



# POSNA

## The Core Curriculum

### Fractures of radial head and neck

#### Objectives

1. Describe the ossification pattern of the proximal radius, and how it relates to the radiographic appearance.
2. List a useful classification system for fractures of the proximal radius.
3. Describe mechanisms of injury resulting in fractures of the proximal radius. Include fractures associated with dislocation of the elbow and Monteggia variants.
4. Describe the incidence and mechanism of acute fractures and stress injuries of the proximal radius.
5. Discuss management of a 30 degree angulated fracture, and of a 60 degree angulated fracture.
6. List complications of fractures of the proximal radius and strategies for their avoidance

#### Discussion points

1. Demonstrate how the radial head could be completely displaced as a result of elbow dislocation. What methods might be successful for management?
2. Can chronic overuse (little league elbow) produce angulation of the radial neck?
3. What is a useful criterion for satisfactory closed reduction? Why should open reduction be avoided if possible?
4. What special radiographic technique can be helpful for evaluating the painful proximal radius?
5. What methods of closed reduction are effective?
6. What is the Metaizeau technique?

#### Discussion

Fractures of the proximal radius are rare in children (about 1%), most occurring in the second half of the first decade of life. Chambers and Wilkins have combined the previous classification systems of Jeffrey and Newman to comprise a useful system. Valgus injuring forces in the extended arm are most common, and can cause either metaphyseal or physeal fractures. Fractures associated with dislocation can occur either during dislocation (anterior) or reduction (posterior). In addition, Monteggia III variants can produce fractures of the radial neck secondary to varus stress. The other major injuring force to the child's proximal radius is chronic overuse which can result either in changes consistent with osteochondritis dissecans or physeal injuries with angulation of the radial neck. The radiocapitellar view is produced by angulating the beam toward the shoulder instead of directly at the elbow, and can be helpful in assessment.

Closed reduction has been traditionally achieved by placing varus stress on the extended elbow with the forearm supinated, and pressing the proximal radius back into place. An alternate method, the Isreali technique, starts with the elbow flexed, and the forearm supinated. The thumb stabilizes the proximal radial fragment while the elbow is pronated. An alternate technique was reported by Chambers and Wilkins who noted that wrapping the arm with an ace bandage in preparation for an open procedure reduced the fracture. Generally, less than 30 degrees of angulation postreduction is desirable, although if motion is satisfactory, the result will be satisfactory. Translation should be less than 4 mm.

If angulation of > 30-45 degrees remains, and motion is restricted, further methods are indicated. One method stabilizes the proximal fragment percutaneously with a small K-wire, and uses the wire to manipulate the fragment into acceptable position. A method undergoing increasing popularity is that described by Metaizeau consisting of inserting an angulated wire into the distal radius and rotating the angulated tip to reduce the fracture. Most authors agree that avoiding actual open reduction of the fragment is preferable, although for completely displaced fractures, open reduction is unavoidable. Often the fracture is stable without fixation, but oblique pins and/or small screws have been used for intra-articular fractures.

Complications are generally related to the severity of injury, and even innocent appearing fractures can do poorly. Fortunately, good function can sometimes occur following avascular necrosis and radial head overgrowth. Nonunion is rare.

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