



Brain Abscess Caused by Untreated Chronic Infection of the Ear

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ABSTRACT

Brain abscess is a localized pyogenic reaction in brain tissue caused by a variety of microorganisms. The direct intracranial route of spread is more frequently associated with subacute and chronic otitis media infections. This case report presented a young adult who had brain abscess with the history of chronic otitis media infection (CSOM) in his ear. The patients came with headache occurs continuously and persists and often feels worse in the morning and towards the evening, making it impossible for the patient to rest. From the case, we can conclude that CSOM that is not treated properly can develop into a life-threatening brain abscess.

Keywords: Brain Abscess, Chronic otitis media infection, untreated

BACKGROUND

Intracranial abscess is a rare and life-threatening serious infection. Intracranial abscesses include brain abscesses and subdural or extradural empyema, classified according to anatomical location or etiologic agent.¹ Intracranial abscesses may originate from infection of adjacent or surrounding structures (e.g. otitis media, dental infection, mastoiditis, sinusitis), secondary to hematogenous spread from a specific site. (especially in patients with cyanotic congenital heart disease), after skull trauma or surgery, and rarely, occurs after meningitis. In at least 15% of cases, no source can be identified. In recent years, the etiology of the complex series of agents causing brain abscesses has become better understood.²

Brain abscess is caused by an intracranial inflammatory process which continues with the formation of an abscess. The most frequent intracranial locations (in order of frequency) are frontal-temporal, frontal-parietal, parietal, cerebellar, and occipital lobes.³ In at least 15% of cases, the source of infection is unknown (cryptogenic).⁴ Infection can enter the intracranial compartment directly or indirectly via 3 routes, namely originating from a nearby suppurative focus (45-50% of cases), hematogenous spread from a distant focus (25% of cases), and trauma (10% of cases).⁵

Brain abscesses are more common in men than women, especially occurring in the first 4 decades of life. Because the main predisposing cause of subdural empyema in young children is bacterial meningitis, the reduction in the incidence of meningitis due to Haemophilus influenzae vaccine has reduced the prevalence in young children.⁶ In about two-thirds of patients with brain abscess, symptoms are present for 2 weeks or less. Most symptoms appear based on the size of the lesion and the location of the SOL (Space Occupying Lesion). The triad of symptoms such as fever, headache (severe attacks especially around the abscess site), and focal nerve deficits occur in less than a proportion of patients. A headache that feels suddenly worse, followed by signs of meningismus, is often associated with the rupture of an abscess.¹ This case report aimed to describe brain abscess case in young adult with history of chronic suppurative otitis media.

CASE PRESENTATION

A 16 year old male patient came to the emergency room at Dr. RSUP. M. Djamil with the main complaint of headache on the right side which had been felt for the past 6 days and felt increasingly severe since 1 day before entering the hospital. Headache is mainly felt on the right side, around the right ear. When a headache occurs, the patient closes his eyes a lot and groans in pain. The headache occurs continuously and persists and often feels worse in the morning and towards the evening, making it impossible for the patient to rest. To reduce headaches, patients prefer to lie on their left side. A white, foul-smelling fluid had been coming out of the patient's right ear for 2 days before entering the hospital. Previously, the patient had a history of suffering from chronic suppurative otitis media (CSOM) in the right and left ears, and watery ears every time he had a fever, especially the right ear. Most brain abscesses arise as a result of direct spread from a middle ear infection, sinusitis, or mastoiditis. It is possible that in this patient, there was a spread of the right middle ear infection, namely dangerous type CSOM, to the intracranial (temporal lobe) so that the headache was felt, especially on the right side.

DISCUSSION

Headaches that occurred due to stretching of the duramater due to increased mass in the brain. The duramater is one of the pain-sensitive structures in the brain. From the results of the physical examination, no neurological deficit was found. We did not find any signs of meningeal stimulation on the patients.

Based on research by Adril, et al., on observations of the management of brain abscesses at RSUD dr. Soetomo Surabaya found only 9% of clinical neck stiffness.

The results of routine blood laboratory examinations showed that the patient had leukocytosis. Leukocytosis describes an ongoing infectious process in the body. Based on the results of the CT scan, a hypodense lesion was seen in the right temporal lobe and after administering a contrast solution, an enhancement ring and perifocal edema were seen, with an abscess measuring 4.4 x 4 x 2.6 cm. The conclusion is that there is a cerebral abscess in this patient. Apart from that, the CT scan also shows a picture of right mastoiditis. Abscess formation in the right temporal lobe can be a direct spread of infection to the mastoid. Therefore, based on the history, physical examination and CT scan results as the Golden Standard examination for abscesses, the diagnosis of this patient was cerebral abscess. Based on literatures, subacute and chronic otitis media accompanied by mastoiditis generally spreads to the inferior temporal lobe and cerebellum.

The medical therapy given was a combination of generation III cephalosporins, namely ceftriaxone and metronidazole, which is an alternative combination option for brain abscess patients. The length of antibiotic treatment depends on the patient's clinical condition but is usually given intravenously for 6-8 weeks followed by orally for 4-8 weeks to prevent relapse. Apart from that, corticosteroids in the form of dexamethasone are also given which are useful for reducing the cerebral edema that occurs. Although the administration of corticosteroids is still controversial. The dose is 16 mg/day in adults and 0.5 mg/kg/day in children.

In cerebral edema due to brain abscess dexamethasone can be given 10 mg IV, followed by 4-6 mg every 6 hours. The disadvantages of administering corticosteroids are reduced antibiotic penetration ability, reduced capsule formation, and increased necrosis. Corticosteroid use should be of short duration and the dose needs to be reduced gradually (tapering off).⁸ The patient also received Codeine at a dose of 3x30 mg as an analgesic to relieve the headache the patient was experiencing. Codeine is an opioid analgesic drug that is used to relieve mild to severe pain. This drug works directly on the central nervous system.⁹

The indication for surgery for a cerebral abscess is if an abscess is found with a diameter of > 2.5 cm and a definitive capsule has been formed that is visible on imaging. The surgical procedure performed can be aspiration of the abscess or excision or both. This therapeutic measure is useful for isolating the organism and reducing Intracranial Pressure (ICP). The prognosis for this patient was likely to be good. Because with good management, the majority of cerebral abscess patients can be cured.¹⁰ The patient's prognosis was good because the onset occurred at a young age, and in addition it was not accompanied by severe neurological deficits, there was no worsening of symptoms at the start of therapy, and there were no comorbid factors.

Conclusion

An abscess is defined as inflammation and purulence in one or more localized areas within the brain parenchyma. Brain abscess is a localized pyogenic reaction in brain tissue caused by a variety of bacteria, fungi and protozoa. In the United States, before the emergence of the AIDS pandemic, brain abscesses were estimated at 1 per 10,000 hospital patients, or 1500-2500 cases per year. The prevalence of brain abscesses in AIDS patients is higher, so the overall rate is increasing. The frequency of fungal brain abscesses is increasing due to frequent administration of broad-spectrum antimicrobials, immunosuppressive agents, and corticosteroids.

Clinical symptoms of cerebral abscess can vary based on the level of disease, virulence of the microorganism, focus of infection, current immune status of the patient, location of the abscess, number of lesions, and whether or not it is accompanied by meningitis or ventriculitis. Initial efforts to make a microbiologic diagnosis are important in planning appropriate antimicrobial therapy. The introduction of CT-guided needle aspiration can provide this important information. Repeated scans, at least once per week, are critical in consolidating treatment response. Although surgical intervention remains an important treatment, patients may respond adequately to antibiotics alone.

Conflict of Interest

No potential conflict of interest relevant to this article was reported

Acknowledgements

The manuscript preparation was supported by Research and Community Services (LPPM) Universitas Andalas, Andalas University and all the sectors involved.

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