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Case report

Odontogenic brain abscess due to *Anaerococcus prevotii* infections: A case report and review article

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ABSTRACT

Background: Odontogenic brain abscess is a rare case primarily caused by normal flora such as *Anaerococcus prevotii*.
Case presentation: A 60-years-old Indonesian female complained of severe left side headaches, hearing loss, a decrease of consciousness, several episodes of nausea and vomiting, and hemiparesis dextra for 5 days. Three months previously, she performed dental operative procedures on the left side of the first and second lower molar and debridement of phlegmon on the left side of the mouth. Head CT scan suggests multiple brain abscesses or high-grade glioma, non-communicating hydrocephalus and suggestive mastoiditis. The patient underwent excision surgery and abscess culture, which resulted in *Anaerococcus prevotii*. The patient received a metronidazole antibiotic, and on the seventh day, his condition improved.
Discussion: Identifying bacterial infection in the brain abscess is crucial for effective treatment. Abscess removal in the brain and antibiotics are treatments for brain abscesses.
Conclusion: Odontogenic brain abscess caused by *Anaerococcus prevotii* infection effectiveness with surgical excision and antibiotics.

1. Introduction

Brain Abscess, a focal pyogenic of the brain, can be caused by bacteria, mycobacteria, fungi or parasites (protozoa and helminths) [1,2]. Various symptoms and signs depend on the abscess's number, location, and site [3]. The incidence of brain abscess has approximately 0.2 to 1.9 in 100.000 new cases per year and reported 0–24% mortality [4,5]. The underlying mechanism includes cranial trauma with direct injection of bacteria into the brain, extension of infection from an adjacent cranial focus and metastatic bacteraemia sent from a distant source of disease [5,6]. One of the causes of brain abscess is a complication of dental infection or odontogenic infection, which is a gap for bacteria to enter the brain. This is a rare case in brain abscess incidents [7]. We are interested in reporting the issue of an Indonesian female with an odontogenic brain abscess due to *Anaerococcus prevotii* infection. We write based on the SCARE 2020 guideline [8].

2. Case presentation

A 60-years-old Indonesian female complained of severe left side headaches, hearing loss, a decrease of consciousness, several episodes of nausea and vomiting, and hemiparesis dextra for 5 days. Severe left side headaches were not relieved with rest and analgetic. She also has 2 weeks history of fever without seizures. Three months previously, she performed dental surgery caused by mandibular osteomyelitis. The patient had no chronic illnesses, diabetes mellitus, or immunodeficiency history. Laboratory marker infection: leucocytes of 17,800/μL, neutrophil of 71.1%, lymphocytes of 21.5%, and C-reactive protein of 0.9 ng/mL. Head CT scan showed multiple lesions with interracial mixed density surrounded by perifocal odema in the left frontotemporoparietal region with the most significant size of 3.4 × 3.2 × 2.6 cm that caused a midline shift 1.2 cm to the right (Fig. 1). Dilatation of the lateral ventricle's temporal horn suggests non-communicating hydrocephalus. The left mastoid air cell was filled, suggestive of mastoiditis. The patient received antibiotic ceftriaxone, metronidazole, and corticosteroid/dexamethasone from the first admission. Next, the patient underwent a

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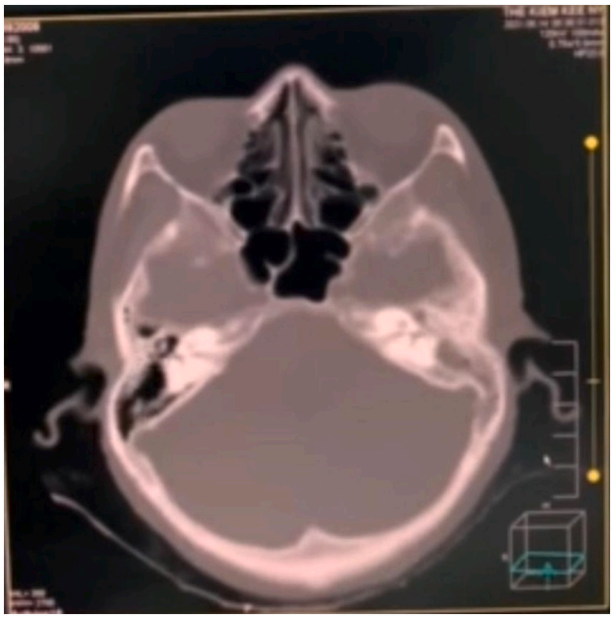

Fig. 1. Head CT-scan revealed features suggestive of multiple brain abscess.

surgical excision (craniotomy).

Post-surgery, abscesses and tissue specimens were analyzed in the microbiology department. Culture from brucella agar showed growth of anaerobic bacteria, and no increase was seen in aerobic culture. The gram stain shows cocci gram-positive bacteria. The bacteria were identified as *Anaerococcus prevotii* using Vitek 2 Compact bioMerieux (Fig. 2). Then antibiotic susceptibility test (AST) was carried out on both specimens. The pathogen bacteria were resistant to metronidazole, moxifloxacin, cefoxitin, meropenem, piperacillin-tazobactam, clindamycin, penicillin, cefotaxime, tetracycline, amoxicillin-clavulanate, chloramphenicol, ampicillin-sulbactam and no sensitive or intermediate antibiotics susceptible.

The patient was treated with ceftriaxone 1 g every 12 h and metronidazole 0.5 g every 8 h. Total administration of antibiotics was 24 days for ceftriaxone and 22 days for metronidazole. The craniotomy intervention and antibiotic treatment showed significant improvement in the right side of the body's motor ability and presented no sign of headache or vomiting. She was permitted to be discharged on the seventh postoperative day. The patient received oral antibiotics, cefixime 200 mg twice daily and metronidazole 500 mg 3 times daily for 6–8 weeks.

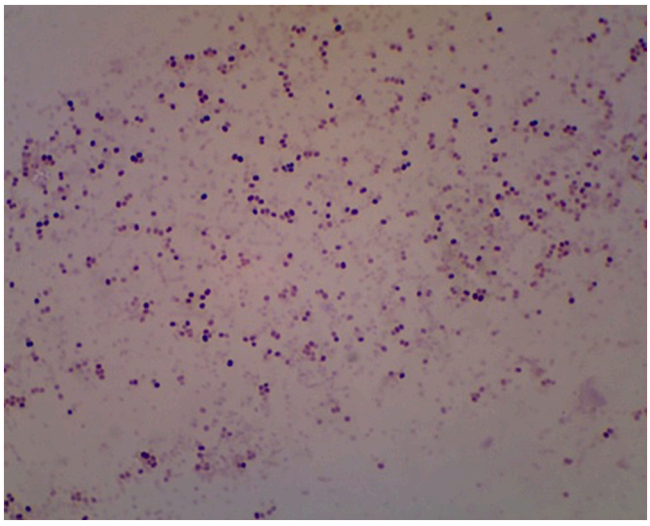

Fig. 2. *Anaerococcus prevotii* in gram stain of gram-positive coccus appears with a high-power field.

3. Discussion

Brain abscess is a focal suppurative process of the brain parenchyma. The most frequent intracranial locations of brain abscess are frontal, temporal, frontal-parietal, cerebellar, and occipital lobes [6]. Less frequent etiologies include dental infection, cardiac anomalies, associated endocarditis, and pulmonary infections [7]. Approximately 5–7% of brain abscesses are caused by dental disease and manipulation [9]. Most cases of odontogenic brain abscesses are caused by anaerobic species as much as 78% [10].

To prove that an abscess has genuinely developed from odontogenic sources, 3 criteria should be met, including no alternative source of bacteremia is found, the bacteria responsible for the bump are typically found in the oral microflora, and clinical sign of the active dental disease is present [1,7]. Clinically, there is usually a latent period of several days or weeks before symptoms of intracranial involvement appear. The first radiologic signs of brain abscess can be seen on CT-scan examination 2–3 weeks after the infection begins [10]. Identifying bacteria in brain abscesses is essential to therapy success because having the right antibiotic minimizes drug resistance [11,12].

Management of odontogenic brain abscesses with multiple brain abscesses such as surgical excision and intravenous antibiotics. Surgical excision removes brain abscess to prevent the spread of infection and save tissue. Abscess removal is also used to identify the type of bacteria causing the abscesses [13,14]. The results of bacterial identification showed that *Anaerococcus prevotii* was a gram-positive, anaerobic bacteria and was also described as a common resident of the normal flora of the skin, the oral cavity and the gut [15]. Previous studies have shown that *Anaerococcus prevotii* is sensitive to metronidazole, and AST is used for confirmation before its use [16,17]. Usually, “triple high dose” antibiotics are recommended intravenously for 2 weeks, followed by 4 weeks of oral therapy. In the case of immunocompromised patients, antimicrobial drugs are given for 3–12 months [18].

The limitation of the study, such as the operative procedure of the COVID-19 pandemic, is that patients who require immediate treatment are waiting to be carried out RT-PCR, and the operative time is slightly shifted.

4. Conclusion

Odontogenic brain abscess is a rare case caused by *Anaerococcus prevotii* infection, which is included in the normal flora. Management of odontogenic brain abscess includes surgical excision and use of antibiotics in which an abscess culture needs to be performed for efficiency.

Consent

Written informed consent was obtained from the guardian/patient family for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

Not applicable.

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Author contribution

All authors contributed toward data analysis, drafting and revising

the paper, gave final approval of the version to be published and agree to be accountable for all aspects of the work.

Guarantor

Eddy Bagus Wasito is the person in charge of the publication of our manuscript.

Registration of research studies

Not applicable.

Provenance and peer review

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Declaration of competing interest

Suharyadi Sasmanto and Eddy Bagus Wasito declare that they no conflict of interest.

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