

## TYPE 1 TYMPANOPLASTY WITH CORTICAL MASTOIDECTOMY: RESULTS AND COMPLICATIONS

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### HOW TO CITE THIS ARTICLE:

Vikramjit Singha, Amlan Debbarma. "Type 1 Tympanoplasty with Cortical Mastoidectomy: Results and Complications". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 82, October 12; Page: 14348-14353, DOI: 10.14260/jemds/2015/2040

**ABSTRACT:** Patients with safe CSOM may have associated disease process in the mastoids. It is a good practice to explore mastoids along with type-I tympanoplasty. **MATERIAL AND METHODS:** It is a prospective study conducted in the department of ENT, Tripura Medical College, Agartala during the period of July 2013 to December 2014. Forty two patients with safe CSOM were selected in the study. These patients were evaluated and prepared for surgery. Cortical mastoidectomy with type-I tympanoplasty was done and the patients were followed up for 6 months. **RESULTS AND OBSERVATIONS:** Graft uptake was successful in 85.7% cases. The complications were graft rejection (14.3%), disturbance in taste (11.9%), vertigo (14.3%), wound infection (9.5%) and sensorineural hearing loss (4.8%). **CONCLUSION:** Exploration of mastoid in conjunction with type-I tympanoplasty gives good result with few complications.

**KEYWORDS:** CSOM, Mastoids exploration, Type-I tympanoplasty, Graft rejection.

**INTRODUCTION:** Chronic suppurative otitis media is one of the commonest disease processes with which patients present in ENT clinic. The choice of treatment in safe CSOM is tympanoplasty with or without mastoidectomy. Aims of tympanoplasty are to eradicate disease and to improve hearing. There is a lot of controversy around the role of mastoidectomy in repair of tympanic membrane in cases of tubotympanic type of CSOM. Holmquist and Bergstrom first suggested that mastoidectomy improves the chance of successful tympanoplasty for patient with non cholesteatomatous chronic otitis media. They maintained that creation of an aerated mastoid enhances success in patients with poor tubal function or a small mastoid air cell system.<sup>1</sup> While this disease may resolve spontaneously after closure of the middle ear, recurrent suppuration with graft loss will occur in some cases.

After myringoplasty with simple mastoidectomy, however, ears with inflammatory mastoids fared very nearly as well as those without signs of inflammatory changes. Once again, this implies a beneficial effect from mastoidectomy in the compromised mastoid.<sup>2</sup> Exploration of the mastoid with removal of granulations and polypoidal tissues increases the chance of graft uptake and reduces chance of recurrence in the long run. Cortical mastoidectomy with tympanoplasty is a safe procedure but sometimes may present with complications like graft rejection, wound infection, disturbance in taste, vertigo and rarely sensorineural hearing loss.

### AIM OF THE STUDY:

- I. To study the results of cortical mastoidectomy with type-I tympanoplasty in the treatment of safe CSOM.
- II. To study the complications, which may arise in the post-operative period.

**MATERIALS AND METHOD:** This is a prospective study conducted in the Department of ENT, Tripura Medical College from July 2013 to December 2014.

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All the patients who had safe variety of CSOM and have undergone cortical mastoidectomy with type-I tympanoplasty were included in the study.

Detailed history was taken in patients with CSOM with central perforations; clinical examinations were done. After admission in the ward investigations were performed and prepared for surgery under local or general anaesthesia. Post aural incision was made and temporalis fascia was harvested, the same incision was elongated inferiorly and cortical mastoidectomy was done using Zeiss microscope. Margins of the perforation was made raw, posteromeatal skin flap was elevated up to annulus. Middle ear cavity was cleared of granulations and polypoidal tissues if any.

The temporalis fascia graft was placed by underlay technique and it was stabilised with gel foam in the middle ear and external auditory canal. The post aural wound was closed in layers. The stitches were removed after seven days and patients were discharged. Patients were called for check up at the end of 2<sup>nd</sup> week and 4<sup>th</sup> week. Audiometry was performed at the end of 2 months. Patients were followed up for at least 6 months.

### Inclusion Criteria:

1. Patients with safe variety of CSOM with central perforation
2. Patients who had undergone cortical mastoidectomy and type-I tympanoplasty.

### Exclusion Criteria:

1. CSOM with cholesteatoma.
2. Patient who had undergone radical mastoidectomy or MRM.
3. Patient who had undergone tympanoplasty other than type -I.

**RESULTS AND OBSERVATION:** A total of 42 patients have come with safe CSOM and undergone cortical mastoidectomy with tympanoplasty. Out of 42 patients, number of male patients was 24 and female were 18 with an M: F ratio of 4:3. Age of the patient ranged from 17 -52 years. The age are tabulated in the table no 1.

Age Groups	No. of Cases	Percentage %
0-10 years	0	0
11-20 years	5	11.9%
21- 30 years	20	47.6%
31-40 years	10	23.8%
41-50 years	6	14.2%
51-60 years	1	2.3%

**Table 1: Age Distribution**

Out of 42 patients small perforations was found in 5 cases, medium perforation was found in 27 cases and subtotal perforation was found in 10 cases which are summarized in table 2.

Small perforation	5 cases	11.9%
Medium perforation	27 cases	64.2%
Subtotal perforation	10 cases	23.8%

**Table 2: Size of Perforation**

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Of all the patients 12 cases had discharge in ear whereas 30 cases had a dry ear. Out of 42 cases, 7 of them were revision surgeries while the rest 35 were operated for the first time. In the present study it is noted that majority of the patients operated was on the left ear. The data are tabulated as;

Side Affected	No. of Cases	Percentage (%)
Left	24	57.1%
Right	18	42.9%

**Table 3: Side Affected**

The different durations of ear discharge are as shown in the table no 4.

Duration	No. of Cases	Percentage
6 months - 1 year	3	7.2 %
1 year - 2 years	7	16.6%
2 years -3 years	20	47.6%
3 years and more	12	28.5%

**Table 4: Duration of Discharge**

During surgery majority of the cases had underlying disease in the mastoids. The findings are depicted in table no 5.

Findings	No. of Cases	Percentage
Normal	15	35.7%
Polypoidal tissues	7	16.7%
Granulations	20	47.6%

**Table 5: Intra Operative Findings of Mastoids**

At the end of 2 month successful graft uptake was found in 38 cases and among the 4 graft rejection cases 3 had partial rejection while 1 had complete rejection.

Graft Uptake	No. of Cases	Percentage
Positive uptake	36	85.7%
Graft rejected	6	14.3%

**Table 6: Graft Uptake Rate**

Among those 36 cases where there was complete graft uptake, audiogram was performed at the end of 2 months. Audiological result has been depicted in table 6. Thirty cases showed satisfactory hearing improvement, three cases showed moderate improvement while two cases showed no improvement in hearing or were worse than preoperative level.

Post op A.C (dB)	No. of Cases	Percentage
0-25 dB	31	73.8%
26-40 dB	3	7.1%
>40 dB	2	4.7%

**Table 7: Audiological results in successful cases -Postoperative air conduction threshold**

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Complications are an integral part of every surgical procedure. In the present study beside 6 cases of graft rejection, there were 4 cases of wound infection, 6 of them had postoperative vertigo, 5 patients suffered from disturbances in taste sensation post operatively and 2 cases had sensorineural hearing loss. No facial nerve palsy was seen postoperatively in this study group.

Complications	Number of Patients	Percentage
Graft rejection	6	14.3 %
Disturbance in taste sensation	5	11.9%
Vertigo	6	14.3%
Wound infections	4	9.5%
S.N hearing loss	2	4.8%

**Table 8: Complications**



**DISCUSSION:** Many authors have recommended mastoidectomy in conjunction with tympanic membrane grafting to increase graft success in tympanoplasty. The primary argument in favour of mastoidectomy has been an improvement in the middle ear and mastoid environment through

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clearance of diseased mucosa and through the ventilatory mechanisms of an open mastoid system. Opponents of mastoidectomy argue that the mastoid air cell system is thought to function, at least in part, as a buffer to the changes in pressure within the middle ear. The functional advantage of a large aerated mastoid was first suggested by Holmquist and Bergstrom,<sup>3</sup> and, later, was substantiated by Sade et al.<sup>4,5</sup> It is theorized that when an aerated mastoid communicates well with the middle ear, it acts as a buffering system to reduce the impact of pressure changes experienced by the middle ear.

The presence of a pneumatized mastoid greatly increases the volume of the middle ear and mastoid system, which, in accordance with Boyle's law, can moderate pressure changes in the middle ear cleft.

In our study on exploration, the mastoid was normal in 35.71%, polypoidal changes were found in 16.66% and granulations in 47.62%. Anita Krishnan et al,<sup>6</sup> found polypoidal tissues in antrum after exploration in 58% of normal looking middle ear during operation whereas the antral mucosa showed similar changes at the rate of 100% in accordance with the middle ear disease.

It was found in the study that the graft uptake rate was 85.7%. Albu S et al,<sup>7</sup> showed success rate of 82.8% in tympanoplasty with cortical mastoidectomy. Our results are comparable to that in the study conducted by McGrew et al,<sup>8</sup> where they had a graft take-up rate of 91.6% in patients who had tympanoplasties with mastoidectomy. They found a better clinical outcome in patients who had tympanoplasty with cortical mastoidectomy. These patients had shown absence of disease progression along with reduction in the number of patients requiring subsequent procedures was noted. Mishiro Y et al.<sup>9</sup> obtained a graft success rate of 90.5% in tympanoplasty with cortical mastoidectomy. Vikas kakkar et al.<sup>10</sup> found success rate of graft uptake in cortical mastoidectomy with tympanoplasty to be 90%

It was found that the duration of disease had no influence on the uptake of graft. Sizes of the perforation have no relation with outcome of surgery. The post-operative air conduction was within 25 dB in 73.8% of cases and within 40dB in 7.1 % of cases. Mishiro Y et al,<sup>9</sup> showed the rates of post-operative AB gap within 20 dB was 90.4%. Vikas Kakkar et al,<sup>10</sup> found in their study hearing improvement of more than 10 dB in 82.5% cases and hearing improvement of more than 20 dB in 25% cases.

In our study we got complications like graft rejection (14.3%), disturbance in taste (11.9%), vertigo (14.3%), wound infection (9.5%), SN hearing loss (4.8%). P. J. D. Dawes.<sup>11</sup> reported wound infection occurred in six per cent of cases, Twenty-six per cent of patients reported symptoms consistent with chorda tympani trauma, vertigo in 10 per cent of patients in a study of 145 cases of tympanomastoid surgery. E H Sham et al <sup>12</sup> found in his study that 50% of the cases had possible injury to chorda tympani nerve, however no patients complained of altered taste or dry mouth.

**CONCLUSION:** It is a good practice to open up mastoid and look for any disease process in type-I tympanoplasty. Opening up of mastoid eradicates disease process and lowers graft rejection. Cortical mastoidectomy also increases the air reserve of the middle ear cleft and improves the middle ear physiology in the long run. Cortical mastoidectomy with type-I tympanoplasty gives high success rate and gives rise to few complications.

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Date of Submission: 28/09/2015.  
Date of Peer Review: 29/09/2015.  
Date of Acceptance: 01/10/2015.  
Date of Publishing: 10/10/2015.