Brain abscess from odontogenic infection

- Fusobacterium necrophorum Brain Abscess Following Invasive Sinusitis in an Immunocompetent Adult: A Case Report
- Clinicopathological heterogeneity and complexity of polymicrobial brain abscesses
- Odontogenic brain abscess caused by Porphyromonas gingivalis and Streptococcus constellatus: a case report and review article
- Spontaneous brain abscess formation: challenge of a shifting pathogen spectrum over the last 21 years - a single center experience
- Odontogenic (hematogenic) or sinusopathy (contiguous) brain abscess: Case report
- Brain Abscess in the Contralateral Frontal Lobe Associated with Frontal Sinusitis that Spread from Odontogenic Maxillary Sinusitis
- Undetected permanent dental inflammation as a possible trigger for brain abscesses? A retrospective analysis over the last 2 decades
- Complicated Odontogenic Sinusitis: Extrasinus Infectious Spread

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Epidemiology

Odontogenic and maxillofacial infections are relatively uncommon [1] According to a retrospective study, about 13.6% of brain abscess infections originated from odontogenic etiology [2]

Pathophysiology

In cases of odontogenic infection, bacteria from an infected tooth, periodontal tissues, or oral cavity can enter the bloodstream, leading to the formation of septic emboli. These emboli can travel to the brain through the arterial circulation, causing infection and the subsequent development of an abscess.

Clinical Presentation

Neurological Symptoms: Patients may experience symptoms such as headache, focal neurological deficits, seizures, altered mental status, or even coma, depending on the size and location of the abscess. Dental Symptoms: The primary dental source, such as a dental abscess or periodontal infection, may or may not be symptomatic.

Diagnosis

Imaging Studies: Brain imaging, particularly contrast-enhanced computed tomography (CT) or magnetic resonance imaging (MRI), is essential for visualizing the abscess. Dental Evaluation:

Identification of the odontogenic source through dental imaging and clinical examination.

Treatment

Antimicrobial Therapy: Broad-spectrum antibiotics are typically initiated to cover a range of potential causative bacteria. Antibiotics may be adjusted based on culture and sensitivity results. Surgical Drainage: Aspiration or surgical drainage of the abscess is often necessary to remove pus and alleviate pressure within the brain.

Dental Treatment: Definitive treatment involves addressing the dental source of infection through procedures such as tooth extraction, root canal therapy, or periodontal intervention.

Complications

Untreated or inadequately managed brain abscesses can lead to severe complications, including neurological deficits, meningitis, and even death.

Prognosis

Prompt diagnosis and intervention significantly improve the prognosis. Successful treatment requires collaboration between neurosurgeons and dentists to address both the intracranial and odontogenic components of the infection.

Management involves a multidisciplinary approach, and timely and appropriate interventions are crucial to prevent long-term neurological sequelae and complications.

Literature reviews

Brain abscess of odontogenic origin: A case report and literature review [3].

Potential infection foci in the oral cavity and their impact on the formation of central nervous system abscesses: A literature review [4].

Case reports

A case of a brain abscess arising from dental sinusitis due to an incomplete infection defense mechanism linked to a post-fusion linear skull fracture. The patient initially presented with a persistent headache, which was diagnosed as frontal sinusitis. Consequently, antibiotic treatment was

started. However, due to a refractory response to antibiotics, MRI was performed, which revealed a brain abscess in the frontal lobe adjacent to the right frontal sinus measuring 40 mm in diameter. This abscess was surgically drained and cultured. Initially, the patient was treated with three antibiotics, which were eventually de-escalated. The cultures revealed nasal commensal bacteria, suggesting a direct spillover from sinusitis leading to a brain abscess. A tooth with root inflammation, which had been left untreated and resulted in bone melting of the maxillary sinus wall, was extracted. After more than eight weeks of antimicrobial therapy, improvement in the clinical and imaging findings was noted, and the patient was discharged. Brain abscesses may develop from sinusitis even after linear fractures have healed due to a continued incomplete infection defense mechanism. Moreover, root and sinus infections should undergo evaluation, including the upper dental crown using coronal computed tomography, and treatment should be initiated promptly [5].

A 47-year-old woman who presented with high fever, disturbed consciousness, headache, and neck pain. Imaging studies revealed a ring-shaped enhanced mass in the left frontal lobe causing a mass effect and midline shift. Magnetic resonance spectroscopy revealed a peak alanine concentration of 1.5 ppm. Supraorbital keyhole surgery with abscess removal was performed, and a bacterial culture confirmed a diagnosis of Parvimonas micra infection. After undergoing 6-week antibiotic treatment, the patient's symptoms resolved completely. No recurrence of abscess was observed during the follow-up period. Although brain abscess caused by P. micra has rarely been reported, an odontogenic origin should be investigated, especially when a patient has a history of periodontal infection or tooth extraction [6]

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A 64-year-old male with a history of septal myocardial infarction, hypertension, and previous smoking. Experienced an episode of blockage and disorientation during work, followed by tonic-clonic movements of the left lower limb. Admitted to the emergency room, where a stroke code was activated.

Diagnosed with a right parietal brain abscess with rapid evolution, possibly secondary to odontogenic infection. Underwent craniotomy for abscess excision, showing postoperative changes, intraparenchymal hemorrhages, and an epidural collection. Progressed favorably, without new seizures, preserved mobility, and a GCS of 15. Consideration for transfer for ongoing antibiotic treatment and definitive treatment of dental phlegmon. Recommendations:

Neurosurgical Follow-up:

Evaluate postoperative evolution and the mass effect, ensuring no additional complications. Antibiotic Treatment:

Continue intravenous antibiotic treatment as recommended by the infectious diseases service. Evaluation by Maxillofacial Surgery:

Manage the interconsultation for definitive treatment of dental phlegmon and coordinate any necessary interventions. Seizure Monitoring:

Continue with anticonvulsant prophylaxis and monitor the need for medication adjustments based on clinical evolution. Complication Monitoring:

Be vigilant for possible postoperative complications, such as infections, hemorrhages, or changes in neurological status. Neurological Follow-up and Rehabilitation:

Assess neurological status in terms of strength, mobility, and functional capacity. Consider referral to rehabilitation services as needed. Control of Cardiovascular Risk Factors:

Maintain control of existing cardiovascular risk factors, including hypertension, and adhere to cardiology follow-up. Patient Education:

Provide information to the patient about the importance of medical follow-up, adherence to treatment, and the need for dental care. Coordination of Transfer:

Arrange the patient's transfer to the referral hospital to continue antibiotic treatment and coordinate comprehensive care. Outpatient Follow-up Consultation:

Plan an outpatient follow-up consultation to assess evolution and make adjustments to the treatment plan as needed.

1)
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