



A STUDY OF AUDIOLOGICAL AND SURGICAL OUTCOME OF TRAGAL CARTILAGE GRAFT IN MYRINGOPLASTY

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ABSTRACT

The use of cartilage in middle ear surgery is not a new concept. However, in the last decade there has been renewed interest in the use of cartilage for middle ear surgeries¹.

Aim of the study: To evaluate the audiological and surgical results of tragal cartilage graft in myringoplasty for reconstruction of tympanic membrane perforation.

Materials and Methods: A total of 25 patients in the age group of 16 - 60 years suffering from chronic suppurative otitis media of tubotympanic type, attending the outpatient department at Rajah Muthiah Medical College and hospital and underwent tragal cartilage myringoplasty between October 2015 to August 2017 were included in the study.

Results: The mean pre operative pure tone average was 37 and the post operative pure tone average was 25.80 at 6th week and 15.60 at 10th week. The calculated p value was less than 0.001 which was statistically significant. Graft uptake was 92% in our study. There was no post operative retraction. Post operative re-perforation was seen in 2 (8 %) patients.

Conclusion: Graft take up in tragal cartilage myringoplasty has been excellent, hearing results are satisfactory and complications are minimal. Immobility of the transplant during the early stages of healing process is the most important factor for successful surgical outcome of myringoplasty².

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INTRODUCTION

Chronic suppurative otitis media (CSOM) is one of the common causes of deafness in India³ and occupies a considerable amount of clinical and operating time of otolaryngologists. Myringoplasty is the surgical procedure used to reconstruct the tympanic membrane perforation occurring as a result of CSOM.

Ideal grafting material used for tympanic membrane closure should have a low basal metabolic rate, low rejection rate, good tensile strength, conductive properties similar to tympanic membrane and should be easily available in sufficient quantity⁴. Temporalis fascia subserves this criteria but in conditions like recurrent perforation, chronic mucosal dysfunction and in severe atelectasis, tympanic membrane may undergo atrophy and

result in graft re-perforation⁵. Cartilage perichondrium being tougher works well in these conditions. Cartilage was first introduced in middle ear surgery in 1959 by Utech⁶. This technique was then promoted by Prof. Heerman who used cartilage palisade technique in 1962⁷. The concept of grafting tragal cartilage and perichondrium was introduced by Goodhill³. Cartilage gives the necessary stiffness, immobility and mechanical stability to avoid retraction. Tragal cartilage is increasingly used for myringoplasty. Hence this study is undertaken to evaluate the audiological and surgical outcome of tragal cartilage myringoplasty.

Aim

To evaluate the audiological and surgical results of tragal cartilage graft in myringoplasty for reconstruction of tympanic membrane perforation.

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Objectives

1. To evaluate the results of graft uptake using tragal cartilage as a graft material in myringoplasty.
2. To evaluate the results of post operative hearing using pre and post operative pure tone average and post operative hearing improvement.
3. To study the complications in the post operative period.

MATERIALS AND METHODS

A total of twenty five patients in the age group 16 - 60 years suffering from chronic suppurative otitis media of tubotympanic type in the inactive stage, attending the outpatient department at Rajah Muthiah Medical College and Hospital and underwent tragal cartilage myringoplasty between October 2015 to august 2017 were included in the study.

Inclusion Criteria

1. Age group in the range of 16 -60 years
2. Dry ear for one month
3. Small to medium sized central perforation
4. Conductive hearing loss up to 40dB
5. Middle ear mucosa free of infection

Exclusion Criteria

1. Attic and / or posterior retraction pocket with cholesteatoma
2. Ossicular chain dysfunction
3. External ear pathology

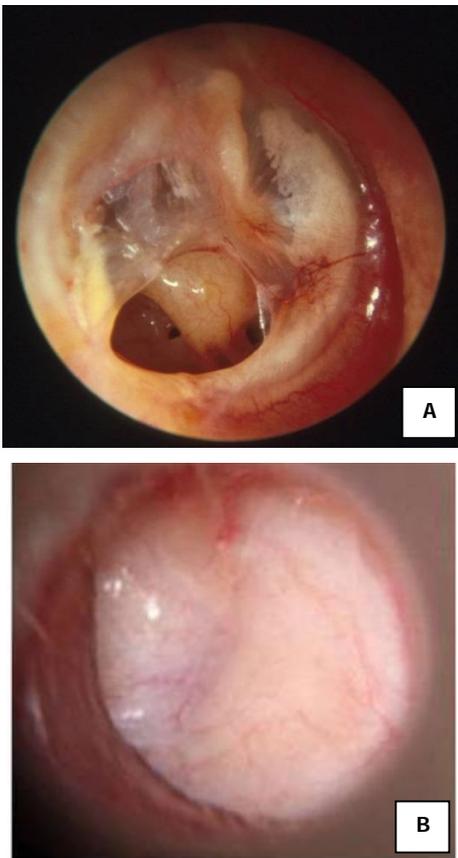


Figure 1 (A) Tympanic membrane with central perforation (B) Post operative tympanic membrane

Once the patient satisfies the inclusion and exclusion criteria, informed consent was obtained from the patient. The above group underwent tragal cartilage myringoplasty. In the post operative period the patient was evaluated for hearing by doing pure tone audiogram. The pure tone average at the end of 6weeks and 10 weeks was studied and the post operative complications were noted.

RESULTS

In our study majority of the patients belonged to the age group 31 - 40 years. The mean average age was 28.6 years. Hearing assessment using pure tone audiogram showed that in 24(96%) patients the pre operative pure tone average was in the range 26 -40dB. In 17(68%) patients the post operative pure tone average at the end of 6 weeks was in the range 0-25 dB and in 24(96%) patients the post operative pure tone average was in the range 0 - 25 dB at the end of 10 weeks. Graft uptake was 92%. There was no post operative retraction. Post operative reperforation was seen in 2 (8 %) patients. The post operative surgical site infection was seen in 3 patients.

Table 1 Statistical Analysis

	N	Mean	Std. Deviation	F- value	p value
Pre operative Pure tone average	25	37.00	4.33013		
Post operative pure tone average at the end of 6weeks	25	25.80	6.23832	79.320	<0.001
Post operative pure tone average at the end of 10weeks	25	15.60	7.11805		

On evaluating the audiological results of tragal cartilage graft in myringoplasty the mean pre operative pure tone average was 37 ,the mean post operative pure tone average at the end of 6 and 10 weeks was 25.80 and 15.60 respectively and mean post operative hearing improvement was 21.4 , our results were found to be statistically significant(p value < 0.001)

DISCUSSION

In our study majority of the patients belonged to the age group 31 - 40 years. The mean average age was 28.6 years. In the study done by Murat Sahan *et al*⁵ out of 33 patients the mean age was 37.5 +/- 12.7.

In our study hearing assessment using pure tone audiogram showed that in 24(96%) patients the pre operative pure tone average was in the range 26 -40dB. In 17(68%) patients the post operative pure tone average at the end of 6 weeks was in the range 0-25 dB and in 24(96%) patients the post operative pure tone average was in the range 0 -25 dB at the end of 10 weeks. M. Cavaliere *et al*⁸ did a study on tragal cartilage in tympanoplasty in 306 cases from Jan 2003 to June 2007. In his study the overall mean pre-operative PTA-ABG was 43.79 +/- 7.07 dB and the post-operative (1 year after surgery) PTA-ABG was 10.43 +/- 5.25 dB (p < 0.0001). A statistically significant improvement was observed in their study. Their study revealed that tragal cartilage shield tympanoplasty was a reliable technique, with a high degree of graft uptake and satisfactory hearing results.

Graft uptake was 92% in our study. In the study done by Veysel Yurttas *et al*⁹ the overall success rate was 93% in terms of perforation closure. In our study there was no post operative retraction. Post operative reperforation was seen in 2 (8 %) patients. The post operative surgical site infection was seen in 3 patients. In the study done by Dr. Rajiv Singh *et al*¹⁰ two residual perforation were seen in cartilage group with no retraction. In fascia group, there were 3 failures which included one retraction and two perforations.

CONCLUSION

Chronic suppurative otitis media is the leading health problem in India causing significant social handicap in terms of hearing loss. Various grafts and techniques have been used for closure of tympanic membrane perforations. The temporalis fascia is the most commonly used graft material for tympanic membrane reconstruction. In the last decade there has been an increasing interest in using cartilage grafts. Cartilage confer greater stability and resistant to negative middle ear pressures. Tragal cartilage seems to be an ideal graft material for tympanic membrane in terms of postoperative healing and acoustic properties. It would be worthwhile to consider tragal cartilage as a suitable alternative to temporalis fascia.

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