



(CASE REPORT)



Malignant type of chronic suppurative otitis media with subperiosteal abscess complications: A case report

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Abstract

A 16-year-old male patient suffers from malignant Chronic Suppurative Otitis Media (CSOM) with subperiosteal abscess complication. The patient has a history of intermittent discharge from the right ear, since his age of 9 years old and never received any treatment. Ear examination was normal in the left ear. In the right ear, the external acoustic canal is narrow, there is no discharge and the tympanic membrane is difficult to evaluate. Examination of the nose revealed no abnormalities. The throat examination revealed no abnormalities. In the right temporoparietal region, there was a lump measuring 9x8 cm, redness, tenderness, warmth and fluctuating. In this patient, incision and drainage were performed. Furthermore, we did dilatation and drainage of the abscess every day until no pus is formed. After that, it was followed by a right canal wall-down mastoidectomy. Intraoperatively, cholesteatoma, granulation, and pus were found in the mastoid cavity, antrum, and tympanic cavity, closing the orifice of the Eustachian tube. Destruction of the incus, scutum, and posterior wall of the external acoustic canal. Perforated tympanic membrane. Tissues suspected of cholesteatoma were examined for anatomic pathology. From the results of anatomical pathology, histomorphology was found to be suitable for cholesteatoma. The principle of therapy for the malignant types of CSOM (with cholesteatoma) is surgery for cholesteatoma eradication and reconstruction. Treatment of subperiosteal abscess includes intravenous antibiotics, incision and drainage of the abscess, and mastoidectomy.

Keywords: Otitis Media; Subperiosteal abscess; Mastoidectomy; Cholesteatoma; Granulation

1. Introduction

Chronic suppurative otitis media (CSOM) is a Chronic inflammation involving the middle ear mucosa and mastoid cavity with perforation of the tympanic membrane and a history of discharge from the ear canal for more than two months, either continuously or intermittently. Malignant CSOM gives symptoms of persistent otorrhea, purulent and smelly secretions, and tend to cause dangerous complications.^{1,2}

Complications of CSOM are divided into intra-temporal complications and intracranial complications. Intra-temporal complications include mastoiditis which can be associated with subperiosteal abscess and deep inferior neck abscess (Bezold Abscess), petrositis, labyrinthitis and facial nerve palsy. Intracranial complications include extradural abscess, lateral sinus thrombophlebitis, brain abscess, otitis hydrocephalus, meningitis and subdural abscess.^{2,3}

Subperiosteal abscess occurs due to the erosion of temporal bone and pus collects under the skin and periosteum over the mastoid cortex in the area of Macewen's trigone. This will usually be seen from behind the ear above the pinna. More than 70% of cases of complications due to otitis media are experienced by children, but along with the rapid development of antibiotics, the prevalence of complications of otitis media, especially subperiosteal abscesses, is also

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decreasing. In this case report, we report a case of a malignant type of chronic suppurative otitis media with complications of subperiosteal abscess in a 16-year-old young male patient.^{3,4}

2. Case presentation

A 16 years old male patient of Balinese ethnicity, from Songan village, Kintamani, was referred from Bangli BMC Hospital on July 3 2021 to Prof. Dr. I.G.N.G. Ngoerah General Hospital Denpasar. He complained of a lump on the right side of his head approximately 15 days before entering the hospital. At first, it was a small bump but it become bigger and the lump was said to be painful. Complaints accompanied by high fever. Currently, complaints of fever have reduced. The patient was previously treated at the BMC Hospital for 3 days and received treatment with ceftriaxone, methylprednisolone and metronidazole. The patient has a history of intermittent discharge from the right ear, since he was 9 years old and never received any treatment. History of coughs and flu was denied.



Figure 1 Patient's clinical condition

Proceeding to physical examination, the general condition of the patient was found to be moderately ill with compos mentis awareness, body weight 44 kg, blood pressure 100/70 mmHg, pulse 82x/minute, respiration 20x/minute and axillary temperature 36.8oC. Ear examination found normal in the left ear. In the right ear, the external acoustic canal is narrow, there is no discharge and the tympanic membrane is difficult to evaluate. Examination of the nose revealed no abnormalities. The throat examination revealed no abnormalities. Endoscopic examination of the ear is shown in Figure 2. In the right temporoparietal region, a lump measuring 9x8 cm, redness, tenderness, warmth and fluctuation was found. Aspiration was carried out to obtain as much as 10cc of pus.



Figure 2 The tympanic membrane of the right and left ears

In laboratory examination at BMC Hospital, complete blood results with leukocytosis ($17.9 \times 10^3/\mu\text{L}$) with an increased number of neutrophils ($\text{Ne}\# 14.70 \times 10^3/\mu\text{L}$). At Prof.Dr.I.G.N.G. Ngoerah General Hospital, a repeat examination was carried out and the results of complete blood count, electrolytes and blood chemistry were within normal limits (WBC $9.66 \times 10^3/\mu\text{L}$, Hb 10.6 g/dL, Na 132, K, 4.01, SGOT 22.1 U/L, SGPT 54.83 U/L). The results of the chest x-ray examination were within normal limits. The patient is planned for a CT scan of the mastoid focus.

Based on anamnesis, physical examination and supporting examinations, the patient was diagnosed with a malignant type of CSOM with right subperiosteal abscess complication. Then we did an incision and drainage of the abscess and obtained pus $\pm 40\text{cc}$ (Figure 3). Patient was hospitalized and given therapy of IVFD NaCl 0.9% 20 drops/minutes, Ceftriaxone 2x1 gram intravenously, Metronidazole 3x500mg intravenously, Paracetamol 3x500mg intraoral, Methylprednisolone 2x62.5 mg intravenously, Omeprazole 2x40mg intravenously, Ketorolac 3x30mg intravenously, and dilatation and drainage of abscesses every day.

On the 2nd day of follow-up on July 5, 2021, the lump in the head had decreased. The patient complained of minimal pain and no complaints of fever. Dilatation and drainage were still found around ± 20 cc of pus. Furthermore, dilatation

and drainage of the abscess was conducted every day until no pus is formed. The results of culture and sensitivity tests on the patient's wound and pus showed normal flora bacteria.



Figure 3 Incision and drainage of pus

On the 5th day, July 8, 2021, a CT-scan focused on the mastoid was carried out, the results of the CT scan were obtained result of chronic otomastoiditis with right cholesteatoma, subperiosteal abscess on the right temporoparietooccipital region (Figure 4).

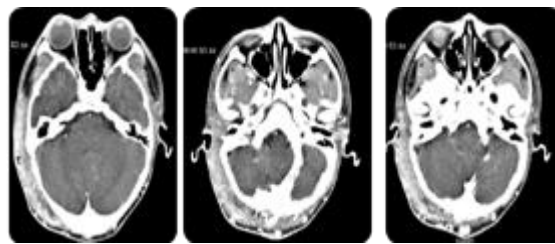


Figure 4 Focused mastoid CT scan with contrast

On the 10th day of follow-up on July 13 2021, there was no pus production from dilatation and drainage (Figure 5). The patient then underwent an audiometric examination and found moderate conductive deafness in the right ear (AC: 42.5 dB, BC: 5 dB) and normal in the left ear (AC: 8.75 dB, BC: -5). The patient also had a facial nerve examination and a balance check where both were found to be within normal limits.



Figure 5 Clinical photo of a patient post-drainage dilatation on the 10th day

The patient was then planned to have a canal wall down D mastoidectomy. The patient underwent a complete pre-operative laboratory examination and was consulted to an anesthesiologist for the feasibility of the operation. The results of the consultation with the anesthesia team were obtained ASA II physical status with mild anemia (Hb: 10.60).

On July 15, 2021, the right canal wall-down mastoidectomy was performed under general anesthesia (Figure 6). Intraoperatively, cholesteatoma, granulation, and pus were found in the mastoid cavity, antrum, and tympanic cavity until covered the opening canal of the Eustachian tube (Figure 7). The incus, scutum, and posterior wall of the external acoustic canal are destroyed. Perforated tympanic membranes were found. Tissues suspected of cholesteatoma were examined by anatomic pathology. A Drain was installed in the right retroauricular and a ribbon gauze was placed in the right External Audicus Canal then the surgical wound was closed using sterile gauze and a head bandage.



Figure 6 Mastoidectomy canal wall down

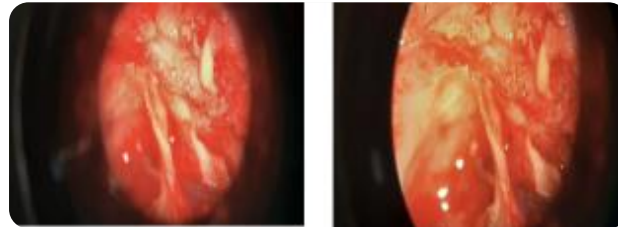


Figure 7 Presence of pus in the mastoid cavity, antrum, and tympanic cavity, covering the opening canal of the Eustachian tube.

After the operation, a follow-up was conducted, during which the patient reported pain in the surgical wound. However, there were no complaints of headaches, spinning dizziness, or pursed lips. Drain production was approximately \pm 1 cc. No signs of infection were observed in the surgical wound, prompting the opening of the head bandage. The surgical wound dressing was changed daily. On the 2nd day post-surgery, the patient still reported minimal pain, and there was no blood production from the drainage, leading to the removal of the drain.

On the 4th day after the operation, on July 19, 2021, the patient no longer complained of pain, and the wound was well-treated. Subsequently, the patient was discharged and advised to continue treatment through the ENT outpatient polyclinic. The patient was provided with home medications, including paracetamol 3x500mg, cefixime 2x200mg, and metronidazole 3x500mg.

The patient came to the ENT polyclinic on the 7th day after surgery, July 22 2021 (Figure 8). The surgical wound was treated and no signs of infection were found in the surgical wound. Two pieces of ribbon gauze that were attached were removed; the condition of the outer ear was evaluated postoperatively. No blood seepage was found, and other complications. From the results of anatomical pathology, histomorphology was found to be suitable for cholesteatoma.



Figure 8 Tympanic membrane of the right and left ears 7 days postoperatively

The patient came back to the ENT polyclinic on July 27 2021, 12 days after surgery (Figure 9). The patient said there were no complaints. The surgical wound was dry and the stitches were removed. The patient was advised to schedule regular weekly reviews at the ENT polyclinic.



Figure 9 Tympanic membrane of the right and left ears 12 days postoperatively

3. Discussion

Chronic Suppurative Otitis Media (CSOM) is a chronic inflammation of the middle ear accompanied by perforation of the tympanic membrane with a history of discharge from the ear (otorrhea) for more than 2 months continuously or intermittently. The Subperiosteal abscess can occur as a complication of acute or chronic otitis media. CSOM is one of the most common diseases in children and causes many complications of deafness, even death. In 2006-2010, 119 cases of a malignant type of CSOM were reported in H. Adam Malik Medan Hospital, where the most cases occurred at the age of 11-20 years, 53.78% male and 46.22% female. More than 70% of cases of complications due to otitis media are experienced by children. In this case, it was reported that a 16-year-old male complained of a boil-like lump on the right side of his head about 15 days before entering the hospital. At first, it was small but then the lump become bigger and it was said to be painful. Complaints accompanied by high fever. The patient has a history of intermittent discharge from the right ear, since he was 9 years old and never received any treatment.⁵

The diagnosis of CSOM is established based on history, physical examination, laboratory and radiology investigation. Anamnesis found symptoms of discharge from the ear (otorrhea) that are persistent or intermittent with a duration of more than 2 months. In subperiosteal abscess, clinical symptoms include persistent complaints of otalgia, fever, and otorrhea accompanied by swelling behind the ear. Clinical examination found abnormalities in the retroauricular area, ear canal and tympanic membrane to the middle ear mucosa. There is retroauricular swelling, a disappearance of retroauricular sulcus and auricle being pushed forward and downward. On palpation, there are fluctuations and when aspiration is carried out, pus will be obtained. In this patient, on physical examination, the general condition of the patient was found to be moderately ill with compos mentis awareness. On examination of the ear found to normal in the left ear. In the right ear, the external acoustic canal is narrow, there is no discharge and the tympanic membrane is difficult to evaluate. In the right temporoparietal region, there was a lump in size 9x8 cm, with redness, tender, warm and fluctuating. Aspiration was carried out to obtain as much as 10cc pus.^{6,7}

A Radiological examination can be performed with a Schuller, Mayer or Owen, Stenver, and Chause III projection which is useful for assessing the presence of cholesteatoma, mastoid pneumatization, and disease extension. The CT-Scan examination should be done early to determine the type of otitis media and detect whether there is destruction, pus formation, and the presence of intracranial infiltration. CT-Scan examination is the gold standard examination, in otitis media which is suspected to be accompanied by complications. In this patient, a CT scan with a focus on the mastoid was performed, and the CT scan results showed; Chronic otomastoiditis with right cholesteatoma and right temporoparietooccipital region subperiosteal abscess.^{6,8}

According to Zhang Yan, bacteria that are often found as causes of CSOM are aerobic bacteria such as *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Proteus sp*, and *Klebsiella sp*. Anaerobic bacteria in minimal quantities such as *Bacteroides*, *Peptostreptococcus*, and *Propionibacterium*. Among the bacteria that cause CSOM, *P. aeruginosa* is considered to be the most responsible because it most often causes progressive damage to the middle ear and mastoid structures due to the toxins and enzymes they produce. In this patient, the results of culture and sensitivity tests showed normal flora results. This is probably because the patient had received antibiotic treatment before the patient was referred.⁹

The principle of the malignant type of CSOM therapy (with cholesteatoma) is surgery that aims to eradicate cholesteatoma and reconstruct it. There are several surgical procedure options for dangerous types of CSOM, including aticotomies, canal wall-down procedures and canal wall-up procedures. Treatment of subperiosteal abscess includes intravenous antibiotics, incision and drainage of the abscess, and mastoidectomy. Ideally, antibiotics should be started after a gram stain and culture are obtained. A prompt mastoidectomy can help prevent further complications. According to research conducted by Psarommatis, simple mastoidectomy is an effective procedure for the management of subperiosteal abscess. In this patient, a right canal wall down mastoidectomy was performed under general anesthesia. Intraoperatively, cholesteatoma, granulation, and pus were found in the mastoid cavity, antrum, and tympanic cavity,

closing the orifice of the Eustachian tube. Destruction of the incus, scutum, and posterior wall of the external acoustic canal. Perforated tympanic membrane. Tissues suspected of cholesteatoma were examined for anatomic pathology. From the results of anatomical pathology, histomorphology was found to be suitable for cholesteatoma.^{8,10}

4. Conclusion

The principle of therapy for malignant types of CSOM (with cholesteatoma) is surgery for cholesteatoma eradication and reconstruction. Treatment of subperiosteal abscess includes intravenous antibiotics, incision and drainage of the abscess, and mastoidectomy. In this case report, we report a case of malignant chronic suppurative otitis media complicated by a subperiosteal abscess in a 16-year-old male patient. In this patient, incision and drainage were performed until pus was found to be minimal. After that, it was followed by a right canal wall down mastoidectomy under general anesthesia. Intraoperatively, cholesteatoma, granulation, and pus were found in the mastoid cavity, antrum, and tympanic cavity, closing the orifice of the Eustachian tube. Destruction of the incus, scutum, and posterior wall of the external acoustic canal. Perforated tympanic membrane. 12 days after surgery the patient said there were no complaints. The surgical wound was dry and the stitches were removed.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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