History: Withheld
Coronal CT reformations

Coronal 3d volume rendered image from CT
Axial CT images obtained of proximal radius and ulna
CT axial images of proximal radius using:

- Soft tissue algorithm
- Bone algorithm
What's the Diagnosis – Case 61

Coronal IR

Coronal PD

Coronal MPGR
Consecutive axial PD images of proximal radius
What's the Diagnosis – Case 61
Findings

- Radiographs demonstrate irregularity and deformity of the proximal radius, periosteal reaction, and no identified radial head epiphyseal ossification center. CT images demonstrate punctate foci of ossification surrounded by soft tissue along the radial aspect of the proximal radius. MR imaging confirms these small foci of ossification with surrounding tissue which is the same signal intensity of the remainder of the unossified ends of the bones of the elbow.
Deformity of radial head with no visualized epiphyses

Periosteal bone/reaction
Displaced radial head epiphyses with early ossification

Periosteal reaction/bone
Small foci of ossification (red circles)

Surrounding soft tissue attenuation

X: Expected location of radial head with foci of ossification displaced 90 degrees radially from this expected or anatomic site.
Same signal around ossification as remainder of the ends of the bones of cartilage anlages

Foci of ossification
Circle: Radial head cartilage anlage
X: Expected or anatomic position of radial head
Diagnosis: Displaced radial head/cartilage anlage fracture

- The elbow has a known time course for the appearance of its multiple epiphyses and apophyses (secondary growth centers). For the purposes of this case, the capitellum is followed by the radial head and then the medial epicondyle with the capitellum beginning to ossify at 1, radial head at 4, and then the medial epicondyle at 7. The cross sectional imaging shows clearly the fractured/displaced unossified radial head epiphysis as soft tissue attenuation on the CT and intermediate signal intensity on the MRI. It contains small areas of early ossification of the secondary growth center on both imaging modalities. Particularly on the coronal PD and MPGR sequences, the cartilage anlagen all demonstrate intermediate signal.

- In this case the patient was a six year old boy who had sustained trauma several months prior and was seen at an outside institution and seen only recently at our institution. However, without a knowledge of prior trauma the periosteal reaction with a soft tissue component and ossification could be seen in the setting of a neoplasm. Periosteal reaction also may be seen in the setting of infection as may a soft tissue mass representing an abscess or phlegmon. This demonstrates the imperative nature of obtaining a good history particularly as relates to the interpretation of images.