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To Compare Surgical Outcomes of Tympanoplasty With and Without Cortical Mastoidectomy in Mucosal Type of Chronic Otitis Media: A Prospective Observational Comparative Study

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ABSTRACT

Background: Tympanoplasty is the standard surgical procedure for mucosal type of chronic otitis media (COM). The role of adding cortical mastoidectomy in cases of dry ear remains controversial.
Objective: To compare graft uptake and hearing improvement following tympanoplasty alone versus tympanoplasty combined with cortical mastoidectomy in mucosal type of chronic otitis media.
Methods: This prospective observational comparative study was conducted on 60 patients with mucosal type of COM and dry ear for at least six weeks. Patients were allocated into two groups using computer-generated random allocation: Group I underwent Type I tympanoplasty alone (n = 30) and Group II underwent Type I tympanoplasty with cortical mastoidectomy (n = 30). Graft uptake was assessed otoscopically at three months postoperatively. Hearing improvement was evaluated using pure tone audiometry, and the mean air–bone gap (ABG) was calculated at 250, 500, 1000, 2000, and 3000 Hz. Statistical analysis was performed using Chi-square test and independent t-test.
Results: Graft uptake was observed in 76.67% of patients in Group I and 96.67% in Group II, with the difference being statistically significant ($p = 0.023$). Mean hearing improvement was significantly greater in Group II (16.17 ± 7.93 dB) compared to Group I (11.5 ± 6.84 dB) ($p = 0.01$). In Group II, graft uptake was higher in patients with patent mastoid antrum, though the association was not statistically significant ($p = 0.266$).
Conclusion: Addition of cortical mastoidectomy to tympanoplasty results in significantly better graft uptake and greater hearing improvement compared to tympanoplasty alone in mucosal type of chronic otitis media.

Keywords: *Chronic otitis media, Tympanoplasty, Cortical mastoidectomy, Graft uptake, Hearing improvement.*

INTRODUCTION

Chronic otitis media (COM) is a common cause of conductive hearing loss, particularly in developing countries, and continues to pose a significant public health burden.[1,2] The mucosal type of chronic otitis media is characterized by a central perforation of the tympanic membrane without the presence of cholesteatoma. The primary goals of surgical management are eradication of disease, achievement of a dry ear, and improvement in hearing.

Tympanoplasty, first described by Wullstein, remains the standard surgical procedure for the management of mucosal type COM.[4] While tympanoplasty alone is sufficient in many cases, the role of adding cortical mastoidectomy in patients with a dry ear remains controversial. Proponents of mastoidectomy suggest that it aids in removal of residual disease,

improves middle-ear ventilation, and enhances graft uptake, whereas opponents argue that it increases operative time and morbidity without offering significant benefit.[6, 7]

Several studies have reported conflicting outcomes regarding graft uptake and hearing improvement following tympanoplasty with and without cortical mastoidectomy.[8-10] Owing to this lack of consensus in the literature, the present study was undertaken to compare the surgical outcomes of tympanoplasty alone versus tympanoplasty combined with cortical mastoidectomy in patients with mucosal type chronic otitis media.

MATERIALS AND METHODS

This prospective observational comparative study was conducted in the Department of Otorhinolaryngology, Atal Bihari Vajpayee Institute of Medical Sciences and Dr. Ram Manohar Lohia Hospital, New Delhi, from March 2023 to August 2024. Approval was obtained from the Institutional Ethics Committee, and written informed consent was taken from all participants.

Study Population

Sixty patients aged 18–50 years diagnosed with mucosal type of chronic otitis media with a dry ear for at least six weeks were included.

Inclusion Criteria

- Mucosal type of chronic otitis media
- Dry ear for ≥6 weeks
- Conductive hearing loss
- Age between 18 and 50 years

Exclusion Criteria

- Previous ear surgery
- Squamosal type of COM
- Sensorineural or mixed hearing loss
- Systemic comorbidities such as diabetes or bleeding disorders

Group Allocation and Intervention

Patients were randomly allocated using a computer-generated randomisation into two groups:

- Group I: Type I tympanoplasty alone (n = 30)
- Group II: Type I tympanoplasty with cortical mastoidectomy (n = 30)

All surgeries were performed by the same surgical team using a postauricular approach. Temporalis fascia graft was placed using the underlay technique in all cases.

Outcome Measures

- Graft uptake: Assessed by otoscopic examination at three months postoperatively
- Hearing improvement: Assessed using pure tone audiometry; mean air–bone gap calculated at 250, 500, 1000, 2000, and 3000 Hz

Statistical Analysis

Data were analyzed using SPSS version 23.0. Chi-square test was used for categorical variables and independent t-test for continuous variables. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 60 patients were included, with comparable age and sex distribution between the two groups. Overall graft uptake at three months was 87%.

In Group I, successful graft uptake was achieved in 23 patients (76.67%), whereas in Group II, graft uptake was seen in 29 patients (96.67%). This difference was statistically significant ($p = 0.023$).

Mean hearing improvement was 11.5 ± 6.84 dB in Group I and 16.17 ± 7.93 dB in Group II. The difference between the two groups was statistically significant ($p = 0.01$).

In Group II, mastoid antrum patency was noted in 73.33% of cases. Although graft uptake was higher in patients with patent mastoids, the association was not statistically significant ($p = 0.266$).

DISCUSSION

The present study demonstrates that addition of cortical mastoidectomy to tympanoplasty results in significantly better

graft uptake and greater hearing improvement in patients with mucosal type chronic otitis media. The graft uptake rate of 96.67% observed in the tympanoplasty with mastoidectomy group is comparable to outcomes reported in previous studies.[5, 9, 12]

Several authors have reported improved hearing outcomes when cortical mastoidectomy is performed along with tympanoplasty, attributing this to better middle-ear aeration and clearance of subclinical mastoid disease.[10, 11, 15] The findings of the present study support these observations, as patients undergoing combined surgery demonstrated significantly greater hearing improvement compared to tympanoplasty alone.

In the present study, mastoid pneumatization did not have a statistically significant influence on graft uptake. Similar observations have been reported by other authors, suggesting that cortical mastoidectomy may be beneficial irrespective of mastoid cellularity.[6, 7, 13] Comparable results have also been documented in both Indian and international literature comparing tympanoplasty with and without cortical mastoidectomy.[8, 9, 14]

The relatively short follow-up period of three months is a limitation of the study. Longer follow-up is required to assess long-term graft stability and hearing outcomes.

CONCLUSION

Tympanoplasty combined with cortical mastoidectomy yields significantly better graft uptake and hearing improvement compared to tympanoplasty alone in mucosal type of chronic otitis media. Cortical mastoidectomy may be considered as an adjunctive procedure in selected cases to enhance surgical success.

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