



Brazilian Journal of
OTORHINOLARYNGOLOGY

www.bjorl.org



ORIGINAL ARTICLE

Comparison between clinical and audiological results of tympanoplasty with modified sandwich technique and underlay technique[☆]

Sanjana Vijay Nemade^{*}, Kiran Jaywant Shinde, Chetana Shivadas Naik, Haris Qadri

Smt. Kashibai Navale Medical College and General Hospital, Pune Maharashtra, India

Received 19 December 2016; accepted 23 March 2017

KEYWORDS

Tympanoplasty;
Temporalis fascia
graft;
Areolar fascia graft;
Sandwich technique;
Post operative
hearing gain

Abstract

Introduction: Surgical repair of the tympanic membrane, termed a type one tympanoplasty is a tried and tested treatment modality. Overlay or underlay technique of tympanoplasty is common. Sandwich tympanoplasty is the combined overlay and underlay grafting of tympanic membrane.

Objective: To describe and evaluate the modified sandwich graft (mediolateral graft) tympanoplasty using temporalis fascia and areolar fascia. To compare the clinical and audiological outcome of modified sandwich tympanoplasty with underlay tympanoplasty.

Methods: A total of 88 patients of chronic otitis media were studied. 48 patients (Group A) underwent type one tympanoplasty with modified sandwich graft. Temporalis fascia was underlaid and the areolar fascia was overlaid. 48 patients (Group B) underwent type one tympanoplasty with underlay technique. We assessed the healing and hearing results.

Results: Successful graft take up was accomplished in 47 patients (97.9%) in Group A and in 40 patients (83.3%) Group B. The average Air-Bone gap closure achieved in Group A was 24.4 ± 1.7 dB while in Group B; it was 22.5 ± 3.5 dB. Statistically significant difference was found in graft healing rate. Difference in hearing improvement was not statistically significant.

Conclusion: Double layered graft with drum-malleus as a 'meat' of sandwich maintains a perfect balance between sufficient stability and adequate acoustic sensitivity.

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[☆] Please cite this article as: Nemade SV, Shinde KJ, Naik CS, Qadri H. Comparison between clinical and audiological results of tympanoplasty with modified sandwich technique and underlay technique. Braz J Otorhinolaryngol. 2017. <http://dx.doi.org/10.1016/j.bjorl.2017.03.009>
Peer Review under the responsibility of Associação Brasileira de Otorrinolaringologia e Cirurgia Cérvico-Facial.

^{*} Corresponding author.

E-mail: drsanjana31@yahoo.in (S.V. Nemade).

<http://dx.doi.org/10.1016/j.bjorl.2017.03.009>

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PALAVRAS-CHAVE

Timpanoplastia;
Enxerto de fásia
temporal;
Enxerto de fásia
aureolar;
Técnica
‘‘sanduíche’’;
Ganho auditivo
pós-operatório

Comparação entre os resultados clínicos e audiológicos de timpanoplastia com a técnica ‘‘sanduíche’’ modificada e a técnica *underlay*

Resumo

Introdução: O reparo cirúrgico da membrana timpânica, denominado timpanoplastia tipo 1, é uma modalidade de tratamento já bem estabelecida. As técnicas *overlay* ou *underlay* de timpanoplastia são comuns. A timpanoplastia pela técnica ‘‘sanduíche’’ é a técnica de enxerto de membrana timpânica *overlay* e *underlay* combinadas.

Objetivo: Descrever e avaliar a timpanoplastia com a técnica ‘‘sanduíche’’ modificada (timpanoplastia médio-lateral) utilizando fásia temporal e fásia aureolar. Comparar o desfecho clínico e audiológico da timpanoplastia com a técnica ‘‘sanduíche’’ modificada com o da timpanoplastia com a técnica *underlay*.

Método: Foram estudados 88 pacientes com otite média crônica. 48 pacientes (Grupo A) foram submetidos à timpanoplastia tipo 1 com enxerto ‘‘sanduíche’’ modificado. A fásia temporal foi utilizada na técnica *underlay* e a fásia areolar na técnica *overlay*. 48 pacientes (Grupo B) foram submetidos à timpanoplastia tipo 1 com a técnica *underlay*. Foram avaliados os resultados da cicatrização e da audição.

Resultados: O sucesso do enxerto ocorreu em 47 pacientes (97,9%) no Grupo A e em 40 pacientes (83,3%) do Grupo B. O fechamento médio do gap aéreo-ósseo no Grupo A foi de $24,4 \pm 1,7$ dB, enquanto no Grupo B foi de $22,5 \pm 3,5$ dB. Houve diferença estatisticamente significativa na taxa de cicatrização do enxerto. A diferença na melhora auditiva não foi estatisticamente significante.

Conclusão: O enxerto de camada dupla e o tímpano-martelo posicionados como o ‘‘recheio’’ do sanduíche mantém um equilíbrio perfeito entre a estabilidade necessária e adequada sensibilidade acústica.

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Introduction

Chronic otitis media with perforation of the tympanic membrane is a common cause of hearing loss and ear discharge.¹ There are two popular surgical techniques, the underlay and overlay methods for tympanoplasty. The underlay technique is quicker and easier to perform, and the creation of a tympano-meatal flap with elevation of the annulus allows inspection of the ossicular chain.² However, there is a risk of medial displacement of the graft, especially in large and/or anterior perforations.³ The overlay technique avoids this pitfall, but there is a risk of keratin pearl formation within the tympanic membrane, and also a risk of blunting of the angle between the drum and the anterior meatal wall.² A number of other techniques of tympanic membrane repair have been described. The term ‘sandwich technique’ was coined by Farrior in 1983 to describe a method in which sheets of areolar fascia were placed medial and lateral to the drum, with the fibrous layer as the ‘meat’ in the sandwich.^{4,5} Raghavan et al. used the same term to describe a technique in which a pedicle skin flap is used to partially cover an overlay tympanic membrane graft of temporalis fascia.⁶ We have modified the sandwich graft by using two different graft materials, i.e. temporalis fascia and areolar fascia; and drum-malleus is sandwiched between the two. We compared the healing and hearing results of tympanoplasty with underlay technique and modified sandwich technique.

Methods

We prospectively studied 96 patients during 2014–2016. Institutional Review Board approval was taken. The approval protocol number is Ref. SKNMC No/Ethics/App/2014/236 dated 23/07/2014. The Registration number is ECR/275/Inst/MH/2013.

Objectives

1. To compare the clinical outcome in terms of healing of the graft in tympanoplasty by underlay technique and modified sandwich technique.
2. To compare the audiological outcome in terms of post operative hearing gain in tympanoplasty by underlay technique and modified sandwich technique.

Inclusion criteria

Patients with tubotympanic type of chronic otitis media with large or subtotal perforation.

Exclusion criteria

Patients with atticointral type of chronic otitis media, revision ear surgery, patients requiring ossicular reconstruction, patients with mixed hearing loss.

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