Osteomyelitis of the proximal radial epiphysis

A case report

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A case of osteomyelitis of the proximal radial epiphysis in a 6-year-old boy is presented. The effect on the cartilaginous tissues and the potential for growth of the epiphysis must be considered.

Case report

A 6-year-old Caucasian boy sustained a minor contusion to his right elbow 8 weeks prior to admission. His past medical history included mild asthma and atopy, but he was otherwise fit and healthy. Following the contusion, he had developed some swelling, but radiographs showed no bony abnormality. The elbow remained quite swollen, but caused minimal distress. Radiography of the radial head, repeated 12 days before admission, showed a definite lytic lesion (Figure 1). Six days before admission, the boy developed acute elbow pain, increased swelling, decreased range of movement, and also some erythema. A low-grade pyrexia and malaise were present. The white cell count was 7,000 and the ESR was 90 mm/h. Oral cloxacillin, 250 mg four times daily, was started.

On admission the right elbow was swollen, with mild erythema. It was warm, and there was localized tenderness over the radial head. Mobility was limited to about 90° flexion and 30° extension. Pronation was extremely painful. There was no clinical involvement of other joints. Radiographically, there was a marked irregularity of the radial head and the lytic lesion had increased in size.

On exploration, purulent fluid was present in the elbow joint,which showed marked synovitis. The articular cartilage appeared normal on the humerus, but thinned on the radial head. The joint was washed out with normal saline and the lytic lesion was curetted. The diagnosis of epiphyseal osteomyelitis and septic arthritis was confirmed by histologic studies. IV flucloxacillin, 750 mg four times daily, and gentamicin, 40 mg four times daily, were started. After 7 days, this regime was changed to oral flucloxacillin, 750 mg four times daily, for 6 weeks. Blood and pus cultures and screening for *Hemophilus influenzae* and *Streptococcus pneumoniae* were negative. Anti-staphylococcal titers were weakly positive. The ESR decreased to 19 mm/h. A bone scan 2 weeks after the operation showed no evidence of osteomyelitis in other foci.

At outpatient follow-up 10 months after discharge, the boy was asymptomatic. The elbow had a nearly full range of painless movement. Radiographs showed some reossification of the proximal end of the radius, suggesting that the cartilage of the radial head has not been damaged beyond repair.

Discussion

Epiphyseal osteomyelitis was considered to occur only in very young children (Trueta 1959); the cartilage growth plate is supposed to act as a physical barrier to the spread of the infection from the metaphysis. Vessels crossing the growth plate are present in the fetus and the infant, but disappear at about 15 months of age (Ogden 1974). These channels would account for the spread of infection to the epiphysis

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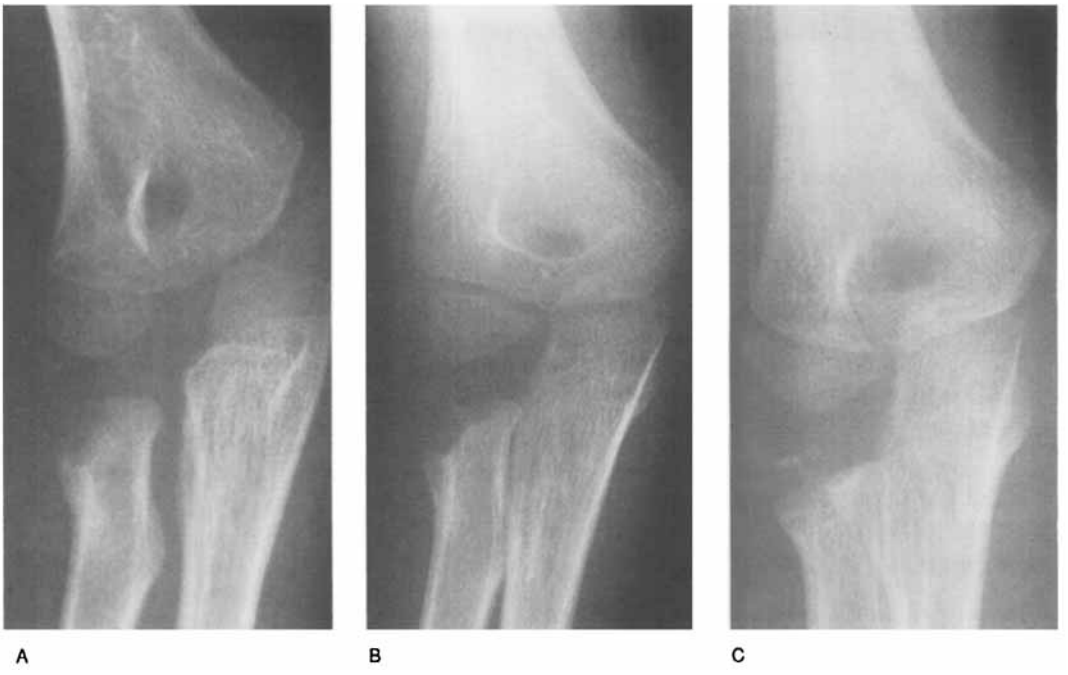

Figure 1. A 6-year-old boy with osteomyelitis of the proximal radial epiphysis.

A. Twelve days before admission, with a lytic lesion of the radial head.

B. At admission. Irregularity of the proximal end of the radius, with increased area of bony destruction. The bones are osteopenic.

C. Ten months later. Irregularity of the proximal radial metaphysis and still some fragmentation of the radial head. Some organized new bone is present along the upper radial shaft. Signs of reossification of the proximal end of the radius are present.

in the young child (Trueta 1959) and for the rarity of epiphyseal osteomyelitis later in life (Kahn and Pritzker 1973).

In the older child, the presence of a subchondral hemodynamic pattern of slow flow, analogous to that found in the metaphysis, is plausible (Trueta 1959). Acute hematogenous epiphyseal osteomyelitis has been recently reported in the lateral femoral condyle of a 11-year-old boy (Kramer, Post and Sussman 1986), and in 10 children aged between 2 months and 9 years (Rosenbaum and Blumhagen 1985). In the latter paper, only in 1 case was the upper limb affected: namely, the upper humeral epiphysis.

The proximal radial epiphysis accounts for about 25 percent of the total length of the radius (Blount 1954). Its destruction at an early age is then likely to cause deformity (Roberts 1970). However, the early evidence of regeneration shown by our patient confirms the resistance of the articular and epiphyseal cartilage to bacterial agents and their growth potential even after severe insult.

References

Blount W P. Fractures in Children. Williams & Wilkins, Baltimore 1954.

Kahn D S, Pritzker K P. The pathophysiology of bone infection. Clin Orthop 1973; 96: 12-9.

Kramer S J, Post J, Sussman M. Acute hematogenous osteomyelitis of the epiphysis. J Pediatr Orthop 1986; 6(4): 493-5.

Ogden J A. Changing patterns of proximal femoral vascularity. J Bone Joint Surg (Am) 1974; 56(5): 941-50.

Roberts P H. Disturbed epiphysial growth at the knee after osteomyelitis in infancy. J Bone Joint Surg (Br) 1970; 52(4): 692-703.

Rosenbaum D M, Blumhagen J D. Acute epiphyseal osteomyelitis in children. Radiology 1985; 156(1): 89-92.

Trueta J. The three types of acute haematogenous osteomyelitis. A clinical and vascular study. J Bone Joint Surg (Br) 1959; 41: 671-80.