

To compare the success rate of Type – 1 tympanoplasty in wet and dry ears - A Prospective Study¹Dr. Vinod Solanki, Junior Resident Department of ENT S.P. Medical College Bikaner.²Dr. Vivek Samor, Prof. & Head Department of ENT S.P. Medical College Bikaner.³Dr. Manphool Singh Maharia, Assistant Professor Department of ENT S.P. Medical College Bikaner.**Corresponding Author:** Dr. Vinod Solanki, Junior Resident Department of ENT S.P. Medical College Bikaner.**How to citation this article:** Dr. Vinod Solanki, Dr. Vivek Samor, Dr. Manphool Singh Maharia, “To compare the success rate of Type – 1 tympanoplasty in wet and dry ears - A Prospective Study”, IJMACR– August – 2026, Volume – 9, Issue –4, P. No. 224 – 229.**Open Access Article:** © 2026 Dr. Vinod Solanki, et al. This is an open access journal and article distributed under the terms of the creative common’s attribution license (<http://creativecommons.org/licenses/by/4.0>). Which allows others to remix, tweak, and build upon the work non- commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.**Type of Publication:** Original Research Article**Conflicts of Interest:** Nil

Abstract

Background: The aim of treatment in COM is to improve the symptoms of otorrhea, close the perforation, improve hearing and reduce complications with minimum adverse effects of treatment. Tympanoplasty is a common procedure used in COM patients. Tympanoplasty refers to surgery performed to reconstruct a perforated tympanic membrane and/ or the small bones of the middle ear.

Method: This study was conducted in the Department of Otorhinolaryngology, in Sardar Patel Medical College and PBM hospital Bikaner.

Results: The results of our study group were analysed, and the overall success rate (closure of tympanic membrane) was 81% (81). The success rate in Dry ear group was 84 % (42) and in Wet ear group it was 78% (39). The total failure rate of our study group was 19% (19). Failure among dry ear group was 16% (8) and in wet ear group it was 22% (11).

Conclusion: Clinically the results of the dry group are better than that of the wet group but the difference between two groups was statistically insignificant. This may be because of smaller sample size; hence further study is required with larger sample size to evaluate in detail.

Keywords: CSOM, Success, Clinical.

Introduction

Chronic otitis media (COM) is a common condition seen in patients attending the otolaryngology clinic. It is an inflammatory process of the mucoperiosteal lining of the middle ear space and mastoid. ¹

The aim of treatment in COM is to improve the symptoms of otorrhea, close the perforation, improve hearing and reduce complications with minimum adverse effects of treatment. Tympanoplasty is a common procedure used in COM patients. Tympanoplasty refers to surgery performed to

reconstruct a perforated tympanic membrane and/or the small bones of the middle ear. The main goals of tympanoplasty are to remove active disease or to repair a sequel condition either to improve hearing or to prevent recurrent otorrhea.²

The underlay and overlay techniques are the two commonly used methods of graft placement in myringoplasty. Some authors have reported a modified method in which the graft is placed laterally to the malleus and medially to the tympanic remnants and annulus. This “over-under” myringoplasty allows for excellent exposure of the anterior middle ear, facilitates direct placement of an ossicular prosthesis under the malleus, and minimises the risk of medialisation or lateralisation of the tympanic membrane. The results of over-under myringoplasty have been reported to be excellent in terms of graft take, absence of complications and auditory outcome.³⁻⁵

However, the success depends on many factors, of which the presence of discharge before surgery makes it a dilemma whether to operate on it or not. The literature also reports conflicting results of tympanoplasty in relation to the condition of the ear at the time of surgery.

Several authors have found that attempts to repair perforation fail significantly more often in moist ears than in dry ears.⁶⁻⁹

Ultimately, while type-1 tympanoplasty remains a well-established intervention for reconstructing the sound-conducting mechanism of the middle ear, the clinical dilemma of whether to operate on an actively discharging ear continues to challenge otolaryngologists. Resolving this ambiguity is critical to optimizing patient care, minimizing surgical failures, and reducing preventable hearing loss, particularly

within populations where poor socioeconomic conditions accelerate the prevalence of chronic otitis media. By systematically examining graft integration and auditory outcomes across distinct cohorts, this study aims to shed light on these conflicting paradigms and offer clearer prognostic insight.

Material and Methods

Study settings: This study was conducted in the Department of Otorhinolaryngology, in Sardar Patel Medical College and PBM hospital Bikaner.

Study duration: 6 months (October 2025 to March 2026)

Study design: Hospital-based longitudinal study

Study Type: Comparative study

Study population: All patients admitted in ENT ward for chronic otitis media and planned for type 1 tympanoplasty

Sampling technique: Convenience sampling.

Sample size: The sample size consisted of all eligible patients enrolled during the study period. No formal sample size calculation was performed, although the sample size was capped to a maximum of 100. All patients meeting the inclusion criteria within the defined time frame were included.

Inclusion Criteria

1. **Chronic Otitis Media (COM):** History of otorrhea despite at least 12 weeks of adequate topical and oral medication.
2. **Age:** Patients must be between 15 and 45 years old, regardless of sex.
3. **Tympanic Membrane Perforation:** Presence of a perforation of any size or location.
4. **Conductive Hearing Loss:** Mild to moderate conductive hearing loss.
5. **General Health:** Patients should be in generally good

health.

6. Absence of Upper Respiratory Infections: No current evidence of infections in the nose or throat.

Exclusion Criteria

1. Presence of Cholesteatoma: Patients with cholesteatoma are excluded.
2. Sensorineural Hearing Loss: Exclusion of patients with sensorineural hearing loss.
3. Previous Tympanoplasty: Prior tympanoplasty or tympanic membrane repair is an exclusion criterion.
4. Patients with bilateral disease.
5. Major Systemic Illness: Any major systemic illness that contraindicates surgery.
6. Attic Retraction: Presence of attic retraction in the tympanic membrane.

Procedure

All patients included in the study went through a comprehensive otorhinolaryngo logical examination. Following this, they were subjected to additional investigations, which included pure tone audio metry, a plain X – ray of the mastoid (Law's view) to assess

Results

Table 1: Success of the Graft.

Graft Taken up	Dryer (No.)	%	Wet ear (No.)	%	Total (No.)	%
Yes	42	84	39	78	81	81
No	8	16	11	22	19	19
Total	50	100	50	100	100	100
χ^2	0.584					
p	0.444					

The results of our study group were analysed, and the overall success rate (closure of tympanic membrane) was 81% (81).

The success rate in Dry ear group was 84 % (42) and in Wet ear group it was 78 % (39). The total failure rate of

mastoid air cell pneumatization and routine hematological and bio chemical tests to evaluate overall fitness. Patients in the wet ear group who did not respond to standard antibiotic treatment had cultures performed to determine the sensitivity of the infection.

After completing the examination and necessary investigations, informed consent was obtained from those willing to participate in the study. Participants were then divided into two groups based on their ear condition:

- Group A: Patients with dry ears
- Group B: Patients with wet ears

All surgeries were performed under local an aesthesia. Post-operatively, patients were evaluated for wound status, graft integration, and hearing improvement.

Statistical Analysis

The data was analysed using the SPSS software. Comparisons between the two groups were made using the Chi-square test and Student's t-test. Statistical significance was determined with a p-value of less than 0.05, which was considered significant.

our study group was 19 % (19). Failure among dry ear group was 16% (8) and in wet ear group it was 22% (11).

Table 2: Perforation Size and Success Rate.

Perforation Size	Ear Condition	Successful Graft	Failure Graft	Total Cases
Small (<25%)	Dry Ear (Group A)	3 (100.0%)	0 (0.0%)	3
	Wet Ear (Group B)	4 (100.0%)	0 (0.0%)	4
Medium (25- 50%)	Dry Ear (Group A)	24(96.0%)	1 (4.0%)	25
	Wet Ear (Group B)	16(66.67%)	8 (33.33%)	24
Large(>50%)	Dry Ear (Group A)	13(68.42%)	6 (31.58%)	19
	Wet Ear (Group B)	19 (95.0%)	1 (5.0%)	20
Sub-Total	Dry Ear (Group A)	2 (66.67%)	1 (33.33%)	3
	Wet Ear (Group B)	0 (0.0%)	2 (100.0%)	2
Total	Dry Ear (Group A)	42(84.0%)	8(16.0%)	50
	Wet Ear (Group B)	39(78.0%)	11(22.0%)	50

In the Dry Ear group (Group A), a 100% success rate was achieved in small perforations (3/3), 96% in medium perforations (24/25), 68.42% in large perforations (13/19), and 66.67% in sub - total perforations (2/3).

In the Wet Ear group (Group B), a 100% success rate was achieved in small perforations (4/4), 66.67% in medium perforations (16/24), 95% in large perforations

(19/20), and 0% success rate in sub-total perforations (0/2). Even though variation was observed across individual size sub - categories between the two groups, the overall anatomical success rate was 84 % for the dry ear group and 78 % for the wet ear group, showing that the size of the perforation does not heavily influence the ultimate outcome of type 1 tympanoplasty.

Table 3: Post - operative PTA

Post-operative PTA	Dry Ear (Group A) Frequency	Wet Ear (Group B) Frequency	Total Study Frequency
Post-operative ABG <20dB	45 (90.0%)	29 (58.0%)	74 (74.0%)
Post-operative ABG >20dB	5 (10.0%)	21 (42.0%)	26 (26.0%)
Total Cases	50 (100.0%)	50 (100.0%)	100 (100.0%)

Compares the post-operative functional hearing outcomes at 3 months between the Dry Ear and Wet Ear cohorts, evaluated by the residual Air-Bone Gap (ABG).

In the Dry Ear group (Group A), 90% (45) of the patients achieved a successful closure of the post-operative air-bone gap to less than 20dB, while remaining 10 % (5) of the patients had a residual air-bone gap greater than 20dB.

In the Wet Ear group (Group B), 58% (29) of the patients achieved a post – operative air -bone gap of less

than 20 dB, whereas 42 % (21) of the patients failed to reach this threshold and maintained an air-bone gap greater than 20 dB.

Overall, the post-operative air-bone gap was successfully reduced to <20 dB in 74% of the patients, while 26% of the patients had a post - operative air – bone gap >20 dB, indicating a higher rate of hearing improvement among patients with an inactive (dry) ear at the time of surgery.

Discussion

The primary anatomical objective of type 1 tympanoplasty is complete closure of the tympanic membrane perforation. Overall success of the graft. Out of the 100 operations performed using the over –under temporalis fascia technique, 81% achieved complete graft uptake and anatomical closure. The success rate was 84% (42/50) in the Dry Ear group (Group A) and 78% (39/50) in the Wet Ear group (Group B). The total failure rate was 19%, with a 16 % failure rate (8/50) in dry ears and a 22% failure rate (11/50) in wet ears. Statistical analysis of these outcomes yielded $\chi^2 = 0.584$ and $p = 0.444$. Because $p > 0.05$, there was no statistically significant difference in anatomical graft take between dry and wet ears, demonstrating that an active mucoid discharge does not preclude a successful structural outcome.

Our anatomical closure success rates align with findings from historical and recent literature. The success rate of 81% using the over-under technique is comparable to the rates reported by Stage and Bak-Pedersen¹⁰ (91%) and Kartush et al.¹¹ (90%). It also fits within the broad ranges published by Glasscock¹² (91% overlay, 96% underlay) and Sheehy and Anderson¹³ (97% overlay). Regarding the dry versus wet ear debate, our findings match the results of Nagle et al.¹³ and Kotecha et al.¹⁴ all of whom concluded that a moist or discharging ear environment does not significantly impede graft integration, provided the discharge is mucoid and scanty.

Conclusion

Clinically the results of the dry group are better than that of the wet group but the difference between two groups was statistically insignificant. This may be because of smaller sample size; hence further study is required with larger sample size to evaluate in detail.

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