the study conducted by Gibb using temporalis fascia as graft material by underlay technique the percentage take rate was 87.5%.⁸ In our study graft uptake after three months in temporalis fascia 95.65%, in tragal perichondrium 89.5%.

CONCLUSION

Tragal perichondrium graft equally effective as temporalis fascia graft in terms of hearing gain and graft uptake. In small central perforation tragal perichondrium gave 100% success rate in our study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Wullestein H. Method for split-skin covering of perforation of the drum by tympanoplasty operations in cases of chronic otitis. *Arch Ohr Nas-u.Kehlk –Helik.* 1952;161:422.
2. Zollner F. Tympanoplasties intended to replace large drum defects combined with defects of ossicles. Panel on myringoplasty. Second workshop on reconstructive Middle Ear Surgery. *Arch Otolaryng.* 1953;78:301.
3. Nishankumar, Chilke D, Puttevar MP. Clinical Profile of Tubotympanic CSOM and Its Management With Special Reference to Site and Size of Tympanic Membrane Perforation, Eustachian Tube Function and Three Flap Tympanoplasty *Indian J Otolaryngol Head Neck Surg.* 2012;64(1):5–12.
4. Ahmad SW, Ramani GV. Hearing loss in perforation of the tympanic membrane. *J Laryngol Otol.* 1979;93:1091–8.
5. Alberti PWRM, Kristensen J. The clinical application of impedance audiometry. *Laryngoscope.* 1970;80:785.
6. Jyothi Dhabolkar, Krishna Vora, Abhik Sikdar; Comparative study of underlay tympanoplasty with temporalis fascia and tragal perichondrium. *Indian J of Otolaryngology head and neck surgery;* 2007;59(2):116-9.
7. Singh M, Rai A, Bandyopadhyay S, Gupta SC. Comparative study of the underlay and overlay techniques of myringoplasty in large and subtotal perforations of the tympanic membrane. *J Laryngol Otol.* 2003;117(6):444-8.
8. Gibb A, Chang SK. Myringoplasty (A Review of 365 operations). *J Laryngol Otol.* 1982;96:915–20.

Cite this article as: Santhanakrishnan K, Bhat PS. A comparative study of the outcomes of temporalis fascia graft versus tragal perichondrium graft in type 1 tympanoplasty in our experience. *Int J Otorhinolaryngol Head Neck Surg* 2018;4:60-2.