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CASE REPORT

A thalamic brain abscess in an immunocompetent patient

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Introduction

Brain abscesses are serious infections, associated with a range of neurological symptoms and severe complications. They rarely present with the pathognomonic triad of symptoms of headache, fever and focal neurology, which can make clinical diagnosis difficult. Imaging and tissue sampling are therefore paramount for efficient diagnosis and management.

This article discusses an unusual presentation of brain abscess of unclear acquisition with normal levels of inflammatory markers; thalamic brain abscesses are rare. Appropriate investigations to identify the causative organism are vital to guide therapy.

Discussion

Brain abscesses are significant infections associated with neurological symptoms and risk of complications. They are caused by the spread of pathogens after otitis, sinusitis, traumatic brain injury or haematogenous dissemination (Cantiera et al, 2019). Thalamic

Case report

A 46-year-old woman presented to the emergency department with a 6-day history of worsening headache associated with vomiting, photophobia and unsteadiness on her feet. She did not report any fevers, neck stiffness or limb weakness and did not usually experience migraines. She was fit in herself before this, with a past medical history of necrotising fasciitis around 15 years ago but otherwise unremarkable. On further history, she reported having attended the dentist about 6 months ago for removal of a filling. She had no history of intravenous drug use, no recent trauma or illnesses.

On examination, she did not show any focal neurological symptoms, but she did have an ataxic gait. Her pupils were normal in size bilaterally, and she demonstrated sensitivity to light. She was afebrile at the time of presentation and her inflammatory markers on admission were C-reactive protein <1 mg/dl, white cell count 12.47×10^9/litre and neutrophils 10.34×10^9/litre.

She was further investigated with a computed tomography scan of the head and magnetic resonance imaging which supported a diagnosis of thalamic abscess (Figure 1), with a possible differential diagnosis being thalamic glioma.

She was started on vancomycin, metronidazole and ceftriaxone as per guidelines and scheduled for surgical aspiration the next morning under neurosurgery. Samples of pus sent for culture and sensitivity grew *Streptococcus intermedius*, so her antibiotics were optimised to continue a minimum of 6 weeks of intravenous ceftriaxone and oral metronidazole.

Postoperatively, she underwent a computed tomography scan of the chest, abdomen and pelvis which showed a previously biopsied 16 mm nodule in the right outer breast, already noted in a previous computed tomography but 2 mm bigger than it was before. The patient was referred to a breast clinic for further assessment of the mass, which was biopsied while she was an inpatient and deemed to be benign. She also received an orthopantomogram, which returned normal. She was tested for HIV (human immunodeficiency virus) and found to be negative, and an echocardiogram showed no evidence of endocarditis. The patient was clinically well postoperatively, with no focal neurological complications.

A post-drainage magnetic resonance imaging of the head (Figure 2) revealed partial drainage of the thalamic abscess. Her blood results showed improving levels of inflammatory markers and there was no clinical evidence of infection during her admission. She was discharged a week after surgery with at home intravenous antibiotic therapy. A follow-up magnetic resonance imaging scan 2 months after drainage (Figure 3) showed complete resolution of the abscess.

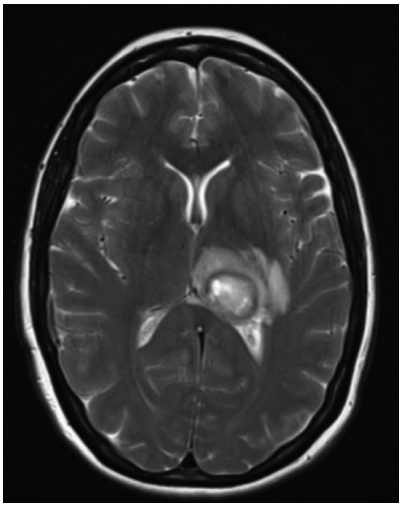

Figure 1. Magnetic resonance imaging of space-occupying lesion, consist with thalamic brain abscess.

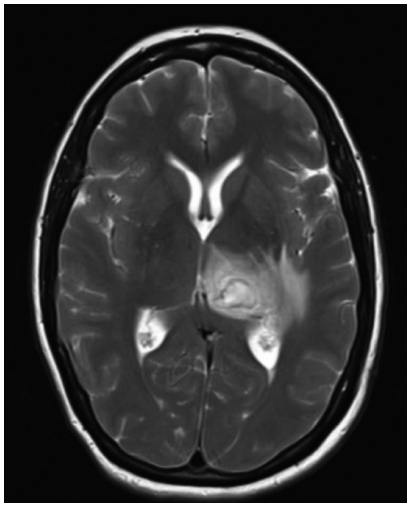

Figure 2. Postoperative magnetic resonance imaging of the drained thalamic abscess.

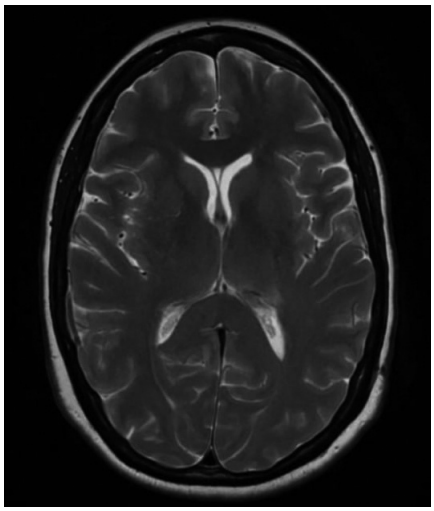

Figure 3. Follow-up magnetic resonance imaging scan 2 months post-surgery showing resolution of the abscess.

brain abscesses are much rarer than other cerebral abscesses, with only a few cases reported (Ganesan et al, 2019).

The triad of symptoms of headache, fever, and focal neurology is present only in about 20% of patients (Crespo et al, 2020). Symptoms of raised intracranial pressure are more common, including nausea, vomiting, photophobia and a reduced level of consciousness. This makes it difficult to differentiate clinically between abscesses and other causes of raised intracranial pressure (Ganesan et al, 2019).

As clinical diagnosis can be difficult as a result of the different symptomatology that abscesses can cause, imaging plays a substantial role in diagnosis. Typically, a rim-like enhancement with surrounding oedema is seen on magnetic resonance imaging, although this is similar to the appearance of necrotic malignant tumours (Liu et al, 2018). As imaging modalities often cannot distinguish between abscesses and other space-occupying lesions such as brain cancers, tissue sampling is ultimately required to making a diagnosis and initiate treatment.

All patients should be investigated for a primary source of infection with HIV testing as well as blood cultures. A computed tomography scan of the chest, abdomen and pelvis should be requested to rule out intrapulmonary or intra-abdominal primary sources of infection should this not be clear, and an orthopantomogram can be requested to investigate dental infection. Finally, a transthoracic echocardiogram is needed to investigate endocarditis if there is clinical suspicion for it.

Management of patients with brain abscesses involves a joint medical and surgical approach with long-term antibiotic treatment and surgical drainage (Muzumdar et al, 2011).

Learning points

- Thalamic brain abscesses are rarer than other brain abscesses and their clinical diagnosis can be challenging.
- Magnetic resonance imaging in conjunction with appropriate diagnostic sampling, as guided by clinical history, is essential to initiate appropriate joint medical and surgical treatment.
- Brain abscesses have a high degree of morbidity and mortality and should be investigated and treated with high priority.
- Clinicians should have high suspicion of a brain abscess in patients presenting with features of raised intracranial pressure and enhancing brain lesions, even in the presence of normal inflammatory markers and no clinical signs of sepsis.

Brain abscesses are associated with high morbidity and mortality (Campioli et al, 2021), with mortality ranging from 5% to 32% (Patel and Clifford, 2014). About half of the patients will retain some degree of neurological deficit, including epilepsy, hemiparesis or dysphasia (Crespo et al, 2020).

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