

(CASE REPORT)



Bilateral chronic suppurative otitis media in pediatric patients

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Abstract

Chronic suppurative otitis media (CSOM) is a chronic inflammatory condition of the middle ear characterized by perforation of the tympanic membrane with recurrent or persistent mucopurulent otorrhea. Otorrhea is the most common complaint of CSOM compared to hearing loss and otalgia. The risk factors for CSOM include allergies, history of acute respiratory infection (ARI), history of AOM, impaired tubal function, and socioeconomic environment. In principle, the diagnosis of CSOM is based on anamnesis and physical examination assisted by supporting examinations. The history generally shows a history of persistent or recurrent otorrhea for more than 2 months. CSOM consists of two types, namely the benign type and the malignant type, which can be distinguished from the presence or absence of cholesteatoma. Treatment of the malignant type of CSOM is surgery to eradicate cholesteatoma.

Here we reported a case report of a 16-years old male patient with a chief complaint of discharge from both ears from 8 years ago. The patient was diagnosed as bilateral malignant type of CSOM with predisposing factors of poor socioeconomic and nutrition. The patient underwent left ear radical mastoidectomy under general anesthesia with good results at the follow-up visit and was planned to undergo radical mastoidectomy on the right ear.

Keywords: Chronic suppurative otitis media; Radical mastoidectomy; Cholesteatoma

1. Introduction

Chronic suppurative otitis media (CSOM) is a chronic inflammation of the middle ear and mastoid with persistent and recurrent tympanic membrane perforation. Generally, CSOM is divided into benign types and malignant types of CSOM. Benign CSOM is a type of CSOM that only affects the mucosa, does not contain cholesterol, and rarely causes complications. Meanwhile, the malignant type of CSOM is dangerous because of the presence of cholesteatoma, marginal and occasionally, subtotal perforations. Chronic suppurative otitis media is considered a complication of acute otitis media, and the risk factors predisposing to CSOM are unclear. Upper respiratory tract infections and poor socioeconomic conditions may be associated with the development of CSOM. Infection is usually caused mainly by bacterial infections, both aerobic (*Pseudomonas aeruginosa*, *Escherichia coli*, *S. aureus*, *Streptococcus pyogenes*) and anaerob (*Propionibacterium*, *Bacteroides*) [1,2].

According to WHO, the incidence of CSOM reaches 65-330 million worldwide and around 60% experience hearing loss. About 360 million people worldwide have hearing loss. CSOM is common in developing countries. The prevalence of CSOM in Indonesia is generally around 3.9% [2]. Riskesdas 2013 showed that around 2.6% had hearing loss. Meanwhile, in developed countries like England, the incidence of CSOM is around 0.9%. The right side of the ear was more frequently infected (46.7%), followed by bilateral (35.5%), and the left ear as much as 17.8% [3].

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2. Case Report

A 16-year-old male patient with the initials MJW presented to the ENT-KL polyclinic at Sanglah Hospital, Denpasar, was referred from the Waikabubak Hospital with complaints of discharge from both ears which had been felt for \pm 8 years. This complaint comes and goes, with a clear and odorless discharge. History of last discharge was 1 month ago, currently there is no discharge from the ear. Other complaints include intermittent pain in both ears and a mass felt behind the left ear from 3 years ago, bilateral hearing loss, and cough. The patient has no history of allergies, diabetes mellitus, hypertension.



Figure 1 Clinical feature of the patient's left ear

On physical examination, the general condition was remarkable, compos mentis, blood pressure 110/70 mmHg, pulse 86 x/min, respiration 20 x/min, axillary temperature 37°C. Ear examination revealed perforated tympanic membranes in both ears. Nose and throat were within normal limits.



Figure 2 Examination of the tympanic membrane

On audiometric examination, AD: severe MHL (AC: 78.75 dB, BC: 33.70 dB), AS: moderate CHL (AC: 50 dB, BC: 5 dB). VII nerve was within normal limit.

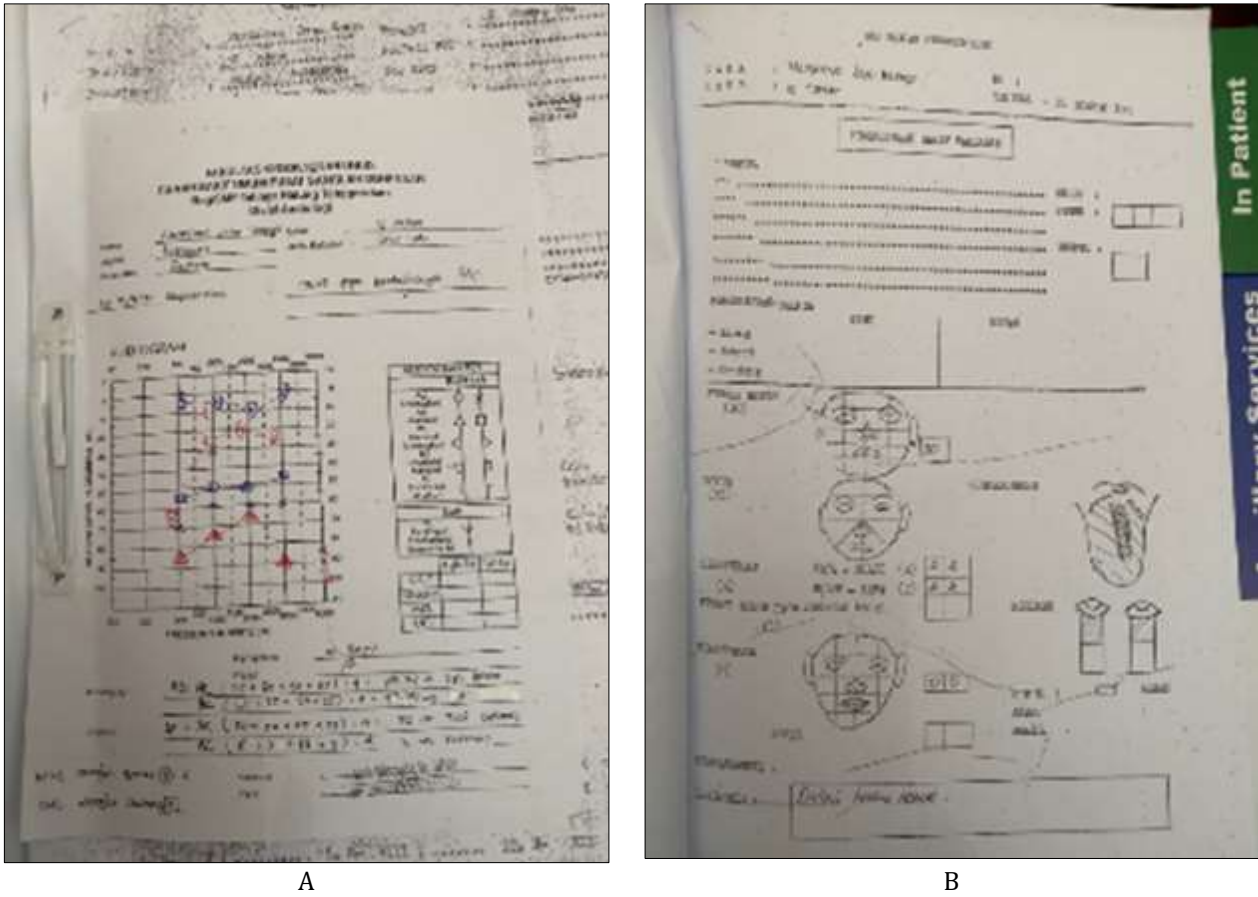
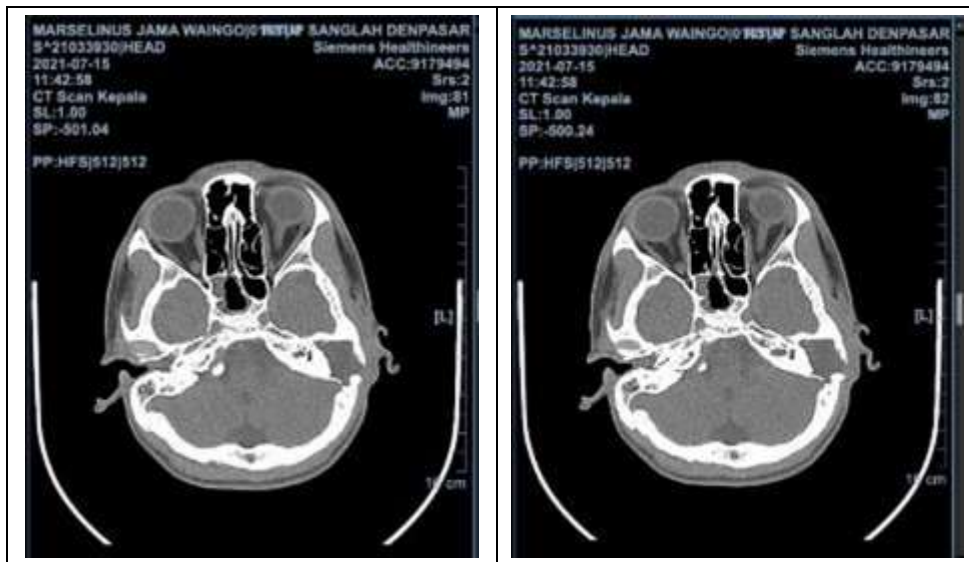


Figure 3 A. Audiometric findings of this patient. B. Cranial nerve VII evaluation of this patient

CT scan of the head with a temporal focus and axial coronal reformate mastoid without contrast showed the impression of a bilateral cholesteatoma (left dominant) with chronic otomastoiditis which destroyed the scutum, left auditory ossicles and os. right stapes, and part of the left mastoid process to the left occipital bone (sigmoid sinus groove region) and soft tissue swelling in the left retroauricular region; maxillary sinus, ethmoidalis, sphenoidalis right and left; left and right inferior turbinate hypertrophy.



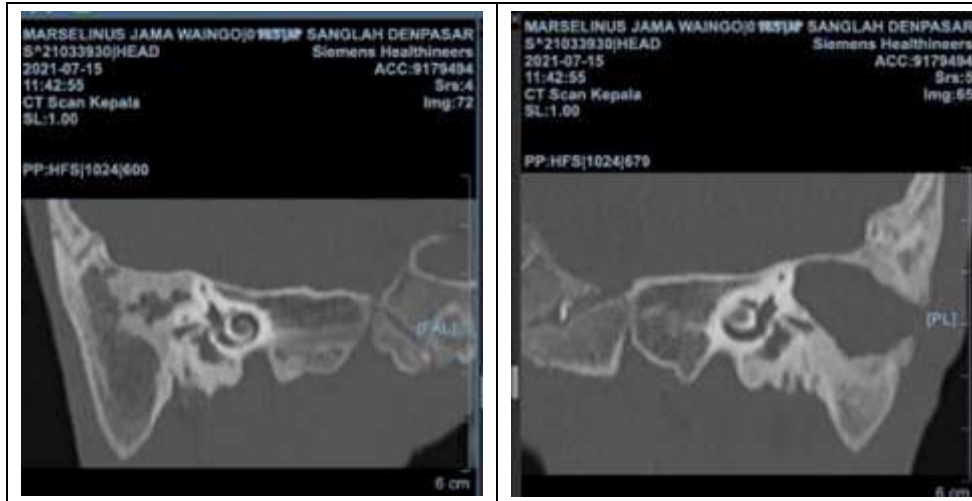


Figure 4 Head CT scan

Based on the examination, this patient was diagnosed with bilateral malignant type of chronic suppurative otitis media (CSOM). The patient underwent left radical mastoidectomy under general anesthesia. Preoperative physical examination was within normal limits with physical status of ASA I. During surgery, cholesteatoma was found in the mastoid and tympanic cavity, destruction of the posterior canal wall, and no ossicles.

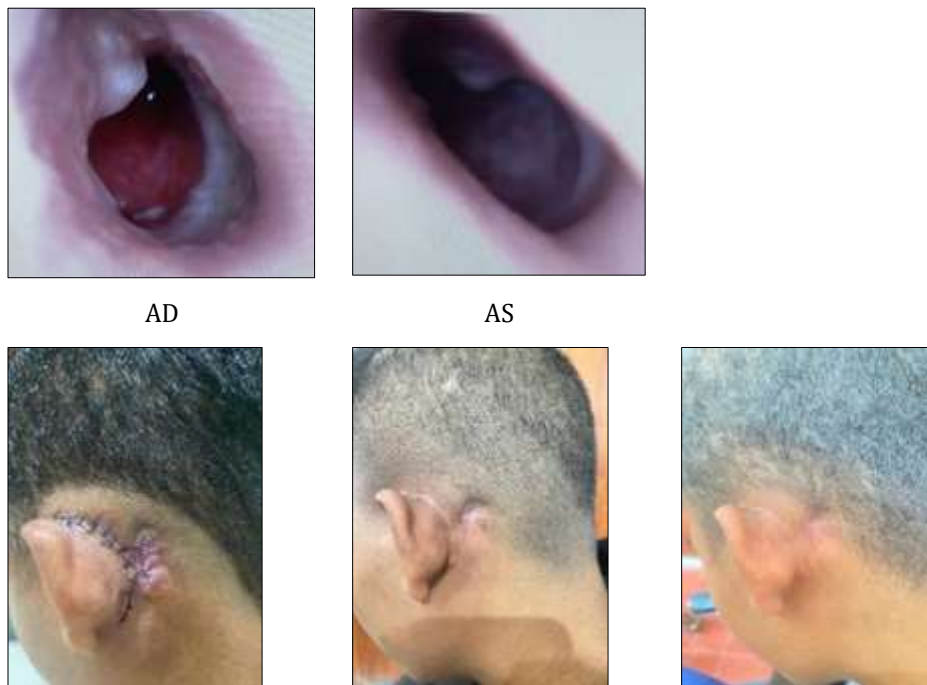


Figure 5 Post-surgery findings

After surgery, intravenous antibiotics were with IV ceftriaxone 2x1 g every 12 hours and fentanyl for analgesic. On the second day after post-surgery, drain was removed and the patient was discharged from hospital with oral medications of 2x200 mg cefixime, 3x500 mg paracetamol, 3x1 mg pseudoephedrine. The patient was advised to schedule a follow-up visit 3 days after. Three months after the operation, there was improvement with the postoperative wound being dry, the scar fading, and the tympanic membrane dry. Finally, the patient was prepared to undergo right-sided ear surgery.

3. Discussion

Chronic suppurative otitis media (CSOM) is a chronic inflammatory condition of the middle ear characterized by perforation of the tympanic membrane with recurrent or persistent mucopurulent otorrhea. The duration of otorrhea to be classified as CSOM ranged from 3 weeks to 3 months. Hearing loss exceeding 30 dB is common in CSOM patients. Moderate-to-severe conductive hearing loss occurs in two-thirds of patients and is characterized at low frequencies and with a tendency to increase the bone conduction threshold. CSOM begins with recurrent otitis media in children because the eustachian tube is shorter and flatter, and has low immunological function. Infectious factors usually originate from the nasopharynx [3,4]. In the case reported by the patient 16 year old male was consulted to the ENT-KL department because of complaints of discharge from both ears which had been felt since 8 years ago.

Methicillin resistant Staphylococcus aureus (MRSA) and methicillin-susceptible *Staphylococcus aureus* (MSSA) have been found in the pus cultures of CSOM patients, which poses a significant challenge to medical management due to common antibiotic resistance. Multi-drug resistance is also increasingly occurring which causes complications related to CSOM. An analysis showed the majority of cases had mixed/polymicrobial infections, especially *Klebsiella pneumoniae* with *Proteus mirabilis* or *Pseudomonas aeruginosa*. So that treatment is needed with antibiotics for gram positive and gram negative plus antifungals [4].

Isolation of *E. coli* dan *K. pneumoniae* indicates that the population is at high risk in an unhygienic environment. *P. aeruginosa* has been reported as the most common isolate. Antimicrobial susceptibility test was performed for all aerobic isolates except coagulase negative staphylococcus. It was found that Ciprofloxacin was the most effective drug [4,5].

Biofilms are resistant to antibiotics, so they are difficult to eradicate and can cause recurrent infections. In addition, biofilms adhere tightly to damaged tissue, such as exposed osteitic bone, mucosal ulcers, or otologic implants such as tympanostomy tubes. Cytokines are also involved in the pathogenesis of otitis media. High levels of proinflammatory cytokines such as IL-8 are found in CSOM patients with middle ear effusion. IL-8 plays a role in OM chronicity and bacterial growth. Compared to healthy individuals, mRNA and protein levels of TNF- α , IL-6, IL-1 β and IFN- γ are more common in the middle ear mucosa of CSOM patients. Upregulation of these pro-inflammatory cytokines can lead to tissue damage as well as the transition from acute to chronic OM [6].

CSOM patients were more in the age group of 11-20 years and male. Otorrhea is the most common complaint of CSOM compared to hearing loss and otalgia [7]. The risk factors for CSOM include allergies, a history of acute respiratory infections (ARI), and a history of AOM. CSOM starts with inflammation and irritation of the middle ear mucosa due to bacterial or viral infections, allergies, impaired tubal function, and socioeconomic environment. Poverty, overcrowding, inadequate housing, and sanitation contribute to CSOM rates. Recurrent ARI and poor socioeconomic conditions are often associated with the occurrence of CSOM. In developed countries, placement of a tympanostomy tube may be the single major etiological factor. Among children with tympanostomy tubes, the risk of CSOM was increased in those with a history of recurrent AOM, older siblings, and those in child care centers. In developing countries, poverty, population density, family history, exposure to cigarette smoke, are important in the occurrence of CSOM. Muftah et al stated that a history of earwax discharge in the last 12 months, swimming, recurrent respiratory infections >3 times/year, and population density >3 families/houses had the strongest relationship with CSOM. Based on the research by Poluan et al, the most common risk factor was a previous history of otitis media (88.3%), followed by ARI and allergies, each at 3.3%. Thus, it is important to consider these factors in the management and/or intervention of CSOM. followed by ARI and allergies, each at 3.3%. Thus, it is important to consider these factors in the management and/or intervention of CSOM. followed by ARI and allergies, each at 3.3%. Thus, it is important to consider these factors in the management and/or intervention of CSOM [2,7]. In this case, what the patient experienced was in accordance with the literature.

In our case, the patient complained about discharge from both ears which is clear in color, odorless, and comes and goes, accompanied by pain that comes and goes in both ears, a mass found behind the left ear, there was hearing loss in both ears, accompanied with cough. The patient lives with his in law in a densely populated environment with very poor environmental hygiene [4].

CSOM consists of two types, the benign type and the malignant type. The benign type generally does not cause complications, perforation is centrally located, and no cholesteatoma is found. Meanwhile, the malignant type is accompanied by cholesteatoma which can be accompanied by granulation tissue and aural polyps, where the perforation is marginal or attic. Cholesteatoma infections produce secretions that are yellow-gray in color and smell very bad [3,8,9]. In principle, the diagnosis of CSOM is based on anamnesis and physical examination assisted by supporting examinations. The history generally shows a history of persistent or recurrent otorrhea for more than 2

months. CSOM which is confined to the middle ear only causes conductive deafness. Meanwhile, mixed hearing loss can indicate complications to the labyrinth [10].

Management of the malignant type of CSOM is surgery to eradicate cholesteatoma. The surgical technique chosen depends on the extent of the damage and the choice of the surgeon. Anterior atticotomy is chosen if the cholesteatoma is still very limited in the attic. If the cholesteatoma cannot be completely removed with this procedure, it can be followed by reconstruction of the hearing function at the same time, such as canal wall down tympanoplasty, canal wall up tympanoplasty, or open and close method tympanoplasty. CSOM patients with intratemporal complications should be hospitalized immediately and given high-dose intravenous antibiotics. Microbiological examination of ear secretions is warranted. Mastoidectomy is performed further with the aim of drainage of purulent material accompanied by decompression of the facial nerve or petrosectomy, according to complications. CSOM patients with complications with signs of intracranial expansion should also be hospitalized immediately and referred to a neurologist or neurosurgeon. High-dose intravenous antibiotics that cross the blood-brain barrier are given for 7-15 days and microbiology of ear secretions is evaluated [10].

Our patient is diagnosed with bilateral malignant types of CSOM. For management, our patient was planned to undergo a left radical mastoidectomy. In CSOM patients with complications, drainage of purulent material by mastoidectomy with/without neurosurgery can be performed depending on the patient's condition [10].

4. Conclusion

Malignant type of chronic suppurative otitis media (CSOM) potentially results in fatal complications. Here we reported a case report of a 16-years-old male patient with bilateral malignant types of CSOM with predisposing factors of poor socioeconomic and poor nutrition.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

There are no conflicts of interest.

Statement of informed consent

Informed consent was obtained from participant included in the study.

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