OSTEOMYELITIS OF THE PELVIS

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Four cases of osteomyelitis of the pelvis are reported to demonstrate the several clinical syndromes to which this disease can give rise. Extensive surgical drainage and antibiotic treatment led to recovery in all cases.

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Osteomyelitis of the pelvis is a rare disease which may be difficult to diagnose (Landy and Katz 1982; Leu et al 1986; Hojgaard, Kalms and Nielsen 1989). Morgan and Yates (1966) and Beaupré and Carroll (1979) suggested the following classification based on the anatomical location of the symptoms and physical signs: ‘hip joint syndrome’, ‘abdominal syndrome’, ‘buttock syndrome’ and ‘sciatic or lumbar disc syndrome’. Beaupré and Carroll (1979) postulated that the location of the symptoms and signs depended upon the direction in which pus drained from the infected bone.

We describe four cases of pelvic osteomyelitis with varied forms of presentation treated at the Hadassah-Hebrew University Medical Centre between 1985 and 1990. Table I gives the details of the patients. Diagnosis was delayed in all cases. All patients eventually underwent surgical drainage and debridement and thereafter made a good recovery. The infection was in the ischium in two patients and in the ilium in the other two. In two patients, the infection spread to the hip. Follow-up was from 18 months to five years, during which time all patients remained free from any sign of infection.

CASE REPORTS
Case I. A 27-year-old man was admitted complaining of severe pain in the right hip which had been present intermittently for several years. The last exacerbation had started several weeks before and was causing severe pain (at night), inability to bear weight on the right leg and a low-grade fever.

Table I. Details of four patients with pelvic osteomyelitis

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (yr)</th>
<th>Sex</th>
<th>Location</th>
<th>Symptoms</th>
<th>WBC (per mm$^3$)</th>
<th>ESR (mm/hr)</th>
<th>$^{99m}$Tc bone scan</th>
<th>CT</th>
<th>Organism</th>
<th>Follow-up (yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27</td>
<td>M</td>
<td>Posterior column of acetabulum</td>
<td>Low-grade fever</td>
<td>10 000</td>
<td>60</td>
<td>Increased uptake</td>
<td>Lytic lesion</td>
<td>Coagulase +ve staphylococcus</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>M</td>
<td>Ischium</td>
<td>Intermittent fever Buttock and hip joint syndrome</td>
<td>7000</td>
<td>120</td>
<td>Not done</td>
<td>Lytic lesion</td>
<td>Streptococcus pneumoniae</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>F</td>
<td>Iliac crest</td>
<td>High fever Hip joint syndrome</td>
<td>15 000</td>
<td>140</td>
<td>Normal</td>
<td>Lytic lesion Collections on both sides of iliac crest</td>
<td>Coagulase +ve staphylococcus</td>
<td>1.5</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>M</td>
<td>Ischium</td>
<td>Intermittent fever Buttock syndrome</td>
<td>8000</td>
<td>15</td>
<td>Normal</td>
<td>Lytic lesion Collections in the hip and buttock</td>
<td>Coagulase +ve staphylococcus</td>
<td>1.5</td>
</tr>
</tbody>
</table>

The right hip was tender to palpation and had a limited range of motion. The WBC was 10 000/mm$^3$ and the ESR was 60 mm/hour. Radiographs and CT showed an osteolytic lesion in the posterior part of the right acetabulum communicating with the joint (Figs 1 and 2). A $^{99m}$Tc bone scan indicated increased uptake at that site. Aspiration of the hip revealed pus from which coagulase-positive staphylococci were grown.

A course of intravenous methicillin (150 mg/kg/day) was started and the joint was explored through a posterior approach. An abscess was discovered in the posterior...
part of the acetabulum communicating with the joint. Immobilisation in a spica cast and continuous irrigation with a lavage system was continued for three months by which time all the signs and symptoms had subsided. Five years later the patient was free from symptoms and had only minimal limitation of hip movements.

Case 2. A 15-year-old boy was admitted with fever, nausea and right buttock pain which had been intermittently present for three weeks. There was tenderness over the right hip and buttock. The WBC was 7000/mm³ and the ESR was 120 mm/hour. Radiographs and CT showed a lytic lesion in the right ischium. Under CT a needle biopsy produced pus and treatment consisted of open surgical drainage and intravenous penicillin (20 mega units/day) for six weeks. Cultures grew *Streptococcus pneumoniae*. Three years later there were no signs or symptoms of disease.

Case 3. A 14-year-old girl was admitted with fever, nausea, vomiting, pain in the right lower abdominal quadrant, and tenderness around the right hip. She had been limping for a week. She was febrile (39°C), and had mild tenderness and guarding in the right lower abdominal quadrant, a positive psoas sign, and tenderness of the right sacroiliac region. The range of motion of the right hip was slightly limited. Thomas’ test was positive.

Her WBC was 15 000/mm³ and the ESR was 140 mm/hour. Pelvic radiographs were interpreted as normal. Puncture of the hip failed to produce any fluid. The presumptive diagnosis was acute appendicitis or periappendicular abscess, but laparotomy revealed no abnormality other than some fluid between the peritoneum and the pelvic wall and mesenteric lymphadenitis. The appendix was removed and was found to be normal.

Postoperatively, the fever continued despite intravenous antibiotics. A 99mTc bone scan showed no foci of increased uptake in the pelvis or spine. Blood cultures grew coagulase-positive staphylococci. CT showed two fluid collections (Fig. 3), one around the iliopsoas muscle.
and the other on the outer surface of the ilium. No bone abnormality was detected. Both these abscesses had repeated needle drainage, and the pus grew coagulase-positive staphylococci. Twenty-three days after admission repeat radiographs and CT showed a focus of osteomyelitis in the right ilium (Fig. 4). Surgical exposure confirmed osteomyelitis with sequestrum formation and a large quantity of pus was drained from both sides of the ilium. Cultures grew *Acinetobacter calcoaceticus* var *anitratus*, which was treated with appropriate antibiotics. Thereafter, the patient's condition improved dramatically and, two years later, she was free from infection.

**Case 4.** A 14-year-old boy was admitted with persistent pain in his left groin which had been present for one week. His temperature was 37.5°C; he had full range of motion of his left hip, but there was tenderness over the left ischium and hamstrings. The WBC was 8000/mm$^3$ and the ESR was 15 mm/hr. Ultrasound examination of the left hip showed no fluid in the joint and a $^{99m}$Tc bone scan was normal. During the next 36 hours, his temperature rose to 40°C and coagulase-positive staphylococci were grown from the blood culture. CT revealed a lytic lesion in the ischium with soft-tissue swelling in the buttock and fluid in the joint. Aspiration yielded pus containing gram-positive staphylococci and the joint and ischium were drained through a posterior approach. Methicillin 150 mg/kg/day was started soon after the positive blood culture and continued for three months. Eighteen months after the operation the patient was free from symptoms.

**DISCUSSION**

Osteomyelitis of the pelvis is uncommon; it was first described about 100 years ago (Fröhner 1890). The rarity of the condition and the way in which its clinical signs imitate other diseases make it an intriguing diagnostic challenge. Its estimated incidence varies from 2% to 11% of all bone infections (Young 1934; Weld 1960; Morgan and Yates 1966; Ghahremani 1973; Beaupré and Carroll 1979). The iliac bone is most commonly affected, perhaps because it is the largest pelvic bone with the richest blood supply (Morgan and Yates 1966). The aetiology is usually obscure; mild trauma and urinary tract infection are possible causes (Weld 1960) and Crohn's disease is known to be associated with pelvic osteomyelitis, mainly of the right ilium (Ghahremani 1973; Simpson 1984; Miller and Miller 1987).

Truncal osteomyelitis is always a clinical challenge (Young 1984). The pelvic (and vertebral) bones are deeply placed and their movements are minimal, so that the usual signs of bone infection, i.e., tenderness to palpation and limitation of motion, are missing. The symptoms and signs vary, depending on the initial site of infection, its duration and the direction of its spread. In two of our patients, spread of the infection into the hip led to the diagnosis.

Laboratory tests can be misleading. In our patients, the WBC was only a little elevated and the ESR was within the normal range in one case. Radiological changes appeared late in the course of the disease or were so slight as to be detected only retrospectively. The $^{99m}$Tc bone scan which is thought to be the most sensitive indicator of bone infection (Beaupré and Carroll 1979; Highland and LaMont 1983; Farley, Conway and Shulman 1985) misled us in two patients (cases 3 and 4). False-negative bone scans have also been described by Scott et al (1990). The CT proved more helpful in the early diagnosis and localisation of the lesion, but it requires very careful evaluation. MRI may prove to be even more useful (Lee and Glazer 1986). In our patients early surgical drainage combined with antibiotic treatment resulted in rapid and complete recovery.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

**REFERENCES**


