Evaluation of healing and hearing results of full thickness cartilage graft versus partial thickness cartilage graft in tympanoplasty

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Introduction

Chronic Suppurative Otitis Media is an inflammatory process in the middle ear space, characterized by a persistent discharge from the middle ear through a tympanic membrane perforation. (Rahul et al., 2014)

The aim of myringoplasty is to close tympanic membrane perforations, restore hearing, and reconstruct a healthy middle ear cavity, prevention of ear infections, and to protect against long-term middle ear damage by preventing the ossicular pathology and preventing the migration of squamous epithelium around the margins of perforation with possible cholesteatoma formation. (Yurttas et al., 2014)

There are a number of materials for closure of TM perforations like skin, perichondrium, vein (Kulkarni et al., 2014), temporalis fascia (Sanjana et al., 2014), dura (Yetiser et al., 2001) and cartilage (Couloigner et al., 2005).

Among all, temporalis fascia is the most frequently used grafting material with high success rate of approximately 90% (Tayyar et al., 2009)

Aim of the study

This study aimed to evaluate the anatomical and audiological outcomes of tympanoplasty performed using tragal cartilage grafts of two different thicknesses (full thickness and half thickness).

Patients And Methods

This prospective study included 30 patients selected from the ENT out-patient clinic of Fayoum university hospital, presenting with CSOM and who underwent type one underlay tympanoplasty between July 2014 & February 2015. Eighteen patients were males (60%) and twelve patients were females (40%). The age ranged from (13-43) years with a mean of (27.8 ± 8.62) years.

Exclusion criteria:

- History of previous mastoid surgery
- Cases requiring ossicular reconstruction
- Cases with cholesteatoma
- Cases with sensorineural hearing loss or mixed hearing loss.

Pre-operative assessment:

1. History taking: age, gender, previous ear surgery, degree of hearing loss, ear discharge, ear pain, tinnitus and facial nerve paralysis.
2. General and local ENT examination including microscopic ear examination, nasal and nasopharyngeal endoscopic examination and tuning fork tests
3. Routine pre-operative laboratory investigations including blood sugar, complete blood count, renal and liver function tests and bleeding profile.
4. Preoperative audiological evaluation using PTA.

Patients were divided into two groups with 15 patients in each group.

The two groups were subjected to an underlay tympanoplasty (primary), using the tragal cartilage.

- Group A: patients received full thickness tragal cartilage graft.
- Group B: patients received half thickness tragal cartilage graft.

Results & Discussion

There was no significant difference regarding demographic characteristics in both groups table (1)

- In Group A, the pre-operative average air-bone gap was 30.15 ± 5.42 dB, the post-operative average air-bone gap was 20.44 ± 5.34 dB and the average air-bone gap closure was 9.71 ± 0.52 dB.
- In Group B, the pre-operative average air-bone gap was 30.22 ± 6.49 dB, the post-operative average air-bone gap was 10.74 ± 4.29 dB and the average air-bone gap closure was 19.48 ± 5.93 dB.

A statistically significant difference was noted in the air-bone gap closure between the two groups graph (1) & (2)

Graft status:

- Group A: tympanic membrane perforation was observed in only one case (6.67%) 3 months post-operatively and the rate of good graft take was (93.33%) during clinical follow-up for 6 months, no other complications such as lateralization or retraction were noted post-operatively.
- Group B: tympanic membrane perforation was observed in only one case (6.67%) 3 months postoperatively and the rate of good graft take was (93.33%) during clinical follow-up for 6 months, no other complications such as lateralization or retraction were noted post-operatively.

Conclusion

According to this study, after comparing full thickness tragal cartilage graft to partial thickness tragal cartilage graft in type I tympanoplasty regarding results of healing and hearing, we found that slicing of the tragal cartilage graft to half of its thickness gave better results regarding post-operative hearing gain and gave excellent graft take rate so; cartilage graft of half thickness offers the best balance between the stability and the acoustic sensitivity.

References:

*Sanjana V, Neomade, Jyoti P, Dabholkar. Healing and hearing results of temporals fascia graft vs. cartilage graft (Full thickness and half thickness) in type I tympanoplasty; Otolaryngology on line journa. 2014; Volume 4, Issue 3