

**COMPARATIVE STUDY ON OUTCOMES OF TYPE 1
TYMPANOPLASTY IN ACTIVE AND INACTIVE VARIETY OF
CHRONIC OTITIS MEDIA**

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Article Received on 15/11/2014

Article Revised on 10/12/2014

Article Accepted on 04/01/2014

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ABSTRACT

Objectives-To compare the outcome of type 1 tympanoplasty in terms of graft uptake rate and hearing improvement in active and inactive variety of COM. **Materials and Methods:** 50 patients of COM attending ENT OPD of a tertiary care hospital were selected and underwent type 1 tympanoplasty (25 active and 25 inactive mucosal variety) in underlay technique using temporalis fascia and the outcomes were compared. **Results:** In our study 88% (n=44) patients had overall successful result. The overall success rate for type 1

tympanoplasty in inactive ear (Ti) and in active ear (Ta) were 92% (n=23) and 84% (n=21) respectively. Postoperative hearing 0-10dB was found in 44% (n=11) patients in both the study groups and 11-20dB hearing was found in 36%(n=9) patients with inactive ear and 28%(n=7) patients with active ear. More than 20dB was found in 20% (n=5) cases in inactive ear and 28%(n=7) cases in active ear. **Conclusion:** The difference of success rate of type 1

tympanoplasty in both study groups in terms of graft uptake and post operative hearing is statistically insignificant ($p > 0.05$). So condition of the middle ear mucosa and presence of active ear discharge does not affect the success rate of type 1 tympanoplasty.

KEYWORDS: tympanoplasty, active variety of COM, inactive variety of COM, graft uptake rate, hearing improvement.

INTRODUCTION

Chronic Otitis Media (COM) is an inflammatory process in the middle ear space that results in long term, or more often permanent changes in the tympanic membrane including atelectasis, dimer formation, perforation, tympanosclerosis, retraction pocket development, or cholesteatoma.^[1] It results from long term Eustachian tube dysfunction with poorly aerated middle ear space, multiple bouts of acute otitis media, persistent middle ear infection or other chronic inflammatory stimulus. It is broadly classified into 5 categories of which Inactive mucosal COM is permanent perforation of the pars tensa but the middle ear mucosa is not inflamed. Active mucosal COM is permanent defect of the pars tensa with an inflamed middle ear mucosa which produces mucopus that may discharge.^[2] Hearing impairment often accompanies this disease. It affects both sexes and all age groups. The incidence of COM continues to be high in developing countries. Tympanoplasty is done as definitive treatment. Type 1 tympanoplasty is mere closure of the tympanic membrane perforation with inspection of ossicular chains.^[3] Ideally surgery is not done in presence of active infection. So it is convention to make ear dry at least for 6 weeks. However it is not always possible to render the active ear inactive before surgery for patients who do not respond well to medical treatment. Though active ear has been suggested as a cause of failure of tympanoplasty however there is no contraindication for performing tympanoplasty in presence of active infection.^[1] Recent studies have shown that there is no evidence that the outcome is poorer in active ears and there is no influence of the condition of the ear at the time of surgery on subsequent graft uptake rate. In this study we will compare the outcomes of type 1 tympanoplasty in active and inactive variety of mucosal COM.

MATERIALS AND METHODS

This prospective study was conducted in Otorhinolaryngology department of a tertiary care hospital in Kolkata from August 2013 to July 2014 and 50 clinically diagnosed cases of COM were included in this study. Patients excluded were age less than 15 years and more than 50 years, revision cases, patients with attic perforations, cholesteatoma and retraction pocket,

with sensorineural and mixed hearing loss, known eustachian tube dysfunction diagnosed by valsalva and impedance audiometry, pathology in external ear canal, diabetes and other debilitating disease, and active infection in ear, nose, throat and paranasal sinuses. 50% of those included in this study had inactive ear after 6 weeks of antibiotic, and 50% of them had active ear after antibiotic therapy. Aural swabs from active ears were subjected to microbiological culture following standard methods^[4] and only cases with no growth in culture were selected. Proper history taking and detail clinical examination done by local examination, aural speculum, otoscope, Siegel's pneumatic speculum and microscope. Auditory function tests including Rinne's test, Weber test and ABC test, with preoperative audiometry and tympanometry were also done. Patients were then subjected to various vestibular function test, facial nerve function test and Eustachian tube function tests. Examination of nose, throat and other systemic examinations were done to rule out any potential source of infection. Selected cases underwent type I tympanoplasty in postaural route using temporalis fascia as graft material. The patients were followed up at regular interval of 3 weeks for 3 months from the date of operation. Post operative otoscopic examination and audiometry done at 3 months to assess graft uptake and hearing improvement.

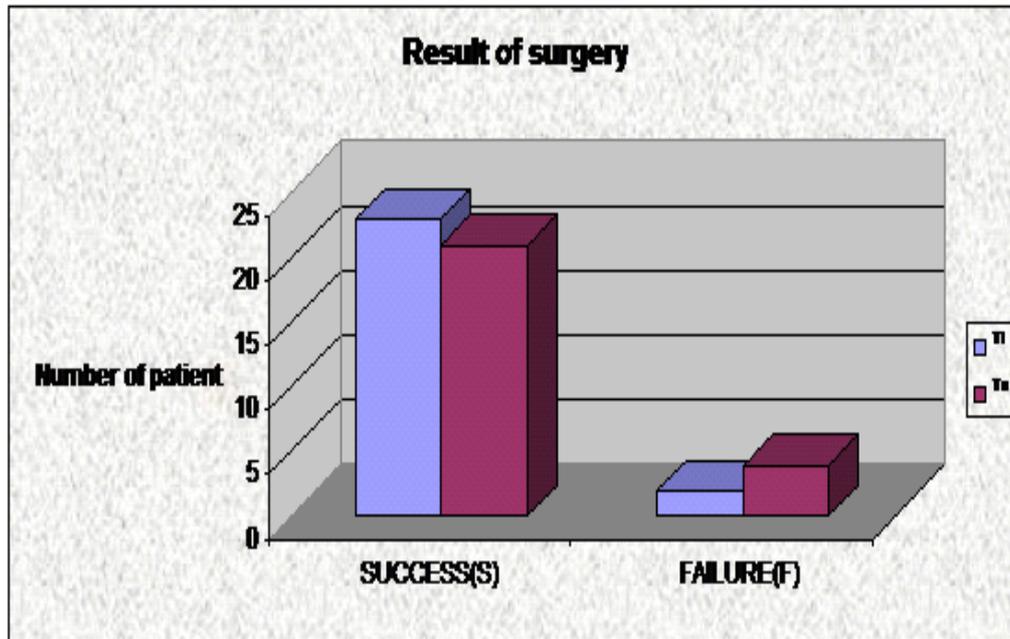
RESULTS

Type 1 Tympanoplasty was done in 50% (n=25) patients with inactive mucosal COM (Ti) and 50% (n=25) patients with active mucosal COM (Ta). The mean age of patients who underwent type 1 tympanoplasty with inactive and active mucosal disease was 33.32 years and 31.24 years respectively (overall 32.28%). Among patients with inactive ears 64%(n=16) had central, 28%(n=7) had subtotal and 8%(n=2) had total perforation. Among the patients with active ears 56%(n=14) had central, 36%(n=9) had subtotal, 8%(n=2) had total perforation. Among patients with inactive ear 92% cases (n=23) had mild hearing loss and remaining 8% cases (n=2) had moderate hearing loss. Among the patients with active ears 96% cases (n=24) had mild hearing loss and remaining 4% cases (n=1) had moderate hearing loss.

Surgery result

In our study 88% (n=44) patients had overall successful result. The overall success rate among type 1 tympanoplasty in inactive ear(Ti) and active ear(Ta) were 92% (n=23) and 84% (n=21) respectively. 12% (n=6) patients were marked as failure cases during post

operative follow up period. The distribution of surgical outcome in terms of success rate was not statistically significant in the two study groups ($p= 0.667$ by Fisher's exact test). (Graph-1)

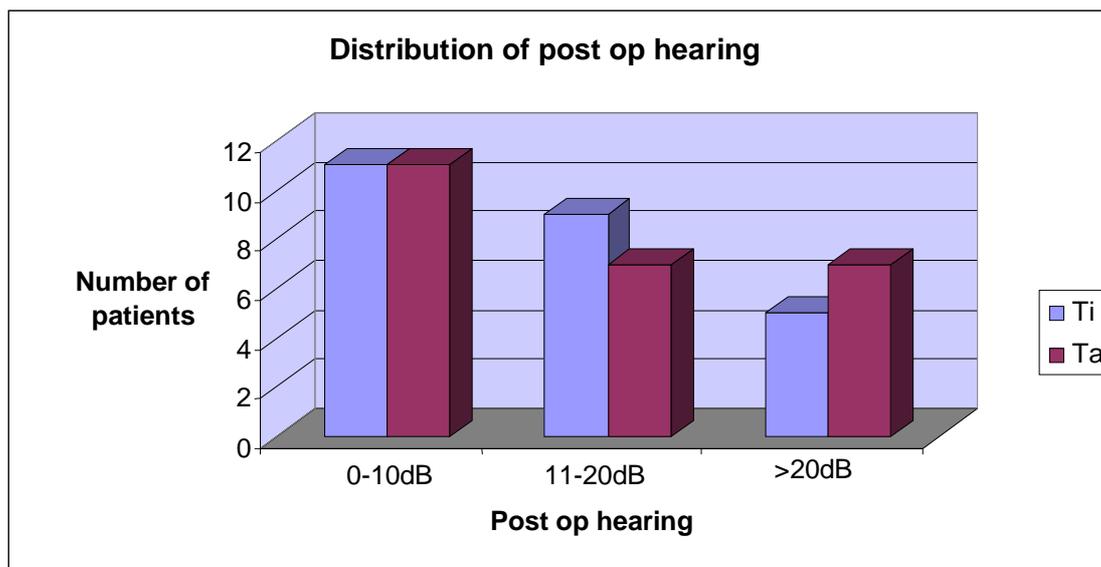


Graph-1: Surgery Result.

The success and failure rate of graft uptake after performing type 1 tympanoplasty in inactive ear (Ti) and in active ear (Ta).

Post operative hearing hearing

Postoperative hearing 0-10dB was found in 44%(n=11) in both the study groups, 11-20dB hearing was found in 36%(n=9) patients with inactive ear and 28%(n=7) patients with active ear. More than 20dB was found in 20%(n=5) cases in inactive ear and 28%(n=7) cases in active ear. Hearing gain in both the study groups were found to be statistically insignificant ($p=0.747$ by Chi square test). (Graph-2)



Graph-2: Post-Operative Hearing.

The distribution of post-operative hearing after performing type 1 tympanoplasty in inactive ear (Ti) and in active ear (Ta).

DISCUSSION

Choric otitis media is one of the commonest otological problems in developing countries. The disease presents with aural discharge and hearing loss. Type 1 tympanoplasty is the procedure of choice in mucosal variety of COM with no ossicular erosion. There has always been confusion of performing this procedure alone in active mucosal variety of COM anticipating its failure in presence of active ear.

Our study shows that success in terms of graft uptake following Type 1 tympanoplasty is 92% and 84% in inactive and active mucosal variety respectively which is statistically insignificant ($p > 0.05$). Hearing gain in both the study groups were found to be statistically insignificant ($p > 0.05$). Nagle S.K. *et al*^[5] (2009) also reported that, success rate for both graft uptake and hearing improvement in dry and wet ear following tympanoplasty is statistically insignificant (P value was > 0.05) though overall success rate of the procedure (88% and 74% respectively for dry and wet ear) was lower than our study.

A study conducted by Vijayendra H. *et al*^[6] (2006) even claimed that graft failure rate is more in totally dry perforation than in wet central perforation, and the reason he proposed was because of avascularity of remanant tympanic membrane in totally dry central perforation. Raj *et al*^[7] (1999) in a study on myringoplasty on patients with wet ear showed primary closure in 84% cases comparable to that of dry perforation. Other studies also

showed that condition of the middle ear does not influence the outcome of tympanoplasty.^{[8, 9,}
^{10]} Thus Type-1 tympanoplasty can be performed in culture negative active mucosal variety of COM with equal success.

ACKNOWLEDGEMENTS

Our sincere thanks to Director, of IPGME& R, Prof (Dr) Pradip Mitra for his kind support and cooperation.

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