Bucket Handle Fracture
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History
9 month old female with multiple fractures.

Diagnosis
Bucket handle fracture. Non-accidental trauma.

Discussion
The first case of non-accidental trauma was described by John Caffey in an infant with multiple fractures and bilateral subdural hematomas in 1946. Since then imaging has played an important role in the diagnosis of child abuse. Synonyms include corner fracture, metaphyseal infraction, metaphyseal avulsion fracture, and metaphyseal flecks but bucket handle fracture better reflects the transmetaphyseal nature of the fracture. The bucket handle fracture is virtually pathognomonic of inflicted injury and is related to shearing forces generated by rapid acceleration-deceleration or torsion. The fracture occurs between the zone of calcified cartilage and the primary spongiosa; the growth plate is not usually directly involved. The distal femora, proximal and distal tibia, and the proximal and distal humeri are the most common sites for this type of injury. Since the ossified fragment is so thin, the fracture quickly becomes inconspicuous related to the hyperemia associated with healing. Usually there is no periosteal new bone formation with bucket-handle fractures. Other skeletal manifestations of inflicted injury include subperiosteal hemorrhage, diaphyseal fractures of long bones (in particular spiral orientation of the fractures), fractures of the acromion and distal clavicle, scapular fracture, multiple rib fractures, skull fractures especially if multiple or bilateral or crossing sutures, and multiple fractures. Fractures in different stages of healing suggest multiple events.

Findings
Thin transmetaphyseal (subphyseal) fracture of distal femur giving rise to a bucket handle appearance.
Posterior-medial corner fracture proximal tibia.

Reference
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