

# Comparison of surgical outcomes in tympanoplasty with and without cortical mastoidectomy in non cholesteatomatous chronic otitis media with subtotal perforation

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## Abstract

**Background:** Chronic suppurative otitis media is one of the most common cause of reversible conductive hearing loss in world. Tympanoplasty and Mastoidectomy are the surgical interventions for chronic infection of the middle ear. In tubotympanic cases, tympanoplasty can be combined with a simple mastoidectomy or performed alone. **Objectives:** To evaluate the surgical outcomes of tympanoplasty with and without mastoidectomy in terms of graft uptake and hearing improvement. **Study Design:** Retrospective study. **Material And Methods:** 80 cases of non-cholesteatomatous chronic suppurative otitis media were selected. Tympanoplasty alone was done in 40 cases and tympanoplasty combined with cortical mastoidectomy was done in another 40 cases. Patients were reviewed postoperatively at 1, 3 and 6 months postoperatively to inspect the operated ear for graft uptake. **Results:** There was no significant difference in the surgical outcomes of both the surgeries in terms of graft uptake and hearing improvement. **Conclusion:** Hearing improvement, graft uptake and clinical improvement were statistically incomparable in 2 groups. Combining cortical mastoidectomy with tympanoplasty will not give additional benefits in terms of hearing gain and graft uptake.

**Key Words:** Pure tone audiometry, Subtotal perforation, Tympanoplasty, Mastoidectomy.

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## INTRODUCTION

CSOM is a long standing infection of middle ear cleft, characterized by ear discharge and permanent perforation of tympanic membrane. Incidence of CSOM is higher in poor socioeconomic group, poor nutrition and lack of health education in rural population.<sup>1</sup> The goal of otologists performing middle ear surgery is to make the

patient free of ear discharge, correct the conductive hearing loss, to improve hearing, as well as to provide functional benefit to the patient.<sup>2</sup> The best and the most effective treatment option for chronic infections of middle ear is the surgical operation of eradicating the pathology by means of tympanoplasty and tympanoplasty with cortical mastoidectomy.<sup>3</sup> Tympanoplasty is defined as an procedure to eradicate the disease in the middle ear and to reconstruct the hearing mechanism with.<sup>4</sup> The two opposing demands of tympanoplasty namely to eradicate the disease and at the same phase trying to maintain as much normal tissue as possible to facilitate reconstruction of hearing mechanism is a demanding task. Mastoid plays an important role in middle ear aeration and pressure regulation. There has been a clinical impression that lack of an aerating mastoidectomy at the time of the initial tympanoplasty may be a significant source of failure in patients with chronic non-cholesteatomatous otitis media

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so cortical mastoidectomy along with tympanoplasty has for long been considered the surgical procedure of choice.<sup>5</sup>

**AIMS AND OBJECTIVES**

The present study was undertaken to evaluate the comparison between tympanoplasty alone and tympanoplasty with cortical mastoidectomy in Non cholesteatomatous CSOM patients with Subtotal perforation in terms of:

1. Graft uptake and perforation closure.
2. Improvement in hearing.

**MATERIAL AND METHODS**

This Retrospective study was conducted in ENT Department of SKIMS MCH Bemina from March 2017 to February 2019 for a period of 2 years. .

Total number of 80 patients having Dry and quiescent ears with Subtotal perforation who attended the ENT OPD and were subsequently admitted in ward were taken in study. Informed consent was obtained from the patients before the start of study.

**Inclusion criteria:**

- All patients having subtotal perforation.
- Dry perforation.
- Mild to moderate conductive hearing loss.
- Normal cochlear function.

**Exclusion criteria:**

- Wet ear.
- Attic and marginal perforation.

Patient aged below 20 years and more than 50 years.

Moderate to severe hearing loss.

Mixed and sensorineural hearing loss.

Previous mastoid operation.

Poor Eustachian tube function.

The patients were randomized into 2 groups and each group comprised of 40 patients. The group I patients underwent tympanoplasty and group II patients underwent cortical mastoidectomy with tympanoplasty. Detailed history, clinical examination including tuning fork test, pure tone audiometry was done to assess the quality and quantity of hearing loss. Otoscopic examination was done to see the margins of the perforation. Any infection of sinuses, tonsils or adenoids was treated. All the patients were subjected to routine preanaesthetic checkup. All the cases were taken up under general anesthesia and the post aural approach was used. Temporalis fascia graft was placed by underlay technique for the repair of the tympanic membrane in all the patients. Post operatively all the patients were discharged on the 2nd post-operative day. Patients were started on systemic antibiotics, analgesics and antihistamines for duration of one week. Post operatively all the patients were followed up for a total of 6 months with regular intervals at 1st, 3rd and 6th month. Post operatively all the study patients were assessed for the status of the graft and the hearing improvement. Pure tone audiogram was done for all the patients at the end of 6 months to assess the level of hearing improvement.

**RESULTS**

**Table 1: Age distribution**

Age distribution	Tympanoplasty (Group I)	Tympanoplasty with cortical mastoidectomy (Group II)	Total
20-30 years	18	20	38
30-40 years	16	12	28
40-50 years	6	8	14
<b>Total</b>	<b>40</b>	<b>40</b>	<b>80</b>

**Table 2: Graft uptake**

	Tympanoplasty (Group I)		Tympanoplasty with cortical mastoidectomy (Group II)	
	No.	%	No.	%
Taken up	35	87.5	37	92.5
Not taken	5	12.5	3	7.5
<b>Total</b>	<b>40</b>	<b>100</b>	<b>40</b>	<b>100</b>

P value was calculated in each group and statistically insignificant difference in graft uptake was found between both these groups.

**Table 2: Audiological assessment**

GROUP	Pre-op mean(dB)	Post-op mean(dB)	Change in mean(dB)
Tympanoplasty (Group I)	35.3	30.6	4.7
Tympanoplasty with cortical mastoidectomy (Group II)	36.8	30.8	6

In Tympanoplasty group, benefit in dB in PTA pre-operatively and 6 months after surgery was 4.7 and in Tympanoplasty with cortical mastoidectomy, it was 6. Though it was slightly more in in latter but difference was statistically insignificant.

## DISCUSSION

Chronic suppurative otitis media represents the most common disease of the middle ear cleft. Tympanoplasty with or without mastoidectomy is performed to eradicate middle ear disease and reconstruct the conductive hearing mechanism.

In present study, the cases selected were between 20 and 50 years. Patients aged between 20 and 30 were more in the study group i.e 38, 28 patients were found in the age group of 30-40 years, 14 in 40-50 age group. In a study conducted by Lasisi and Afolabi(2008)<sup>6</sup> the majority of patients were aged 21-34 years which was in concurrence with present study.

**Graft take up rate:** In our study, the graft take up rate was 87.5% in Group I and 92.5% in Group II. Though the graft uptake was more in group II but the difference in both the groups was statistically insignificant. In a retrospective study done by Agarwal A *et al.*(2017)<sup>1</sup>, graft uptake was 80% in tympanoplasty and 95% in patients who underwent tympanoplasty with cortical mastoidectomy. In a study done by Toros *et al.* (2010)<sup>7</sup> tympanic membrane perforation closure was successful in 76.1% patients undergoing Myringoplasty and in 78.3% of the patients undergoing Myringoplasty with mastoidectomy. The difference was not statistically significant ( $P>0.05$ ). In a study done by McGrew *et al.* (2004)<sup>8</sup> graft uptake rate was 90.6% and 91.6% in patients undergoing tympanoplasty and in patients undergoing tympanoplasty with cortical mastoidectomy respectively with  $p>0.05$ . In the retrospective analysis of 251 cases of non cholesteatoma cases of chronic otitis media by Y Mishiro *et al.* (2001)<sup>8</sup> who underwent tympanoplasty with and without mastoidectomy, graft success rates were 90.5 % in group A and 93.3% in group B without a statistically significant difference.

**Post operative Hearing Benefit:** Hearing improvement was compared in both the groups. In tympanoplasty group it was 4.7 and in tympanoplasty combined with cortical mastoidectomy it was 6. However the difference between the two groups for hearing gain was also not statistically significant. In a study done by A. Agarwal *et al.* (2004)<sup>1</sup> hearing improvement was 9.41 in tympanoplasty group and 12.05 and in tympanoplasty combined with cortical mastoidectomy. In a retrospective study done by Manpreet kaur *et al.* (2014)<sup>5</sup> hearing gain in decibel (dB) in tympanoplasty group was 7.64 and in tympanoplasty combined with cortical mastoidectomy was 8.84. Though tympanoplasty combined with cortical mastoidectomy was better in hearing improvement but the difference in 2 groups was statistically insignificant. In a prospective study done by Mohanty *et al.* (2016)<sup>9</sup> hearing

improvement was 3.9 and 3.8 in tympanoplasty and in tympanoplasty with cortical mastoidectomy respectively with no significant difference in both groups.

## CONCLUSION

As P value is insignificant in our study, we concluded that Mastoidectomy gives no statistically significant benefit over tympanoplasty in tubotympanic type of CSOM with subtotal perforation as regards to graft uptake rate and hearing gain, though tympanoplasty combined with cortical mastoidectomy is better in hearing improvement, graft uptake and clinical improvement.

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