

## Original Research Article

# Analysis of hearing improvement in patients with chronic mucosal otitis media after type-1 tympanoplasty

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**Received:** 18 December 2018

**Revised:** 04 February 2019

**Accepted:** 06 February 2019

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## ABSTRACT

**Background:** Chronic mucosal otitis media implies a permanent abnormality of the pars tensa. It can be active, where there is pus formation and inflammation or it can be inactive, where there is no inflammation and pus formation. It may occur due to many etiological factors like recurrent Upper respiratory tract infection leading to Eustachian tube blockage, sequelae to unresolved acute otitis media etc. Patient is most commonly presented with pus discharge from ears and decreased hearing.

**Methods:** This prospective study was carried out in 44 patients, above the age of 18 years, with unilateral chronic mucosal otitis media. All patients underwent type 1 tympanoplasty. Pre and post treatment hearing was measured by pure tone audiometry.

**Results:** The result shows that most patients were in the age group of 20-30 years of age. Most common symptom patients presented with was hearing loss and pus discharge. The pre treatment mean air bone gap was 34 db and the post treatment mean air bone gap was 14 db.

**Conclusions:** Most common age group was between 20-30 years. Patients presented with mostly hearing loss and discharge from the ear which was chronic in nature and mostly mucoid. All patients benefitted in hearing postoperatively after type 1 tympanoplasty was done. It shows that type 1 tympanoplasty is still one of the most used methods and produces effective results in patients with chronic mucosal otitis media.

**Keywords:** Chronic mucosal otitis media, Unilateral ear, Type 1 tympanoplasty

## INTRODUCTION

Chronic mucosal otitis media is defined as permanent perforation of tympanic membrane. They are further divided into 2 subtypes, active and inactive chronic mucosal otitis media. Active chronic otitis media is defined as permanent perforation in tympanic membrane with chronic inflammation of mucosa of middle ear and mastoid with varying degrees of oedema, submucosal fibrosis, hypervascularity and an inflammatory infiltrate including lymphocytes, plasma cells and histiocytes.<sup>1</sup> Inactive chronic otitis media is permanent perforation in tympanic membrane but the middle ear and mastoid are not inflamed.

The World Health Organization (WHO) estimated that 65–330 million people worldwide are affected by CSOM, of whom 50% suffer from hearing impairment.<sup>2</sup>

Most common causes of mucosal chronic otitis media seen are otitis media with effusion, sequelae of acute otitis media and Eustachian tube dysfunction.

Tympanoplasty refers to any operation involving reconstruction of the tympanic membrane and/or the ossicular chain. Myringoplasty is a tympanoplasty without ossicular reconstruction. Over the years many methods have been used for closing perforations. The most widely used and accepted method is underlay graft

of temporalis fascia or sometimes perichondrium. Type 1 tympanoplasty is the type of tympanoplasty on which the graft is placed on an intact ossicular chain.

## METHODS

**Study design:** Prospective study

The study comprises of 44 patients with chronic mucosal otitis media. All the cases were operated in the duration of one year between March 2016 to February 2017 in the Department of E.N.T., Dr D.Y. Patil Medical College, Pune.

All the patients above the age of 16 years having unilateral chronic otitis media were included in this study.

Patients with traumatic perforation, squamosal type of otitis media, bilateral chronic mucosal otitis media, with sensorineural hearing loss and below the age of 16 years were excluded from the study.

Cases selected for the study were subjected to a detailed history taking and clinical examination of ear, nose and throat with special reference to the ear. Examination under microscope was done in all the patients. X-ray mastoids were done in all the patients and HRCT temporal was done as and when required.

Tuning fork tests (rinne, weber and absolute bone conduction) were performed in all the patients pre and post operatively.

Type 1 Tympanoplasty was performed in all the cases and hearing was evaluated by Pure tone Audiometry after 3 months post operatively.

Patients who didn't follow up were not included in the study.

Quantity of data was summarized using mean and standard deviation. Quality of data was summarized using percentage such as paired 't' test were used.

### Ethics approval

The necessary permission and approval from ethics committee and authority, prior to starting the study was taken. Informed written consents were obtained from the patients.

## RESULTS

In our study of 44 people, maximum patients were seen in the age group of 21-30 years (52%) and no patients were seen in the age group of 51-60 years of age.

29 patients were males (65.90%) and 15 were females (34.1%) with male:female ratio was 1.93:1.

**Table 1: Sex distribution.**

Sex	Number of ears	Percentage (%)
Male	29	65.90
Female	15	34.1

Most common presenting symptom was hearing loss followed by pus discharge from affected ear.

**Table 2: Pretreatment and post treatment air bone gap.**

Air bone gap (db)	Pre-treatment (ear and percentage)	Post treatment (ear and percentage)
<15 db	0	38 (86.36)
15-30 db	15 (34)	4 (9.09)
31-45 db	27 (61.46)	2 (4.55)
>45 db	2 (4.54)	0

Majority of patients showed mild to moderate conductive hearing loss with maximum patients with air bone gap between 31-45 db (65%).

**Table 3: pre and post operative mean gain in air bone gap.**

Preoperative hearing loss (mean) (SD)	Post operative hearing loss (mean) (SD)	Difference in hearing loss (db) (SD)
33.48 (7.41)	13.80 (5.60)	19.68 (8.02)

Pre treatment mean air bone gap was 33.48 db and post treatment mean air bone gap was 13.80 db. Gain in hearing was of 19.68 db. Paired 't' value was 6.21. The difference of freedom was 43. The p value was less than 0.0001 which means it is statistically significant.

## DISCUSSION

In our study, there were 44 ears having chronic mucosal otitis media. Mean age at presentation is 28.42 years and maximum ears were in the age group of 20-30 years. A study conducted by Deb et al corresponded to the same age group.<sup>3</sup> In a study conducted by Raghuwanshi et al, the mean age at presentation was 29.87 years.<sup>4</sup>

In our study, there were 29 males and 15 females with M:F ratio – 1.93:1 while in a similar study conducted by Sengupta et al the male: female ratio was 1:1.<sup>5</sup>

Most common presenting symptom was hearing loss which was seen in 24 ears (54%).

All the patients underwent type 1 tympanoplasty. The pretreatment mean air bone gap in our study was 33.75 db and the post treatment mean air bone gap was 13.79 db. The mean gain in air bone gap was 19.96 db.

In a study conducted by Raghuwanshi et al, post operatively the average auditory gain was 10.8 db and in 70% ears, air bone gap was closed to <10 db.<sup>4</sup>

In a similar study conducted by Mane et al, follow-up examinations approximately 1 year postoperatively of 28 ears showed that the PTA had improved significantly after surgery and that the ABG was significantly reduced. 5–15 db gain was seen in six cases, 15–30 db gain was seen in four patients, 30–40 db gain seen in four patients. Mean air-bone gap was improved from 8.4 to 15.8 dB.<sup>6</sup>

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Karodpati NS, Kasliwal A. Analysis of hearing improvement in patients with chronic mucosal otitis media after type-1 tympanoplasty. *Int J Otorhinolaryngol Head Neck Surg* 2019;5:675-7.