



## Paediatric transverse divergent dislocation of the elbow

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Paediatric elbow dislocations are uncommon injuries, accounting for 3-6% of all elbow injuries in childhood. A *divergent* elbow dislocation is an even more infrequent injury, where in addition to the elbow dislocation there is divergence of the proximal radius and ulna, either in a transverse (extremely rare) or in an anteroposterior plane, as a result of the distal humerus being forced between the proximal ends of the forearm bones. The lesion results from indirect forces transmitted to the elbow from a fall on the outstretched hand. The authors report a case of transverse divergent elbow dislocation in an 8-year-old boy, treated by closed reduction and immobilisation in a cast. At 6 months follow-up the patient had regained a full range of motion, without instability or pain.

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as a result of the distal humerus being forced between the proximal ends of the forearm bones. The injury results from indirect forces transmitted to the elbow from a fall on the outstretched hand. The divergent dislocation involves disruption of the humeroulnar, radiocapitellar and proximal radioulnar joint. Altuntas *et al* (1) found 14 paediatric cases of divergent dislocation of the elbow in the literature of the last 23 years.

Divergent dislocation occurs predominantly in patients with joint laxity (6). It may be of two types : the more frequent anteroposterior and the extremely rare mediolateral or transverse dislocation. In the anteroposterior form the radial head comes to rest in the coronoid fossa with the proximal ulna being dislocated posteriorly ; in the transverse type, the proximal radius lies lateral to and the proximal ulna medial to the distal humerus (2). Our case illustrates a transverse divergent elbow

### INTRODUCTION

Paediatric elbow dislocations are uncommon injuries, accounting for 3-6% of all elbow injuries in childhood. Nevertheless, they make up nearly half of all traumatic elbow dislocations (9). These dislocations are most commonly posterior, although anterior, lateral and medial types, as well as the rare divergent type, have been described. Most occur between the ages of 4 and 10 years (8). A divergent elbow dislocation is an extremely rare injury where, in addition to the elbow dislocation, there is divergence of the proximal radius and ulna

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*Fig. 1.* — Anteroposterior and lateral radiographs clearly showing transverse divergent dislocation of the elbow.

dislocation. The first references to transverse divergent dislocation date back to the 19<sup>th</sup> century : in 1854 Warmont described a first case in a 15-year-old boy, and in 1893 Wight a second case in a 30-year-old woman (in 1). De Lee (3) reported a case in an 8-year-old boy in 1981.

### CASE REPORT

A right hand dominant 8-year-old boy fell on to his outstretched left hand while roller-skating in a sports centre. He presented to the accident and emergency department with severe pain and inability to move his elbow. Clinical examination revealed a swollen, deformed and widened left elbow held in varus and flexion. On palpation, the 3-point bony configuration of the elbow was altered and tender. The radial head was superficially palpable lateral to the distal humerus, and the olecranon was unduly prominent posteriorly. The skin and the neurovascular system were intact.

There were no other injuries.

Roentgenograms revealed a posterior dislocation of the left elbow with divergent displacement of the proximal radius and ulna in a mediolateral plane (fig 1). Under general anaesthesia, closed reduction was easily achieved with gentle longitudinal traction and countertraction to reduce the humeroulnar articulation, followed by mediolateral compression and flexion to reduce the radioulnar divergence. Full supination resulted in a third distinct click felt over the head of the radius. A good range of motion was noted, without instability. Intraoperative roentgenograms showed a satisfactory reduction (fig 2).

The elbow was immobilised in an above elbow plaster splint, in full supination and in 90° of flexion, for 5 weeks. Physiotherapy was subsequently started. At 6 months follow-up the patient was symptom free ; he had a full range of movement, without clinical or radiological evidence of joint instability (7).



**Fig. 2.** — Anteroposterior and lateral radiographs after closed reduction of dislocated elbow.

## DISCUSSION

Transverse divergent dislocations are thought to occur when pressure is applied to the extended elbow joint in the direction of its long axis, by a fall on the outstretched hand. The exact mechanism of dislocation has not been elucidated by anatomical observations, as the patients do not require operative intervention (2).

These injuries are usually a result of significant high-energy trauma and involve extensive soft tissue disruption, which, however, facilitates reduction. They may be associated with fractures, among others of the coronoid process, and with recurrent subluxation of the radial head (5). Care must be taken to ensure that the radial head is completely reduced. Early recognition and reduction by closed methods usually lead to a good result. Most patients regain excellent elbow function.

Immobilisation should be limited to 3 weeks, according to Altuntas *et al* (1); the authors preferred 5 weeks of immobilisation, which may however involve a risk for ankylosis.

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