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TEMPORALIS FASCIA VERSUS TRAGAL CARTILAGE IN TYPE 1 TYMPANOPLASTY

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ABSTRACT

Tympanolplasty is a common surgery performed by Otolaryngologists worldwide. There are a great number of variations in the technique and method of tympanoplasty conducted by various surgeons. Study was performed to evaluate the anatomical and audiological outcomes of Type1 Tympanoplasty performed with a temporalis fascia and tragal cartilage graft on a total of 80 patients. Results of study were compared using using rate of graft uptake and hearing gain. 38 patients (95%) showed graft success and 2 patients (5%) showed graft failure in which temporalis fascia was used. 37 patients (92.5%) showed graft success and 3 patients (7.5%) showed graft failure in which cartilage was used. In patients with temporalis fascia hearing gain was 8dB and in patients with tragal cartilage it was 7dB. Thus cartilage is a good substitute as a graft material in tympanoplasty surgeries.

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INTRODUCTION

The first true tympanoplasty was performed by Berthold in 1878, using de-epithelised TM (Sarkar, 2013). Borkowski *et al*. introduced a perichondrium–cartilage composite graft for closure of total perforations of the tympanic membrane (Borkowski, 1999). Temporlais fascia ia time tested material used in tympanoplasty surgeries. The use of cartilage is experiencing a renaissance in ear surgery because of its reliability as a graft material and also the increasing use of endoscope in ear surgeries. The tragal cartilage is nourished by diffusion and eventually becomes incorporated in the tympanic membrane (Levinson, 1987). The graft is easily accessible, adequate and its rigidity makes it easy to fashion and manipulate, reducing the learning curve in endoscopic tympanoplasty. Temporalis fascia and perichondrium are the most popular and commonly used graft material. They contain collagen and mucopolysaccharides. These two components give it a high tensile strength and low metabolic rate. For this reason it does not get autolysed in the presence of infection. Cartilage being a bradytrophic tissue allows stable and functionally reliable reconstruction of the ear drum.

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Reconstruction of tympanic membrane with graft supported by cartilage counteracts tendency to reconstruction of soft autologous materials like temporalis fascia or perichondrium. Because of its low turnover rate, cartilage is more resistant to infection (Debasish, 2018).

Aim: To evaluate the Anatomical and Audiological outcomes of Type1 Tympanoplasty performed with a temporalis fascia and tragal cartilage graft.

Objectives

- To compare rate of Graft Uptake.
- To compare Hearing Gain.

MATERIALS AND METHODS

This was a Prospective and Comparative study conducted in the Department of Otolaryngology at Rohilkh and Medical College and Hospital from June 2016 to May 2017. A total of 80 patients with Inactive Mucosal COM with large/subtotal perforations were included in the study.

Group A - Temporalis Fascia Grafts (40 patients)
Group B - Partial Thickness Tragal Cartilage Grafts (40 patients).

Following patients were excluded-

- Ossicular Chain Discontinuity
- Conductive Hearing Loss due to acquired and congenital conditions other than tympanic membrane perforation
- Sensorineural Deafness
- Revision Surgeries
- Pure tone audiogram (PTA) was carried out in each patient postoperatively after 3 months.
- Otomicroscopic examination of the operated ears was carried out in each follow-up visit to assess the graft uptake and complications that would have occurred in the follow-up period.

DISCUSSION

- In Group A
  - 38 patients (95%) showed graft success
  - 2 patients (5%) showed graft failure.
- In Group B
  - 37 patients (92.5%) showed graft success
  - 3 patients (7.5%) showed graft failure.
  - In group A average hearing gain was 8dB and in group B it was 7dB.

The graft take up rate is not an issue with tragal cartilage, the only controversy this material faces is its effect on the hearing owing to its thickness. Zahnert *et al*. examined the frequency response function of the tragal cartilage plates using a laser Doppler interferometer. There were transmission losses at lower frequencies when large tympanic membrane defects were reconstructed with thick pieces of cartilage. They concluded that a cartilage plate with a thickness of less than 0.5 mm gave the least acoustic transfer loss (Zahnert, 2000).
Dornhoffer showed good anatomical and audiologic results in cartilage tympanoplasty (Dornhoffer, 1997). Using cartilage is a new graft material and is associated with few challenges. On slicing the cartilage graft the perichondrium contracts and causes the edges of the graft to curl to the same side. This curled graft is difficult to place in an underlay manner. Tos has mentioned four incisions of the perichondrium – "the anti-curling incisions" which may help to solve this (Tos, 2009).

Conclusion

- Thus cartilage is an excellent alternate grafting material to temporalis fascia. Advantage being-
- easily accessible (endaurally)
- resistant to negative middle ear pressures
- Stable and elastic at the same time
- well tolerated by the middle ear
- resistant to resorption
- Comparable graft take rate and hearing gain.

Hence cartilage offers the best balance between the stability and the acoustic sensitivity.

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