

An uncommon cause of headache

Uma causa incomum de cefaleia

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Keypoints

What is known

- Brain abscesses are rare infections of the central nervous system.
- The classic triad of manifestations consists of fever, headache, and focal neurological deficits.
- The presence of *Streptococcus intermedius* should make us suspect an oropharyngeal source.

What is added

- Fever can be absent and neurological deficits may be subtle, making differential diagnosis more challenging.
- Both brain abscesses and neoplastic lesions show surrounding edema, indistinguishable by CT, making MRI crucial for diagnosis.

A 15-year-old male was brought to the emergency department because of a frontal headache lasting four days, which made him wake up in the night and led to vomiting since the day before. He also reported discomfort in the lower left limb that was associated with previous soccer training. The patient denied having fever. On observation, he was in good general condition and hemodynamically stable. At the neurological examination, he scored 15 points on the Glasgow Coma Scale, displayed adequate speech, and was oriented in time and space. However, he had decreased muscle strength against resistance in the left upper and lower limbs (grade 4), with positive Barré and Mingazzini tests on the same side. Osteotendinous reflexes were present and meningeal signs were absent.

Complete blood count, ionogram, liver and kidney function, uric acid and lactic dehydrogenase tests were normal, with a C-reactive protein of 36.1 mg/L. A computed tomography scan revealed an expansive right

frontal lobe lesion measuring 22 x 38 x 27 mm, hypodense, with a thin ring uptake after intravenous iodinated contrast, and with marked surrounding edema. Diagnostic hypotheses of an abscess or neoplastic lesion were considered, and a magnetic resonance imaging (MRI) was performed, confirming the diagnosis of a brain abscess, which led to a mass effect with obliteration of the cortical grooves and a midline shift to the left. The MRI also showed normal ventilation of the sinus cavities and no abnormal mastoid fillings.

Surgical drainage was performed (by aspiration) and intravenous antibiotic therapy with ceftriaxone and metronidazole was started. The symptoms of intracranial hypertension (vomiting and headache) ceased and the neurological deficits progressively improved. *Streptococcus intermedius* was isolated from the drained purulent contents. Antibiotic treatment was maintained for 6 weeks. He is clinically well and remains on levetiracetam to this day.

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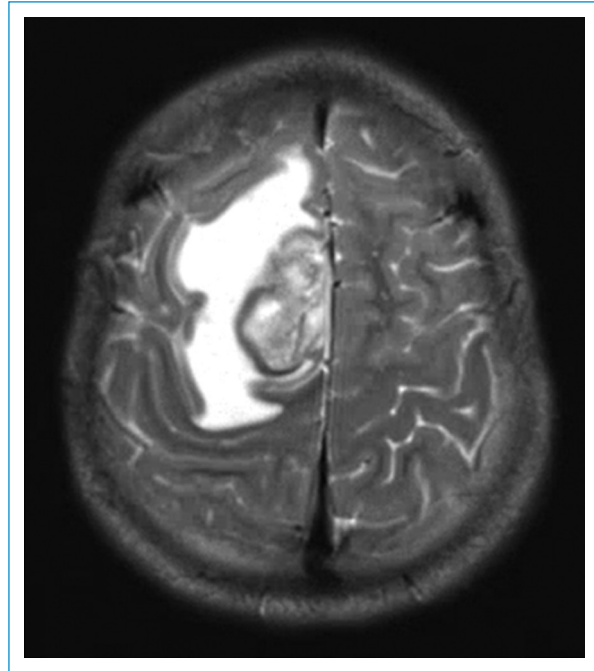


Figure 1. MRI, transverse plane.

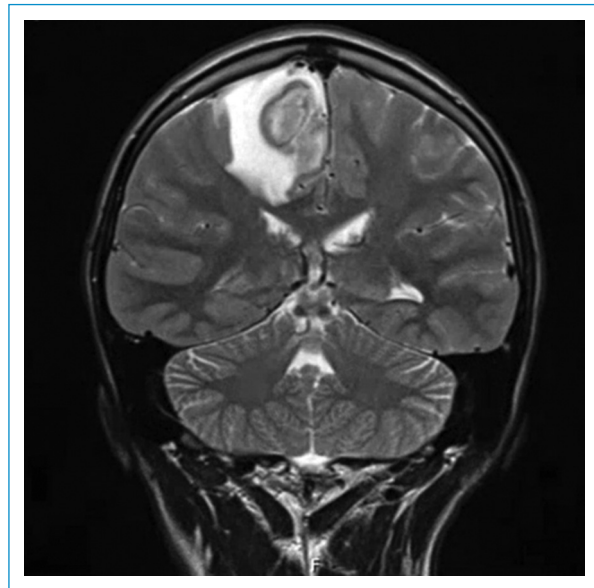


Figure 2. MRI, coronal plane.

The air-filled paranasal sinuses on the MRI, the absence of abnormal mastoid fillings as well as other symptoms, the isolated microorganism, and the personal history of dental cavities under treatment increased the likelihood that the origin of the disease was odontogenic.

Brain abscesses are rare focal infections of the brain parenchyma that are characterized by the accumulation of purulent content and surrounding edema^{1,2}. They may result from direct inoculation (head trauma, neurosurgical procedures), from contiguous spread (through sinusitis or mastoiditis, for example) or from hematogenous spread (from a distant source of infection)³. Odontogenic infections occur in teeth and their supporting structures and dental cavities are often found at the source. Through contiguous or hematogenous spread, this type of infection can move to the brain parenchyma and form an abscess, with the frontal lobe being the most affected in these cases².

Streptococcus intermedius is a gram-positive bacterium that is part of the *Streptococcus anginosus* (or *Streptococcus milleri*) group. Members of this group are part of the normal microbiota, being frequently involved in brain and liver abscesses and thoracic empyemas. Previous dental manipulation is a risk factor for infections by these agents⁵.

The classic triad of manifestations consists of fever, headache, and focal neurological deficits, but it is present in only a small percentage of cases^{1,3,4}. Fever may be absent in more than 60% of cases³. Nausea and vomiting (due to increased intracranial pressure), seizures, and changes in the state of consciousness are common^{1,3}. Symptoms can be subtle, especially at the beginning, so the average duration between the onset and the diagnosis is seven to 11 days¹. In this case, with no fever, the subtle neurological deficits prompted an investigation that led to an earlier diagnosis.

Author contributions

M. Sousa Santos: Conception and design of the study, report, review or other type of work or paper; Acquisition of data either from patients, research studies, or literature; Analysis or interpretation of data either from patients, research studies, or literature; Drafting the article; Final approval of the version to be published; Agreement to be accountable for the accuracy or integrity of the work. E. Pereira: Conception and design of the study, report, review or other type of work or paper; Acquisition of data either from patients, research studies, or literature; Analysis or interpretation of data either from patients, research studies, or literature; Critical review of the article for important intellectual content; Final approval of the version to be published; Agreement to be accountable for the accuracy or integrity of the work. J.A. Costa: Final approval of the version to be published; Agreement to be accountable for the accuracy or integrity of the work. F. Rodrigues: Acquisition of data either from patients, research studies, or literature; Analysis or interpretation of data either from patients, research studies, or literature; Final approval of the version to be

published; Agreement to be accountable for the accuracy or integrity of the work.

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Conflicts of interest

None.

Ethical considerations

Protection of humans and animals. The authors declare that the procedures followed complied with the ethical standards of the responsible human experimentation committee and adhered to the World Medical Association and the Declaration of Helsinki. The procedures were approved by the institutional Ethics Committee.

Confidentiality, informed consent, and ethical approval. The authors have followed their institution's

confidentiality protocols, obtained informed consent from patients, and received approval from the Ethics Committee. The SAGER guidelines were followed according to the nature of the study.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

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