

Efficacy of Day-Care Tympanoplasty in Chronic Suppurative Otitis Media: Audiological Improvements and Complications

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ABSTRACT

Introduction: Chronic suppurative otitis media (CSOM) is a common cause of persistent ear discharge and conductive hearing loss. Day-care tympanoplasty has emerged as a cost-effective and convenient surgical approach that allows early discharge without compromising patient safety. The present study was conducted to evaluate the efficacy of day-care tympanoplasty in patients with CSOM, with particular emphasis on audiological improvement and postoperative complications.

Methods & Materials: This prospective study was carried out in the Department of Otolaryngology and Head-Neck Surgery at Bangladesh Medical College & Hospital, Dhaka, between January 2008 and September 2008. A total of 100 patients with chronic suppurative otitis media (CSOM), tubo-tympanic type, planned for day-case tympanoplasty under local anesthesia were included in the study. Data analysis was done using SPSS version 26.0. **Result:** Day-care tympanoplasty resulted in significant audiological improvement, with the mean air conduction threshold decreasing from 32.4 dB preoperatively to 16.68 dB postoperatively and the mean air–bone gap reducing from 24.3 dB to 11.9 dB, yielding a mean closure of 12.4 dB. Postoperative complications were infrequent, with graft failure occurring in 4.0% of patients, lateralization and reoperation in 2.0% each, and anterior blunting in 1.0%, while no cases of adhesive middle ear, medialization, tympanosclerosis, or postoperative cholesteatoma were observed. **Conclusion:** This study demonstrates that day-care tympanoplasty is an effective and safe treatment modality for patients with chronic suppurative otitis media. The procedure resulted in significant audiological

improvement, as evidenced by marked reductions in postoperative air conduction thresholds and air–bone gap values. Furthermore, postoperative complications were infrequent and generally minor, with a low rate of graft failure and no major adverse outcomes observed.

Keywords: Tympanoplasty, Chronic Suppurative Otitis Media, Audiological Improvements

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INTRODUCTION

Chronic suppurative otitis media (CSOM) remains a persistent global health problem, particularly in low- and middle-income countries, where it continues to be a major cause of preventable hearing impairment. It is characterized by chronic inflammation of the middle ear and mastoid cavity, associated with tympanic membrane perforation and recurrent otorrhea. If left untreated, CSOM can lead to long-term conductive hearing loss, reduced quality of life, and social communication difficulties^[1,2]. Tympanoplasty is the standard surgical procedure aimed at reconstructing the tympanic membrane and restoring the functional integrity of the middle ear. The primary goals of tympanoplasty include closure of the tympanic membrane perforation, prevention of recurrent infections, and improvement of hearing thresholds, particularly the air–bone gap^[3]. Over the past few decades, advancements in microsurgical techniques and anesthesia have significantly improved surgical outcomes and patient safety. Day-care or outpatient tympanoplasty has emerged as a modern approach in otologic surgery, allowing patients to be discharged on the same day of surgery without overnight hospital admission. This model has gained

increasing acceptance due to its potential benefits, including reduced hospital costs, improved patient turnover, decreased risk of nosocomial infections, and enhanced patient satisfaction^[4]. However, concerns remain regarding postoperative complications, adequacy of pain control, and the safety of early discharge, especially in resource-limited settings. Several studies have demonstrated that tympanoplasty, whether performed as an inpatient or day-care procedure, yields high graft uptake rates and significant audiological improvement. Systematic reviews have reported postoperative air–bone gap closure ranging from 10 to 15 dB in most patients, with overall success rates exceeding 80% in uncomplicated CSOM cases^[5,6]. These findings support tympanoplasty as an effective intervention for hearing restoration. Audiological improvement remains a key outcome measure in tympanoplasty. Pure tone audiometry typically shows a significant reduction in air conduction thresholds and improvement in hearing efficiency after surgery. Factors influencing hearing outcomes include size and location of perforation, status of the ossicular chain, Eustachian tube function, and surgical technique used^[7]. Despite overall

favorable results, variability in postoperative hearing gain continues to be reported across different populations and surgical settings. Complications following tympanoplasty are generally low but may include graft failure, residual perforation, infection, altered taste sensation, and transient dizziness. Reported complication rates in contemporary literature range from 10% to 15%, with most being minor and self-limiting^[5,8]. Day-care tympanoplasty requires careful patient selection to minimize risks and ensure safe postoperative recovery. In recent years, multiple studies and meta-analyses have compared endoscopic and microscopic tympanoplasty, demonstrating comparable graft success and audiological outcomes, while also highlighting reduced operative time and complications in minimally invasive approaches^[9,10]. The present study was conducted to evaluate the efficacy of day-care tympanoplasty in patients with CSOM, with particular emphasis on audiological improvement and postoperative complications.

METHODS & MATERIALS

This prospective study was conducted in the Department of Otolaryngology and Head-Neck Surgery, Bangladesh Medical

College & Hospital, Dhaka, from January 2008 to September 2008. A total of 100 patients diagnosed with chronic suppurative otitis media (CSOM), tubo-tympanic type, who were scheduled for day-care tympanoplasty under local anesthesia, were enrolled. Patients aged between 12 and 60 years with dry ears (absence of otorrhea for at least 6 weeks preoperatively) were included in the study. Patients younger than 12 years or older than 60 years were excluded, along with those having active ear discharge, attic-antral disease, inner ear pathology, otitis externa, vertigo, labyrinthine fistula, or significant systemic comorbidities such as uncontrolled hypertension, myocardial infarction, or bleeding disorders. All patients underwent tympanoplasty using the underlay technique with temporalis fascia graft under local anesthesia in a day-care setting, with discharge on the same day of surgery following postoperative stabilization. Standard perioperative care

was provided to all patients. Demographic data, clinical history, otoscopic findings, and intraoperative details were systematically recorded. Postoperative outcomes were assessed in terms of graft uptake, postoperative complications, and audiological improvement. Patients were followed up weekly during the first postoperative month, at 3 months, and at 6 months, with additional visits as required. The mean follow-up duration was 14 weeks (range: 10–22 weeks). A successful surgical outcome was defined as an intact, well-healed, and mobile tympanic membrane with a dry ear on follow-up examination. Audiological assessment was performed 3 months postoperatively according to International Organization for Standardization (ISO) guidelines. Postoperative complications, including graft failure, residual perforation, infection, otalgia, dizziness, and other procedure-related events, were recorded and analyzed as part of the study outcomes. Data were

analyzed using descriptive statistics with SPSS version 26.0. Results were expressed in frequency, percentage, and mean $\pm$ standard deviation as appropriate. Ethical approval for the study was obtained from the ethical review committee of Bangladesh Medical College & Hospital. Informed consent was obtained from all participants before enrollment.

RESULTS

Among the 100 study participants, the majority were in the 25–35 years age group (63.0%), followed by 15–25 years (21.0%) and 35–55 years (16.0%). Males constituted 58.0% of the study population, while females accounted for 42.0%. Regarding socioeconomic status, most patients belonged to the middle-class group (78.0%), followed by the poor (12.0%) and higher-class (10.0%) groups (Table I).

Table I

Demographic and Socioeconomic Characteristics of the Study Participants ($n = 100$).

Variable	Category	Total Patients, n (%)
Age Group (years)	15–25	21 (21.0%)
	25–35	63 (63.0%)
	35–55	16 (16.0%)
Sex	Male	58 (58.0%)
	Female	42 (42.0%)
Socioeconomic Status	Poor Class	12 (12.0%)
	Middle Class	78 (78.0%)
	Higher Class	10 (10.0%)

All patients (100.0%) presented with intermittent otorrhea, making it the universal symptom in this study. Hearing loss was present in 70.0% of patients, while tinnitus was reported in 22.0%. Unilateral ear involvement (63.0%) was

more common than bilateral disease (37.0%). Regarding perforation size, most patients had medium perforations (62.0%), followed by small (20.0%) and subtotal perforations (18.0%). In terms of site, anterior perforations were most frequent

(48.0%), followed by posterior (34.0%) and subtotal perforations (18.0%) (Table II).

Table II

Clinical Characteristics, Perforation Features, and Presenting Symptoms ($n = 100$).

Variable	Category	Total Patients, n (%)
Presenting Symptoms*	History of intermittent otorrhea	100 (100.0%)
	Hearing loss	70 (70.0%)
	Tinnitus	22 (22.0%)
Ear Involvement	Unilateral	63 (63.0%)
	Bilateral	37 (37.0%)
Size of Perforation	Small	20 (20.0%)
	Medium	62 (62.0%)
	Subtotal	18 (18.0%)
Site of Perforation	Anterior	48 (48.0%)
	Posterior	34 (34.0%)
	Subtotal	18 (18.0%)

*Multiple responses were possible.

The endaural approach was the most commonly used surgical technique (86.0%), followed by the transcanal (8.0%)

and postauricular (6.0%) approaches (Table III).

Table III
Distribution of Surgical Approach in Tympanoplasty (*n* = 100).

Surgical Approach	Total Patients, n (%)
Postauricular	6 (6.0%)
Endaural	86 (86.0%)
Transcanal	8 (8.0%)
Total	100 (100.0%)

There was a marked improvement in hearing status after surgery, as evidenced by a reduction in the mean air conduction threshold from 32.4 dB preoperatively to 16.68 dB postoperatively. Similarly, the mean air-bone gap decreased from 24.3 dB before surgery to 11.9 dB after surgery, reflecting a mean closure of 12.4 dB (*Table IV*).

Table IV
Summary of Audiological Outcomes Following Tympanoplasty (*n* = 100).

Audiological Parameter	Mean (dB)
Preoperative Air Conduction Threshold	32.4
Postoperative Air Conduction Threshold	16.68
Preoperative Air-Bone Gap	24.3
Postoperative Air-Bone Gap	11.9
Change in Air-Bone Gap	12.4

The most common complication was graft failure, seen in 4.0% of cases, followed by lateralization and reperforation, each occurring in 2.0% of patients. Anterior blunting was observed in 1.0% of cases. No cases of adhesive middle ear, medialization, tympanosclerosis, or postoperative cholesteatoma were noted (*Table V*).

Table V
Postoperative Complications Following Tympanoplasty (*n* = 100).

Complication	No. of Patients (%)
Graft failure	4 (4.0%)
Lateralization	2 (2.0%)
Reperforation	2 (2.0%)
Anterior blunting	1 (1.0%)
Adhesive middle ear	0 (0.0%)
Medialization	0 (0.0%)
Tympanosclerosis	0 (0.0%)
Postoperative cholesteatoma	0 (0.0%)

DISCUSSION

In the present study, the majority of patients were aged 25–35 years (63%), followed by 15–25 years (21%) and 35–55 years (16%), with a male predominance (58%). Similarly, a study reported that the most affected age group undergoing tympanoplasty was 21–40 years (61.2%), with males accounting for 56.8% of cases [11]. Regarding socioeconomic status, most patients in our study belonged to the middle class (78%), followed by the poor (12%) and the higher class (10%). A similar distribution was reported by Maharjan et al., where 70.5% of CSOM patients undergoing tympanoplasty were from lower-middle or middle socioeconomic backgrounds [12]. In clinical presentation, all patients (100%) presented with intermittent otorrhoea, followed by hearing loss in 70% and tinnitus in 22%. Biswas et al. also reported otorrhoea in 100% of cases, hearing loss in 74%, and tinnitus in 18% [13]. In the present study, unilateral disease was more common (63%) compared to bilateral involvement (37%). In the present study, the endaural approach was the most commonly used

surgical technique (86%), followed by transcanal (8%) and postauricular (6%). Gupta et al. reported use of the endaural approach in 80% of cases, transcanal in 10%, and postauricular in 10%, showing a similar preference pattern for minimally invasive approaches in tympanoplasty [14]. Audiological outcomes in this study showed significant improvement, with mean air conduction threshold improving from 32.4 dB preoperatively to 16.68 dB postoperatively. The mean air–bone gap reduced from 24.3 dB to 11.9 dB, indicating a mean closure of 12.4 dB. Batni et al. reported a similar improvement, where the mean preoperative air–bone gap was 26.1 dB, which reduced to 12.8 dB postoperatively, with a mean gain of 13.3 dB [15]. Singh et al. also demonstrated comparable findings, showing a reduction in air–bone gap from 25.4 dB to 12.6 dB after tympanoplasty [16]. Postoperative complications in the present study were low, with graft failure in 4%, lateralization in 2%, reperforation in 2%, and anterior blunting in 1%, while no cases of adhesive middle ear, medialization, tympanosclerosis, or postoperative

cholesteatoma were observed. Prasad et al. reported graft failure rates ranging from 5% to 12% depending on middle ear condition and Eustachian tube function, which is slightly higher than our study [17].

LIMITATIONS

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

This study demonstrates that day-care tympanoplasty is an effective and safe treatment modality for patients with chronic suppurative otitis media. The procedure resulted in significant audiological improvement, as evidenced by marked reductions in postoperative air conduction thresholds and air–bone gap values. Furthermore, postoperative complications were infrequent and generally minor, with a low rate of graft failure and no major adverse outcomes observed.

RECOMMENDATION

Based on the findings of this study, day-care tympanoplasty may be recommended as a safe and effective treatment option for selected patients with chronic suppurative otitis media. Proper patient selection, meticulous surgical technique, and regular postoperative follow-up are essential to optimize hearing outcomes and minimize complications. Further studies with larger sample sizes and longer follow-up periods are recommended to validate these findings and assess long-term surgical success.

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CONFLICT OF INTEREST

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