Case Report

Correspondence
Henry J. Carson
hjcmed@earthlink.net

Received 31 December 2014
Accepted 6 May 2015

Streptococcus pneumoniae infection of the lumbar epidural spine: a rare condition with distinctive signs requiring specialized intervention

Henry J. Carson, Jonnine Boyd and Frederick L. Witt

Mercy Hospital, Iowa City, IA, USA

Introduction: Bacterial infection of the vertebral column is uncommon, but when it occurs, the meninges are at high risk.

Case presentation: A patient presented with acute-onset back pain and signs of inflammation, excluding an elevated white count and bacteraemia. Laminectomy specimens showed infection with *Streptococcus pneumoniae*. No previous source of possible seeding of the bacteria was identified.

Conclusion: The infection responded to intravenous ceftriaxone. This case informs us to be aware of infection in a case of back pain even without a prior source of infection.

Keywords: acute onset; radicular pain; *Streptococcus pneumoniae*; vertebral column.

Introduction

Bacterial infection of the vertebral column is uncommon but can be very serious when it occurs. Among the sites that may be affected, the meninges are at high risk. In adults, the infectious agent of meningitis is usually *Streptococcus pneumoniae* (Clark *et al.*, 1989). Infection of the vertebral bodies by *Streptococcus pneumoniae* in the form of osteomyelitis has also been reported (Kutas *et al.*, 1995; Poyanli *et al.*, 2001). Elsewhere in the vertebral column, however, this organism is unusual. The epidural space is rarely a site of infection (Jenkins *et al.*, 1996; Marks & Bodensteiner, 1988; Talwalkar *et al.* 2006). In these cases, the causative organisms are typically *Staphylococcus aureus*, and rarely *Salmonella* spp. or *Streptococcus pneumoniae* (Jenkins *et al.*, 1996). In infants, *Staphylococcus aureus* is a common pathogen, whilst in children under 1 year of age, the infection is often caused by *Haemophilus influenzae* (Marks & Bodensteiner, 1988). Infection affecting the epidural space has infrequently been reported in the cervical spine (Marks & Bodensteiner, 1988; Talwalkar *et al.*, 2006). Infection of the epidural space of the lumbar spine is very rare.

Case report

An 89-year-old white male presented with severe, acute-onset, lower back pain with a past medical history of systemic hypertension, hyperlipidaemia and a remote history of prostate cancer that had not recurred and was

considered clinically cured. He had no known recent chest or other infections, fever or chronic obstructive pulmonary disease. The patient took medications for hypertension and hyperlipidaemia, but no steroids or other immunosuppressive drugs. The pain radiated to his right knee. He achieved immediate short-term relief with morphine while the work-up commenced. Physical examination was notable for a previous right knee replacement. Initial laboratory examination showed elevated values for C-reactive protein (248.58 nmol l⁻¹), erythrocyte sedimentation rate (115 mm h⁻¹) and D-dimer (25.99 nmol l⁻¹). The peripheral leukocyte count was not elevated. The laboratory evidence of inflammation was unexpected in the presence of radicular disease. Blood cultures were not sought at this time, however.

Investigations

Magnetic resonance imaging of the spine demonstrated severe central canal stenosis of lumbar vertebrae L4–L5. On the basis of these examinations, laminectomies were performed on L1–L5 on the second hospital day.

Diagnosis

In the course of surgery, suspected epidural abscesses were observed and cultures were obtained from L3–L4 and L4–L5, which were positive for *Streptococcus pneumoniae*. Concurrent blood cultures were negative for bacteria.

Treatment

The patient was treated with intravenous ceftriaxone following the procedure and was maintained on this regimen for 6 weeks.

Outcome and follow-up

At the last follow-up, the patient had recovered from the surgery without complications.

Discussion

The aetiology of *Streptococcus pneumoniae* infection of the epidural space appears to be haematogenous dissemination of the bacteria from elsewhere, such as a previous episode of pneumococcal pneumonia, endocarditis (Marks & Bodensteiner, 1988) or another unknown site (Talwalkar *et al.*, 2006). Rarely, a patient may present as this man did, with no identifiable source of infection. Occasionally, a factor such as intervertebral disc protrusion may be related to the risk of infection of the epidural space (Jinkins *et al.*, 1996). The initial presentation of epidural space infection may be one of localized slow onset (Talwalkar *et al.*, 2006) or may be systemic with fever and rapidly evolving back pain (Clark *et al.*, 1989; Marks & Bodensteiner, 1988). The presentation may include intense pain, which in this case was highly responsive to narcotics, accompanied by evidence of inflammation, including elevated levels of C-reactive protein, erythrocyte sedimentation rate and D-dimer (seen in this patient), or an elevated peripheral white count. In an elderly patient, low-grade or silent bacteraemia may be masked by several conditions, such as age itself, malignancy or steroid treatment. Therefore, other tests such as pre-operative blood cultures or urinary antigen tests for infections such as *Streptococcus pneumoniae* may be useful in the work-up. Complications related to the infected site may include quadriparesis due to inflammation of the cervical spine (Talwalkar *et al.*, 2006) or lower-extremity weakness due to inflammation of the lumbar spine (Clark *et al.*, 1989). Mortality and morbidity can be high (Talwalkar *et al.*, 2006), but rapid

intervention can prevent spinal cord ischaemia or death. Ceftriaxone is an effective drug in cases of *Streptococcus pneumoniae* infection of the epidural space, as most serotypes of the bacterium are sensitive to this antibiotic, and it infiltrates the intervertebral space effectively when administered intravenously (Lang *et al.*, 1994).

The present case demonstrates an unexpected presentation of *Streptococcus pneumoniae*, an epidural infection, without an identifiable original source of bacteria, including no evidence of bacteraemia. The presence of inflammatory markers in the serum, including D-dimer, without peripheral leukocytosis is unusual. This case informs us to be aware of possible infectious aetiology in a case of acute back pain with radicular symptoms and evidence of systemic inflammation. Appropriate intervention can prevent serious complications such as paresis or death.

Acknowledgements

The authors report no conflicts of interest.

References

- Clark, R., Carlisle, J. T. & Valainis, G. T. (1989). *Streptococcus pneumoniae* endocarditis presenting as an epidural abscess. *Rev Infect Dis* **11**, 338–340.
- Jinkins, J. R., Bazan, C. III & Xiong, L. (1996). MR of disc protrusion engendered by infectious spondylitis. *J Comput Assist Tomogr* **20**, 715–718.
- Kutas, L. M., Duggan, J. M. & Kauffman, C. A. (1995). Pneumococcal vertebral osteomyelitis. *Clin Infect Dis* **20**, 286–290.
- Lang, R., Folman, Y., Ravid, M., Bental, T. & Gepstein, R. (1994). Penetration of ceftriaxone into the intervertebral disc. *J Bone Joint Surg Am* **76**, 689–691.
- Marks, W. A. & Bodensteiner, J. B. (1988). Anterior cervical epidural abscess with pneumococcus in an infant. *J Child Neurol* **3**, 25–29.
- Poyanli, A., Poyanli, O., Akan, K. & Sencer, S. (2001). Pneumococcal vertebral osteomyelitis: a unique case with atypical clinical course. *Spine* **26**, 2397–2399.
- Talwalkar, N., Debnath, U. & Medhian, S. (2006). Quadriparesis from a panspinal extradural abscess following pneumococcal meningitis. *Acta Orthop Belg* **72**, 647–650.