



POSNA

The Core Curriculum

Fractures of the proximal humerus

Objectives

1. Describe the incidence and location of proximal humeral fractures in children
2. Describe the configuration of the proximal humeral physis
3. Discuss clinical and radiographic findings of a proximal humeral fracture in the newborn
4. Discuss the muscular forces on the proximal humeral fracture in the adolescent
5. Discuss management and prognosis of proximal humeral fractures in the adolescent

Discussion points

1. When does the proximal humeral physis close?
2. How does one decide on a method of management of a completely displaced proximal humeral physeal fracture based on the available data base in the literature?

Discussion

The proximal humeral epiphysis does not ossify until about age 6 months. Fusion occurs at about age 15 in girls and 17 in boys. Bortel and Pritchett have published a straight line graph for upper limb growth similar to Moseley's for the lower limb. The shape of the physis is conical, with the apex pointing posteromedial. The medial metaphysis is intra-articular. Fractures of the proximal humerus account for less than 5% of children's fractures. Birth injuries are transphyseal, with the proximal humeral epiphysis not yet ossified at birth, the malalignment of the shaft to the glenoid is the only radiographic finding. Ultrasound and arthrography have been found helpful in diagnosis. Congenital dislocation of the shoulder is rare, but has occurred. Management of proximal humeral fractures in infancy is relatively simple. Reduction with traction, abduction, and flexion has been described, but with the generous remodeling potential of this site, good results are uniform. Proximal humeral fractures primarily are seen in infancy and adolescents. Fractures prior to adolescence are more often metaphyseal. In the adolescent, they are primarily physeal injuries, the vast majority Type II. The pull of the rotator cuff and subscapularis on the proximal fragment leave it abducted, flexed, and externally rotated, the pectoralis major pulls the distal fragment into adduction. Treatment options include manipulative reduction (similar maneuver to that for the infant), followed by cast immobilization (which is extremely rarely used at present), manipulation and immobilization in a sling and swathe, closed reduction and percutaneous pinning, open reduction, and no reduction using simply symptomatic immobilization with the arm in a sling and swathe. Various figures of what constitutes an acceptable reduction are available; Dameron's recommendation of 20 degrees in the older child is often quoted. The literature on proximal humeral fractures is scanty compared to that of the distal humerus, but several reasonably large series have been reported over the past 2 decades, with one exception, nonoperative treatment is

avored for all fractures. The remodeling potential of the proximal humerus is perhaps the most impressive in the body, and the mobility of the shoulder surely compensates for residual deformity at skeletal maturity.

Acute fractures of the lesser tuberosity in athletes have been singled out as doing better with open reduction.

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