CASE REPORT

Spinal cord compression secondary to epidural abscess: the importance of prompt diagnosis and management

Chloe Thomson

Acute Medicine, William Harvey Hospital, Ashford, UK

Correspondence to

Dr Chloe Thomson,
chloe.thomson@doctors.org.uk,
chloe_thomson@hotmail.co.uk

Accepted 23 January 2018

SUMMARY

A 66-year-old woman presented with a 4-day history of fever, lethargy, neck and lower back pain. Neurological examination revealed mild quadraparesis. In view of this, MRI whole spine with contrast was performed and showed extensive spinal epidural abscess extending from the cervical to lumbar region causing compression of the thecal sac, spinal cord and nerves. The patient received multiple laminectomies to decompress the spinal cord and required a prolonged course of intravenous flucloxacillin as *Staphylococcus aureus* was cultured from three sets of blood cultures. Although spinal epidural abscess is rare, it is important for clinicians to have a high index of suspicion; so appropriate imaging is performed to determine the diagnosis. Patient age, degree of thecal sac compression and duration of symptoms are all independently associated with poor outcome.¹

BACKGROUND

Spinal epidural abscess is a rare condition which typically presents with vague symptoms, making diagnosis difficult. This condition requires prompt

recognition and management to prevent overwhelming sepsis and irreversible neurological deficit. Clinicians need to be aware of the insidious nature, risk factors and management options for this condition to aid prompt diagnosis and thereby improve patient outcome.

This case is particularly interesting as the patient had an extensive spinal epidural abscess extending from the foramen magnum to the lower lumbar region with multilevel cord compression.

CASE PRESENTATION

A 66-year-old woman presented to Accident and Emergency at her local hospital with a 4-day history of lethargy, fever, loss of appetite and back pain. She reported that her back pain was worsening, but importantly there was no history of bladder or bowel dysfunction. On further questioning, the patient had no significant medical history, but 1 month prior to her presentation, she had several pimples containing pus over her back which resolved spontaneously.

On examination, the patient was clinically septic and was found to be in atrial flutter. Auscultation of her precordium revealed normal first and second heart sounds and no murmur. Cranial nerve examination was normal, but limited as the patient had pain on movement of her neck. Peripheral neurological examination revealed mild quadriparesis with 4/5 power in the upper and lower limbs. No sensory deficit was elicited and proprioception and coordination were normal with brisk upper and lower limb reflexes. Digital rectal examination revealed slightly reduced anal tone.

INVESTIGATIONS

Blood tests on admission showed high inflammatory markers with a white cell count of $20.6 \times 10^9/L$ and a C-reactive protein of 568 mg/L. This supported a diagnosis of sepsis in addition to the patient's clinical signs, and thus blood cultures were taken in the emergency department and broad-spectrum antibiotics commenced.

In view of the patient's back pain and mild quadraparesis, an MRI whole spine was performed which revealed extensive epidural collections throughout the spine, extending from the cranio-cervical junction to the lower lumbar spine. There was an extensive epidural collection which involved all of the cervical spine (figure 1). It extended into

Figure 1 T1-weighted, postcontrast image of the cervical spine showing the spinal abscess extending from the C1 spinous process level to T4 posterior to the cord.

To cite: Thomson C. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-220694

Figure 2 T2-weighted image of thoracolumbar spine showing the spinal abscess from the lower border of T11–L4 level posterior to the cord.

the thoracic and lumbar spine, causing compression of the thecal sac, cord and nerves (figures 2 and 3). The MRI images showed inflammatory changes which extended to the perispinal soft tissues.

Three sets of blood cultures were taken in total and over the next few days they grew *Staphylococcus aureus*.

DIFFERENTIAL DIAGNOSIS

Spinal epidural abscess is a rare condition that often presents with non-specific findings of back pain, fever, leucocytosis, high C-reactive protein level and is therefore frequently misdiagnosed on presentation, particularly in neurologically intact patients.

Figure 3 T1-weighted, postcontrast image showing the spinal abscess posterior to the cord at the level of T11–L4.

Often, more common infectious conditions such as osteomyelitis, discitis and endocarditis are diagnosed at the time of initial evaluation. Clinicians must have a high index of suspicion of this condition and the presence of risk factors for spinal epidural abscess can aid in the diagnosis.

TREATMENT

Our patient was initially treated with vancomycin at the local hospital, which was then changed to ceftriaxone and clindamycin. Empirical intravenous antibiotics were given until culture-guided sensitivities were known. *S. aureus* was grown from serial blood cultures and the provisional diagnosis was infective endocarditis. The patient's inflammatory markers improved with this antibiotic regimen, but there was no improvement in her symptoms.

After the results of the MRI whole spine were known, the patient was admitted under the neurosurgeons who performed multiple laminectomies at C3–C4, T7–T8 and L1–L2 and pus was evacuated at all levels.

OUTCOME AND FOLLOW-UP

After decompressive surgery, the patient recovered well and had 5/5 power in all four limbs. She unfortunately had a slow recovery as she developed ileus 2 days after surgery which resolved with bowel rest.

S. aureus was cultured from the pus collected during surgery and was sensitive to penicillin. Our patient was treated with intravenous flucloxacillin for 6 weeks and repatriated to the local hospital for ongoing rehabilitation.

DISCUSSION

Spinal epidural abscess is still considered a rare condition, accounting for 0.2–1.2 cases per 10 000 hospital admissions per year.¹ However, in the past two decades, the incidence has doubled.² Many complications can occur, secondary to sepsis and prolonged immobility. Several large studies suggest that the mortality rate of patients with non-tuberculous spinal epidural abscess is between 13% and 16%. The diagnosis of this condition remains challenging as early clinical symptoms are not specific and can mimic many other conditions. The classic triad of fever, back pain and neurological deficit occurs in only 10%–15% of patients at the time of diagnosis.¹

Our patient had an interesting case of spinal epidural abscess as it involved almost the entire vertebral column from the foramen magnum to the lower lumbar region. In most cases of spinal epidural abscess, it predominantly locates in the thoracic and lumbosacral regions.²

Identification of risk factors for this condition may help in the early establishment of the diagnosis. Our patient had localised acne on her back 1 month prior to her presentation to hospital and this is the likely source of *S. aureus* which led to haematogenous dissemination to the spinal epidural space.

Common risk factors include recent spinal trauma, intravenous drug use and immunocompromised states, namely, diabetes mellitus and alcoholism. Spinal surgery and other invasive procedures including lumbar puncture and epidural anaesthesia are estimated to be responsible for approximately 15% of cases of spinal epidural abscess.²

The gold standard of imaging diagnostics in spinal epidural abscess is MRI with gadolinium. It provides a non-invasive, sensitive means of diagnosing spinal epidural abscess, having a sensitivity and specificity greater than 90%.² Gadolinium-enhanced MR images can aid in the definition of the age and consistency of the abscess. Liquid pus is associated with an area of low signal

intensity on T1-weighted images, whereas tissue that enhances after the injection of gadolinium indicates granulation tissue.³

Lumbar puncture is not needed for diagnosis and has a high risk of spreading bacteria in the subarachnoid space with consequent meningitis and thus should not be performed.⁴

The most effective treatment for spinal epidural abscess is evacuation of pus by decompressive laminectomy and washout, followed by a prolonged course of intravenous antibiotics targeted to the cultured bacteria.² Review of several retrospective studies shows an overwhelming consensus that surgical decompression with intravenous antibiotics is the treatment of choice for patients who are able to undergo surgery. As preoperative neurological status is the most important predictor of the

final neurological outcome and the rate of neurological deficit is difficult to predict decompressive laminectomy and debridement of infected tissues should be performed as early as possible. The review also states that the usual duration of intravenous antibiotic therapy is at least 6 weeks.⁵

In conclusion, early diagnosis and intervention improves prognosis in patients with spinal epidural abscess. Despite the advances in diagnostic and management methods, about 30% of patients still do not have a good outcome.⁴ The difficulty with this condition is timely diagnosis before irreversible neurological deficit develops.

Funding This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

© BMJ Publishing Group Ltd (unless otherwise stated in the text of the article) 2018. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

Learning points

- ▶ Spinal epidural abscess is a rare condition with high morbidity if not recognised and treated early.
- ▶ Spinal epidural abscess typically presents as a septic patient with non-specific symptoms and thus requires a high index of suspicion for the diagnosis to be considered.
- ▶ MRI spine with contrast is the best imaging modality to detect spinal epidural abscess as it is highly sensitive and non-invasive.
- ▶ Management of choice is decompressive laminectomy with culture-guided intravenous antibiotic therapy.
- ▶ Patients require a prolonged course of intravenous antibiotics sensitive to the pathogenic organism, usually a minimum of 6 weeks.

REFERENCES

- 1 Grewal S, Hocking G, Wildsmith JA, *et al.* Epidural abscesses. *Br J Anaesth* 2006;96:292–302.
- 2 Rosc-Bereza K, Arkuszewski M, Ciach-Wysocka E, *et al.* Spinal epidural abscess: common symptoms of an emergency condition. A case report. *Neuroradiol J* 2013;26:464–8.
- 3 Parkinson JF, Sekhon LH. Spinal epidural abscess: appearance on magnetic resonance imaging as a guide to surgical management. Report of five cases. *Neurosurg Focus* 2004;17:1–6.
- 4 Reihnsaus E, Waldbaur H, Seeling W. Spinal epidural abscess: a meta-analysis of 915 patients. *Neurosurg Rev* 2000;23:175–204. discussion 205.
- 5 Darouiche RO. Spinal epidural abscess. *N Engl J Med* 2006;355:2012–20.

Copyright 2018 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow