Research Article

INTERNATIONAL RESEARCH JOURNAL OF PHARMACY

www.irjponline.com

ISSN 2230-8407 [LINKING]

RESULTS OF CARTILAGE-PERICHONDRIUM COMPOSITE GRAFT TYMPANO PLASTY IN PATIENTS WITH CHRONIC SUPPURATIVE OTITIS MEDIA

Dr. Bhaben Choudhury

Associate Professor, Department of ENT, Nootan Medical College and Research Centre, Visnagar, Gujrat

Email: Drbhabenchoudhury@gmail.com

How to cite: Choudhury B. Results of cartilage-perichondrium composite graft tympanoplasty in patients with chronic suppurative otitis media. International Research Journal of Pharmacy. 2022;13:5:13-16.

DOI: 10.7897/2230-8407.1303183

==========

ABSTRACT

Background: Cartilage-perichondrium composite grafts are the preferred materials for rebuilding recurring tympanic membrane perforations and atelectatic tympanic membranes. However, there is a scarcity of literature data on this topic.

Aim: The current study aims to evaluate the results and efficacy of cartilage-perichondrium composite graft tympanoplasty in patients with tympanic membrane perforations. The study also looked at complications, postoperative hearing outcomes, and success rates for tympanic membrane closure.

Methods: The study evaluated 220 patients with clinical evidence of CSOM (chronic suppurative otitis media) who were treated with cartilage-perichondrium composite graft tympanoplasty during the study period. The data were analyzed for effectiveness, results, complications, postoperative hearing outcomes, and tympanic membrane closure success rates.

Results: The overall intake of grafts in research patients was 99.09%. Type I, type II, and type III tympanoplasty resulted in an air-bone closure of up to 20dB in 86.11%, 72.22%, and 70.58% of research patients, respectively. 97.26% of participants who underwent various forms of tympanoplasty obtained a hearing level of 30 decibels or below, which is regarded socially acceptable.

Conclusions: The current study suggests that a cartilage-perichondrium composite graft is a dependable and effective method of healing tympanic membrane holes. This procedure produces great closure rates and enhanced hearing outcomes, leading in an improved quality of life for the participants.

Keywords: AB gap closure, cartilage-perichondrium composite graft, tympanic membrane, tympanoplasty.

INTRODUCTION

The ear's tympanic membrane is essential for transferring sound waves and maintaining appropriate middle ear function. Since the introduction of cartilage grafts in middle ear reconstruction, their role has evolved significantly, from being used solely for occuloplasty to support the fascia graft in the 1950s to being the sole reconstruction material as a cartilage-perichondrium composite graft for membrane reconstruction. Cartilage-perichondrium composite grafts are commonly used to repair recurring perforations and atelectatic tympanic membranes.1,2

There are currently 23 methods for cartilage tympanoplasty, including composite chondro-perichondrial clip tympanoplasty and in-lay butterfly cartilage tympanoplasty in special cartilage tympanoplasty and subtotal perforations, special total pars tensa cartilage perichondrium composite grafts, cartilage-perichondrium composite island grafts, and Palisades, Stripes, and

Slices with attached perichondrium on the ear canal side; foils, thin plates, and thick plates, not co In all situations, the graft adapts to its new role as the pathophysiology changes.3,4

The current study aimed to comprehensively assess the efficacy and outcomes of cartilage-perichondrium composite graft tympanoplasty in repairing tympanic membrane perforations by assessing the success rates of cartilage-perichondrium composite graft tympanoplasty in achieving tympanic membrane perforation closure and assessing postoperative hearing outcomes. The study also looked at the frequency of complications related to cartilage-perichondrium composite graft tympanoplasty.

MATERIALS & METHODS

The current prospective and retrospective mixed study aimed to comprehensively assess the efficacy and outcomes of cartilage-perichondrium composite graft tympanoplasty in repairing tympanic membrane perforations by assessing the success rates of cartilage-perichondrium composite graft tympanoplasty in closing tympanic membrane perforations and assessing postoperative hearing outcomes. The study also looked at the frequency of complications related to cartilage-perichondrium composite graft tympanoplasty. The research subjects were members of the Institute's Department of ENT. All individuals provided verbal and written informed consent before to participation.

The study included 220 participants of all genders who had tympanic membrane perforation. The study included participants with good cochlear reserve, long-standing ear discharge with tympanic membrane perforation, with and without tympanosclerotic patch, with and without cholesteatoma/granulations, and subjects who had their tympanosclerotic patches removed. These patients were scheduled for tympanoplasty with mastoidectomy for granulation and cholesteatoma. The research excluded participants who had otogenic intracranial problems.

Following the final inclusion of the research subjects, all individuals had a complete clinical history and examination using a premade structured proforma built specifically for the study. All individuals underwent a pre-operative audiometric evaluation, which included pure tone audiometry (PTA).

Perforation was examined in all individuals using otoscopy, followed by inspection under a microscope. Following this, all individuals had the appropriate preoperative assessments. Tympanoplasty was performed under local anesthetic in adults, whereas general anesthesia was utilized in children. The individuals had surgery using either a post-aural or endaural technique. This was followed by tragal cartilage harvesting and tympanoplasty with a cartilage-perichondrium composite island transplant performed using the underlay approach after the cartilage was sliced using the cartilage slicer. Suture removal was performed on all participants between the seventh and tenth day after surgery. Antibiotics were provided to subjects for a six-week period. The individuals were revisited every 3 to 6 months for follow-up and collection of post-operative observations.

The collected data were statistically analyzed using SPSS (Statistical Package for the Social Sciences) software version 16.0 (SPSS Inc., Chicago, USA) for descriptive measures and the chi-square test. The data were presented in the form of mean and standard deviation, as well as frequency and percentage. A p-value < 0.05 was considered statistically significant.

RESULTS

The current prospective and retrospective mixed study aimed to comprehensively assess the efficacy and outcomes of cartilage-perichondrium composite graft tympanoplasty in repairing tympanic membrane perforations by assessing the success rates of cartilage-perichondrium composite graft tympanoplasty in closing tympanic membrane perforations and assessing postoperative hearing outcomes.

The study also looked at the frequency of complications related to cartilage-perichondrium composite graft tympanoplasty. The study comprised 220 people of both genders, including 39.09% (n=86) men and 88.18% (n=194) women. The research individuals' average age was 32.48±6.82 years, with a range of 10 to 62 years. 164 of the 220 individuals showed central perforation, whereas 56 had granulations or cholesteatoma. Deafness was the most prevalent presenting symptom in 98.18% (n=216) of the research patients, followed by diarrhea in 92.72% (n=204) and ear discomfort in 42.72% (n=94).

The study findings revealed that in the current investigation, any graft utilized for tympanic membrane perforation repair that remained intact for three months after surgery was deemed the graft being removed, as observed and reported in 99.09% (n=218) of the study individuals.

At 3 months postoperatively, 30.55% (n=44) and 16.66% (n=6) of individuals with type I and type II tympanoplasty had an A-B bone closure score of 0-10, respectively. Air bone gap closure of 11-20 was found in 55.55% (n=80), 55.55% (9n=20), 70.58% (n=24), and 66.66% (n=4) of participants having type I, type II, type III, and type IV tympanoplasty.

21-30 air-bone gap closure was seen in 12.5% (n=18), 16.66% (n=6), 29.41% (n=10), and 33.33% (n=2) of participants undergoing type I, type II, type III, and type IV tympanoplasty. A-B gap closure of more than 30 was reported in 1.3% (n=2) and 11.11% (n=4) of patients with type I and type II tympanoplasty, respectively (Table 1).

As shown in Table 2, air-bone gap closure of 0-10 was seen in 22.72% (n=50) subjects, 11-20 in 58.18% (n=128) subjects, 21-30 in 16.36% (n=36) study subjects, and >30 in 2.7% (n=6) study subjects.

DISCUSSION

The current study comprised 220 people of both genders, with 39.09% (n=86) men and 88.18% (n=194) women. The research individuals' average age was 32.48±6.82 years, with a range of 10 to 62 years. 164 of the 220 individuals showed central perforation, whereas 56 had granulations or cholesteatoma. Deafness was the most prevalent presenting symptom in 98.18% (n=216) of the research patients, followed by diarrhea in 92.72% (n=204) and ear discomfort in 42.72% (n=94). These findings were similar to those of Desarda K.K et al.5 in 2005 and Singh M et al.6 in 2003, who evaluated patients with demographic data similar to the current research.

It was discovered that in the current investigation, any graft utilized for tympanic membrane perforation repair that remained intact for three months after surgery was deemed the graft being removed, as observed and reported in 99.09% (n=218) of the study individuals. These findings were comparable with those of O. Ben Gamra et al7 in 2008 and Vaidya S et al8 in 2014, who showed good graft uptake and acceptability in their investigations of people with tympanic membrane perforation, as shown in the current research.

The study results indicated that when analyzing the A-B bone closure in different types of tympanoplasty at 3 months postoperatively, AB of 0-10 was found in 30.55% (n=44) and 16.66% (n=6) of the participants with type I and type II tympanoplasty. Air bone gap closure of 11-20 was found in 55.55% (n=80), 55.55% (9n=20), 70.58% (n=24), and 66.66% (n=4) of participants having type I, type II, type III, and type IV tympanoplasty. 21-30 air-bone gap closure was seen in 12.5% (n=18), 16.66% (n=6), 29.41% (n=10), and 33.33% (n=2) of participants undergoing type I, type II, type III, and type IV tympanoplasty. A-B gap closure of more than 30 was seen in 1.3% (n=2) and 11.11% (n=4) of participants having type I and type II tympanoplasty, respectively.

These findings were consistent with the findings of Vijayendra H et al9 in 2006 and Varshney S et al10 in 2010, who proposed comparable A-B bone closure in various forms of tympanoplasty as in the current investigation, as reported by the authors in their separate studies. In terms of overall air-bone closure in study subjects in dB, AB gap closure of 0-10 was seen in 22.72% (n=50) subjects, 11-20 in 58.18% (n=128) subjects, air-bone gap closure of 21-30 in 16.36% (n=36) study subjects, and air-bone gap closure of >30 in 2.7% (n=6) study subjects. These results were in line with the findings of Patil K et al[11] in 2014 and Demirpehlivan IA et al[12] in 2011 where authors reported similar overall air-bone closure in their study subjects as seen in the present study.

CONCLUSIONS

Considering its limitations, the present study concludes that cartilage-perichondrium composite graft is a reliable and efficacious approach to repairing the perforations of the tympanic membrane. This technique results in excellent closure rates and improves the hearing outcomes resulting in improved quality of life in the subjects. Future longitudinal studies with larger sample sizes and longer monitoring are needed for further conclusion.

REFERENCES

1. Khan MM, Parab SR. Reinforcement of sliced tragal cartilage perichondrium composite graft with temporalis fascia in type I tympanoplasty: our techniques and results. J Rhinolaryng Otol. 2013;1:57-62.
2. Mundra, R.K., Sinha, R. & Agrawal, R. Tympanoplasty in Subtotal Perforation with Graft Supported by a Slice of Cartilage: A Study with Near 100 % Results. Indian J Otolaryngol Head Neck Surg. 2013;65:631–5.
3. Cavaliere M, Panetti M, Iemma M. Tragal cartilage shield tympanoplasty: our technique and results in 612 cases. Acta Oto-Laryngologica. 2014;134:890-7.

4. Neumann A, Schultz-Coulon HJ, Jahnke K. Type III tympanoplasty applying the palisade cartilage technique: a study of 61 cases. Otology & neurotology. 2003;24:33-7.
5. Desarda K.K., Bhisegaonkar D.A. & Gill S. Tragal perichondrium and cartilage in reconstructive tympanoplasty. Indian J Otolaryngol Head Neck Surg. 2005;57:9–12.
6. Singh M., Rai A., Bandyopadhyay S., & Gupta S. Comparative study of the underlay and overlay techniques of myringoplasty in large and subtotal perforations of the tympanic membrane. The Journal of Laryngology & Otology. 2003;117:444-8.
7. O. Ben Gamra · C. Mbarek· K. Khammassi ·N. Methlouthi · H. Ouni · I. Hariga · S. Zribi ·J. Koubâa · A. El Khedim Cartilage graft in type I tympanoplasty: audiological and otological outcome. Eur Arch Otorhinolaryngol. 2008;265:739-2.
8. Vaidya S, Sharma JK, Singh G. Study of the outcome of tympanoplasties about size and site of tympanic membrane perforation. Indian J Otolaryngol Head Neck Surg. 2014;66:341-6.
9. Vijayendra H, Rangam CK, Sangeeta R. Comparative study of tympanoplasty in wet perforation v/s dry perforation in tubotympanic disease. Indian J Otolaryngol Head Neck Surg 2006;58:5-167.
10. Varshney S, Nangia A, Bist SS, Singh RK, Gupta N, Bhagat S. Ossicular chain status in chronic suppurative otitis media in adults. Indian J Otolaryngol Head Neck Surg. 2010;62:421-6.
11. Patil K, Baisakhiya N, Deshmukh PT. Evaluation of different graft material in type 1 tympanoplasty Indian J Otol. 2014;20:106–14.
12. Demirpehlivan IA, Onal K, Arslanoglu S, Songu M, Ciger E, Can N, et al Comparison of different tympanic membrane reconstruction techniques in type I tympanoplasty Eur Arch Otorhinolaryngol. 2011;268:471–4.

TABLES

Air bone gap closure (AB)	Type I		Type II		Type III		Type IV	
	n	%	n	%	n	%	n	%
0-10	44	30.55	6	16.66	-	-	-	-
11-20	80	55.55	20	55.55	24	70.58	4	66.66
21-30	18	12.5	6	16.66	10	29.41	2	33.33
>30	2	1.3	4	11.11	-	-	-	-

Table 1: A-B gap closure in different types of tympanoplasty at 3 months postoperatively

AB gap closure	Number (n)	Percentage (%)
0-10	50	22.72
11-20	128	58.18
21-30	36	16.36
>30	6	2.7

Table 2: Overall air-bone closure in study subjects in dB