

# CSOM CAN LEAD TO INFECTIVE ENDOCARDITIS: A COMPLICATION UNEARTHED IN A SERIES OF 9 CASES

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Contributions:  
A Study design/planning  
B Data collection/entry  
C Data analysis/statistics  
D Data interpretation  
E Preparation of manuscript  
F Literature analysis/search  
G Funds collection

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## Abstract

**Background:** Chronic suppurative otitis media (CSOM) leads to numerous well identified complications reported by many researchers.

**Case report:** Present case study includes 9 patients with CSOM (active squamous type) where we found infective endocarditis as a rare complication.

**Conclusions:** The current study highlights the importance of early management of CSOM and proper cardiologic evaluation which can prevent catastrophic complications such as infective endocarditis.

**Key words:** complications • echocardiography • infective endocarditis • CSOM

## CSOM MOŻE PROWADZIĆ DO INFEKCYJNEGO ZAPALENIA WSIEDZIA: POWIKŁANIE ODKRYTE W SERII 9 PRZYPADKÓW

### Streszczenie

**Wprowadzenie:** Jak donosi wielu badaczy, przewlekłe ropne zapalenie ucha środkowego (CSOM) prowadzi do wielu dobrze znanych powikłań.

**Studium przypadku:** Niniejsze studium przypadku obejmuje 9 pacjentów z CSOM, u których zakaźne zapalenie wsierdzia jest rzadkim powikłaniem.

**Wnioski:** Wyniki badań potwierdzają znaczenie wczesnego leczenia CSOM i właściwej oceny kardiologicznej, co może zapobiec bardzo poważnym powikłaniom, takim jak infekcyjne zapalenie wsierdzia.

**Słowa kluczowe:** powikłania • echokardiografia • infekcyjne zapalenie wsierdzia • CSOM

### Introduction

Chronic suppurative otitis media (CSOM) is one of the most common disorders in otology practice today. The majority of CSOM cases are seen in Southeast Asia, the Western Pacific, and Africa. India is the country with the highest prevalence (>4%) of CSOM [1]. Lack of awareness and not visiting the hospital at an earlier enough stage is a major cause [2]. CSOM is more common in low socio-economic groups, overcrowded communities, where there is inadequate housing, lack of breast feeding, malnutrition, poor immunological status, active or passive smoking, frequent upper respiratory tract infection, repeated nasopharyngeal infection, and inadequate health care systems [3].

Chandrashekharayya et al. [4] reported several complications of CSOM which included tympanic membrane perforation,

brain abscess, facial nerve paralysis, and labyrinthitis. Sharma et al. reported intracranial and extracranial complications in patients with CSOM: intracranial complications can be brain abscess, meningitis, and lateral sinus thrombophlebitis; extracranial complications include mastoid abscess followed by labyrinthitis and facial nerve palsy [5]. Poorey and Iyer [6] indicated that both gram positive and negative organisms are responsible for infection of the middle ear. They studied 100 cases of CSOM to determine the bacterial flora and to investigate the antibiotic sensitivity pattern of the organisms isolated. Sharma et al. [5] isolated *Proteus mirabilis*, *Pseudomonas aeruginosa*, and *Staphylococcus epidermidis* in a patient with CSOM. Saha et al. [7] showed lateral sinus thrombosis with lung abscess in patients with CSOM. In a similar way, Baig et al. [8] noted cholesteatoma in 10.6% and ossicular damage in 13.5% of a population with CSOM. Dubey and Larawin [9] found otitic meningitis, lateral sinus

thrombosis, and cerebellar abscess in patients with CSOM. They also reported mastoid abscess, postauricular fistula, and facial palsy as a complication. Wahid et al. [10] reported subperiosteal abscess and extradural abscess as complications of CSOM.

The earlier literature has reported complications such as brain abscess, meningitis, lateral sinus thrombophlebitis, mastoid abscess, labyrinthitis, facial nerve palsy, cholesteatoma, otitic meningitis, lateral sinus thrombosis, and cerebellar abscess [3-5,7,9,11]. Infective endocarditis (IE) is a multisystem disease that results from bacterial infection of the endocardial surface of the heart. Smith et al. [12] found infective endocarditis in a patient with mastoiditis. Guler et al. [13] found bicuspid aortic valve complications due to infective endocarditis arising from underlying chronic otitis media. To the best of our knowledge, to date there are only a very few single case studies reporting infective endocarditis in patients with CSOM. There is a need to report infective endocarditis in more patients with CSOM from developing countries which would add to our knowledge of the rare but life-threatening complications of otitis media. The aim of the present study is to report infective endocarditis in 9 patients with CSOM.

### Case Report

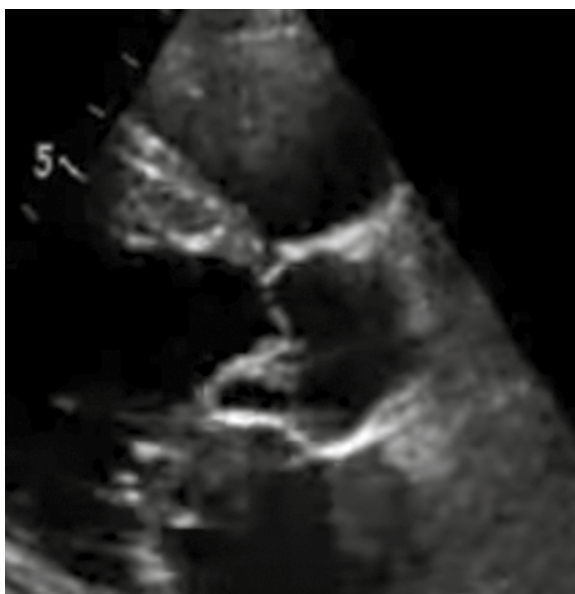
The present case study includes 9 patients (5 males and 4 females) studied from 2016 to 2019. The age range was from 15 to 18 years with a history of ear discharge from 1 to 3 years. Bilateral ear discharge was found in 3 males and 2 females, whereas unilateral discharge was found in 2 males and 2 females. None of the patient had diabetes, tuberculosis, or immune suppression. CSOM was diagnosed in all patients after clinical examination, HRCT of the temporal bone, and pure tone audiometry. Microscopic examination revealed unsafe CSOM in all subjects. The aural discharge of patients was sent for culture and gram staining, and *Staphylococcus aureus* was found in all of them. All patients were advised to undergo ear surgery and were

given a routine pre-anesthetic checkup. During the checkup, murmur was reported by the attending anesthesiologist for which patients were referred to a consultant cardiologist for further evaluation. The cardiologist subjected patients to an electrocardiogram (ECG) and echocardiography (ECHO). ECHO showed vegetation on the aortic valve in 5 patients and on the tricuspid valve in 4 patients. Blood culture was advised in all patients and the report came back positive for the same organism (*S. aureus*) as was diagnosed by the culture of ear discharge from each patient. None of the patients had had a previous history of infective endocarditis, congenital heart disease, or valvular transplant. Oral and written consent were taken from all participants. All patients are currently under medical treatment for infective endocarditis.

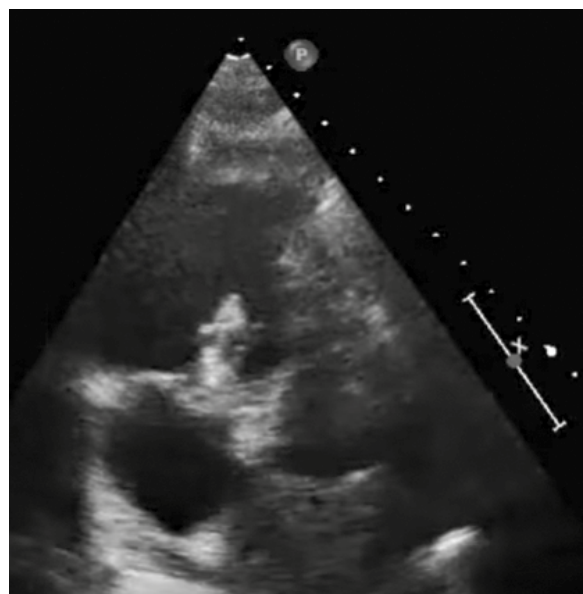
### Discussion

According to Thuny et al. [14], in spite of improvements in medical sciences, infective endocarditis is associated with poor outcomes and remains a medical challenge. They also reported that many factors responsible for the slow prognosis of this serious disease: its severity, virulence of the microorganism, underlying disease, delays in identification and management, surgical indications, and timing of surgery. Common causes of deaths related to infective endocarditis (IE) include cardiac failure, brain stroke, multi-organ dysfunction, sepsis, and sometimes sudden death [15]. Westphal and colleagues [16] highlight the importance of ECHO in the diagnosis of infective endocarditis.

There are several well identified complications of otitis media [4-5,10]. Infective endocarditis is a rare complication of CSOM. The present case study is in consonance with the findings of a previous case study which reported subacute bacterial endocarditis as a rare complication of mastoiditis [12]. The current study reveals that CSOM is risky and can lead to infective endocarditis; identification of this potential complication can prevent morbidity and mortality. The present case study also underlines the importance of proper cardiologic evaluation in patients of



**Figure 1.** Echocardiography showing vegetation of the aortic valve



**Figure 2.** Echocardiography showing vegetation of the tricuspid valve

CSOM, since diagnosis may prevent life-threatening complications such as infective endocarditis.

### Conclusion

Clinical observations, echocardiography, and blood culture findings are vital for the early identification and

diagnosis of infective endocarditis. Early treatment of CSOM can prevent catastrophic complications such as infective endocarditis, which remains under-diagnosed. There is a need for additional large-scale multicenter reportage in order to calculate the incidence and prevalence of infective endocarditis in CSOM.

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