

## Clinical Records

# Computerized tomography is not reliable in the diagnosis of brainstem infection

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### Abstract

The case of a 17-year-old girl who presented with a two-day history of absolute dysphagia secondary to a bulbar palsy due to a pre-pontine abscess is described. Rigid oesophagoscopy was normal and a neurology consultation suggested a central cause for her dysphagia. However the diagnosis was delayed because a computed tomography (CT) scan of her brain and brainstem was reported as normal. A subsequent magnetic resonance image (MRI) scan revealed a pre-pontine abscess. CT scanning is not as reliable as MRI in the diagnosis of infective lesions of the brainstem/brain, especially early in the course of the infection.

**Key words:** Deglutition Disorders; Paralysis Bulbar; Pons; Abscess

### Introduction

The causes of dysphagia can be broadly divided into local and general causes (Table I). When a local cause has been excluded, a central cause should be suspected. The principal radiological investigations for assessing central causes of dysphagia are CT and MRI of the brain and brainstem. While CT scanning is more readily available, it is notoriously unreliable for the diagnosis of intracranial infection, particularly early in the course of the infection. We present the case of a pre-pontine abscess in a young woman which was not visible on a CT scan but was diagnosed later on MRI.

### Case report

A 17-year-old girl presented with a two-day history of absolute dysphagia. A full blood count, chest and lateral soft tissue neck X-rays were normal. A rigid oesophago-

TABLE I  
CAUSES OF DYSPHAGIA

#### Local causes

*In the lumen of the pharynx/oesophagus*

Foreign body

*In the luminal wall*

Pharyngeal pouch, stricture, web, diverticulum, achalasia, tumour, rings

*Extraluminal*

Aortic aneurysm, mediastinal lymph node, retrosternal goitre, bronchial carcinoma

#### General causes

Myasthenia gravis

Glandular fever

Bulbar palsy

Hysterical



FIG. 1

Non-contrast axial CT scan (soft tissue windows) at the level of the pons. This was reported as normal. Note the artifact seen medial to the temporal bones which obscures the soft tissues adjacent to them (white arrow).

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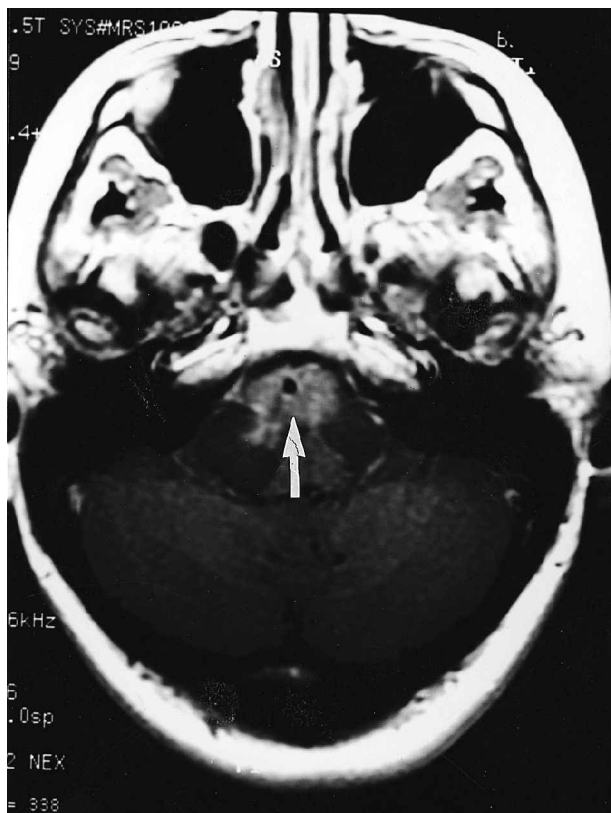


FIG. 2

T1-weighted axial post-contrast (gadolinium) MRI scan showing an enhancing 1 cm pre-pontine mass (white arrow) surrounding the basilar artery.

scopy was also normal. A neurological consultation suggested a central cause for the dysphagia and a subsequent CT scan was reported as normal (Figure 1). The following day the patient's condition deteriorated. She complained of severe neck stiffness and was pyrexial. The white cell count was raised at 18, blood cultures were performed and the patient was started on intravenous antibiotics. Chest X-ray did not show surgical emphysema or a pneumomediastinum. A lumbar puncture revealed pus cells but no growth of bacteria. The lumbar puncture was repeated on two occasions over the next week with the same result. The patient's symptoms failed to resolve on antibiotics and an MRI scan of the brain was performed (Figure 2). This showed a large pre-pontine abscess. This was drained transcranially under general anaesthesia and radiological guidance. She made a slow but steady recovery initially, but, two weeks later developed meningism again. A repeat MRI scan showed a small collection of pus in the pre-pontine region. This was drained again transcranially under general anaesthesia and radiological guidance. Following this she was treated with intravenous antibiotics for six weeks. She was then discharged home without any neurological deficit.

### Discussion

This patient's diagnosis was a bulbar palsy secondary to a pre-pontine abscess. The source was presumed to be a septic embolus, although a thorough infective screen was normal. This is not unusual in such cases.<sup>1</sup> Possible sites from which haematogenous spread can occur include the lungs, heart and urinary tract. Other possible sources include stab wounds, lumbar puncture and meningitis. Pontine abscesses have also been described in HIV infection.<sup>1</sup> Occasionally, the abscess may occur within a

tumour.<sup>2</sup> The most common offending microbes are staphylococci, streptococci, *Escherichia coli*, *Actinomyces* sp., *Proteus* sp. and *Listeria*.<sup>3</sup> Fungus (*Histoplasma capsulatum*) and parasites (tapeworms) have also been identified as causative agents.<sup>4</sup>

Laboratory investigations in pontine and pre-pontine abscesses typically show an increased or normal white cell count and CSF shows raised protein but cultures are invariably negative.<sup>1</sup> MRI scanning is now the preferred method of diagnosing infective processes of the brainstem especially early in the course of the infection when CT scanning is not sensitive.<sup>5</sup> MRI scanning is also the preferred method of diagnosing subdural and epidural abscesses and cerebritis.<sup>5-9</sup>

Re-drainage of pontine abscesses is required in up to 25 per cent of cases.<sup>3</sup> If treatment is instigated early, then fewer than 25 per cent suffer a major neurological deficit.<sup>1</sup> There is a 75 per cent survival rate depending on the speed of diagnosis and treatment.

### Conclusion

Any patient who presents with acute onset dysphagia when no obvious local cause can be found should undergo an urgent MRI scan of the brain and brainstem to exclude a central cause. MRI scanning is now the preferred method of diagnosing infective intracranial and brainstem lesions, especially early in the course of the infection when CT scanning is not sensitive. The prognosis of brainstem abscesses is good if the diagnosis is made early and treatment is instituted promptly.

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