CASE REPORT

The diagnostic dilemma of cerebellopontine angle lesions: re-evaluating your diagnosis

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SUMMARY

An unusual presentation of a life-threatening cerebellopontine abscess shows the importance of re-evaluating existing diagnoses when the clinical picture changes. Despite being rare, brain abscess is a potentially fatal condition that requires early radiological and surgical intervention. It has a varied presentation, with many cases showing no localising typical features, making it hard to diagnose at presentation. A high index of suspicion should be applied to cases exhibiting rapidly changing neurology. This is the first reported case of cerebellopontine abscess with no primary infective foci.

BACKGROUND

This is an unusual clinical and radiological presentation of an abscess of the cerebellopontine angle (CPA) region which resulted in potentially life-threatening complications. This rare case highlights the importance of questioning and reviewing the initial diagnosis when the clinical picture changes. The authors believe this to be the first reported case of primary cerebellopontine abscess.

CASE PRESENTATION

A hotel manager in his late 40s presented to the regional infectious diseases unit with diplopia, dizziness and headache. He described no infective symptoms, presenting without fever on admission and not complaining of fevers, night sweats or weight loss. A few weeks previously, he had presented with similar symptoms to the neurosurgeons in Southern England where a CT head was reported as normal with an MRI showing a 4 mm area of signal alteration in the cerebellar peduncle, presumed to represent an epidermoid cyst. Physical examination was unremarkable other than nystagmus worse on left lateral gaze. No palpable lymphadenopathy was present, with no evidence of intravenous drug abuse.

INVESTIGATIONS

Serology, vasculitis screen and CT of brain detected no abnormalities. A lumbar puncture revealed a mild elevation in white cell count and significant elevation of protein in the cerebrospinal fluid. A provisional diagnosis of chemical meningitis from presumed epidermoid rupture was made and he was started on acyclovir and ceftriaxone.

Over the next 10 days, he developed numbness around his right jaw. Clinical examination revealed bilateral horizontal nystagmus, worse on left gaze with an associated sixth nerve palsy. There were no limb deficits, and tests of coordination were

unremarkable. MRI was performed which showed a lobulated cavity centred on the right middle cerebellar peduncle extending into the CPA (figure 1). This was thought to be an epidermoid tumour and his antibiotics were stopped.

He was therefore transferred to the neurosurgical department. He gave a history of previous employment in the meat industry, and further serological tests to investigate parasitic cysts were sent.

While waiting for these investigations to be completed, his neurological status deteriorated, and he developed a facial palsy with dysarthria. Repeat MRI of brain revealed enlargement of the lesion with brainstem compression and hydrocephalus (figure 2). As his Glasgow Coma Scale began to drop over the day, he underwent insertion of a ventricular access device as an emergency case. He was taken to the theatre on the following day for an image-guided biopsy of the cerebellopontine lesion (figure 3).

DIFFERENTIAL DIAGNOSIS

(CPA) lesions are infrequent and represent 6–10% of all intracranial tumours. Acoustic neuromas and meningiomas are the two most frequent lesions that account for approximately 85–90% of all CPA tumours. The other 10–15% encompass a large variety of lesions. Epidermoid tumours are the third most frequent tumour of the CPA, arising from

Figure 1 MRI, February 2012, shows high T2 signal in the right middle cerebellar peduncle, with a small nodule, no contrast was given. Lesion appearances are non-specific.

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Figure 2 MRI, March, shows a lobulated cavity centred on the right middle cerebellar peduncle on T2-weighted imaging extending into the cerebellopontine angle, with peripheral enhancement on post Gd T1-weighted imaging. Differential diagnosis: epidermoid cyst, parasitic cyst and abscess.

normal epithelial cells included during neural tube closure. After this, dermoid and arachnoid cysts are a possibility.

Significantly rarer differentials include lipomas, which are rarely symptomatic, with conservative follow-up often preferred to resection. Vertebral and basilar artery branches pass through the cerebellopontine cistern, where aneurysms can cause symptoms.

TREATMENT

The lesion was aspirated under image guidance and the specimens grew streptococcus intermedius, sensitive to ceftriaxone and metronidazole. The gentleman recovered well and was discharged after 6 weeks of intravenous antibiotics.

Figure 3 MRI, April, shows significant enlargement with similar imaging characteristics. Differential diagnosis: likely abscess.

OUTCOME AND FOLLOW-UP

The source of infection remains unclear. Transoesophageal echo revealed no evidence of infective endocarditis. CT of chest, abdomen and pelvis revealed no infective foci. Dental examination was unremarkable. Whipple's serology was negative. Repeat MRI 4 weeks later showed a significant reduction in the size of the abscess. He was discharged home to his family on oral antibiotics with monitoring of his CRP.

DISCUSSION

Despite the advent of modern neurosurgical techniques, new antibiotics and improvements in imaging, brain abscess is still a potentially fatal infection. The portal of entry includes haematogenous spread, postneurological states and parameningeal contiguous infection from otogenic foci and paranasal sinusitis.¹ The causative pathogens of bacterial brain abscess vary with geographic distribution, age, underlying medical and/or surgical conditions and mode of infection. A large number of Gram-positive cocci, Gram-negative aerobic bacilli, anaerobes and *Mycobacterium tuberculosis* have been reported as the causative agents of bacterial brain abscess.²

Regardless of the portal of entry, brain abscess is almost always secondary to a focus of suppuration elsewhere in the body. This was not apparent with our patient, with no primary infective source being identified. The limited data available on this topic suggest that haematogenous spread is frequently community acquired and associated with higher rates of shock and death. In contrast, postneurosurgical causes are associated with a favourable outcome.³ The temporal lobe and the cerebellum are the commonest sites affected by an otogenic source, with *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Escherichia coli*, *Proteus* and *Pseudomonas* species being the most common causative organisms.⁴

Predetermining factors include head trauma, previous neurosurgical intervention and a distant focus with a propensity for haematogenous spread. Again, our patient had none of these risk factors.

One study looking at 123 cases of brain abscesses found fever, headache, altered consciousness and hemiparesis to be the most common presenting complaints, occurring in 44–58% of patients. Focal neurological deficits correlated with the location of the abscess, and were seen in approximately 63% of cases with 37% showing no localised signs.

CT has contributed significantly in terms of reducing mortality both by way of early detection as well as by permitting precise CT-guided aspiration in selected cases. CT scanning acts as an important diagnostic tool to help differentiate brain abscess from other closely resembling lesions like tumours, infarcts and haematoma.

Surgical drainage remains as the definitive treatment for brain abscess, along with aggressive antibiotic therapy. Third-generation cephalosporins in combination with metronidazole should be considered for the majority of abscesses cases resulting from infection with Gram-negative bacilli and streptococcal species. Different therapeutic regimens have shown no significant statistical effect on prognosis.³

A MEDLINE search using the MeSH terms 'CPA' and 'abscess' revealed 24 results. When these were restricted to human subjects with abstracts written in English, only five abstracts were clinically relevant. Three of these cases involved cerebellopontine abscess secondary to either chronic ear infections or previous surgery. The two remaining cases fail to mention whether any primary foci of infection existed. This

represents the first reported case of primary bacterial cerebello-pontine abscess, having searched extensively for a primary source of infection with the investigations described above. We therefore feel that abscess should be considered for any lesion in this area, despite no evidence of systemic infection.

In summary, brain abscess is a rare but potentially fatal condition that requires early radiological and surgical intervention. It has a varied presentation, with many cases showing no localising typical features. A high index of suspicion should be applied to cases exhibiting rapidly changing neurology.

Learning points

- ▶ Cerebellopontine angle abscess can occur as a primary source of infection.
- ▶ Brain abscess should be considered as a differential when rapidly evolving neurology is present.
- ▶ The working diagnosis should be revisited and revised when the clinical picture alters.
- ▶ A high index of suspicion, timely diagnostic support by CT scan, surgical intervention and vigorous antimicrobial therapy are crucial for better outcome.

Competing interests None.

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