

Life-threatening pelvic osteomyelitis: pelvic destruction in an 8-year-old boy

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Clinical record

An 8-year-old Indigenous Australian boy was transferred from a regional hospital to a metropolitan paediatric hospital, with fevers, 2 weeks of left hip and thigh pain, and a left thigh abscess that had begun to discharge. Two weeks earlier, he had fallen while rollerblading and had sustained a superficial wound on the left thigh. He complained of ongoing left hip and groin pain and presented on several occasions to his general practitioner, who diagnosed a soft tissue injury. On arrival, the patient was in septic shock. Outside-taken radiographs (Figure, A) and magnetic resonance imaging (MRI) (Figure, B) showed extensive osteomyelitis and bony destruction, focused at the left ischium.

The necrotic ischium, pubis and hamstrings were debrided and large purulent collections were drained from the thigh; swabs were taken for microbiological culture. The initial debridement did not involve the exploration of the internal aspect of the pelvis. During a second debridement, 48 hours later, the pus had a faeculent odour and colour. Bowel involvement was not detected at this stage. During the third debridement, 5 days after the initial surgical treatment, faeculent fluid drained freely from the wound and further exploration revealed a retroperitoneal sigmoid colon perforation. The general surgical team created a colostomy and the wound was packed with gentamicin antibiotic beads and covered with a vacuum dressing.

Two strains of *Escherichia coli*, mixed anaerobes, *Candida* species and non-multiresistant, methicillin-resistant *Staphylococcus aureus* were cultured from the samples taken during the initial debridement. The patient was treated with oral clindamycin and rifampicin. After almost 9 weeks in hospital, he was discharged with a prescription for these antibiotics to be taken for 1 year.

The patient's colostomy was reversed at 6 months with no complications. One year after discharge, the boy had a 3 cm leg length discrepancy and reduced range of motion of his left hip. An MRI scan 1 year after discharge showed regeneration of the ischium and pubis, avascular necrosis of the left femoral head and formation of a left hip pseudoarthrosis (Figure, C). Despite radiographic changes, at follow-up he was surprisingly active, could walk over 1 km without pain, participated in sport (including soccer), and rarely needed analgesics.



A: Outside-taken plain anterior–posterior pelvis radiograph showing left hip subluxation, bony changes in the ischium, ilium and pubis, and distended small bowel. **B:** MRI at initial presentation showing large medial thigh collection (large arrow), left hip subluxation and oedema in the soft tissue, and fluid collection in the retroperitoneum (small arrow). **C:** MRI of the pelvis 1 year after discharge showing partial resorption of the left acetabulum and confirming avascular necrosis of the left femoral head (arrow). ◆

Pelvic osteomyelitis is a rare occurrence, with reported rates of 1%–11% of all cases of acute haematogenous osteomyelitis (AHO) occurring between the ages of 7 and 14 years.¹ In a review of the medical records of 220 children with AHO, 19 children had pelvic osteomyelitis.² A review of cases of AHO at our institution showed infection of the pelvis in 8% of 102 patients with AHO and a male : female ratio of 2.1 : 1.³

Pelvic osteomyelitis has been described in three entities — gluteal, lumbar and abdominal.⁴ Although these designations can be useful for determining the spread of infection, they have no prognostic value.^{4,5}

Acute pelvic osteomyelitis is often not initially recognised. It can be difficult to detect due to its variable clinical signs and differential diagnoses.¹ In one study, the time span between initial

symptoms and the diagnosis ranged from 1 to 8 days.² Difficulty diagnosing the condition may result in a delay of appropriate treatment.^{1,6,7}

In our patient, plain radiographs (which are usually normal for the first 7–10 days⁸) and magnetic resonance imaging (MRI) scans showed extensive bony and soft tissue destruction of the left hemipelvis, hip and thigh. Is it plausible that these changes occurred within 2 weeks, considering the patient's history? As we were unable to find supporting reports in the literature, this matter was discussed within various hospital departments. Concerns were raised that the time frame was too short to cause this level of destruction. It was proposed that the mixed flora that were cultured could cause a high level of destruction within 14 days. Although plausible, there was no direct evidence to support this theory.

Lessons from practice

- Negligible accidents can form the starting point of life-threatening osteomyelitis, particularly in the pelvic region. To avoid major complications, it is important to repeat physical examinations within a short time period (ie, daily).
- If any doubt arises regarding a correct diagnosis, check for inflammatory parameters and refer the patient to a major hospital for sophisticated imaging and commencement of appropriate treatment.
- Consider magnetic resonance imaging early, as this is the most sensitive method for detecting (pelvic) osteomyelitis. ◆

When during the course of the infection did the bowel perforation occur? In the literature, we found two case reports of a bowel perforation associated with pelvic osteomyelitis. Both occurred in adult patients, and bony infection was secondary to Crohn disease in both cases.^{9,10} On arrival at our hospital, our patient's radiographs showed dilated loops of bowel and no signs of free gas. The MRI scan showed oedema and signs of inflammation of the soft tissue at the perineum, surrounding the rectum, urethra, bladder and sigmoid colon. Free fluid was seen within the pelvis; however, there was no obvious pelvic collection. Enteric flora were cultured from the initial intra-operative swabs. These factors indicate that the bowel perforation was probably present on arrival, possibly as a sealed perforation, which was only detected 5 days after the initial debridement. Although we were unable to ascertain the cause of the bowel perforation, we believe that its association with pelvic osteomyelitis was significant.

We recommend that sophisticated imaging studies be performed at an early stage. MRI is the most sensitive test for osteomyelitis of the pelvis and spine, with a reported sensitivity of 97%–100% and specificity of 73%–92%.¹¹

Staphylococcus aureus is the most common causative organism in AHO, accounting for 76% of cases, with an increased emergence of community-acquired methicillin-resistant *Staphylococcus aureus* (MRSA) accounting for 9% of these.³ Aggressive community-acquired MRSA, which was isolated from the initial swabs, was thought to be the causative organism of this patient's pelvic osteomyelitis. We believe that the late diagnosis and the bowel perforation contributed to the extraordinary tissue destruction described in this article. We believe that the extent of the patient's recovery, including the partial repair of bony destruction, was remarkable.

Most cases of pelvic osteomyelitis reported in the literature were treated adequately with antibiotics alone; surgical intervention was

rarely required.^{1,5} Complications, including recurrence and permanent sequelae, were uncommon, with rates reported between zero and 7%.^{1,5} Increasing rates of community-acquired MRSA require clinicians to consider whether a change to more efficacious antibiotic therapy is necessary if the patient is not responding to flucloxacillin alone.

Unusual circumstances that delay the diagnosis can always occur, particularly in rural communities, where access to sophisticated imaging is limited.

Competing interests

None identified.

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