Unusual association of diseases/symptoms

Bilateral psoas abscesses and vertebral osteomyelitis in a patient with sickle cell disease

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Summary

The authors present a case of a patient with sickle- β thalassaemia (S β^0 Thal) who had bilateral psoas abscesses on a background of splenectomy in early childhood. The patient also turned out to have vertebral osteomyelitis and hydronephrosis on the side of the larger abscess. The only organism recovered from the patient was a *Bacteroides* species. The patient was managed with percutaneous drainage and intravenous antibiotics and made a full recovery.

BACKGROUND

Sickle cell disease (SCD) is associated with an increased risk of infections by compromising host immune responses. Despite this, psoas abscesses have been rarely described. In this report, we describe a case of bilateral psoas abscesses caused by a *Bacteroides* species with vertebral osteomyelitis (VO) in a patient with SCD.

CASE PRESENTATION

A 30-year-old man known to have SCD (haemoglobin sickle- β thalassaemia (S β^0 Thal)) presented to the University Hospital of the West Indies (UHWI) with a tender painful lump over the right loin for 1 week. There was no history of trauma. The lump progressively enlarged in size and later involved the lumbar regions and was associated with a high fever. He noted that he was unable to flex or extend his right hip and thigh. Three days prior to presentation, he also noted a similar swelling on the left side. Past history was significant for a childhood splenectomy and recurrent priapism. He also had a known allergy to penicillin.

INVESTIGATIONS

On examination, he was ill-looking with a temperature of 98.8 °F and icteric. His oxygen saturation was 100% on room air. His cardiovascular examination revealed a pulse rate of 110/min and a blood pressure of 109/77 mm Hg. Of note, his right hip was held in flexion and he was unable to extend both his right hip and thigh. The only significant findings on blood investigations were anaemia, haemoglobin 6.3 g/dl (steady state = 10 g/dl), a high white cell count of 64.4×10^9 /litre with a neutrophilia of 65% and an elevated erythrocyte sedimentation rate (ESR) of 44 mm/h. Serology was negative for venereal disease research laboratory (VDRL) test and HIV. Abdominal-pelvic ultrasound revealed a large multiloculated abscess, which extended

from the inferior pole of the right kidney to the right inguinal region and was intimate with the right psoas. The right kidney was hydronephrotic (figure 1). A smaller abscess was also noted on the left side. The rest of the intra-abdominal organs were normal and visualisation of the spleen was not consistent with the surgical history.

TREATMENT

A diagnosis of bilateral psoas abscesses was made and he was resuscitated and started on an intravenous infusion of ceftriaxone and metronidazole. His bleeding indices, liver function tests and electrolytes were all normal. Ultrasound guided drainage was performed using 10.3-French self-retaining multi-purpose drainage catheters (Cook Medical, Bloomington, IN, USA). A total of 650 ml of pus was aspirated and sent for culture and grew *Bacteroides* species. Blood cultures were sterile.

A repeat ultrasound 24 h later revealed partial resolutions of the abscesses as well as the hydronephrosis. He made gradual improvement with progressive decrease in drainage from both sites and decrease in his white cell count.

Further investigations with lumbar spinal x-rays (figure 2) revealed destruction of the bodies of L2 and L3 consistent with osteomyelitis. The patient was transferred to the orthopaedic team for further management of his VO, which was confirmed on MRI (figures 3 and 4). Investigations for tuberculosis were all negative. He was treated once again with intravenous metronidazole and clindamycin and had weekly blood tests (ESR and C reactive protein (CRP)) done to track inflammatory markers. Both decreased from ESR 44 mm/h and CRP 8.07 to 16 mm/h and 3.15, respectively, after 8 weeks of intravenous antibiotics. The drains were removed 4 weeks post-admission and the patient was discharged after completion of intravenous antibiotic treatment for follow-up in the orthopaedic clinic.

Figure 1 Intravenous Pyelogram film demonstrating right hydronephrosis on the side of the larger psoas abscess.

OUTCOME AND FOLLOW-UP

His ESR and CRP reduced to 3 mm/h and 2.6, respectively, after 6 months, and 1 mm/h and 0.65 after a year. After 1 year of follow-up there have been no recurrences or complication of his disease.

DISCUSSION

Psoas abscesses are an uncommon occurrence¹ and may be primary or secondary based on the presence or absence of an underlying aetiology. Nowadays, primary psoas abscesses are often due to haematogenous spread of an infection process from an occult source especially in immunocompromised and elderly patients.² The most common pathogens are *Staphylococcus aureus* (88.4% of cases), streptococci (5%) and *Escherichia coli* (3%).^{3 4} Poor nutrition and low socioeconomic class are regarded as risk factors. Secondary psoas abscesses are classified as those which occur by direct spread from contiguous structures. Previous reviews have shown worldwide variations in the aetiology of this disease.^{1 4 5} Several diseases have been implicated with Crohn's disease being the most common (60%) and other causes being appendicitis (16%), ulcerative colitis, diverticulitis, colon cancer (together 11%) and VO (10%).⁴ Secondary psoas abscesses are caused mainly by *E coli* and *Bacteroides* species.⁴ *Mycobacterium tuberculosis* as a cause of psoas abscesses is currently rare in the USA but, in areas of the world where tuberculosis is still a common disease, it continues to be an important pathogen.⁶ Unusual causes are not uncommon, and there have been case reports of psoas abscesses secondary to *My kansasii*⁶ and *M xenopi*.⁷ Locally, there has been a report of a bilateral case of this disease attributed to disseminated granuloma inguinale.⁸

Psoas abscesses may present with vague and often non-specific symptoms. A high index of suspicion is mandatory to enable early recognition of this rare clinical disease. The classical clinical trial consisting of fever, back pain and limp is present in only 30% of cases.⁹ This was quite typical in our case, which was further supported by the examination findings.

With the increasing use of ultrasonography and CT, cases of psoas abscess are being diagnosed earlier and more frequently; thereby, decreasing the morbidity and mortality of this illness.^{10 11} CT better evaluates the retroperitoneal areas identifying additional collections, which may require separate drainage if percutaneous drainage is utilised.

Treatment involves the use of appropriate antibiotics as well as drainage of the abscess.³ Knowledge of common pathogens should guide initial choice of antibiotics. Some authors advocate a surgical approach—in particular if the CT demonstrates involvement of adjacent structures.¹² Several studies have substantiated the effectiveness and relative safety of percutaneous drainage of abdominal abscess.¹³ Benefits include avoidance of general anaesthesia and laparotomy as well as prolonged postoperative admission to hospital. Although our patient spent an extended length of time in hospital, this was attributed to his comorbid illnesses and the concurrent finding and treatment of his VO. Our patient had drains removed after 4 weeks as he had clinically significant drainage from the sites until then, and it has been recommended that abscess drainage needs to be continued until obliteration of the abscess cavity occurs and there is evidence of clinical improvement.¹⁴ Successful treatment generally requires long term (2–4 weeks) drainage and this was assessed by sequential sonography, clinical examination, measurements and observations of the drainage.

Figure 2 Lumbosacral views showing vertebral body destruction at multiple levels.

Figure 3 Sagittal T2W MRI showing confluent vertebral osteomyelitis (arrows).

Recurrences usually indicate an underlying uncorrected problem. The treatment protocol in our patient was quite successful as there was no recurrence. The presence of VO extended his treatment regimen and he had 8 weeks of dual antibiotic treatment. VO is usually caused by *S aureus* and coagulase-negative staphylococci.¹⁵ Anaerobic infections are much less implicated in spine and disc space infections, and *Bacteroides* account for only about 8% of isolates from bony infections. A report in 2007 has reviewed 12 cases of VO secondary to *Bacteroides*, and diabetes mellitus, Gaucher's disease, SCD and rheumatoid arthritis have been indicated as possible predisposing factors. Even though it is an uncommon cause of VO, its presence should be considered in those who have contiguous intra-abdominal or pelvic infections or who have had recent gastrointestinal procedures that may lead to *Bacteroides* bacteraemia. Out of the 12 cases cited, 9 were shown to have documented elevated ESR and CRP levels as has been shown in the present case as well. Positive blood cultures were seen in only 33% of the cases. Even though metronidazole is the drug of choice for managing *Bacteroides* infections, and there is no data supporting the use of dual antibiotic treatment, this regime has been used in the past with psoas abscess in an immunocom-

promised patient.¹⁶ As our patient was also immunocompromised from the presence of SCD as well as having had a splenectomy, both clindamycin and metronidazole were used. An extended period of intravenous treatment was used as it has been recommended that antibiotic treatment be individualised,¹⁴ and a falling ESR has been used as a marker of improvement.¹⁷ We used both a fall in ESR and CRP as inflammatory markers, along with clinical improvement, to guide our management.

Despite that fact that SCD causes much reduction in host immune responses, psoas abscesses have been only rarely reported in this population. Psoas abscesses as a result of VO have been even less frequently described with the only case being found in the literature presenting with *Salmonella* osteomyelitis.¹⁸ Whereas *Salmonella* species continue to be the most prevalent causative organisms causing osteomyelitis in patients with SCD, anaerobic causes are relatively uncommon.¹⁹ Patients who have SCD may be more susceptible to acute anaerobic osteomyelitis due to focal gut mucosal ischaemia, translocation of bacteria and seeding in infarcted bone marrow.²⁰ Although believed to be rare, it is likely that VO is underdiagnosed. Septic involvement of the spine may cause collapse,²¹ may cause fusion of vertebral

Figure 4 Axial T2W MRI showing spread of purulent material into the right psoas.

bodies²² and may present as psoas abscesses. Patients with SCD and bone pain present a diagnostic dilemma between avascular bony crises and osteomyelitis, and a high index of suspicion is required to help make a clear diagnosis.

Learning points

- ▶ SCD will compromise host immune responses; worse in cases that have had a splenectomy.
- ▶ Although back pain is a common site for painful crises in those with SCD, other causes, such as VO and psoas infections, should be considered in them as well.
- ▶ *Salmonella* species are commonly associated with osteomyelitis seen in SCD, but more uncommon organisms may be a cause.

Competing interests None.

Patient consent Obtained.

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Asnani M, Williams EW, Cawich S, Reid M, Mansingh A, Shah S, Williams-Johnson J. Bilateral psoas abscesses and vertebral osteomyelitis in a patient with sickle cell disease. *BMJ Case Reports* 2010;10.1136/bcr.01.2010.2642, date of publication

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