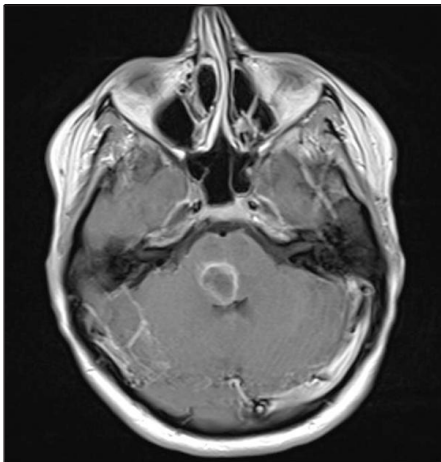


# Brainstem abscess presenting with lateral gaze palsy in a healthy adolescent patient

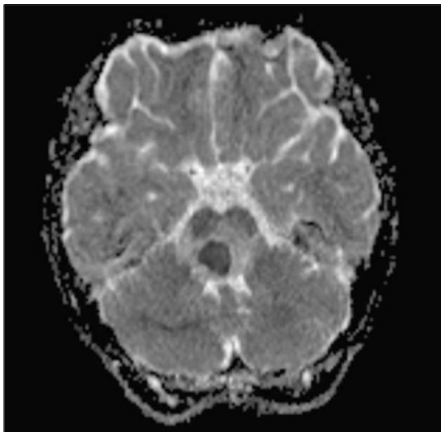
## Introduction

This article reports a case of a previously fit and well patient who presented with a

**Figure 1. T1-weighted images including contrast demonstrating a right-sided pontine lesion with peripheral contrast enhancement.**



**Figure 2. Restricted diffusion demonstrated on the apparent diffusion coefficient map.**

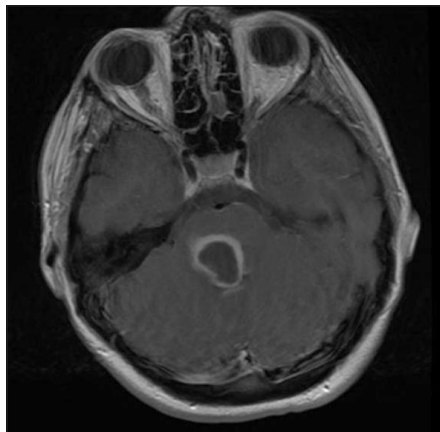


lateral gaze palsy caused by a brainstem abscess which was treated surgically. This case highlights the importance of appropriate magnetic resonance imaging sequencing for the exclusion of key differentials as well as the therapeutic challenges of this rare clinical entity.

## Discussion

Brainstem abscesses account for just 0.5% of brain abscesses (Sclar et al, 2007; Walkden et al, 2013). These can, unusually, involve the paramedian pontine retic-

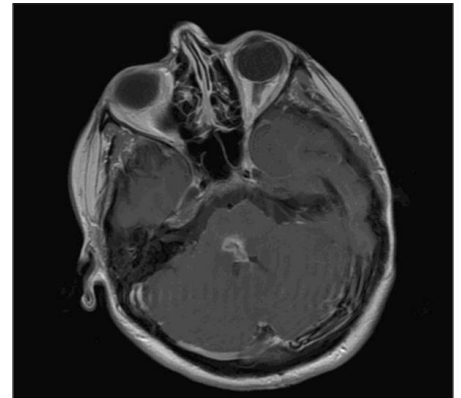
**Figure 3. T1-weighted image clearly demonstrating an expansion in the size of the lesion 2 days after admission.**



ular formation, which results in the syndrome of ipsilateral lateral gaze palsy and nystagmus on contralateral gaze (Cohen et al, 1968; Sclar et al, 2007).

Magnetic resonance imaging findings of a peripherally enhancing lesion with highly restricted diffusion are virtually diagnostic of an abscess because the highly cellular environment of an abscess results in restricted diffusion of water molecules (Noguchi et al, 1999). This, in combination with other radiological findings – such as ring enhancement, high T2 intensity and low-intermediate T1 intensity, allows for exclusion of necrotic tumour or infarct (Noguchi et al,

**Figure 4. Postoperative images showing a significant reduction in the size of the abscess.**



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## Case Report

An 18-year-old female student presented to accident and emergency with a constant, progressively worsening occipital headache associated with an inability to look to the right. She also complained of lethargy and paraesthesia affecting her left hand and forearm. She reported no recent weight loss, trauma or infection, but had noticed bleeding on tooth brushing.

On examination, she was febrile, had a right-sided lateral gaze palsy (inability to look towards the right hand side), nystagmus on leftward gaze and reduced power in her left arm. Haematological tests showed a normal white cell count and marginally raised C-reactive protein level of 7 mg/litre. Magnetic resonance imaging revealed a contrast-enhancing lesion of the right posterior pons with restricted diffusion (Figures 1 and 2) and a diagnosis of brainstem abscess was made. Blood and urine cultures were negative and dental and echocardiographic examination yielded no abnormality. She was admitted and treated conservatively with intravenous ceftriazone and metronidazole.

Two days later she developed a right lower motor neurone palsy and repeat magnetic resonance imaging demonstrated enlargement of the lesion (Figure 3). She was urgently taken to theatre for microsurgical drainage of the abscess, following which her gaze palsy recovered. On repeat imaging, the abscess was significantly reduced in size (Figure 4). Culture of abscess material grew alpha-haemolytic streptococci which directed antibiotic therapy.

1999; Cartes-Zumelzu et al, 2004). Magnetic resonance proton spectroscopy may play a future role in the discrimination of abscesses from necrotic tumours, but it is more time consuming and may be less accurate than diffusion-weighted magnetic resonance imaging when considering deep, non-skull base lesions (Lai et al, 2002). In this case, rapid expansion of the lesion adds certainty to the diagnosis of abscess.

The early identification of brainstem abscesses expedites antibiotic treatment, which may negate the need for surgery (Carpenter, 1994). Antibiotic therapy, either used definitively or as an adjunct to surgery, must cover commonly implicated pathogens including streptococcus, *Staphylococcus* spp and anaerobic organisms (Carpenter, 1994; Muzumdar et al, 2011).

Common sites of primary infection include the skin, ears, lungs, dentition and cardiac valve vegetation (Carpenter, 1994; Rajshekhar and Chandy, 1994). These should be assessed to identify causative

organisms and guide treatment. If the patient deteriorates despite antibiotic therapy, immediate microsurgical or stereotactic drainage should be performed (Rajshekhar and Chandy, 1994; Sclar et al, 2007). **BJHM**

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## LEARNING POINTS

- Ipsilesional lateral gaze palsy and contralesional nystagmus indicates pathology involving the paramedian pontine reticular formation.
- Diffusion-weighted magnetic resonance imaging is a key tool to allow the differentiation of brain abscess from other pathologies, such as infarcts and neoplasms.
- Initial conservative management using intravenous antibiotics is appropriate for small abscesses.
- If the patient deteriorates or fails to improve clinically or radiologically, urgent surgical drainage of the abscess is essential.

## IMAGES IN MEDICINE

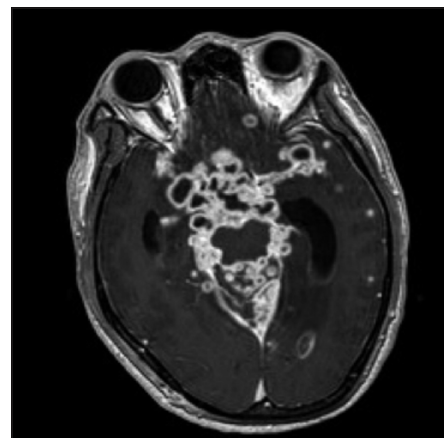
# Tuberculosis of the central nervous system

**A** 24-year-old Nepalese man presented with intermittent confusion, fever and weight loss over a 2-month period. Lumbar puncture was performed demonstrating acid-fast bacilli, consistent with *Mycobacterium tuberculosis* meningitis. He was commenced on quadruple therapy but became increasingly drowsy and developed hydrocephalus requiring ventriculostomy. Despite CSF diversion his consciousness level continued to worsen and arm and leg weakness developed.

Magnetic resonance imaging of the entire neuro-axis was therefore performed. The T1-weighted magnetic resonance

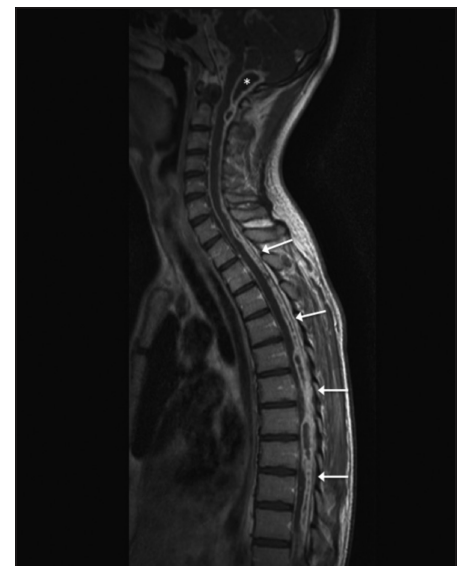
images with gadolinium demonstrated multiple enhancing tuberculous abscesses in the brain (*Figure 1*) and along the length of the spinal cord (arrows, *Figure 2*). The abscess at the craniocervical junction (star, *Figure 2*) was causing brainstem compression and was subsequently surgically decompressed.

**Figure 1.** Axial T1-weighted magnetic resonance imaging of the brain with contrast.



While his ventriculostomy was successfully converted to a ventriculo-peritoneal shunt his neurological status did not improve. **BJHM**

**Figure 2.** Sagittal T1-weighted magnetic resonance imaging of the whole spine with contrast.



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