

Transverse divergent dislocation of the elbow

A report of two cases

Two children with transverse divergent dislocation of the elbow had quick and complete recovery following closed reduction and immobilisation.

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In transverse divergent dislocation of the elbow the olecranon lies medial and the radial head lateral to the distal humerus. Clinical descriptions of this lesion were given in 1854 by Warmont and in 1893 by Wight (Stimson 1899), and radiographically verified cases have been reported by DeLee (1981) and Carey (1984).

Among 120 elbow dislocations treated at our department in the years 1972 to 1984, two were of the transverse divergent variety.

Case reports

Case 1. A 10-year-old boy fell over the edge of a pavement and injured his left elbow. He was not able to recollect the mechanism of injury to the elbow, which

was painful and could not be moved. Movement of the hand produced pain at the wrist. The elbow was disfigured, swollen and fixed at about 45 degrees of flexion with the forearm in slight supination. There was a noticeable prominence of the radial head on the dorso-radial side of the upper forearm. Neurovascular complications were not present. Radiographs showed a transverse divergent dislocation of the elbow.

Reduction was easily accomplished under axillary block by the application of traction. Afterwards there was a tendency to redislocation on extension of the elbow. A posterior slab of plaster with the elbow at a right angle and the forearm in a neutral position was applied for 4 weeks. Reduction was confirmed by repeated radiographic examinations. Mobility was normalized within 2 weeks by active exercises. At follow-up after 3 years the boy had no complaints, and clinical and radiographic examination was normal.



Figure 1. Case 2. Transverse divergent dislocation of the left elbow in a 6-year-old boy.

Case 2. A 6-year-old boy fell from his bicycle and injured his left elbow. The mechanism of injury could not be established. The elbow appeared markedly broadened and was held in flexion and at about neutral rotation. There were no signs of neurovascular lesions. Radiographs showed a transverse divergent dislocation of the elbow (Figure 1).

Closed reduction was performed under general anaesthesia. The olecranon was reduced by direct pressure, and then the radial head by extension and supination of the elbow. The elbow was stable on reduction and could be moved through a normal range. A circular cast of plaster was applied with the elbow nearly at a right angle and the forearm in supination. After 3 weeks the cast was removed and active exercises were encouraged. Two weeks later mobility was normal, except for 20 degrees lack of extension.

At follow-up after 3 years the boy had no complaints, and clinical and radiographic examination was normal.

Discussion

In the usual posterior types of elbow dislocation, lesions to the lateral ligament, posterior capsule, anterior capsule and ligament and possibly the medial ligament are encountered (Osborne & Cotterill 1966). In transverse divergent dislocations, there must also be a lesion to the annular ligament and to the interosseous membrane of the forearm. Furthermore the olecranon and radial head must impinge on the distal humerus in a spread and stable position. Except for Wight's case (Stimson 1899), all cases of transverse divergent dislocation of the elbow have occurred in children. Closed reduction has been possible in all reported cases, either by traction alone or in combination with direct pressure to the upper ends of the radius and ulna. Post-reduction instability suggested by Smith (1972) has been demonstrated only in our Case 1. Quick and complete recovery has been the rule.

The mechanism producing this injury is still unsettled, but is possibly a fall to the outstretched hand with the elbow extended (Stimson 1899, DeLee 1981, Carey 1984). Thus dislocation of the radial head is produced by a rotational (pronation) strain (Evans 1949, Vesely 1967, DeLee et al. 1984), and the olecranon is subsequently dislocated through hyperextension of the elbow. Carey (1984) considers the

rotational position of the forearm during the final dislocation to be decisive for the type of divergent dislocation produced, the transverse type being produced in supination and the anteroposterior type in more pronation. In the latter variety, the radial head is lodged in the coronoid fossa and the olecranon is dislocated posteriorly (Stimson 1899, Smith 1972, DeLee et al. 1984). In the case of convergent dislocation (Carey 1984), the upper radius and ulna were dislocated posteriorly in a reversed relationship due to extreme pronation; the mechanism of this injury was not clear. The dislocation was irreducible due to interposition of the orbicular ligament.

A mechanism similar to that described also produces some Monteggia and forearm fractures (Evans 1949). Cases of radial (Wilson 1976) and ulnar (DeLee et al. 1984) shaft fractures with concomitant atypical divergent dislocations of the elbow have been reported.

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