History
13 year old male with knee pain after a basketball injury

Diagnosis
Tibial tuberosity avulsion fracture

Discussion
Tibial tuberosity fractures affect physically active adolescents. Activities involving powerful contraction of the knee extensors can result in avulsion fractures of the tibial tuberosity apophysis. Radiography of the knee is the main imaging study. Tibial tuberosity fractures typically occur in individuals aged 14-17 years. Watson-Jones classified the fractures into the following 3 types:
Type I: The fracture is within the most distal portion of the tibial tuberosity ossification center and usually results in avulsion of the most distal portion.
Type II: Extension of the fracture line occurs into the proximal end of the tibia through the cartilage bridge but does not involve the articular surface.
Type III: This is an intra-articular fracture in which the fracture line has propagated into the joint.

Findings
Lateral radiograph demonstrates separation of the tibial tuberosity from the tibia as well as soft tissue swelling. MRI demonstrates edema within the tibial tuberosity physeal cartilage as well as within the adjacent epiphysis along the cartilage bridge between the apophysis and epiphysis. Hypointense fracture line or area of impaction also extends through the anterolateral epiphysis in this region. There is anterior displacement of the tibial tuberosity by up to one centimeter. There is surrounding soft tissue edema and patellar tendon sprain.

Reference
Emedicine, tibial tubercle fracture.
Wheeless" textbook of orthopedics: Avulsion of the tibial tubercle.
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