Pseudomonas pelvic osteomyelitis in a healthy child

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Abstract

Pediatric pelvic osteomyelitis is a rare entity. The diagnosis is frequently delayed due to difficulty in confirming the diagnosis. To our knowledge, this is the first case report of Pseudomonas pelvic osteomyelitis in a previously healthy adolescent boy. The diagnosis was made radiographically and confirmed by culture. The patient was treated with Levofloxacin and Gentamicin resulting in a complete recovery.

Discussion

Osteomyelitis of the pelvis is a rare entity in children with an estimated incidence of 1-11% of all hematogenous osteomyelitis. It is difficult to diagnose because of the rarity of infection and difficulty localizing the site of infection. Common misdiagnoses include septic arthritis or synovitis of the hip, appendicitis, cellulitis, pelvic inflammatory disease and nephrolithiasis. There is a general delay in diagnosis with mean duration of illness prior to diagnosis of 11 days. Pelvic osteomyelitis occurs more frequently in older children (mean age 8.7 years), affects males slightly more and is less likely to present after antecedent trauma. It usually occurs in a single bone with the ilium being the most affected site.

The most common presenting complaints are fever and pain. Other symptoms include limp or inability to bear weight on affected side. In children non-specific complaints such as anorexia and weight loss can also occur. The most common clinical findings are tenderness, fever, inability to bear weight, antalgic gait and decreased hip range of motion, although this is less severe than in children with septic arthritis.

Common laboratory findings include an elevated ESR and CRP as well as an elevated white blood cell count, however, the diagnosis should not be excluded based on normal laboratory values. The most frequently recovered organisms are Staphylococcus aureus with up to 50% of cultures being negative. Other organisms infrequently found were H. parainfluenzae, Salmonella, Group A Streptococcus, E. cloacae, P. aeruginosa, and K. kingae.

Bone scans are frequently positive earlier in the course of pelvic osteomyelitis as compared with radiographs, however, a negative bone scan does not exclude the diagnosis. MRI may be the most sensitive and specific diagnostic test with sensitivity reported between 82-100% and specificity between 75-96%. Generally positive by day 3-5 of illness. It is also useful in determining the extent of infection and distinguishing between soft tissue infection and bony involvement. Ultrasound may be a non-invasive initial test that can be used to diagnose pelvic osteomyelitis as long as the clinician suspects the diagnosis. In one study, the overall sensitivity and specificity of ultrasound was 86% and 100% respectively. However, ultrasound is only helpful if the study is specifically directed to look at the deep soft-tissues of the pelvis.

Surgical drainage and debridement may be necessary depending on extent of disease, response to antibiotic therapy and possible development of an extra-osseous abscess but due to the substantial blood flow to the pelvic bones, antibiotics are generally sufficient in treating pelvic osteomyelitis. Most patients were treated for 4-6 weeks.

The most common complication of pelvic osteomyelitis is abscess formation in adjacent musculature. Other complications that have been reported include fusion of the sacroiliac and ilium joint and deep vein thrombosis in a protein-C-deficient patient. Persistent infection due to chronic osteomyelitis or chronic recurrent multifocal osteomyelitis generally resolves with long-term antibiotics. Follow up should be long enough to identify complications such as growth abnormalities and chronic recurrent infections. Long-term prognosis is generally good provided prompt and adequate duration of treatment.
of antibiotic therapy.3,6

In conclusion, pelvic osteomyelitis is a rare condition in children. However, clinicians should suspect this diagnosis especially in a school-aged child who presents with fever, pain, limp, and/or inability to bear weight (Table 1).1-9 If the diagnosis is suspected, the initial non-invasive test to consider is a bone scan. Once confirmed, a biopsy with culture should be sent to direct antibiotic therapy. Most patients with acute disease improve with no complications after 4-6 weeks of antibiotic therapy. Adequate follow-up is needed to ensure that the patient remains free of long-term sequelae.

References


Table 1. Summary of published pediatric pelvic osteomyelitis cases series.

<table>
<thead>
<tr>
<th>Review, Y</th>
<th>Demographics</th>
<th>Presentation</th>
<th>Treatment</th>
<th>Pathogen</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kumar, 2010, n=23</td>
<td>Male 65% Mean age NA Range 1m-13y9m</td>
<td>Limp 100% Fever 65%</td>
<td>Debridement 30% IV abx 100% mean 18.7d then PO abx for 1-12 wks</td>
<td>Blood cx: Negative 70% MSSA 22% MRSA 4% Salmonella 4%</td>
<td>Complete resolution 97% Vascular necrosis of femoral head 3%</td>
</tr>
<tr>
<td>Klein, 2007, n=31</td>
<td>Male 61% Mean age 8y11m Range 1.5m-17y9m</td>
<td>Pain 50% Fever 71% Limp 29% Weight loss/anorexia 3%</td>
<td>IV abx 97% (4-6 wks) PO abx 3% (4 wks)</td>
<td>Blood cx: Negative 59% MSSA 33% MRSA 4% K. kingae 4% Tissue cx: Negative 59% MSSA 27% E. coli 5% P. aeruginosa 3% Salmonella 5%</td>
<td>Complete resolution 97%</td>
</tr>
<tr>
<td>Weber-Chrysochoou, 2007, n=19</td>
<td>Male 72% Mean age 8.0 y Range 5 m-15y7m</td>
<td>Limp 100% Fever 84% Hx of trauma 58% Local swelling/erythema 21%</td>
<td>Abl 100%</td>
<td>Blood cx: S. aureus 41% Tissue cx: S. aureus 42% S. pneumoniae 8%</td>
<td>Complete resolution 100%</td>
</tr>
<tr>
<td>Davidson, 2003, n=64</td>
<td>Male 63% Mean age 11 y6m Range 1y2m-17y6m</td>
<td>Pain 85% Limp 48% Fever 47% Hx of trauma 20%</td>
<td>IV abx 97% (aor 4 wks) I/D 8%</td>
<td>Source unspecified Negative 50% S. aureus 41% S. pneumoniae 3% H. parainfluenzae 2% Salmonella 2% GAS 2% Polymicrobial 2%</td>
<td>Complete resolution 97% Persistent infection 3% Other complications 5%</td>
</tr>
<tr>
<td>Zvulunov, 2003, n=146</td>
<td>Male 75% Mean age 8.1 y Range NA</td>
<td>Hx of trauma 17%</td>
<td>NA</td>
<td>Blood cx: S. aureus 47% S. pneumoniae 2% HIB 1% GAS 1% Tissue cx: S. aureus 47% S. pneumoniae 2% HIB 1% GAS 1% Salmonella 6%</td>
<td>Recurrent osteomyelitis 2% Permanent deformity 1%</td>
</tr>
<tr>
<td>Hammond, 2001, n=16</td>
<td>Male 75% Mean age 7.0y Range 7m-13.0v</td>
<td>Limp 100% Fever 88% Hx of trauma 31%</td>
<td>IV abx 94% (3-7 wks) IV abx+I/D 6%</td>
<td>Blood cx: Negative 18% S. aureus 30% GAS 27% S. pneumoniae 9% Fusobacterium 9%</td>
<td>Complete resolution 100%</td>
</tr>
<tr>
<td>Totals, n=299</td>
<td>Males 206 (69%) Mean age 8.1y Range 1m-17y</td>
<td>Limp 112 (73%) Fever 81 (53%) Hx of trauma 51 (21%)</td>
<td>Resolution 268 (97%)</td>
<td></td>
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</tr>
</tbody>
</table>

Years; M, months; Hx, history; IV, intravenous; Abx, antibiotics; wks, weeks; d, days; cx, culture; MRSA, methicillin-resistant Staph aureus; MSSA, methicillin-sensitive Staph aureus; NA, not applicable; HIB, H. influenzae type B; GAS, Group A Streptococcus.