in 34 patients at an average follow-up of 5 years. No avascular necrosis or chondrolysis occurred.

We believe, like Hurley et al. (1996), that slipped capital femoral epiphysis is not a unilateral disease but a disease of both hips. Our case demonstrates 2 complications that resulted from non-optimal operative therapy. First, the implants were removed too early, at the age of 10 years. A short time after this operation, a unilateral new slipping occurred. Prophylactic pinning of the contralateral side was not performed, because the parents refused this operation, although we recommended it. Within 6 months, a further slippage of the non-stabilized hip was detected, which would have been obviated by simultaneous pinning.

We use threaded wires, because we have seen few complications with this technique. An outgrowing of these wires from the physeal plate occurs very seldom, so the risk of restabilization is low. This is important, because too-early removal of the implants and outgrowing seem to be the same functionally.


Irreducible fracture-separation of the distal ulnar epiphysis in the Galeazzi equivalent fracture—a case report

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An 11-year-old girl was admitted to the emergency room after sustaining an extension injury to her outstretched left hand, presenting pain, tenderness and swelling of the wrist. The neurovascular examination was normal. Radiographs showed a distal radial shaft fracture and a type II Salter-Harris fracture of the distal ulna with dorsal displacement of the proximal fragment (Figure 1).

Closed reduction under general anesthesia was tried but the ulnar fracture could not be reduced. Open reduction was performed through a dorso-ulnar approach over the distal radioulnar joint. Intraoperative examination revealed that the ulnar metaphyseal fragment was dislocated into a capsular buttonhole (Figure 2), leaving the epiphysis of the distal end of the ulna with its metaphyseal flake in its normal location at the distal radioulnar
Joint. The metaphyseal fragment prevented the reduction maneuver and made it necessary to enlarge the buttonhole and unblock the metaphyseal fragment. Then the fracture could be reduced and the forearm placed in complete supination. In this position, reduction was stable. Percutaneous fixation of the radial fracture was performed using a Kirschner wire. The capsular tear was closed and a brachial cast was applied with the forearm in complete supination. Postoperative radiographs revealed correct reduction.

The cast and Kirschner wire were removed 6 weeks later. Active exercises of the wrist and elbow were started immediately. Hand motion and strength were normal at the 4- and 9-month follow-up examination and the patient had no pain. Comparative radiographs of both wrists at the last control revealed no physeal disturbance and the ulnar variance was symmetrical.

Discussion

Galeazzi fracture-dislocations consist of a fracture of the radial shaft, usually at the union of the mid third and the distal third of the shaft, together with a dislocation or subluxation involving the distal radioulnar joint (Mikic 1975, Reckling 1982, Mohan et al. 1988). In children, there is a variation of this lesion consisting in a radial fracture associated with a distal ulnar epiphysiolysis instead of distal radioulnar joint dislocation (Mikic 1975, Reckling 1982, Landfried et al. 1991). This occurs because the physeal plate offers less resistance to injury in hyperpronation than does the triangular fibrocartilage complex (Landfried et al. 1991).


As opposed to adults, in whom the common treatment is open reduction with rigid fixation of the radius with a plate (Chambers et al. 1996), in children, the treatment consists of closed reduction and application of a brachial cast with the

In children, open reduction may be necessary if reduction of the radius is not correct (Campbell 1990) or if dislocation of the radioulnar distal joint or the ulnar physeal fracture cannot be reduced, usually due to interposition of the extensor tendons (Karlsson and Appelqvist 1987, Hanel and Scheid 1988, Biyani and Bhan 1989, Landfried et al. 1991, Letts and Rowhani 1993) or the periosteum (Landfried et al. 1991).

We describe a case in which reduction of the ulnar physeal fracture was impossible due to a capsular buttonhole involving the ulnar metaphysis. To our knowledge, this has been described only once in the literature in a case of an isolated Salter-Harris type II epiphysiolysis involving the ulnar distal epiphysis (Engber and Keene 1985).

In the presence of a fracture of the distal third of the radius, the existence of a distal radioulnar joint injury or an ulnar physeal fracture must be ruled out. Clinical examination searching for deformity and/or pain and an extensive radiographic evaluation should be performed since the ulnar component of the lesion is missed very often (Walsh et al. 1987, Mohan et al. 1988, Letts and Rowhani 1993).

In children who sustain a fracture-dislocation or a Galeazzi-equivalent fracture, closed reduction (under general anesthesia) and cast immobilization should be attempted first. In cases where reduction of the ulnar injury is impossible, repeated attempts should be avoided, because they can cause physeal damage (Lee et al. 1984). Open reduction must be performed because of the interposition of various structures, usually tendons or periosteum, but the interposition of a capsular buttonhole should also be considered, as described in this paper.

The child should be followed until growth stops since physiolyses at this level are associated with precocious physical closure in more than half of the cases (Chambers et al. 1996).