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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/24102
DOI URL: <http://dx.doi.org/10.21474/IJAR01/24102>



RESEARCH ARTICLE

A STUDY TO COMPARE THE OUTCOMES OF TYMPANOPLASTY AND TYMPANOPLASTY WITH CORTICAL MASTOIDECTOMY IN MUCOSAL TYPE CHRONIC OTITIS MEDIA

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Manuscript Info

Manuscript History

Received: 04 July 2026

Final Accepted: 08 August 2026

Published: September 2026

Key words:-

Chronic Otitis Media, Tympanoplasty,
Cortical Mastoidectomy, Graft Uptake,
Postoperative Discharge

Abstract

Background: Chronic Otitis Media (COM) is a persistent inflammatory condition of the middle ear, leading to significant morbidity, particularly in developing countries. The optimal surgical approach for inactive mucosal COM remains debated, with tympanoplasty alone often compared to tympanoplasty combined with cortical mastoidectomy. This study aimed to compare the outcomes of these two surgical techniques in terms of graft uptake and postoperative discharge.

Aims and Objectives: To evaluate and compare the efficacy of Type 1 tympanoplasty alone versus Type 1 tympanoplasty with cortical mastoidectomy in patients with inactive mucosal COM, focusing on graft uptake rates and the presence of postoperative discharge. **Methods:** A prospective study was conducted among 42 participants aged 18–40 years diagnosed with inactive mucosal COM. Participants were randomly divided into two groups: Group 1 (n=21) underwent tympanoplasty alone, and Group 2 (n=21) underwent tympanoplasty with cortical mastoidectomy. Postoperative outcomes, including graft uptake and discharge, were assessed at 2, 4, and 6 months. Statistical analysis was performed using IBM SPSS version 23, with a p-value <0.05 considered significant.

Results: No significant differences were observed between the two groups in terms of graft uptake or postoperative discharge. At 2 months, graft uptake was 85.7% in both groups (p=1), and discharge was absent in 90.5% of Group 1 and 95.2% of Group 2 (p=0.55). These trends persisted at 4 and 6 months, with graft uptake rates of 90.5% and discharge rates of 90.5% in both groups (p=1). Preoperative and postoperative hearing loss, as well as perforation size, were also comparable between the groups (p>0.05).

Conclusion: The addition of cortical mastoidectomy to tympanoplasty did not provide significant clinical benefits in the management of inactive mucosal COM. Type 1 tympanoplasty alone appears sufficient for achieving favorable outcomes, suggesting that mastoidectomy may be reserved for cases with active disease or complications. Further studies with larger cohorts and longer follow-up periods are recommended to validate these findings.

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Introduction:-

Chronic Otitis Media (COM) is a persistent inflammation of the middle ear characterized by recurrent infection, tympanic membrane perforation, and ear discharge. Chronic otitis media is a long-standing infection or inflammation of the middle ear that causes persistent eardrum perforation and ongoing fluid or pus drainage lasting more than six weeks. Chronic otitis media is a long-standing, persistent inflammation or infection of the middle ear. Unlike a typical, brief ear infection, this chronic condition usually spans several weeks or months and is frequently associated with a perforated eardrum (a hole in the tympanic membrane) or repetitive fluid buildup. It is a major cause of preventable hearing loss, especially in developing countries. COM is broadly classified into tubotympanic (mucosal) and atticotympanic (squamous) types, with the former being more common and less destructive.

Mucosal type chronic otitis media (COM), historically referred to as tubotympanic or "safe" COM, is a long-standing inflammatory condition of the middle ear. It is characterized by a permanent perforation of the pars tensa (the main portion of the eardrum) and subsequent chronic or recurrent infection of the middle ear mucosal lining. Unlike the squamous (atticotympanic) type, mucosal COM does not involve a cholesteatoma (an aggressive skin growth) and rarely leads to life-threatening intracranial complications. Eustachian tube dysfunction and poor mastoid pneumatization contribute to the development and persistence of COM. Chronic infection can cause conductive hearing loss (CHL) due to ossicular damage and, in severe cases, sensorineural hearing loss (SNHL) due to cochlear damage. Complications such as cholesteatoma and intracranial infection may also occur. Treatment includes aural toilet and topical antibiotics, while surgery such as tympanoplasty with or without mastoidectomy is indicated in persistent disease. The role of mastoidectomy in non-cholesteatomatous COM remains controversial, as studies have shown similar hearing and graft outcomes with tympanoplasty alone compared with tympanoplasty combined with mastoidectomy. Thus, further studies are needed to determine the optimal surgical approach for non-cholesteatomatous COM.

Aims and Objectives:-

To compare the outcome of type 1 tympanoplasty with cortical mastoidectomy with type 1 tympanoplasty in inactive mucosal type of chronic otitis media.

Material and Methods :-

The study is conducted on 42 patients with inactive type of CSOM in ENT department, government rajaji hospital, Madurai, all patients with CSOM were examined in detail which includes detailed clinical history, ENT examination, Otoscopic examination, Otomicroscopic examination, Tuning fork test among 42 who were randomly divided into two treatment groups: , group 1 proceeded with tympanoplasty alone and group 2 proceeded with tympanoplasty in combination with cortical mastoidectomy, All patients were Age >18 years, Minimal conductive hearing loss (<40dB) with central perforation/mucosal type COM, No active discharge for 4 weeks, middle ear mucosa healthy and no residual disease in mastoid antrum confirmed by CT temporal bone taken after medical management. Patient with Age <18 years, Presence of sensorineural hearing loss, Marginal or attic perforation/cholesteatoma ear/ squamous type COM, COM with otitis externa, Previous mastoid surgery, Any foci of sepsis in nose/PNS/nasopharynx were excluded. Surgical procedure

Group 1(tympanoplasty) :

Tympanoplasty is a surgical procedure performed by an ear, nose, and throat (ENT) specialist to repair a hole or tear in the eardrum (tympanic membrane). The primary goals of this microsurgery are to restore natural hearing, waterproof the middle ear to prevent chronic infections.

Under Strict aseptic precaution, patient in semi Fowler's position, using 0 degree Hopkins rod endoscope, infiltrated locally (2% lignocaine + bupivacaine + adrenaline), temporalis fascia harvested, then perforated tympanic membrane margins are freshened, tympanomeatal flap elevated between 6 o'clock to 12 o'clock, annulus elevated, then graft placed underlay technique, flap repositioned, gel foam kept, medicated ear wig kept.

Group 2 (cortical mastoidectomy with tympanoplasty) :

A cortical mastoidectomy—also called a simple mastoidectomy—is a surgical procedure that opens and removes infected air cells from the mastoid bone behind the ear while keeping the back wall of the ear canal and middle ear structures intact.

Under Strict aseptic precaution, patient in semi Fowler's position, using operating microscope, infiltrated locally (2% lignocaine + bupivacaine + adrenaline) Then modified Williams Wilde's incision made, temporalis fascia graft harvested. Periosteum elevated and mastoid cortex exposed. Mastoid cortex drilled out with appropriate burr with motor , antrum reached patency achieved , then perforated tympanic membrane margins are freshened , tympanomeatal flap elevated between 6 o' clock to 12o'clock , annulus elevated , then graft placed underlay technique , flap repositioned , gel foam kept , medicated ear wig kept then periosteum and skin closed with appropriate suture material , sterile mastoid dressing applied Postoperative outcomes, including graft uptake and discharge, were assessed at 2, 4, and 6 months between these two group.

Graft uptake, often referred to as "graft take," is the process by which a transplanted tissue—most commonly a skin graft— successfully integrates, adheres, and establishes a new blood supply at the recipient wound bed. Because tissue grafts are harvested completely detached from their original blood supply, their survival relies entirely on a sequence of physiological phases that bridge them to the underlying tissue.

Postoperative discharge marks the official transition from a surgical center or hospital to home recovery once a patient meets specific stability criteria. A successful recovery depends entirely on strict adherence to instructions regarding wound management, pain control, dietary adjustments, and mobility limitations. Because anesthesia compromises coordination and decision-making, a responsible adult must drive you home and remain with you for at least the first 24 hours after surgery.

Observation and Result:-

We conducted this study among 42 participants with inactive type of chronic otitis media who were randomly divided into two treatment groups: tympanoplasty alone or tympanoplasty in combination with cortical mastoidectomy. Post-operatively, we compared the clinical outcomes in terms of graft uptake and presence of discharge between the two groups.

- We observed that the median age of the participants of both the groups were similar to each other, with no significant difference between the groups. [28 (22-38.5) vs 29 (24-37.5), p-value=0.614].

Table 1: Comparison of graft uptake and discharge at 2 months

Variable	Group 1 [n (%)]	Group 2 [n (%)]	p-value
Graft uptake at 2 months			
Graft uptake	18/21 (85.7)	18/21 (85.7)	1
Residual perforation	3/21 (14.3)	3/21 (14.3)	1
Discharge			
Absent	19/21 (90.5)	20/21 (95.2)	0.55
Present	2/21 (9.5)	1/21 (4.8)	0.55

At 2 months, there was no significant difference in the graft uptakes between the two groups. [85.7% vs 85.7%, p-value=1]

Table 2 : Comparison of graft uptake and discharge at 4 months

Variable	Group 1 [n (%)]	Group 2 [n (%)]	p-value
Graft uptake at 4 months			
Graft uptake	19/21 (90.5)	19/21 (90.5)	1
Residual perforation	2/21 (9.5)	2/21 (9.5)	1
Discharge			
Absent	19/21 (90.5)	19/21 (90.5)	1
Present	2/21 (9.5)	2/21 (9.5)	1

Similarly, the two groups were comparable at 4 months in terms of the graft uptake and presence of discharge, with no significant difference between the two groups. [p-value=1]

Table3 : Comparison of graft uptake and discharge at 6 months

Variable	Group 1 [n (%)]	Group 2 [n (%)]	p-value
Graft uptake at 6 months			
Graft uptake	19/21 (90.5)	19/21 (90.5)	1
Residual perforation	2/21 (9.5)	2/21 (9.5)	1
Discharge			
Absent	19/21 (90.5)	19/21 (90.5)	1
Present	2/21 (9.5)	2/21 (9.5)	1

Similarly, the two groups were comparable at 6 months in terms of the graft uptake and presence of discharge, with no significant difference between the two groups. [p-value=1]

Discussion:-

We conducted this study among 42 participants with inactive type of chronic otitis media who were randomly divided into two treatment groups: tympanoplasty alone or tympanoplasty in combination with cortical mastoidectomy. Post-operatively, we compared the clinical outcomes in terms of graft uptake and presence of discharge between the two groups. In our study, we enrolled participants aged 19-40 years, with the median age being 28 years in group 1 and 29 years in group, with no statistically significant difference between the two. This reduces the role of age as a potential confounder and ensures similarity between the groups. Similarly, the pre-operative hearing loss between the two groups was similar, thus reducing the potential confounding effect of

severity of hearing loss on the post operative clinical outcomes. [30 (27.5-37.5) vs 29 (24-37.5), p-value=0.919] Similarly, the size of the perforation was observed to be similar between the groups, thus reducing the confounding effect of size of perforation. We observed that a small perforation was observed in 28.6% and 38.1% of participants of group 1 and 2 respectively.

Similarly 33.3% of participants of each of the groups had a medium perforation. Lastly 38.1% of group 1 participants and 28.6% of group 2 participants had a large perforation. Post operatively, at 2-,4- and 6 months, we did not observe any significant difference between the two groups in terms of graft uptake and presence of discharge. At 2 months, 85.7% of participants of both the groups had graft uptake, with 14.3% reporting residual perforation. [p-value=1] Similarly discharge was reported by 90.5% and 95.2% of participants of group 1 and 2 respectively, which was not observed to be statistically significant. [p-value=0.55] At 4 months, 90.5% of participants of both the groups had graft uptake, with 9.5% reporting residual perforation. [p-value=1] Similarly, 90.5% of participants of both the groups had no discharge, with 9.5% reporting presence of discharge. [p-value=1] This trend sustained at 6 months, wherein 90.5% reported graft uptake and no discharge, whereas 9.5% had residual perforation and presented with discharge in both the groups. Our findings suggest that addition of cortical mastoidectomy to tympanoplasty for management of inactive mucosal type of chronic otitis media, did not provide any additional benefits and the clinical outcomes were similar to those who underwent tympanoplasty alone.

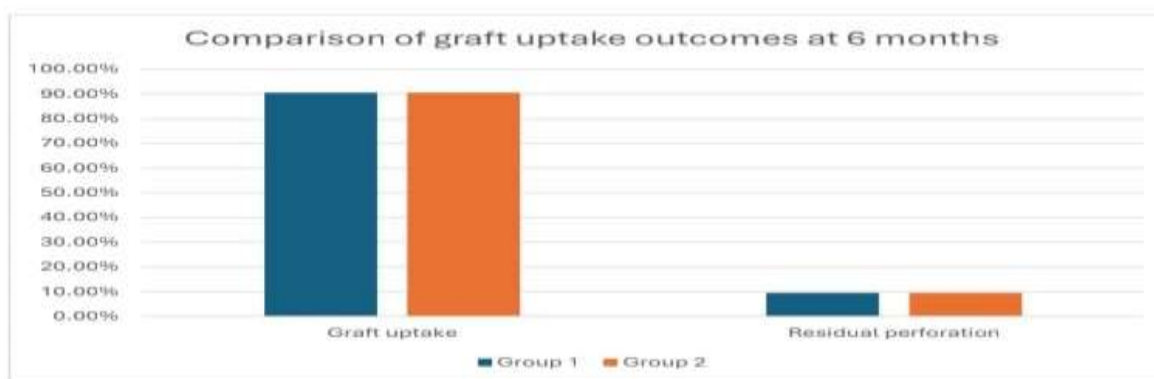


Figure 37: Comparison of graft uptake outcomes at 6 months

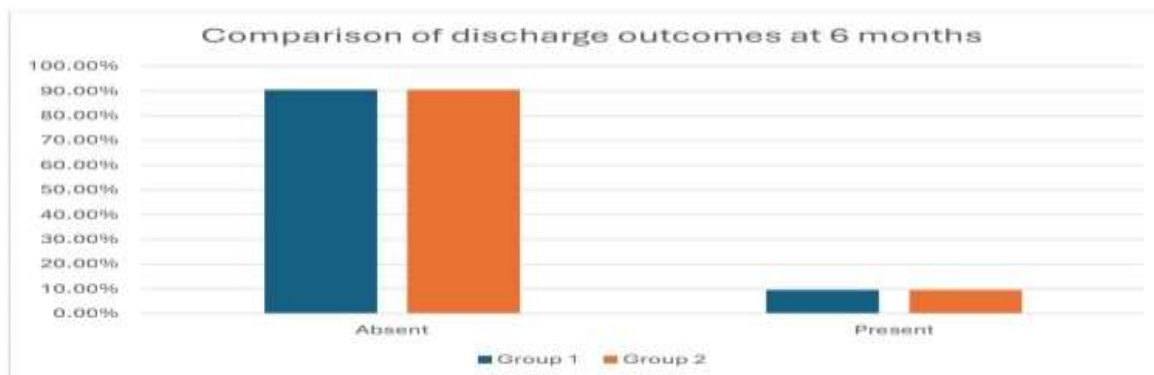


Figure 38: Comparison of discharge outcomes at 6 months

Conclusion:-

The study was conducted mainly to assess the outcomes of tympanoplasty alone and cortical mastoidectomy with tympanoplasty in mucosal type of chronic otitis media. Chronic Otitis Media (COM) is a persistent inflammatory condition of the middle ear, leading to significant morbidity, particularly in developing countries. We aimed to compare the outcomes of Type 1 tympanoplasty alone versus Type 1 tympanoplasty combined with cortical mastoidectomy in patients with inactive mucosal COM. We included 42 participants aged 18–40 years, and randomly divided into two groups. Group 1 underwent tympanoplasty alone, while Group 2 underwent tympanoplasty with cortical mastoidectomy. The primary outcomes measured were graft uptake and postoperative discharge, assessed at 2, 4, and 6 months.

The results revealed no significant differences between the two groups in terms of graft uptake or postoperative discharge. At 2 months, graft uptake was observed in 85.7% of both groups, with residual perforation in 14.3%. Discharge was absent in 90.5% of Group 1 and 95.2% of Group 2. These trends persisted at 4 and 6 months, with graft uptake rates of 90.5% and discharge rates of 90.5% in both groups. Preoperative and postoperative hearing loss, as well as the size of perforation, were also comparable between the groups, with no statistically significant differences. The study concludes that Type 1 tympanoplasty alone is sufficient for managing inactive mucosal COM, as the addition of cortical mastoidectomy did not improve clinical outcomes. This suggests that mastoidectomy may be reserved for cases with active disease or complications, reducing unnecessary surgical intervention.

SUMMARY : Chronic Otitis Media (COM) is a persistent inflammatory condition of the middle ear, leading to significant morbidity, particularly in developing countries. We aimed to compare the outcomes of Type 1 tympanoplasty alone versus Type 1 tympanoplasty combined with cortical mastoidectomy in patients with inactive mucosal COM. We included 42 participants aged 18–40 years, and randomly divided into two groups. Group 1 underwent tympanoplasty alone, while Group 2 underwent tympanoplasty with cortical mastoidectomy. The primary outcomes measured were graft uptake and postoperative discharge, assessed at 2, 4, and 6 months.

The results revealed no significant differences between the two groups in terms of graft uptake or postoperative discharge. At 2 months, graft uptake was observed in 85.7% of both groups, with residual perforation in 14.3%. Discharge was absent in 90.5% of Group 1 and 95.2% of Group 2. These trends persisted at 4 and 6 months, with graft uptake rates of 90.5% and discharge rates of 90.5% in both groups. Preoperative and postoperative hearing loss, as well as the size of perforation, were also comparable between the groups, with no statistically significant differences.

The findings align with previous studies, such as those by Murkey N et al. (2023), Nambiar RV et al. (2019), and Bhat KV et al. (2008), which similarly reported no additional benefits from combining cortical mastoidectomy with tympanoplasty in inactive mucosal COM. The study concludes that Type 1 tympanoplasty alone is sufficient for managing inactive mucosal COM, as the addition of cortical mastoidectomy did not improve clinical outcomes. This suggests that mastoidectomy may be reserved for cases with active disease or complications, reducing unnecessary surgical intervention. Limitations of the study include its small sample size and short follow-up period. Future research with larger cohorts and longer follow-ups is recommended to validate these findings.

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