Single Sitting Bilateral Myringoplasty: Outcomes and Complications

In a Meta-Analytic Study

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By

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List of Abbreviations

ABG : Air-bone gap
AOM : Acute otitis media
CHL : Conductive hearing loss
CNS : Central nervous system
CSOM : Chronic Suppurative Otitis Media
ET : Eustachian tube
FEM : Fixed-effects method
IBCM : Inlay butterfly cartilage myringoplasty
IL : Interleukin
ME : Middle ear
REM : Random-effects method
SNHL : Sensorineural hearing loss
SUM : Simple underlay myringoplasty
TM : Tympanic membrane
TNF : Tumor necrosis factor

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Abstract:

Background: Tympanoplasty is the standard and well established procedure for closure of tympanic membrane perforations. Traditionally each ear drum is taken up for grafting sequentially in two different sittings. The reluctance to deal with both sides at the same sitting has been primarily due to a theoretical risk of iatrogenic sensory-neural hearing loss, need of bilateral ear canal gauze packing and chances of graft intake failure. Chronic Suppurative Otitis Media (CSOM) is a widely prevalent public health problem presenting with discomfort, hearing loss, otorrhea and psychological trauma. CSOM is characterized by an inflammatory process of the middle ear often associated with irreversible tissue alterations. It may be further classified into safe chronic otitis media and unsafe chronic otitis media according to the absence or presence of a cholesteatoma.

Aim: This study aim at assessing the single stage bilateral surgical procedure in bilateral tympanic membrane perforation caused by chronic otitis media as regard the graft take and hearing improvement as outcomes.

Methodology: A meta-analysis study is done to assess the feasibility and the possibility of operating the bilateral perforation in tympanic membrane in chronic otitis media cases on same session rather than doing it in separate sessions. The outcomes that were selected to evaluate such approach are graft take and hearing improvement. Hospital stay, cost of the operation and time were supposed to be evaluated however, there was no sufficient data to treat such outcomes in this meta analytic study upon that these outcomes are going to be appraised and stated bases on the available data.

Results: The graft take was evaluated on the bases paper by ototscopic examination post operative from 3 weeks to 3 months by closure of the perforation. It was estimated in this study to be 88%. This percent is matching the result obtained by Ihsan et al 2016 "who operated on 50 patients with a graft uptake rate of 86 %",Olusesi et al, 2017 " with a total of 38 participants underwent either bilateral sequential same-day tympanoplasty (18 patients, 36 ears) or bilateral sequential different-day tympanoplasty (20 patients, 40 ears). The overall graft take rate was 88 per cent (32 out of 36 ears in the same-day tympanoplasty group, 35 out of 40 ears in the different-day tympanoplasty group; p = 0.96, odds ratio = 0.984)" (88 %), and Katsura et al, 2005 who revised the SUM using a 17 patients who underwent bilateral same-day surgery with a success rate of (85%).

Conclusion: Simultaneous bilateral myringoplasty is safe and effective as a single-stage operation with a high success rate as regard the graft take and hearing improvement.

Keywords Bilateral Myringoplasty, Tympanoplasty, Meta-analysis

Introduction

Introduction

Tympanoplasty is the standard and well established procedure for closure of tympanic membrane perforations. Traditionally each ear drum is taken up for grafting sequentially in two different sittings. The reluctance to deal with both sides at the same sitting has been primarily due to a theoretical risk of iatrogenic sensory-neural hearing loss, need of bilateral ear canal gauze packing and chances of graft intake failure **(Matsuda et al., 2009).**

Chronic Suppurative Otitis Media (CSOM) is a widely prevalent public health problem presenting with discomfort, hearing loss, otorrhea and psychological trauma. CSOM is characterized by an inflammatory process of the middle ear often associated with irreversible tissue alterations. It may be further classified into safe chronic otitis media and unsafe chronic otitis media according to the absence or presence of a cholesteatoma **(Matsuda et al., 2009; Lorenzo et al., 2012).**

The surgical approach for tympanoplasty may be endoaural, transmeatal or post-auricular. The most common grafting techniques are the underlay (medial) and the overlay (lateral).Types of grafts ranges from autografts and isografts which are usually not considered foreign and, therefore, do not elicit rejection. Allografts and xenografts are recognized

as foreign by the recipient and are rejected. Autologous materials such as temporalis fascia, cartilage or perichondrium are the common choices for grafting as they are mechanically stable and have proper acoustic performance for good sound transmission. Other grafting materials include lobular fat, and AlloDerm **(Downey et al., 2003; Dhingra, 2017).**

Quite often, the disease is bilateral, so is the perforation in the ear drum, leading to bilateral conductive hearing loss. Surgery aims at re-establishing sound conduction by obtaining a cavity filled with air and thus restoring the mechanisms that transmit sound, improving hearing and stopping otorrhea. Type 1 tympanoplasty is the most broadly agreed surgical approach to these patients, traditionally performed on each ear in succession. The reluctance to deal with both sides has been primarily due to a theoretical risk of iatrogenic sensori-neural hearing loss. The risk of iatrogenic hearing loss engaged with chronic ear surgery has been found to be variable (1.2–4.5 %), depending upon the pre-morbid conditions like congenital malformations, cholesteatoma or if concurrent ossiculoplasty was performed **(Mane et al., 2013; Rai et al., 2014).**

Another argument against a bilateral procedure includes the use of ear canal packing with various materials

for a period of typically 1–3 weeks after surgery in a number of centers. Accordingly, bilateral packing and the concurrent conductive hearing impairment has been claimed to leave the patient practically deaf for weeks after the operation **(Caye-Thomasen et al., 2007; Rai et al., 2014).**

In the current study, the researchers will review the available data on the same sitting surgery in relation to outcomes, complications, hospital stay and cost.

Aim of the Work

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To evaluate the results of bilateral same-sitting tympanoplasty type 1 for bilateral perforated tympanic membrane in relation to outcomes" graft take and hearing improvement", complications, hospital stay and cost through a meta-analytic study.