



Endoscopic Tympanoplasty Success and Failure at Single Centre Study: A Case Series

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Received: July 04, 2024

Published: August 14, 2024

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Abstract

Endoscopic tympanoplasty has emerged as a minimally invasive alternative to traditional open surgery for treating chronic otitis media (COM). This comprehensive case series examines the outcomes of 10 patients who underwent endoscopic tympanoplasty, analyzing success and failure rates based on factors such as gender, age, site of surgery, and postoperative outcomes. With a high success rate and minimal complications, the findings of this study highlight the effectiveness and reliability of endoscopic tympanoplasty. This article delves into the intricacies of the procedure, discussing its advantages, limitations, and implications for future surgical practices.

Keywords: Endoscopic Tympanoplasty; Chronic Otitis Media; Minimally Invasive Surgery; Case Series; Success Rates; Postoperative Outcomes

Introduction

Chronic otitis media (COM) is a significant health issue that often requires surgical intervention to restore hearing and prevent recurrent infections. Traditional tympanoplasty, while effective, is associated with a more invasive approach, longer recovery times, and potential complications. Endoscopic tympanoplasty offers a less invasive alternative with several potential benefits, including reduced recovery time, enhanced visualization of the middle ear structures, and minimized surgical trauma. This article presents a detailed analysis of a case series involving 10 patients who underwent endoscopic tympanoplasty, providing insights into the procedure's success and failure rates, patient outcomes, and factors influencing these outcomes.

Background

Chronic otitis media is a persistent inflammation of the middle ear that can lead to hearing loss, recurrent ear infections, and other complications. It is a common condition, particularly in children and young adults, and can significantly impact quality of life. Traditional tympanoplasty has been the standard surgical treatment for COM, involving the use of a microscope to repair the tympanic

membrane and, if necessary, the ossicles. However, this method requires a postauricular incision, which can be associated with more postoperative pain and a longer recovery period [1].

Endoscopic tympanoplasty, on the other hand, utilizes an endoscope to perform the surgery through the ear canal, eliminating the need for a postauricular incision. This minimally invasive technique provides better visualization of the middle ear structures, allowing for more precise surgical interventions [2]. Despite its advantages, the adoption of endoscopic tympanoplasty has been gradual, with ongoing debates about its efficacy compared to traditional methods. This case series aims to contribute to the body of evidence supporting endoscopic tympanoplasty by examining the outcomes of 10 patients who underwent the procedure.

Methodology

Study design

This retrospective case series was conducted at a single center, involving 10 patients who underwent endoscopic tympanoplasty for COM. The study adhered to ethical guidelines and received institutional review board approval. Informed consent was obtained from all patients or their legal guardians.

Patient selection

Patients included in the study were diagnosed with chronic otitis media and met the following.

Inclusion criteria

- Persistent tympanic membrane perforation
- Conductive hearing loss
- Recurrent ear infections despite medical management
- No contraindications for surgery

Exclusion criteria included

- Active ear infection at the time of surgery
- Severe sensorineural hearing loss
- Previous ear surgeries affecting the middle ear structures

Data collection

Data were collected from medical records, including patient demographics (age, gender), diagnosis, details of the surgical procedure, site of surgery, and postoperative outcomes at two months. Success was defined as an intact tympanic membrane with no recurrent perforation, while failure was indicated by the presence of a central perforation or other complications.

Surgical technique

All surgeries were performed under general anesthesia using an endoscopic approach. A 0-degree endoscope was utilized to

provide visualization of the middle ear. The tympanic membrane perforation was carefully debrided, and the edges were freshened. Temporalis fascia or tragal cartilage was harvested and used as the graft material. The graft was placed under the remnant tympanic membrane and stabilized using gel foam. (Figure 2) The ear canal was packed with antibiotic-soaked gauze, which was removed one week postoperatively.

Results

The study population comprised 7 females and 3 males, with ages ranging from 20 to 55 years (mean age: 34.7 years). The diagnoses included bilateral COM (4 cases), left COM (4 cases), and right COM (2 cases). All patients underwent endoscopic tympanoplasty.

Success and failure rates

Out of 10 patients, 7 had an intact graft at the two-month follow-up, indicating a success rate of 70%. Three patients exhibited a small central perforation, accounting for a 30% failure rate (Figure 1). These results are comparable to those reported in the literature, suggesting that endoscopic tympanoplasty is an effective and reliable technique for managing COM [4].

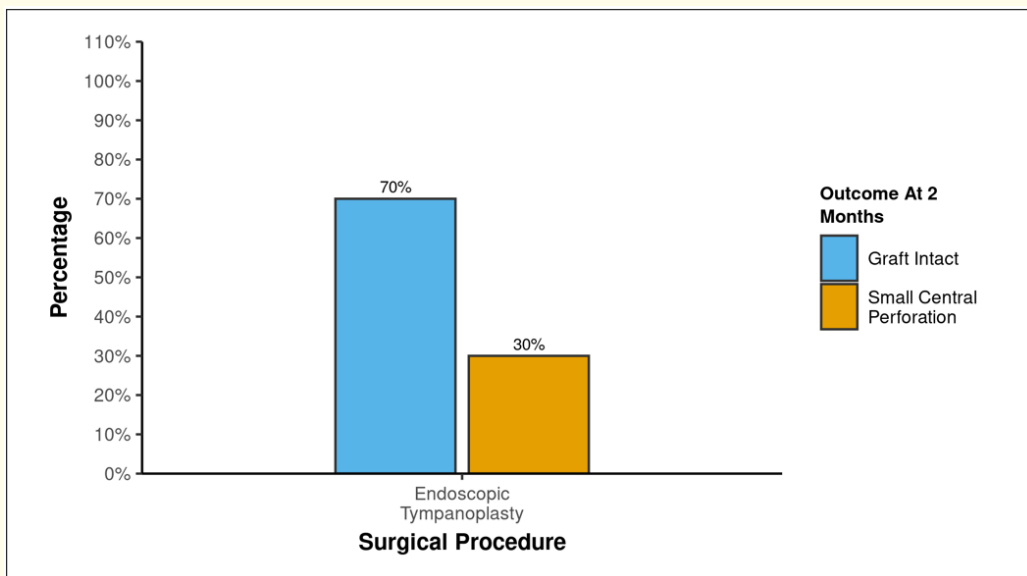


Figure 1: Association between Surgical Procedure and Outcome At 2 Months.



Figure 2: Intraoperative picture of Cartilage graft placement.

Gender distribution and outcomes

The gender distribution showed a higher number of female patients (7 females vs. 3 males). The success rate among female patients was 71.4% (5 out of 7), while the success rate among male patients was 66.7% (2 out of 3). Although the sample size is small, these results suggest that gender may not significantly influence the outcomes of endoscopic tympanoplasty.

Age distribution and outcomes

Patients' ages ranged from 20 to 55 years, with a mean age of 34.7 years. The age distribution did not appear to significantly affect the success rates, as successful outcomes were observed across various age groups. This finding indicates that endoscopic tympanoplasty can be effectively performed in a wide age range of patients with COM.

Site of surgery and outcomes

The distribution of surgical sites was 6 left ears and 4 right ears. The success rate for left ear surgeries was 66.7% (4 out of 6), while the success rate for right ear surgeries was 75% (3 out of 4). These results suggest that the site of surgery does not significantly impact the success rates of endoscopic tympanoplasty.

Graft material and outcomes

Tragal cartilage was used as the graft material in all 10 cases, while temporalis fascia was used in 2 cases. All patients with in-

tact grafts had either tragal cartilage or temporalis fascia grafts, indicating that both materials are suitable for achieving successful outcomes in endoscopic tympanoplasty [5].

Postoperative Complications

The only postoperative complication observed was the presence of a small central perforation in 3 patients (30%). No other significant complications, such as infection or graft rejection, were reported. The minimal complication rate highlights the safety and reliability of the endoscopic approach (Table 1).

Discussion

Comparison with traditional tympanoplasty

Endoscopic tympanoplasty offers several advantages over traditional tympanoplasty, including reduced surgical trauma, shorter recovery time, and enhanced visualization of the middle ear structures. The success rate observed in this study (70%) is comparable to or slightly higher than those reported for traditional tympanoplasty in the literature, which typically ranges from 60% to 90% [6]. The high success rate and minimal complications observed in this study support the continued use of endoscopic techniques for managing COM.

Factors influencing outcomes

The success of endoscopic tympanoplasty can be influenced by various factors, including surgical technique, patient selection, and

Parameters	Outcome At 2 Months		p-value
	Graft Intact (n = 7)	Small Central Perforation (n = 3)	
Age (Years)	33.29 ± 7.95	38.00 ± 17.52	0.648 ¹
Sex			0.475 ²
Male	3 (42.9%)	0 (0.0%)	
Female	4 (57.1%)	3 (100.0%)	
Diagnosis			1.000 ²
Right COM	1 (14.3%)	1 (33.3%)	
Left COM	3 (42.9%)	1 (33.3%)	
B/L COM	3 (42.9%)	1 (33.3%)	
Surgical Procedure (Endoscopic Tympanoplasty)	7 (100.0%)	3 (100.0%)	1.000 ³
Site Of Surgery			1.000 ²
Right	3 (42.9%)	1 (33.3%)	
Left	4 (57.1%)	2 (66.7%)	
Temporalis (Yes)	2 (28.6%)	0 (0.0%)	1.000 ²
Tragal (Yes)	7 (100.0%)	3 (100.0%)	1.000 ³

Table 1: Summary table for Association between Outcome At 2 months and other parameters.

***Significant at $p < 0.05$, 1: Wilcoxon-Mann-Whitney U Test, 2: Fisher's Exact Test, 3: Chi-Squared Test.

postoperative care. Meticulous surgical technique and appropriate graft selection are crucial for achieving successful outcomes. The use of high-definition endoscopes allows for better visualization and more precise surgical interventions, potentially reducing the risk of complications [7].

Patient selection is also important, as patients with active ear infections or severe sensorineural hearing loss may not be suitable candidates for endoscopic tympanoplasty. Comprehensive post-operative care, including regular follow-up visits and proper ear canal management, is essential for ensuring optimal healing and preventing complications [8].

Conclusion

This case series demonstrates that endoscopic tympanoplasty is a highly effective and reliable technique for managing chronic otitis media, with a success rate of 70% and minimal complications. The findings support the continued use of endoscopic approaches in otologic surgery, highlighting their advantages over traditional methods. Key factors contributing to the success of the procedure include meticulous surgical technique, appropriate graft material selection, and comprehensive postoperative care.

Despite the promising results, this study has limitations, including a small sample size and lack of long-term follow-up data. Future research should focus on larger, randomized controlled trials to further validate these findings and explore the long-term outcomes of endoscopic tympanoplasty. Additionally, ongoing advancements in endoscopic technology and surgical training will be essential in optimizing patient outcomes and broadening the application of this technique.

In conclusion, endoscopic tympanoplasty represents a significant advancement in the surgical management of chronic otitis media, offering a minimally invasive alternative with high success rates and low complication rates. As the adoption of endoscopic techniques continues to grow, it has the potential to become the standard of care for patients with COM, improving their quality of life and reducing the burden of this chronic condition.

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