CASE REPORT

Discitis and *Clostridium perfringens* bacteraemiaChen Han Yong,^{1,2} Miranda Lam^{1,2}

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SUMMARY

The authors present a case involving an 80-year-old man with infectious T10/T11 discitis on the background of a recent *Clostridium perfringens* bacteraemia. This case report describes a case of probable *C. perfringens* discitis as further investigations failed to identify any causative agents. He was treated with intravenous piperacillin/tazobactam to good effect, achieving favourable clinical outcome. Diagnosis of discitis/osteomyelitis can often be delayed and mismanaged due to its non-specific presentations. Timing of empirical antimicrobial therapy requires careful consideration based on haemodynamic stability and neurological function to maximise microbiological yield.

BACKGROUND

Vertebral osteomyelitis is commonly monomicrobial, whereby *Staphylococcus aureus* accounts for half of non-tuberculous cases.¹ In contrast, anaerobic causes are rarely seen and constitute <4% of cases.¹ There are very few reports of *Clostridium perfringens* bacteraemia causing discitis as it is more commonly associated with hepatobiliary tract diseases. In this case report, we describe a patient with probable *C. perfringens* T10/T11 discitis with a significant clinical improvement after receiving piperacillin/tazobactam.

CASE PRESENTATION

An 80-year-old man presented to hospital with a 2-day history of right-sided pleuritic chest pain associated with worsening back and flank pain over 5 weeks. Back pain has occurred at night affecting his sleep and was exacerbated with movement. He also reported having 5-week history of night sweats without weight loss. This was in the setting of a recent hospital admission with fever and similar back pain 3 weeks prior, during which he was treated with piperacillin/tazobactam for *C. perfringens* bacteraemia of unclear source. *C. perfringens* was isolated in one anaerobic culture bottle out of two blood culture samples taken during that admission. Other significant medical history included atrial fibrillation with permanent pacemaker, non-insulin-dependent diabetes mellitus and prostate cancer for which he is on regular goserelin injections. Physical examination revealed mild lumbar spinal tenderness without neurological deficit. Body temperature was normal.

INVESTIGATIONS

Initial investigations revealed acutely raised inflammatory markers (erythrocyte sedimentation rate (ESR), 120 mm/h; C reactive protein (CRP) 57 mg/L) with a normal white cell count. Other tests including prostate-specific antigen, urine and three sets of blood cultures were negative. A CT pulmonary angiogram confirmed a subsegmental pulmonary embolism in the right lower lobe with incidental findings suggestive of discitis at the T10/T11 level. MRI was not performed as it was contraindicated in the setting of his pacemaker. Further imaging with CT lumbosacral spine confirmed irregularity of inferior vertebral body and endplate at the T10/T11 level without visible gas (figure 1). The suspicion for osteomyelitis/discitis was supported by a Tc99 bone scan (figure 2), which revealed inflammatory activity localising to the T10/T11 disc/vertebral articulation. Given the unusual presentation and a history of previous malignancy, a CT-guided needle biopsy of the disc was performed to distinguish an infective process from malignancy. The sample was inoculated into blood culture bottles, which subsequently had no bacterial growth on both aerobic and anaerobic incubation after 5 days. Histopathology showed inflammatory changes only, therefore excluding malignancy as a cause of the radiological changes.

OUTCOME AND FOLLOW-UP

He was managed as an infective discitis presumed secondary to *C. perfringens* and received intravenous piperacillin/tazobactam for a total duration of

Figure 1 CT lumbosacral spine showing irregularity of vertebral body and endplate at the T10/T11 level (arrow).

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Figure 2 Tc99 bone scan showing inflammatory activity localising to the T10/T11 level (arrows).

Table 1 Main features of published *Clostridium perfringens* bacteraemia cases

Authors	Sex/age (years)	Presentation	Risk factors	Blood culture	Needle biopsy	Level
Lotte <i>et al</i> ²	83/F	Chronic lumbar back pain over 6 months	Nil gastrointestinal pathology on CT	Negative	Positive	L4/L5
Caudron <i>et al</i> ³	79/F	Low back pain over 2 months	Colonic diverticulosis	Negative	Positive	L4/L5
Bednar ⁴	68/M	Acute back pain 6 day post-spinal surgery	Laminotomy, disctomy	Positive	Positive	L4/L5
Pate and Katz ⁵	62/F	Low back pain over 6 weeks	Diverticular disease	Positive	Negative after 3 days of antibiotics	L3/L4
Beguiristain <i>et al</i> ⁶	33/M	Low back pain over 7 days	No obvious risk factors	Not done	Positive	L1/L2

6 weeks. Pulmonary embolism was thought to be a provoked episode and was treated with warfarin. His pain subsequently abated with the resolution of inflammatory markers. The patient received ongoing rehabilitation following hospital discharge to facilitate his recovery to pre-morbid levels of functioning. Repeat CT lumbosacral spine performed 4 months later showed resorption of T10/T11 disc content with the resolution of para-vertebral inflammatory changes.

DISCUSSION

C. perfringens is a Gram-positive, anaerobic, spore-forming bacillus of the genus *Clostridium*. They are commonly found throughout nature especially in soil and water. In humans, they are considered a normal commensal of the gastrointestinal tract. When there is a breach in the mucocutaneous layer resulting in the displacement of the normal flora, *C. perfringens* can manifest

various clinical scenarios including gas gangrene, gastroenteritis and cellulitis.

To date, only six cases of *C. perfringens* discitis have been published.^{2–6} Table 1 illustrates the characteristics of *C. perfringens* discitis in patients for whom information is available. Diagnosis of discitis may be elusive considering its non-specific clinical presentation mimicking other pathologies. ‘Red flag’ symptoms including older age and a history of cancer may be used to identify patients at risk for a more dangerous cause of back pain. It is noted that lower back pain is a common theme among all five reported cases, with associated raised ESR in the setting of apyrexia noted in three patients. In our case, his initial presentation 3 weeks prior was characterised by back and flank pain, coupled with fever as well as a raised ESR.

A retrospective cohort study by Yang *et al* has identified intra-abdominal and lower respiratory tract as the most common

sources of *C. perfringens* bacteraemia.⁷ Renal insufficiency, malignancy and hypertension have also been described as the most common comorbidities in *C. perfringens* bacteraemia.⁷ Of the six reported cases, haematogenous spread of the bacilli from a primary gastrointestinal source resulting in secondary spinal infection was suspected in two patients with known diverticular diseases. Iatrogenic discitis was considered in one patient after having a spinal surgery, thus suggesting transcutaneous inoculation of the bacillus. Risk factors and potential portal of entry were not identified in two cases. Similarly, no clear source of entry was identified in our case as CT abdomen/pelvis did not detect any gastrointestinal or renal tract pathology and colonoscopy was not performed. There is no clear association between pulmonary embolism and *C. perfringens* discitis. Our patient was thought to have a provoked pulmonary embolism in the setting of reduced mobility due to back pain and recent hospitalisation.

As part of the diagnostic evaluation, obtaining a minimum of two blood cultures is recommended for all patients with suspected vertebral osteomyelitis. Elevation in ESR or CRP has a sensitivity of 94% to 100%, respectively, and are often used to rule out vertebral osteomyelitis or malignancy in patients with back pain.⁸ Like our case, a normal white cell count is reported in up to 40% of patients with vertebral osteomyelitis.⁸ MRI spine is the imaging of choice with a sensitivity of 97% and specificity of 93% in diagnosing vertebral osteomyelitis.⁸ Other imaging modalities such as spine gallium/ Tc99 bone scan, CT scan or positron emission tomography scan is recommended when MRI is contraindicated or unavailable. An image-guided aspiration biopsy is appropriate when a microbiological diagnosis for a common causative organism has not been established by a blood culture. Pathological examination of aspiration fluid may also assist in differentiating an infectious process from malignancy or degeneration, which is essential in managing our patient who has a background history of prostate cancer.

In our case, previous antimicrobial treatment may have decreased the microbiological yield from the aspiration biopsy, emphasising the importance of deferring empirical antimicrobial treatment until further diagnostic biopsy in otherwise stable patients. Initiation of empirical antimicrobial therapy is recommended in patients with haemodynamic instability, sepsis or severe neurological symptoms in conjunction with an attempt at establishing a microbiological diagnosis.⁸ Immediate surgical intervention is required in patients with neurological compromise.

The favourable outcome with single antibiotic penicillin therapy in previous published cases suggests that penicillin alone

is appropriate in *C. perfringens* discitis. A combination of penicillin and lincosamide was used in one reported case.² Six weeks of antimicrobial therapy is recommended in vertebral osteomyelitis with evidence suggesting that it is non-inferior to longer duration of treatment, reporting similar rates of relapse and death.⁹ In previous reported cases of *C. perfringens* discitis, duration of antimicrobial therapy ranges from 5 weeks to 3 months, achieving similar clinical outcomes^{3 6}.

Learning points

- ▶ *Clostridium perfringens* discitis is a rare condition.
- ▶ Diagnosis of discitis/osteomyelitis can be difficult given its non-specific presentations.
- ▶ MRI spine is the imaging of choice in diagnosing osteomyelitis/discitis.
- ▶ Timing of empirical antimicrobial therapy administration requires careful consideration based on haemodynamic stability and neurological function to maximise microbiological yield.

Contributors CHY: wrote the manuscript. ML: supervised development of work and manuscript evaluation.

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