Childhood Osteomyelitis with Septic Arthritis -
A Case Report and Review of Literature

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ABSTRACT
A 4 year old girl presented with pathological fracture of right shaft femur with ipsilateral septic arthritis and epiphyseal separation of the head of femur. Pathophysiology, radiological findings, management and coexistence of septic arthritis and osteomyelitis with review literature is presented. Worst prognosis is seen in older children, due to delay in diagnosis or in neglected cases. Because of the devastating sequels on immature skeleton including limb shortening, osteomyelitis, destruction of joint surface, epiphyseal separation of proximal epiphysis, and pathologic fracture of shaft femur, the importance of early diagnosis and prompt treatment cannot be overemphasized.

Keywords: Childhood osteomyelitis; septic arthritis; fracture shaft femur

INTRODUCTION
Hematogenous metaphyseal osteomyelitis and septic arthritis are commonly associated in neonates. Approximately 20% of infants with septic arthritis have adjacent osteomyelitis, but more than half of neonates associated with septic arthritis may have concomitant osteomyelitis. Epiphyseal plate prevents infection from entering joint space in older children but apparently does not act as a barrier in infants. The transphyseal blood vessels disappear by age 6 months. The aim of presenting this case report is to reveal the final outcome of our patient and find out the possible risk factors for poor result.

CASE REPORT
A 4 years old girl child presented with pathological fracture of right shaft femur with ipsilateral septic arthritis and epiphyseal separation of the head of femur. This was associated with purulent discharge from the fracture site at shaft femur. She had injury to right lower limb 2 months back while playing. She received treatment by some local practitioner, where she was given bandages, and after 10 days above knee plaster cast was applied over the fractured limb. After 10 days of plaster application, purulent discharge began from the fracture site, edema developed in right lower limb and she became febrile. Plaster was removed and antibiotics were administered for one month at that center. Thereafter she presented to our institute. Radiological picture revealed segmental fracture of shaft of femur with epiphyseal separation of the head of femur, associated with extensive involvement of the femoral shaft. The proximal femoral epiphysis was separated and fragmented. (Figure 1) Pus culture showed a positive growth of Staphylococcus aureus.

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Fig. 1: Epiphyseal separation and posterior dislocation of right hip joint and osteomyelitis.
The patient underwent surgical debridement of hip joint and right femur. Then epiphyseal separation of the head of femur was reduced and fixed with K wire, and at the site of fracture shaft femur, external fixator was applied (Figure 2).

Intravenous antibiotics were given for 2 weeks, followed by oral antibiotics for further 4 weeks. Pus discharge stopped and wound healed during this period. External fixator was removed after 6 weeks and fracture shaft femur was fixed with intramedullary K wire and protected with spica for further 3 weeks. After 12 weeks K wire was removed from the fractured shaft femur when her fracture site united radiologically. After one year her right lower limb again got injured due to fall and she had a fracture shaft femur in upper half. Again fracture shaft femur was fixed with K wire and hip spica was applied for 4 weeks. After one year of follow-up, (Figure 3) the patient is doing well except for limb length discrepancy of six centimeters.

**DISCUSSION**

*Staphylococcus aureus* is the most common causative agent in children and adults while streptococcus is most commonly found in infants and neonates. In 70% of cases the femur and tibia are affected. Osteomyelitis and septic arthritis commonly occur simultaneously in neonate and young infant as blood supply to the epiphysis and metaphysis is contiguous, but in older child the blood supply to the epiphysis and metaphysis is separate. Hematogenous osteomyelitis in children affects mainly the rapidly growing and highly vascular metaphysis of long bones. Metaphyseal terminal arterial branches progress into a network of capillary loops and large venous sinusoids where blood flow is sluggish and functioning phagocytes are scarce. These are optimal conditions for bacteria to inoculate. Bacterial septic emboli spread into the vascular channels, raising intraosseous pressure and obstructing the flow of blood. Consequent ischemic necrosis of bone results in the formation of subperiosteal and soft tissue abscesses. Infection spread occurs in joints where the articular capsule is attached to the periosteum beyond the edge of the articular cartilage. In those joints (shoulder, elbow, hip, knee joint) rupture of an abscess located in the metaphysis can lead to septic arthritis. The presence of vascular connections between the metaphysis and the epiphysis makes infants particularly prone to septic arthritis of the adjacent joint. Transphyseal vessels between the epiphysis and metaphysis transgress the growth plate and thus it is not uncommon for infection to extend from its primary site in the metaphysis to the epiphysis and then out into the joint space. Late imaging findings on plain radiographs, especially in 3-4 week period, are bony destruction and following periosteal new bone deposition.

**Competing interests**

The authors have no competing interests

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**REFERENCES**

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*Fig. 2: Fixation with K wire and external fixator*

*Fig. 3: Xray at one year of follow-up*


