Reminder of important clinical lesson

Abscess or tumour? Lumbar spinal abscess mimicking a filum terminale tumour

Jahangir Sajjad, Chandrasekaran Kaliaperumal, Michael O'Sullivan

Department of Neurosurgery, Cork University Hospital, Wilton, Cork, Republic of Ireland

Correspondence to Chandrasekaran Kaliaperumal, ckaliaperumal@gmail.com

Summary

A 62-year-old woman presented with a 4-month history of central lower backache and a 2-week history of progressive bilateral leg weakness. She also complained of numbness on her left thigh and gluteal region, associated with urinary hesitancy and constipation. On examination, she had bilateral partial foot drop, absent knee and ankle reflexes and a negative Babinski's reflex and associated hyperaesthesia in L3 distribution bilaterally with decreased anal tone. Laboratory results revealed normal inflammatory markers. MRI scan demonstrated a large uniformly enhancing lesion in the filum terminale suggestive of a lumbar spinal tumour. An emergency spinal laminectomy from L3 to S2 was performed. Per operatively, the duramater was thickened and hyperaemic. The histopathology report suggested inflammation with no evidence of malignancy. Tissue specimen of cultured *Staphylococcus aureus* was sensitive to flucloxacillin. A final diagnosis of lumbar spinal abscess was made and subsequent antibiotic treatment led to good clinical recovery.

BACKGROUND

Spinal abscess and spinal tumours, for example, ependyoma, meningioma and astrocytoma, are separate clinical entities. Both have distinct risk factors, clinical course, radiological findings and treatment modalities. We report a case of spontaneous spinal abscess in an otherwise immunocompetent individual. Clinical and radiological pictures favoured the possibility of a spinal tumour, but histopathology and microbiology confirmed a spinal abscess. MRI remains the gold standard investigation for clinical diagnosis in this clinical scenario and despite its use there was diagnostic discrepancy. We discuss the MRI findings of spinal abscess and various spinal tumours to reiterate the clinical importance.

CASE PRESENTATION

A 62-year-old woman presented with a 4-month history of central lower backache and a 2-week history of progressive bilateral leg weakness, more in the left leg than in the right. She complained of numbness on posterolateral aspect of the left thigh and gluteal region. She also had urinary hesitancy and constipation for 3 days prior to the current presentation. She had no fever or any preceding trauma. There was no history of anorexia and weight loss. She had not concurrent medical illness and was not on any medications.

On examination, she had a power of 3/5 on ankle dorsiflexion bilaterally. Knee and ankle reflexes were absent. Plantar reflex was down-going and sensory examination revealed hyperaesthesia in L3 distribution bilaterally. She was noted to have decreased anal tone with normal perianal sensation.

INVESTIGATIONS

Haematological investigations showed a white cell count of $11.8 \times 10^9/l$, erythrocyte sedimentary rate 46 mm/h and C-reactive protein <5 mg/l. HIV test and hepatitis B

and C screening were negative. An MRI scan of the lumbar spine showed a large well-defined and lobulated abnormality within the spinal canal involving L3 to S2 levels (figures 1–5). The abnormality enhanced intensely

Figure 1 T1-weighted MRI non-contrast sagittal scan revealing area of hyperintensity in the filum terminale.

Figure 2 T1-weighted MRI postcontrast scan demonstrating diffuse contrast enhancement in the L4/5 region with abnormality involving the whole of the spinal canal.

Figure 4 T2-weighted noncontrast MRI demonstrating hyperintensity in the lower lumbar spine.

and uniformly. The findings were suggestive of a spinal ependymoma. Non-contrast CT brain showed normal study. The chest x-ray and echocardiogram were normal.

DIFFERENTIAL DIAGNOSIS

- ▶ Spinal ependymoma
- ▶ Meningioma
- ▶ Astrocytoma
- ▶ Spinal abscess

Figure 3 MRI axial T1-weighted scan demonstrating enhancing lesion.

Figure 5 Postoperative T2 MRI scan demonstrating laminectomy.

TREATMENT

She underwent lumbar spinal laminectomy from L3 level to S2 level. The dura was found to be extremely thickened and hyperaemic. Dissection on inferior aspect showed thickened arachnoid, clumped nerve roots and greyish-looking material. Excision of this abnormality was technically not feasible. Initial smear examination from the frozen section suggested the possibility of a tumour but also showed macrophages. Further biopsies were taken from L5 and S1 areas. Postoperative MRI scan revealed good decompression of the cauda equina nerve roots (figures 5 and 6).

OUTCOME AND FOLLOW-UP

Final histopathology analysis favoured tissue inflammation with no definite evidence of malignancy. Haematoxylin and eosin staining revealed no microorganisms. Tissue specimen cultured *Staphylococcus aureus* sensitive to flucloxacillin. A final diagnosis of intradural spinal abscess of filum terminale was made. Four weeks of intravenous antibiotics led to good clinical recovery and she showed a good clinical response to treatment.

DISCUSSION

Spinal abscess is known to be associated with risk factors; however, spontaneous abscess in the spine is also known to occur. Intravenous drug abuse is the most spinal trauma and immunosuppression due to various causes.² In this case, the patient had no co-morbidities and risk factors. Clinically, all patients with spinal abscess are known to have backache as a common feature.³ Other findings include sensory abnormalities (86%), motor weakness (72%), fever (55%), bladder dysfunction (55%) and altered consciousness (10%).³ It can present acutely in 21% of cases and can be chronic in 79% of cases.³

S aureus is the most common causative agent of spinal abscess.⁴ Other bacterial pathogens include *Streptococci*,

Klebsiella pneumoniae, *Escherichia coli*, *Salmonella* species, *Pseudomonas* and *Enterobacter* species, etc.

MRI scan with contrast is the investigation of choice for differentiating various spinal pathologies. MRI scan of spinal abscess is iso-intense or hypo-intense on T1-weighted images and hyperintense in T2-weighted images. Contrast studies show peripheral rim of enhancement, suggesting granulation tissue.⁵

Similarly, ependymomas are usually iso-intense on T1WI and hyperintense on T2WI, but the contrast enhancement is usually uniform.⁶ These are usually found solitary in the brain and spinal cord; however, a rare case of primary ependymomatosis has been reported involving multiple segments of the spinal cord without involvement of the brain.⁷ In these circumstances, neuroimaging of the brain and the whole spine is recommended. Our patient had her entire neuro-axis imaged and there was no other abnormality noted.

On MRI, spinal meningiomas are generally iso-intense to spinal cord on both T1- and T2-weighted images, but can be hyperintense on T2WI. These are enhanced homogeneously with contrast and mostly show dural attachment or a dural tail is noted in a majority of cases.

Intramedullary spinal astrocytomas form another important differential diagnosis; however, it is rare in the region of filum terminale. They tend to be iso-intense or hypo-intense on T1-weighted images and hyperintense on T2-weighted MRI images. These are almost always enhanced with contrast on T1WI. The enhancement is usually less intense, partial and inhomogeneous.

In this case, the inference from MRI findings suggested a diagnosis of filum terminale tumour. The uniform contrast enhancement favoured spinal ependymoma (myxopapillary variant). The fact that the patient had no risk factors for an abscess and the absence of serum inflammatory response further supported this diagnosis. Frozen section during surgery suggested a strong possibility of spinal tumour but the presence of macrophages led to the need for further sampling for histology and microbiological analysis in the form of microscopy, culture and sensitivity. Early spinal decompression proved to be beneficial.

Figure 6 T2 postcontrast MRI axial spine demonstrating postoperative changes in soft tissues and decompression.

Learning points

- ▶ Spontaneous spinal abscess can occur in an immunocompetent individual with the absence of any risk factors and normal serum inflammatory markers and a misleading MRI picture.
- ▶ We recommend that in these circumstances, surgical exploration in the form of spinal laminectomy decompression is essential to decompress to neural elements.
- ▶ Apart from intraoperative pathological analysis, the tissue specimen should be sent also for microbiology examination including microscopy, culture and sensitivity.
- ▶ MRI scan of the spine with and without contrast remains the prime tool in diagnosis and in certain cases, if necessary, the MRI of the entire spine and brain may be needed to aid the diagnosis and as a part of clinical management.

Competing interests None.

Patient consent Obtained.

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Sajjad J, Kaliaperumal C, O'Sullivan M. Abscess or tumour? Lumbar spinal abscess mimicking a filum terminale tumour. *BMJ Case Reports* 2012;10.1136/bcr.03.2012.5994, Published XXX

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