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Case Report: Chronic Suppurative Otitis Media Bilateral

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Abstract: Chronic Suppurative Otitis Media (CSOM) is a persistent middle ear infection characterized by tympanic membrane perforation and prolonged or recurrent ear discharge lasting more than two months. **Objective**: This case report aims to analyze the clinical presentation and management approach in a patient with CSOM, as well as to evaluate the success of type II endoscopic tympanoplasty in repairing tympanic membrane perforation and restoring hearing function. **Methodology**: This case study utilized a qualitative approach, collecting data through physical examination, audiometric testing, and CT imaging to assess the condition of the patient's ears. The patient underwent type II endoscopic tympanoplasty on the right ear. **Findings**: A 52-year-old female patient presented with bilateral ear discharge for two months, mild conductive hearing loss in the right ear (39 dB threshold), and normal hearing in the left ear (24 dB threshold) with slight reductions at frequencies ≤1000 Hz and ≥4000 Hz. CT imaging revealed mucosal thickening in the Prussak space and bilateral mastoid air cells with sclerotic edges, with no cholesteatoma detected. After type II endoscopic tympanoplasty, the patient showed significant improvement, with the cessation of ear discharge and no major complications. **Implications**: This case highlights the importance of early diagnosis and timely intervention in managing CSOM, demonstrating that type II endoscopic tympanoplasty is an effective, minimally invasive surgical option to repair tympanic membrane perforations and prevent further complications, such as more severe hearing loss. **Novelty and Contribution**: This case report provides a new contribution to the management of safe type CSOM, emphasizing the success of type II endoscopic tympanoplasty as a less invasive surgical alternative to traditional methods, especially for patients with mild conductive hearing loss and recurrent ear infections.

Keywords: Chronic Suppurative Otitis Media (CSOM), Tympanoplasty, Endoscopic Surgery, Conductive Hearing Loss, Perforated Tympanic Membrane, Audiometry.

INTRODUCTION

Chronic Suppurative Otitis Media (CSOM) is a persistent infection of the middle ear and mastoid, characterized by tympanic membrane perforation and continuous or recurrent ear discharge lasting more than two months. It remains a significant health problem,

especially in low- and middle-income countries. According to the World Health Organization (WHO), CSOM is one of the leading causes of hearing impairment worldwide, particularly among children under 5 years of age. In Indonesia, the prevalence of CSOM is alarmingly high, affecting approximately 3.9% of the population (Soepardi, 2017). This condition not only leads to physical discomfort and hearing loss but also has long-term socio-economic implications, particularly for children, as it can impede educational development and reduce quality of life.

The pathophysiology of CSOM involves various microbial agents, including bacteria and fungi. Risk factors for CSOM are multifactorial and include environmental conditions, limited healthcare access, inadequate antibiotic therapy for acute otitis media (AOM), exposure to cigarette smoke, and poor hygiene practices. Additionally, genetic factors, such as age, gender, and craniofacial abnormalities, can increase susceptibility to CSOM. Despite a growing body of research on its epidemiology and risk factors, the complex interaction between these elements and their role in disease progression remains insufficiently explored (Airlangga Hardjoprawito et al., 2024).

Numerous studies have provided valuable insights into the microbial causes of CSOM and its associated complications. Common pathogens implicated in CSOM include Pseudomonas aeruginosa and Staphylococcus aureus (Ai et al., 2020; Khairkar et al., 2023), while the presence of cholesteatoma has been identified as a major complication that exacerbates the condition. However, the molecular mechanisms by which these microorganisms induce chronic inflammation and damage ear structures are still not well understood. Furthermore, while the presence of cholesteatoma is well-documented, its co-occurrence with bacterial and fungal infections in CSOM patients requires further investigation (Khairkar et al., 2023).

Management of CSOM is typically divided into non-surgical and surgical approaches. Non-surgical treatment primarily involves patient education, aural hygiene, and antibiotic therapy. In contrast, surgical intervention, such as tympanoplasty with or without mastoidectomy, is considered the definitive treatment for advanced cases (Saini et al., 2024). However, while surgical outcomes have been widely studied, the optimal timing for surgery remains a subject of debate. Additionally, the effectiveness of non-surgical management in preventing recurrence and minimizing hearing loss in the long term has not been fully addressed in the literature.

This study aims to fill these gaps by evaluating the effectiveness of different treatment modalities, focusing particularly on tympanoplasty, and assessing their long-term impact on hearing restoration and the prevention of complications like cholesteatoma. By exploring both surgical and non-surgical management strategies, this research seeks to contribute new insights that can improve the clinical management of CSOM, particularly in settings with limited healthcare resources.

Based on existing literature, we hypothesize that tympanoplasty significantly improves hearing outcomes and reduces infection recurrence in patients with CSOM. Furthermore, we propose that early surgical intervention, especially in the safe type of CSOM, may prevent the progression of the disease to more severe forms, such as cholesteatoma or facial nerve paralysis. We also anticipate that a multidisciplinary approach, combining both surgical and non-surgical treatments, will lead to better overall outcomes, including a reduction in complications and improved quality of life for patients.

RESEARCH METHOD

This study employs a case study design with a quantitative approach to evaluate the outcomes of surgical treatment in a patient with Chronic Suppurative Otitis Media (CSOM) bilateral. The subject of the study is a 52-year-old female who presented to the ENT Clinic at Pasar Rebo Regional Hospital with complaints of fluid discharge from both ears for the past two months. The discharge appeared intermittently, associated with a cough, cold, and fever, with yellow and foul-smelling fluid. Additionally, the patient experienced hearing loss, more severe in the right ear, severe pain in both ears, and dizziness that was unaffected by positional changes. This study focuses on evaluating the effectiveness of endoscopic tympanoplasty in improving hearing function and alleviating the symptoms of CSOM in the patient.

Data for this study were derived from the patient's medical records, which included her clinical history, physical examination, audiometry results, and diagnostic imaging such as CT scans. Information regarding the surgical procedure performed and postoperative recovery was also collected to understand the impact of the treatment on the patient’s condition. Additionally, an interview was conducted to gather the patient's perspective on her symptoms, the surgical procedure, and recovery. This interview provided supplementary information regarding the patient's perceptions of changes in her condition before and after the surgery.

Data collection involved clinical observation, including physical and diagnostic examinations. Audiometry tests were conducted to assess hearing loss before and after surgery. CT scans were performed to evaluate the condition of the mastoid and to detect any cholesteatoma. The data obtained from physical examination, audiometry, and CT scans were analyzed to assess the surgical treatment's effects on hearing improvement and medical recovery. Furthermore, the patient interview was analyzed narratively to explore her experience with the treatment and its impact on her quality of life.

Data analysis was performed using descriptive statistical methods to illustrate changes in audiometry results before and after surgery. The CT scan data were analyzed to confirm findings related to cholesteatoma and changes in the ear's anatomical condition post-surgery. Additionally, the interview data were analyzed qualitatively to provide insights into the patient's recovery experience. The analysis results were compared with existing literature on the effectiveness of surgical treatments for CSOM, particularly in improving hearing function and preventing complications such as cholesteatoma.

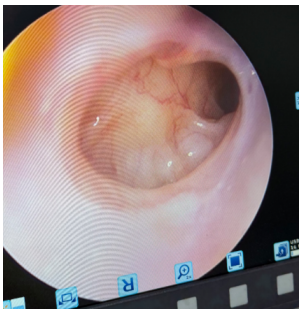
RESULT AND DISCUSSION

Case Illustration

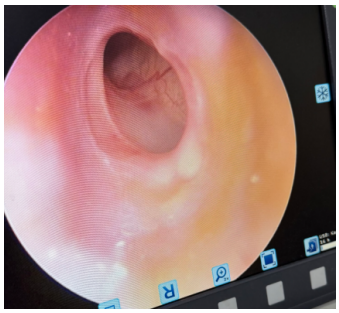
Mrs. NM, a 52-year-old woman, came to the ENT Clinic at Pasar Rebo Regional Hospital with a two-month history of intermittent fluid discharge from both ears. The discharge was yellow, foul-smelling, and accompanied by a cough, cold, and fever. The patient reported similar symptoms in the past, with her right ear having had discharge since 2017 and her left ear experiencing discharge since childhood. In addition to the ear discharge, the patient also experienced hearing loss in both ears, with the right ear being more severely affected. She also complained of severe pain in both ears and dizziness, which had been persistent for two months. Notably, there were no complaints of tinnitus, swelling, or discharge behind the ears.

Upon physical examination, vital signs were found to be within normal limits. Both preauricular and retroauricular examinations showed no hyperemia, tenderness, or fistula around the ears. The examination of the right ear revealed a wide ear canal, with a total perforation of the tympanic membrane. Mucopurulent discharge was present, but no cholesteatoma was observed. Similarly, the left ear showed a wide ear canal, total tympanic membrane perforation, and mucopurulent discharge, but there was no cholesteatoma present. The peripheral facial nerve examination showed no signs of House-Brackmann

grade I or any signs of facial nerve paralysis, indicating that there was no peripheral facial nerve involvement at that time.



Right Tympanic Membrane



Left Tympanic Membrane

Figure 1. Right Ear Examination Before Surgery

Figure 1 illustrates the preoperative examination of the right ear, showing the perforated tympanic membrane and the mucopurulent discharge present in the ear canal. This image is key in visualizing the condition of the tympanic membrane before surgery, highlighting the extent of the perforation and the discharge that is characteristic of CSOM.

To evaluate the patient's hearing, audiometric testing was conducted. The Rinne test showed negative results in both ears, indicating conductive hearing loss. The Weber test showed lateralization to the right ear, further confirming the conductive nature of the hearing loss. The Swabach test showed an extension in the right ear, which also suggested a longer conduction time, a sign of conductive hearing loss. Pure tone audiometry results revealed mild conductive deafness in the right ear with a hearing threshold of 39 dB. In contrast, the left ear showed a normal hearing threshold of 24 dB, although there was a slight decrease in hearing at frequencies less than or equal to 1000 Hz and at frequencies above 4000 Hz.

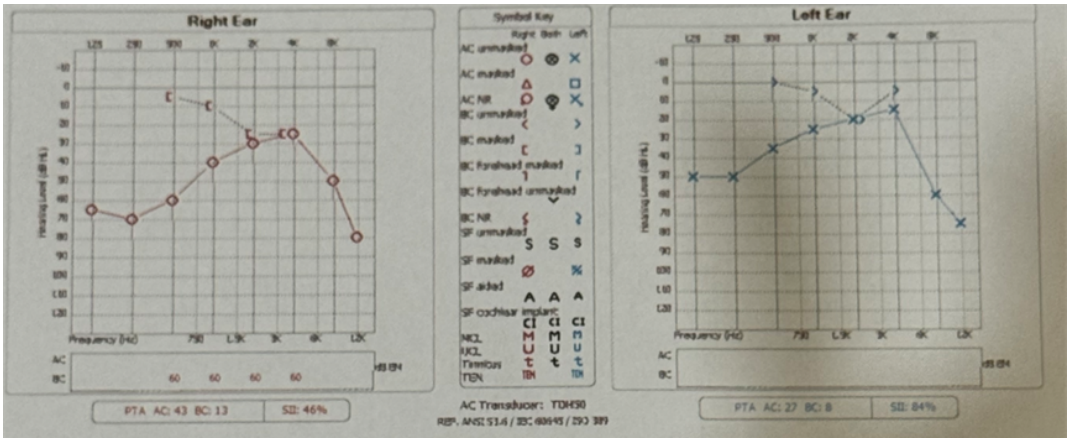


Figure 2. Preoperative Pure Tone Audiometry Examination

Figure 2 depicts the preoperative pure tone audiometry results. The chart shows the mild conductive hearing loss in the right ear, with a threshold of 39 dB, indicating mild hearing impairment in the low to mid-frequency range. The left ear had a normal threshold, but slight reductions in hearing sensitivity were observed at higher and lower frequencies, suggesting possible early-stage conductive hearing changes, which were consistent with the patient's complaints of hearing loss.

A CT scan of both mastoids was performed without contrast to evaluate the condition of the middle and inner ear structures. The scan revealed that the external acoustic meatus was neither widened nor closed, and there was no mucosal thickening observed in the external acoustic canal. The tympanic membrane appeared intact, and the external acoustic canal had no significant narrowing. However, mucosal thickening was observed in the Prussak space and bilateral mastoid air cells, with sclerotic edges. The tegmen tympani and scutum were intact, and the malleus, stapes, and incus bones appeared normal. The cochlea and right semicircular canal were intact, and the facial canal, carotid canal, jugular canal, and Eustachian tube were all visible. The cranial base was also intact, and no intracranial abnormalities were detected.

The CT scan results suggested bilateral chronic otomastoiditis with suspected cholesteatoma in the bilateral Prussak space. The mucosal thickening seen in the Prussak space and mastoid air cells, along with the sclerotic edges, pointed to a long-standing inflammatory process that had likely caused these changes in the mastoid region.

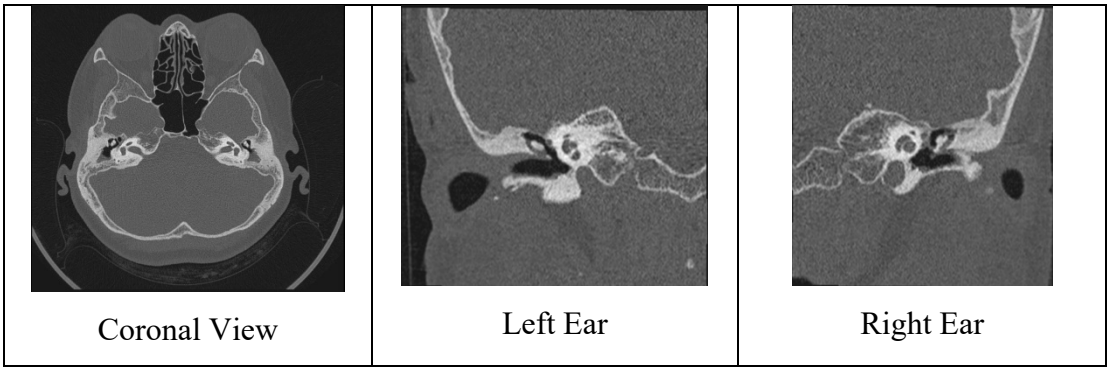


Figure 3. Preoperative CT scan of the Mastoid Without Contrast

Figure 3 shows the preoperative CT scan of the mastoid without contrast, presenting a coronal view of both ears. The image clearly illustrates the mucosal thickening in the Prussak space and mastoid air cells, which suggests chronic infection. The presence of sclerotic edges further supports the diagnosis of chronic otomastoiditis. The scan also

demonstrates that the middle ear structures, such as the ossicular chain, were intact, and no obvious cholesteatoma was visible at this stage.

On June 19, 2025, Mrs. NM underwent a type II endoscopic tympanoplasty on the right ear. The procedure began with aseptic preparation, followed by a tragus incision to harvest tragus cartilage and perichondrium grafts. After obtaining the grafts, a tympanomeatal flap was elevated, and granulation tissue from the incudotapedial joint was carefully removed. The incudostapedian joint was intact, and the stapes movement was good, indicating no ossicular chain involvement. A composite graft, along with perichondrium, was placed to repair the tympanic membrane, and Spongostan was applied in the tympanic cavity and ear canal to stabilize the graft.

The patient was in stable condition during the first postoperative day, conscious and alert. She complained of pain in the right ear, which was covered by a bandage, as well as dizziness and nausea. However, there was no blood seepage, vomiting, or ringing in the ears. No weakness on one side of the face was observed, and there were no disturbances in taste. Facial nerve examination confirmed House-Brackmann grade I, indicating no facial nerve dysfunction. Additionally, a gaze nystagmus test was negative, suggesting no signs of vestibular involvement.

In the postoperative care, the patient was administered tranexamic acid 500 mg three times daily, ketorolac 30 mg three times daily, ranitidine 50 mg twice daily, and ceftriaxone 1 g twice daily. The patient's general condition remained moderate, with compos mentis consciousness. While still experiencing pain in the right ear and dizziness, there was no blood seepage, vomiting, ringing in the ears, or weakness on one side of the face. Taste disturbances were not reported, and the facial nerve examination continued to confirm House-Brackmann grade I. The gaze nystagmus examination remained negative.

DISCUSSION

According to the Indonesian Ministry of Health To establish a diagnosis of chronic suppurative otitis media, the diagnosis can begin with anamnesis, physical examination, and supporting examinations. The anamnesis will reveal several symptoms that can confirm a diagnosis of CSOM, namely: ear discharge that comes and goes or is continuous for at least 2-6 weeks; the discharge may be thin or thick, clear, or pus-like; hearing loss, a feeling of fullness in the ear, and intussusception; symptoms that indicate complications such as temporary or persistent facial paralysis, otalgia, vertigo, high fever, photophobia,

and swelling behind the ear (indicating mastoiditis). Ear discharge in cases of a perforated eardrum usually occurs due to an upper respiratory tract infection that enters the middle ear through the Eustachian tube. The medical history usually shows ear discharge for several days to several weeks, along with an active upper respiratory tract infection or respiratory allergy (Hendra Wirawan et al., 2020).

This aligns with the patient's complaints in this case. The patient complained of fluid discharge from both ears for two months prior to hospital admission. The complaint was intermittent and appeared with a cough and cold, accompanied by a fever. The discharge was yellow and foul-smelling. Similar complaints had occurred previously. The patient complained of discharge in the right ear in 2017. He complained of discharge in the left ear as a child. Other complaints included hearing loss in both ears, but more severe in the right ear, severe pain in both ears, and dizziness unaffected by positional changes since two months prior to hospital admission. There were no other complaints such as ringing in the ears, swelling, or discharge behind the ears.

According to (Airlangga Hardjoprawito et al., 2024) CSOM can be divided into safe and dangerous types. Safe type CSOM (mucosal/tubotympanic type) is inflammation limited to the middle ear mucosa, with central perforation in the pars tensa and rarely causes complications. In this type there is no cholesteatoma. Safe type CSOM is divided into two, namely the active type when there is secretion or fluid coming out of the perforation (wet ear), and the quiet type when the tympanic cavity is dry. Meanwhile, dangerous type CSOM (aticoantral type) is characterized by marginal or attic perforation accompanied by cholesteatoma. Clinical signs of dangerous type CSOM include marginal or attic perforation, the presence of an abscess or fistula behind the ear, polyps or granulation tissue in the external ear canal, pus-like discharge with a distinctive odor, and the appearance of cholesteatoma shadows on mastoid x-ray examination. OMSK with cholesteatoma can cause various complications outside the skull (e.g. facial paralysis, subperiosteal abscess, and mastoiditis), as well as complications inside the skull (e.g. meningitis and brain abscess) (Khairkar et al., 2023). Facial nerve paresis is one of the intratemporal complications of malignant CSOM caused by the presence of granulation tissue and/or cholesteatoma that erodes the facial canal bone (Valentina & Wicaksono, 2022). The severity of facial paralysis can be assessed based on the House and Brackmann classification recommended by the American Academy of Otolaryngology (Bansal, 2012).

In this case, the results of the physical examination found the right ear: a wide ear canal, a total perforation of the tympanic membrane, mucopurulent discharge, and no cholesteatoma. On examination of the left ear: a wide ear canal, a total perforation of the tympanic membrane, mucopurulent discharge, and no cholesteatoma. On examination of the preauricular and retroauricular of the right and left ears there was no hyperemia, tenderness, or fistula. Examination of the peripheral facial nerve house brackmann 1 or no peripheral facial nerve paralysis. On CT Scan examination of the Mastoid found mucosal thickening in the Prussak space and bilateral mastoid air cells with sclerotic edges, the impression of bilateral chronic Otomastoiditis and suspected cholesteatoma in the Prussak space bilaterally. However, at the time of surgery, no cholesteatoma was found in the right ear. From the results of the examination, it can be said that the patient has active safe type CSOM in the right ear.

The types of hearing loss that occur in CSOM can be divided into three groups: conductive hearing loss, sensorineural hearing loss, and mixed hearing loss. The degree of hearing loss can be categorized as mild, moderate, severe, and profound. However, in CSOM cases, the most common type of hearing loss is conductive hearing loss (CHL), accounting for 90.5% (Triola et al., 2023). According to research by (Anggrayni et al., 2024). In CSOM, perforation of the tympanic membrane and erosion of the ossicular chain can cause middle ear dysfunction, which invariably results in conductive hearing loss (CHL). Hearing loss in patients is generally observed as an increase in the air conduction threshold, resulting in conductive hearing loss. Common factors influencing hearing loss are tympanic membrane abnormalities, ossicular chain disorders, and middle ear status. However, sensorineural hearing loss and mixed hearing loss can also occur in CSOM patients. This may be due to the complications that occur in patients with dangerous types of CSOM, so that the damage reaches the inner ear.

Based on the tuning test using a 512 Hz tuning fork in this case, the Rinne test results were negative in both ears, the Weber test found lateralization to the right ear, and the Swabach test was elongated in the right ear. It can be concluded that the patient has a conductive ear disorder in the right ear. A pure tone audiometry examination was performed. The results obtained were mild conductive deafness in the right ear of 39 dB, and the hearing threshold of the left ear was normal at 24 dB with a decrease in frequencies less than or equal to 1000 Hz and more than 4000 Hz. On CT Scan examination of the Matoid bones of the malleus, stapes and incus were good; and at the time of surgery, good

stapes movement was found. This allows the hearing loss in the right ear experienced by the patient to be mild, because the hearing bones function well.

Tympanoplasty is a surgical procedure to repair a perforated tympanic membrane, with or without repair of the auditory bones (ossiculoplasty), with the aim of preventing re-infection and restoring hearing. The technique of tympanoplasty was first popularized in the 1950s by Wullstein and Zollner, who introduced the overlay graft technique to repair the TM and restore sound conduction function in the middle ear (A. Gupta et al., 2024; P. Gupta et al., 2020).

Wullstein Classification:

1. **Type I:**Repair of the eardrum only, without abnormalities in the middle ear (also called myringoplasty).
2. **Type II:**Repair of the eardrum and middle ear bone if the malleus is damaged; the graft is attached to the incus.
3. **Type III:**The eardrum is attached directly to the head of the stapes if the malleus and incus are damaged.
4. **Type IV:**The drum is attached to the stapes footplate which can still move.
5. **Type V:**The repair involves the stapes footplate which is no longer moving.

The primary goal of tympanoplasty is to repair the tympanic membrane with or without repair of the ossicular chain, thereby preventing recurrent infections (otorrhea) and restoring hearing. The most common indication is chronic suppurative otitis media, either with or without cholesteatoma. Eardrum tears resulting from medical procedures (e.g., ventilatory insertion in children) may also be an indication. Traumatic tears that do not heal on their own (approximately 80% of acute tears will heal spontaneously) also require surgical repair (Wijaya et al., 2022).

Contraindications for tympanoplasty according to (Araújo et al., 2024; Ida Ayu Arnya Laksmi Dewi & Komang Andi Dwi Saputra, 2023) divided into relative and absolute:

1. Relative: too young/old age, non-functioning eustachian tube, ear that can no longer hear, or if the operation is performed on the ear with better hearing.
2. Absolute: uncontrolled cholesteatoma, complications of otitis media such as brain abscess, meningitis, lateral sinus thrombosis, cancer, or severe contraindications to anesthesia.

Autologous grafts are readily available, biocompatible, and inexpensive, so artificial materials are rarely used. Grafts are typically taken from the temporal fascia or the perichondrium of the tragus/turbinate, but they can also be taken from the fascia lata, the skin of the ear canal, and the periosteum. Artificial grafts, such as cell-free dermal matrix and absorbable gelatin sponges, offer the advantage of reduced pain and scarring because they eliminate the need for tissue harvesting. However, they are more expensive and carry the risk of disease transmission, so many otolaryngologists prefer autologous grafts. Cartilage is generally stronger and more resistant to shrinkage, but there are concerns about sound conduction due to its stiffness, which can lead to mild conductive hearing loss at low frequencies. Cartilage can also be misdiagnosed as cholesteatoma after surgery (Arifuddin et al., 2025).

Endoscopic repair of tympanic membrane perforations is less invasive than traditional postauricular and endaural approaches. This method provides a more comprehensive view of the middle ear anatomy without external incisions, resulting in shorter surgery and recovery times. Studies have shown comparable success rates and hearing recovery to microscopic tympanioplasty. However, endoscopic surgery is performed with one hand and carries the risk of heat damage from the endoscope's light (Xiao et al., 2022).

Endoscopic tympanoplasty uses a transcanal approach. The edges of the perforation are cleaned of epithelium if necessary. An incision is made in the ear canal to elevate the tympanomeatal flap and annulus, allowing access to the middle ear. The malleus is released from the TMJ, and ossiculoplasty is performed if necessary. A graft is placed under the TMJ near the malleus, and gel foam sponges are then inserted into the middle and external ear canals (Bhutta et al., 2024). In this case, a type II tympanoplasty was performed endoscopically on the right ear. This was because the right ear had worse hearing than the left ear. In cases of bilateral, safe CSOM, the ear with the more severe hearing loss is the one to be operated on first. Surgery is performed to prevent re-infection and restore hearing. This type II tympanoplasty aims to repair the eardrum by attaching a graft to the incus bone. The graft was taken from the perichondrium of the patient's tragus. This was performed endoscopically because a CT scan of the mastoid showed no involvement of the mastoid, and endoscopic repair of a tympanic membrane perforation is more invasive.

CONCLUSION

This case report highlights the clinical presentation and management of Chronic Suppurative Otitis Media (CSOM) in a 52-year-old woman. The main findings from this study include the presence of mild conductive hearing loss, a total perforation of the tympanic membrane in both ears, and the absence of cholesteatoma, suggesting a less severe form of CSOM. The patient's symptoms, such as intermittent ear discharge, hearing loss, and pain, were consistent with the diagnosis of active safe type CSOM in the right ear. Audiometric testing and CT imaging played crucial roles in confirming the diagnosis and determining the appropriate course of treatment.

The study's key contribution to the field lies in demonstrating the successful management of safe type CSOM using endoscopic type II tympanoplasty, a less invasive surgical approach that avoids external incisions while achieving favorable outcomes. The successful outcome suggests that early intervention with appropriate surgical methods, alongside postoperative care involving antibiotic therapy and pain management, can significantly reduce complications and improve patient recovery. This research adds to the growing body of evidence supporting endoscopic tympanoplasty as an effective treatment option for patients with tympanic membrane perforations.

However, the study also has its limitations. The primary limitation is that it is based on a single case, which may not be representative of all CSOM patients. Additionally, the study did not address long-term follow-up outcomes, which would be essential in determining the sustainability of the surgical success and the prevention of recurrence. Future studies with larger sample sizes and long-term monitoring are recommended to further validate the findings and assess the effectiveness of endoscopic tympanoplasty in diverse patient populations with varying degrees of CSOM severity.

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