

## ORIGINAL RESEARCH

**Tympanoplasty with or without mastoidectomy: A comparative study for the treatment of chronic suppurative otitis media tubotympanic type**<sup>1</sup>Dr. Ashok Kumar Lal, <sup>2</sup>Dr. Balbodh Singh<sup>1</sup>Assistant Professor, Department of Otorhinolaryngology (ENT), Narayan Medical College and Hospital, Jamuhar, Sasaram, Bihar, India<sup>2</sup>Assistant Professor, Department of General Surgery, Narayan Medical College and Hospital, Jamuhar, Sasaram, Bihar, India**Corresponding Author:** Dr. Balbodh Singh

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**Abstract****Background:** A chronic infection confined to the middle ear mucosal cleft that comprises the eustachian tube, mesotympanum, aditus, and mastoid air cells is defined as chronic otitis media (COM).**Materials and Methods:** 80 patients with chronic suppurative otitis media of both genders were divided into two groups of 40 each. Group I patients underwent tympanoplasty, and group II patients underwent tympanoplasty with cortical mastoidectomy.**Results:** Group I had 18 males and 22 females and Group II had 17 males and 23 females. Age group 14-30 years had 25 patients in group I and 22 in group II, 31-50 years had 10 patients in group I and 12 in group II and > 50 years had 5 in group I and 6 patients in group II. The difference was non-significant ( $P= 0.793$ ). Graft acceptance rate was seen in 40 patients in group I and 7 patients in group II. Graft rejection rate was 44 patients in group I and 3 patients in group II respectively. The difference was highly significant ( $P< 0.001$ ). Hence in our study we have found that there was no significant difference in the graft uptake rates between the two groups.**Conclusion:** When treating CSOM tubotympanic type with dry ear, cortical mastoidectomy does not provide a statistically significant advantage over simple tympanoplasty in terms of graft acceptance rate and disease elimination.**Keywords:** Chronic otitis media, Cortical mastoidectomy, Tympanoplasty**Introduction**

A chronic infection confined to the middle ear mucosal cleft that comprises the eustachian tube, mesotympanum, aditus, and mastoid air cells is defined as chronic otitis media (COM). Mucosal and squamous are the two types of chronic otitis media (COM) that are recognized clinically. Among the most common diseases presenting to ENT surgeons in India is chronic suppurative otitis media. Therefore, tympanoplasty is a common procedure that ENT surgeons perform. When deciding to do tympanoplasty, otolaryngologists usually wait for the ear to become inactive.<sup>1,2,3</sup>

For patients with non-cholesteatomatous chronic otitis media, mastoidectomy improves the chance of a successful tympanoplasty, according to the first suggestion made by Holmquist and Bergstrom. They found that patients with small mastoid air cell systems or weak tubal function have a higher chance of success when an aerated mastoid is created.<sup>4</sup>

In mucosal COM, cortical mastoidectomy is generally performed to aerate the mastoid and clear any atticofacial blockage that may be present. When attempting to improve graft uptake and hearing after tympanoplasty, aeration of the mastoid has been considered to be one of the most important factors. It is still controversial whether mastoidectomy should be used for reestablishing mastoid antrum drainage in cases of safe or non-cholesteatomatous chronic suppurative otitis media.<sup>5</sup>

Jackler et al. found that any inflammatory condition within the mastoids becomes trapped behind the tympanic membrane repair after myringoplasty alone. Recurrent suppuration with graft loss occurred in some cases, implying the beneficial effects of mastoidectomy in compromised mastoid, even though the condition might resolve spontaneously after middle ear closure.<sup>6</sup>

### **Aims and Objectives**

The present study was conducted to compare tympanoplasty and tympano-mastoidectomy for the surgical outcome in tubotympanic type CSOM.

### **Materials and Methods**

The present comparative study was conducted on 80 patients with chronic suppurative otitis media (CSOM) tubotympanic type of both genders at the Department of Otorhinolaryngology (ENT), Narayan Medical College and Hospital, Jamuhar, Sasaram, Bihar, India. All participants gave written consent after being made aware of the study. The study was approved by the Institutional Ethics Committee. The duration of the study was from January 2017 to June 2017. A treatment chart and patient data collection form with demographic details such as name, age, gender, etc. were recorded.

### **Inclusion Criteria**

- Patients who gave written informed consent.
- Patient's age between 14 and 60 years.
- All patients having central perforation with sclerotic bone
- Mild to moderate conductive hearing loss.
- All patients having CSOM tubotympanic type
- Dry ear for at least 1 month.
- Normal cochlear function and Patent the Eustachian tube.
- Good ET tube function.
- There is no evidence of infection in the nose, PNS, nasopharynx, or throat.
- Available for follow-up.

### **Exclusion Criteria**

- Patients who don't give written informed consent.
- Patient aged below 14 years.
- Wet ear.
- Attic and marginal perforation.
- Moderate to severe hearing loss.
- Previous mastoid operations
- Uncontrolled systemic disorder DM, Hypertension, Sepsis.
- Not available for follow-up.

The patients were randomised and divided into 2 groups, and each group included 40 patients:

- Group I: Patients underwent tympanoplasty and
- Group II: Patients underwent tympanoplasty with cortical mastoidectomy.

ENT examination with a tuning fork test, middle ear examination, and examination under a microscope were performed. A PTA was then used to determine the kind and extent of

hearing loss. Every standard laboratory and radiological test were performed, such as X-rays of the PNS and nasopharynx, as well as X-rays of the mastoid's view.

In cases of any infection of tonsils, sinuses, or adenoids, they were first treated. All patients were subjected to a routine preanesthetic checkup. Tympanoplasty and mastoidectomy Surgeries were performed under local anaesthesia and general anaesthesia, depending on the patient's age and general condition, via a postaural approach. Clinico-audiological assessment of the operated ear with respect to graft status, ear discharge, and hearing improvement was done in both groups.

### Statistical Analysis

The data thus obtained were subjected to statistical analysis. The Chi-square test was used to assess categorical data, whereas the Analysis of Variance (ANOVA) was used to examine means. The findings were obtained by using suitable statistical tests utilising Microsoft Excel and the Statistical Package for Social Sciences (SPSS). A P value < 0.05 was considered significant.

### Results

**Table I: Gender wise distribution of the patients**

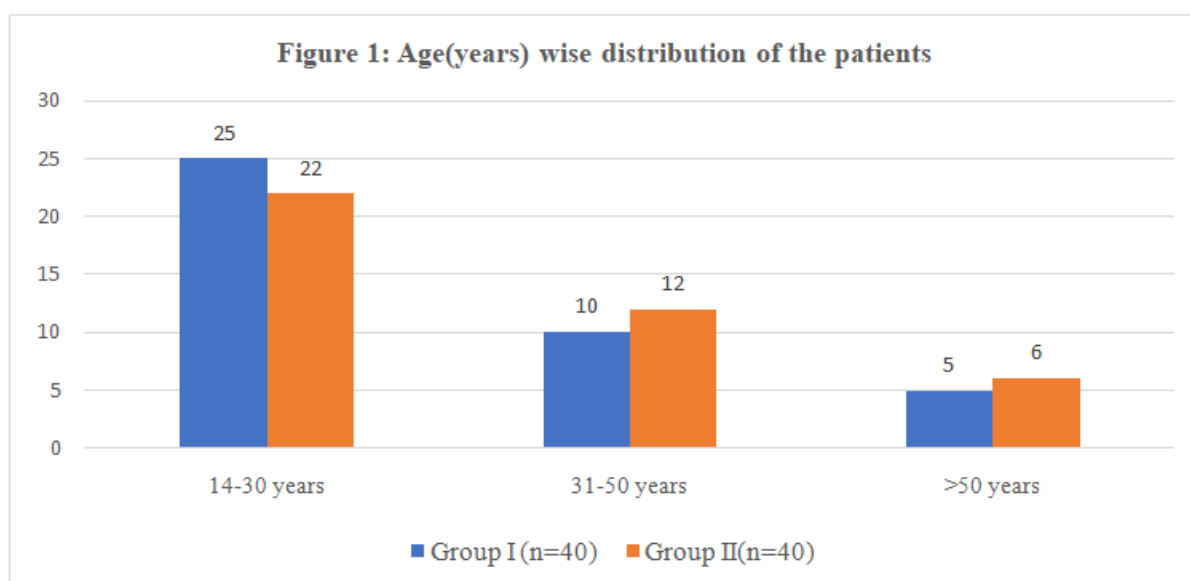
Parameters	Group I(n=40)	Group II(n=40)
Method	Tympanoplasty	Tympanoplasty with cortical mastoidectomy
M:F	18:22	17:23

Table I shows that group I had 18 males and 22 females and group II had 17 males and 23 females.

**Table II: Age wise distribution of the patients**

Age group (years)	Group I (n=40)	Group II(n=40)	P value
14-30	25	22	0.793
31-50	10	12	
>50	5	6	

Table II and figure 1, shows that age group 14-30 years had 25 patients in group I and 22 in group II, 31-50 years had 10 patients in group I and 12 in group II and > 50 years had 5 in group I and 6 patients in group II. The difference was non- significant (P= 0.793).



**Table III: Assessment of the duration of ear discharge in both groups**

Duration of ear discharge (in years)	Group I(n=40)	Group II(n=40)	P value
5-6	26	22	0.562
7-10	12	14	
>10	02	04	

Table III shows that duration of ear discharge in 5-6 years had 26 patients in group I and 22 in group II, 7-10 years had 12 patients in group I and 14 in group II and > 10 years had 2 in group I and 4 patients in group II. The difference was non- significant (P= 0.562).

**Table IV: Assessment of the duration of dryness of ear which is to be operated in both groups**

Duration of ear dryness (in months)	Group I(n=40)	Group II(n=40)	P value
1-3	28	29	0.81
4-6	09	07	
>6	03	04	

Table IV shows that duration of ear dryness in 1-3months had 28 patients in group I and 29 in group II, 4-6 months had 9 patients in group I and 7 in group II and >6months had 3 in group I and 4 patients in group II. The difference was non- significant (P= 0.81).

**Table V: Assessment of the degree of hearing loss**

Degree of hearing loss	Group I(n=40)	Group II(n=40)
Mild	36	31
Moderate	04	09

**Table VI: Comparison of the graft acceptance rate**

Groups	Graft acceptance rate (n=40)	Graft rejection rate (n=40)	P value
Group I	34	38	0.001
Group II	06	02	

Table VI, shows that graft acceptance rate was seen in 40 patients in group I and 7 patients in group II. Graft rejection rate was 44 patients in group I and 3 patients in group II respectively. The difference was highly significant (P< 0.001). Hence in our study we have found that there was no significant difference in the graft uptake rates between the two groups. There was no statistical significance between the two groups as p>0.05, suggesting that mastoidectomy when combined with tympanoplasty offers no added benefit over tympanoplasty alone. Also, it mastoidectomy requires a well-trained otologist to do the surgery under general anaesthesia.

### Discussion

The middle ear cleft becomes inflamed in cases of chronic otitis media. In cases of CSOM, the main purposes of surgical intervention have to achieve a permanently dry ear, aid in the closure of the perforation, and improve the hearing.<sup>7,8</sup> The procedure known as tympanoplasty Without undergoing a mastoidectomy, tympanic membrane perforations can be properly closed and chronic ear drainage can be eliminated.<sup>9</sup>

In the present study, Patients aged group 14-30 years had 25 patients in group I and 22 in group II, 31-50 years had 10 patients in group I and 12 in group II and > 50 years had 5 in group I and 6 patients in group II. Lasisi and Afolabi found that the majority of patients were aged 21–34 years, which was in concurrence with the present study.<sup>10</sup>

In the present study, duration of ear discharge in 5-6 years had 26 patients in group I and 22 in group II, 7-10 years had 12 patients in group I and 14 in group II and > 10 years had 2 in group I and 4 patients in group II. In a study by Varshney et al.<sup>11</sup>, the duration of discharge varied from 6 months to 50 years, with 26 patients having a duration of discharge ranging from 1 to 5 years, which was comparable to the present study.

We observed that graft acceptance rate was seen in 40 patients in group I and 7 patients in group II. Graft rejection rate was 44 patients in group I and 3 patients in group II respectively. we have found that there was no significant difference in the graft uptake rates between the two groups, suggesting that mastoidectomy when combined with tympanoplasty offers no added benefit over tympanoplasty alone. Also, it mastoidectomy requires a well-trained otologist to do the surgery under general anaesthesia. The graft acceptance rate of myringoplasty with or without mastoidectomy was reported to be 88% and 76%, respectively, in the study done by Kaur et al.<sup>12</sup>.

The outcomes of tympanoplasty alone and in combination with cortical mastoidectomy on graft uptake, hearing improvement, and removal of disease were studied by Agrawal A et al.<sup>13</sup> Postoperative graft uptake was assessed in patients at 2, 4, 8, and 16 weeks, and PTA was performed at the 4-month period to assess improvement in hearing. Comparing the two groups, the tympanoplasty group showed a 9.41 hearing improvement, whereas the group that underwent tympanoplasty along with cortical mastoidectomy showed a 12.05. Graft uptake was 95% in the case of tympanoplasty with cortical mastoidectomy and 80% in the tympanoplasty alone group. Ten percent of tympanoplasty instances had a discharge recurrence. Whereas graft uptake, clinical improvement, and hearing improvement were all improved by tympanoplasty combined with cortical mastoidectomy, the difference between the two groups is not statistically significant. In terms of hearing gain and graft uptake, the outcomes of tympanoplasty by itself and tympanoplasty combined with cortical mastoidectomy were not statistically significant.

According to Albu et al.<sup>14</sup>, there would be no extra advantages in terms of disease clearance, graft acceptance rate, or improvement in hearing if cortical mastoidectomy and tympanoplasty were combined.

#### **Study limitations**

The small sample size and short study period were the study's shortcomings.

#### **Conclusion**

The authors observed that in terms of graft acceptance rate and disease removal, cortical mastoidectomy does not provide a statistically significant advantage over simple tympanoplasty when treating chronic suppurative otitis media (CSOM) tubotympanic type with dry ear.

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