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CASE REPORT

Intra-medullary abscess of the spinal cord at the high cervical level

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Summary Intramedullary spinal cord abscess (ISCA) is a rare entity in the central nervous system, especially in patients without meningitis. It is often difficult to promptly establish the diagnosis. In this report, we describe the case of a woman 52 years of age who presented with progressive neck pain that was followed by rapidly worsening quadriparesis. The cervical spine magnetic resonance imaging revealed an ovoid lesion at the level of C2-C4 with a gadolinium contrast ring enhancement. Because ISCA was suspected, we performed surgery to decompress the cervical spinal cord. The bacterial culture of the cystic content revealed the growth of two bacteria, *Fusobacterium nucleatum* and *Peptoniphilus asaccharolyticus*, which have rarely been observed. The patient's postoperative course was uneventful and her outcome was excellent on discharge. Antibiotics were prescribed for 6 weeks. We further report the result of a literature review on the management of ISCA. The surgical indications for ISCA are controversial, but early surgery to decompress the spinal cord and confirm bacterial growth is recommended in rapidly worsening cases.

1. Introduction

Among the differential diagnoses for central nervous system infections, intramedullary spinal cord abscess (ISCA) is a rare entity. The destruction of the spinal cord can be great, thus the resulting rates of mortality and morbidity are high. Most patients with ISCA have concurrent meningitis or an infectious source at another site. However, the most common cause of ISCA is cryptogenic. Pre-existing anatomical defects, sepsis, spinal surgery, trauma, and infectious endocarditis have been reported as the main causes of ISCA. *Staphylococcus aureus* is the most common isolated pathogen in bacterial ISCA.

The presentations of patients with ISCA are variable, which can lead to a delayed diagnosis. Magnetic resonance

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imaging (MRI) with gadolinium contrast enhancement is the best diagnostic tool for intramedullary lesions. We report a case with a good outcome that demonstrates the utility of prompt surgical intervention after the early diagnosis of ISCA.

2. Case report

A woman 52 years of age without any known systemic disease developed neck pain 1 week before admission for which she underwent a massage. However, the pain worsened and began to radiate to the suboccipital area and shoulders. She also felt numbness in her limbs on the left side and on the same side of her trunk, except for her chest wall. These sensations were accompanied by nausea, vomiting, and poor appetite. She was admitted to our hospital as a result of her intolerable neck pain.

On examination, she appeared to be uncomfortable and held her head stiff. Her body temperature was 37.3°C. The suboccipital and trapezius muscles were tense and tender. The range of motion of her neck and arms was not limited, and the muscle power of all four limbs was Grade 5 of 5. The pinprick tests on her body and limbs were symmetrical. The deep tendon reflex of her right brachioradialis, right triceps and lower limbs were hyperactive. She also had urinary retention. Laboratory investigations revealed leukocytosis. MRI of her cervical spine revealed an intramedullary oval lesion with a high signal change at the level from C2 to C3 on a T2-weighted image (T2WI; Fig. 1A), but with an isosignal on the T1-weighted image (T1WI; Fig. 1B). Spinal cord swelling from the craniovertebral junction to the cervicothoracic junction was identified from the T2WI (Fig. 1A).

Soon after admission, the muscle power in the patient's four limbs deteriorated to Grade 1-2 of 5. A contrast-enhanced MRI of the cervical spine revealed an intramedullary oval lesion with a linear enhancement around the margin. This extended from C2 to C4 on T1WI (Fig. 2). An ISCA was the leading differential diagnosis.

Because of deterioration in the patient's neurologic status, a spinal cord decompression procedure was performed with a laminectomy from C2 to C4. The spinal cord protruded freely during the opening of the dura mater and approximately 0.7 ml of sticky pus-like fluid was aspirated from the intramedullary cyst. Bacterial culture of the cyst fluid grew two rare microorganisms, *Fusobacterium nucleatum* and *Peptoniphilus asaccharolyticus*. Metronidazole and penicillin-G 300 were prescribed postoperatively according to the sensitivity test. Furthermore, we performed a gallium inflammation scan to search for other possible sources of infection. This revealed increased uptake in the right maxilla and the dental bed. Oral and dental examinations revealed poor oral hygiene and severe gingival recessions with a pus-like discharge. After 37 days of treatment with antibiotics, the patient was discharged. The pain in her neck and shoulders had greatly improved, and the muscle power of all four limbs was Grade 4-5 of 5 on discharge.

Two months postoperatively, follow-up MRI of the cervical spine with and without gadolinium contrast revealed that the lesion had shrunk. Only a small, enhanced nodule in the spinal cord was detectable on T1WI (Fig. 3B).

After a 3-month period of rehabilitation, she could freely walk.

3. Discussion

ISCAs are rare. The first case was reported by Hart in 1830,[1] and several series have been published, mainly taken from literature reviews accompanying single case reports.[2–4] Fewer than 130 cases have been reported during the last century.

ISCAs are most commonly caused by bacteria from a cryptogenic source,[4,5] which is where transient bacteremias or extraspinal sites of infection are difficult to identify.[6] Dermal sinus infections play a major role in pediatric ISCA, causing up to 45% of cases.[7] Anatomic

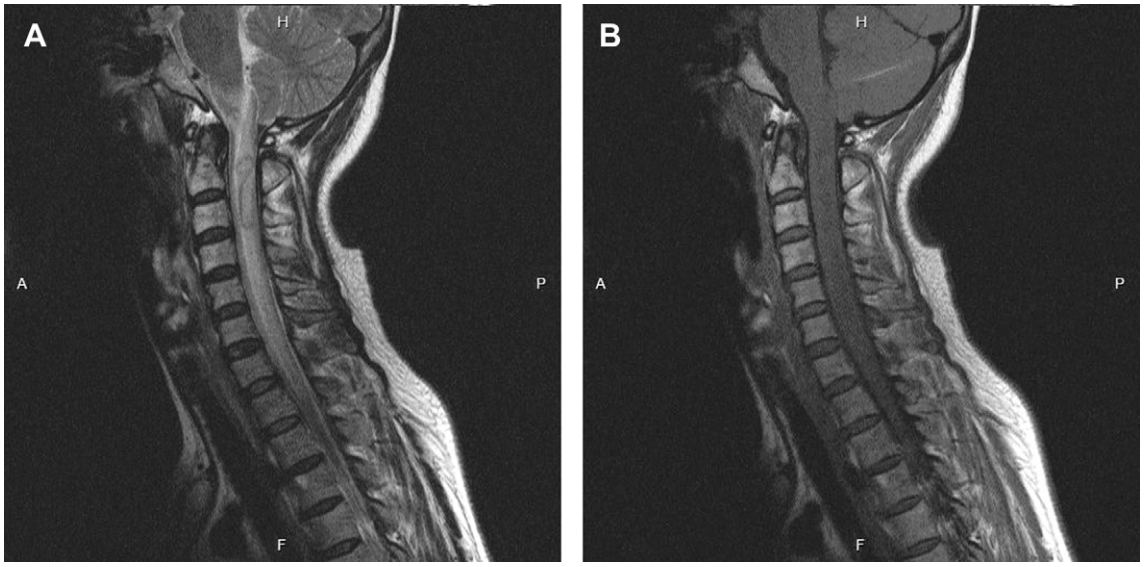

Figure 1 Preoperative magnetic resonance imaging without contrast on: (A) T2-weighted imaging; and (B) T1-weighted imaging.