CLOSED REDUCTION OF FRACTURES OF THE PROXIMAL RADIUS IN CHILDREN

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We present a method for the reducing a displaced radial head in children, by rotating the forearm while pressing over the displaced fragment. This has been successful in a series of 10 cases.

In children, the radial head and neck are the site of 5 to 10% of all fractures around the elbow (Tachdjian 1972) and in 90% of cases, the fracture line involves the physis or the radial neck (Henrikson 1969; Tibone and Stoltz 1981). Most authors agree that where there is angulation of 30 to 60°, closed reduction under anaesthesia is necessary; angulation of less than 30° may be accepted, but over 60° closed reduction usually fails, and open reduction is needed (Blount 1954; Tachdjian 1972; Tibone and Stoltz 1981). The difficulty of obtaining satisfactory reduction by closed methods has been described (Dougall 1969), and has led some surgeons to accept up to 45° tilt of the radial head (Tachdjian 1972).

We also have experienced difficulty in achieving acceptable reduction by the Patterson (1934) manoeuvre which involves extensive manipulation, and have devised a new method.

TECHNIQUE

Manipulation is performed under general anaesthesia with image intensifier control. The proximal humerus of the affected limb is stabilised by an assistant and the elbow is flexed to 90°. The forearm is held by the surgeon’s ipsilateral hand, that is the left hand for the left forearm and vice versa (Fig. 1), in the maximum possible supination. No varus strain is applied.

Pressure is then applied by the thumb of the surgeon’s other hand over the anterolateral aspect of the head of the radius, just distal and lateral to the cubital fossa. At the same time, the affected forearm is gradually but steadily rotated to a neutral position and then into a position of full pronation. This manoeuvre rotates the displaced and tilted radial head under the external pressure, and, with the elbow flexion providing a lax capsule, easily reduces the radial head.

The reduction and its stability are confirmed radiographically. The arm is placed in a posterior above-elbow plaster splint for three weeks; a check radiograph is taken one week after reduction.

RESULTS

We have treated 10 cases, six of them boys, by this method in a three-year period. The mean age was 8.5 years (range 6 to 11 years). All fractures were of the Rockwood Type IA, that is, juxta-epiphyseal and produced by a valgus force. All were treated within 12 hours of injury.

In eight of the 10 cases we achieved an accurate reduction, while in two we accepted 10° of angulation. All patients were reviewed at two to five years after the fracture; all had a full range of movement.

Illustrative case reports. Case 1. A 10-year-old girl fell on her outstretched right hand. The initial radiographs showed an angulated fracture (Fig. 2). Reduction under general anaesthesia, using our method, achieved a complete and stable reduction (Fig. 3).

Case 2. A nine-year-old boy injured his right elbow while playing football, sustaining a juxta-epiphysseal fracture (Fig. 4a). Immediate reduction under general anaesthesia secured good, stable alignment of the fracture (Fig. 4b).

DISCUSSION

Fractures of the radial head and neck in children are uncommon, but demand immediate and definitive treatment. It is agreed that accurate reduction is needed (Watson-Jones 1941), but there are differences of
Pressure is applied over the radial head while the patient’s forearm is held in maximum supination with the elbow 90° flexed. The forearm is then slowly pronated.

Case 2 – Anteroposterior views before and after reduction.

opinion as to whether the reduced fracture is stable (Keon-Cohen 1966; Dougall 1969; Jones and Esah 1971).

Many classifications have been proposed, the most comprehensive by Rockwood, Wilkins and King (1984). In this classification, Type I are fractures produced by a valgus mechanism subdivided into: A, juxta-epiphyseal fractures; B, fractures involving the head of the radius as well as the metaphysis; and C involving the proximal metaphysis only.

Our method of reduction is suitable for those fractures of Type 1A and IC with radial head displacement or tilt of up to 60°. The manoeuvre is very easy to perform and, in all 10 cases so far treated, gave a good, stable reduction at the first attempt.

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REFERENCES


