



## Quadripareisis from a panspinal extradural abscess following pneumococcal meningitis

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A 63-year-old male presented with marked quadripareisis, three weeks after a pneumococcal meningitis. The MRI-scan was suggestive for extradural abscess in the craniocervical region extending into the lower thoracic spine. Cervical laminectomy was performed and a large abscess was drained. Culture revealed *Streptococcus pneumoniae* sensitive to benzylpenicillin. The patient was treated with antibiotics for six weeks. His neurological condition recovered completely, and he walked normally, without support, 6 weeks later. Pneumococcal infection of the extradural space is rare. The course of spinal epidural abscess is unpredictable and may present with quadriplegia. Complete recovery of the neurological deficit may occur if the abscess is drained before any ischaemic insult occurs to the cord.

**Keywords :** spinal epidural abscess ; *Streptococcus pneumoniae* ; pneumococcal meningitis.

this disease process and associated illnesses, the mortality still remains as high as 20% (8). Most of these infections are haematogenous (9).

*Streptococcus pneumoniae* infection of the spine is rare : only 28 cases have been reported in the literature (12). The authors report a case of pneumococcal meningitis which led to a panspinal extradural abscess, and subsequently to quadripareisis.

### CASE REPORT

A 63-year-old male was admitted with 39.2° Celsius of fever, drowsiness, shortness of breath and a four-day history of muscular weakness and worsening neck and back pain. Three weeks

### INTRODUCTION

In spite of significant advances in neuro-imaging and neurosurgery in the last decade, Spinal Epidural Abscess (SEA) continues to be a challenging problem. The incidence of SEA, once thought to be stable, has recently been reported to be increasing (1). SEA accounts for approximately 2 out of 10,000 hospital admissions (4). Although uncommon, this condition may produce irreversible neurological injury or death if treatment is delayed (1). Due to the frequently rapid evolution of

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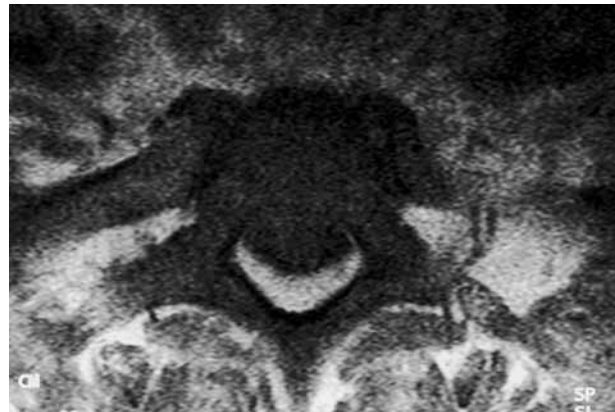
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prior to this admission he had been treated successfully with intravenous penicillin for a cerebrospinal fluid culture positive pneumococcal meningitis. He had no antecedents, apart from a seven-year history of hypertension which was well controlled with anti-hypertensive medication. On admission he had difficulty in micturition and defecation, along with mild weakness in the upper limbs. He developed quadriparesis within 24 hours. On examination he had tachycardia, hypotension and a high respiratory rate. The body temperature was 38.6° C. There was no neck stiffness. He had a normal tone, but muscle testing showed a grade 1/5 in all 4 limbs. The tendon reflexes were weak. The plantar reflex was in extension. The bulbocavernosus reflex was present. The sensory level was T2. Biochemistry : white blood cell count 35,000/mm<sup>3</sup>; CRP 156 mg/l, pH 7.47. Blood gas values : pCO<sub>2</sub> 5.96 ; pO<sub>2</sub> 7.98. The cerebrospinal fluid contained 70 WBCs/mm<sup>3</sup>, 1.1 g/dl protein and 45 mg/dl of glucose. No organism was identified on Gram stain. The patient was ventilated. An infusion and high doses of benzylpenicillin were administered intravenously. No improvement was noted in the next twenty-four hours. Suspicion of an epidural abscess was confirmed by an MRI scan (figs 1, 2), which demonstrated a diffuse hyperintense signal, suggestive of an extradural abscess in the cranio-cervical region, extending into the lower thoracic spine. The cord was almost circumferentially compressed by the extradural abscess. There was also pachymeningitis, associated with the recent meningitis, but absence of discitis at all levels.

An emergency cervical laminectomy C3-C7 was performed. A small silicone catheter was introduced caudally, and the abscess was evacuated under mild continuous suction. Infected granulation tissue was removed from the cervical epidural space. The patient was subsequently treated in the intensive care unit. He showed signs of neurological improvement from the third day onwards. Muscle testing revealed improvement from grade 1/5 to grade 2/5 in the upper limbs, but still a grade 1/5 in the lower limbs. CSF culture showed *Streptococcus pneumoniae*, sensitive to benzylpenicillin. The intravenous antibiotics were continued for two weeks after surgery.



**Fig. 1.** — Coronal T2 weighted MRI of the cervical spinal cord showing hyperintensity or fluid-equivalent disk signal intensity posterior to the cord representing the abscess.



**Fig. 2.** — Sagittal T2 weighted MRI scan revealing the extent of the extradural abscess to the thoracic spine.

Neurological assessment, two weeks after surgical decompression, demonstrated a grade 4/5 power in both upper and lower limbs and a normal sensation in all affected dermatomes. On discharge, 3 weeks after surgery, the patient was walking with a support; his muscle force scored 5/5 in all 4 limbs. One year later he was leading a normal life without any residual sequelae.

## DISCUSSION

Spinal Epidural Abscess (SEA) is a disease of the elderly, and has a peak incidence in the sixth and seventh decades of life. The aetiologic agent of SEA is *Staphylococcus aureus* in 60% of the cases (10). Pneumonia and meningitis are the most frequent manifestations of infection with *Streptococcus pneumoniae*. Pneumococcal SEA has been reported to occur in patients with predisposing factors such as diabetes mellitus, alcoholism, and corticosteroid treatment. Turner *et al* (12) reported a patient with epidural abscess who had concomitant meningitis and endocarditis. SEA has been described as a "painful, febrile, spinal syndrome" (3). The spinal epidural space is not a uniform space. It is a metameric structure with septa preventing free communication between the anterior and posterior epidural space (5). This segmentation may also limit the longitudinal spread of the abscess. Multisegmental involvement is usually limited to three or four segments (1). In this case, the MRI showed a longitudinal spread as well as an almost circumferential involvement. In general, the abscess neither involves the anterior epidural space nor the complete circumference of the thecal sac. In this case there may have been disruption of the normal anatomical septation. The neurological damage is thought to be due to a combination of compression and vascular insult (2). The speed of the progression of symptoms from spinal ache to complete paralysis is variable (11). Slow onset can be the reason of a late diagnosis. Rapid onset of neurological deterioration is a neurosurgical emergency. There are reports about patients with neurologic deficit, improving with just antibiotic therapy (7). Leys *et al* (6) recommended non-surgical management for patients with an abscess involving

a considerable length of the spinal canal or for patients with complete paralysis since more than 3 days (6). In our patient, a total of 7 days had elapsed since his initial symptoms of neck pain and weakness in the limbs before he underwent spinal decompression. The duration of neurological symptoms has been shown to influence the functional outcome. If a neurological grade 4 (classification of Ravikovitch and Spallone) (9) is present for more than 36 hours, little or no return of function can be expected (4). The present case would be grade 4. The outcome of the surgical treatment depends upon the initial neurological grade (9). There was an elapse of 72 hours from the onset of quadriplegia to surgical decompression. We believe that the neurological deficit in this case was purely due to compression without any ischaemic insult to the cord. This may explain the complete recovery from the quadriplegic state.

Thus, the course of spinal epidural abscess is unpredictable in pneumococcal infection, and surgical intervention before the onset of ischaemia of the cord may result in a successful outcome without undesirable sequelae.

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