INTRAMEDULLARY REDUCTION AND STABILISATION OF ADULT RADIAL NECK FRACTURES

HANS W. KELLER, KLAUS E. REHM, JOACHIM HELLING

From the University Hospital, Köln, Germany

We report the treatment of six adult patients with displaced fractures of the radial neck by intramedullary reduction and stabilisation.

Nine months after operation all the patients had good joint function, little or no pain, complete healing and no significant periarticular calcification. This simple semi-closed procedure may help to avoid resection of the radial head in some cases.

Received 7 June 1993; Accepted after revision 5 November 1993

Fractures of the radial neck with major displacement usually require open reduction, but even then stabilisation is difficult. Recommended methods include transarticular fixation, crossed Kirschner wires, and screw or plate fixation (Heim and Pfeiffer 1991; Müller et al 1992). We have used intramedullary pins, slightly bent at one end to achieve reduction and stabilisation without opening the elbow. This is particularly valuable when there are contraindications to arthrotomy.

PATIENTS AND METHODS

We use conventional Kirschner wires or titanium pins (Keller, Huber and Rehm 1993) with a diameter of 2 or 3 mm according to the size of the bone. The wire is slightly bent at its tip and introduced into the medullary canal of the radius through a drill hole in an easily accessible part of its distal half. It is pushed up to the fracture and manipulated into the dislocated radial head under radiographic control. It is then rotated to turn the 'hook' and reduce the radial head on to the fractured neck (Figs 1 and 2). When the position is satisfactory the wire is cut short and bent distally to fix it against the bone (Figs 2c and 3b) to prevent it slipping out of the radius. A second wire is sometimes introduced in the same way to help prevent redisplacement (Figs 1 and 3b). Finally, the elbow is aspirated to decompress any haemarthrosis.

Six patients aged from 16 to 48 years have been treated by this method in the last three years. The preoperative angulation of the articular surface of the radial head was between 25° and 50° in five (Fig. 2a). In the sixth it was about 90° (Fig. 3a), and the patient also had an elbow dislocation and severe skin abrasions. After reduction of the elbow, the radial head remained in its displaced position until manipulated by the method described above.

The first five patients were treated within eight hours of injury, but in the other, reduction was delayed for 24 hours by a serious head injury. All six patients had immobilisation in plaster for two to three weeks and subsequent physiotherapy. The wires were removed at about nine months.

Diagram to show closed reduction and fixation of a severely displaced fracture of the radial neck.

Fig. 1

H. W. Keller, MD, Trauma Surgeon
K. E. Rehm, MD, Trauma Surgeon
J. Helling, MD, Trauma Surgeon
Department of Trauma Surgery, University Hospital, Joseph-Stelzmann-Strasse 9, 50931 Köln, Germany.

Correspondence should be sent to Dr H. W. Keller.

©1994 British Editorial Society of Bone and Joint Surgery
0301-620X/94/3780 $2.00

THE JOURNAL OF BONE AND JOINT SURGERY
RESULTS
At the time of removal of the wire or wires all six patients had little or no pain. Four had completely full ranges of movement and two had deficits of less than 20° in any of the ranges. Radiographs showed union, but there was partial necrosis of the radial head in the patient with the most serious fracture dislocation (Fig. 3c). The position was anatomical in four cases and there was residual tilting of less than 15° in two. No patient showed significant periarticular calcification.

DISCUSSION
This method of reduction was first described by a paediatric surgeon for the treatment of radial neck fractures in children (Metaizeau 1988) and we have been able to confirm (Keller et al 1993) the good results recently reported by Metaizeau et al (1993). We have now shown that it is also practicable in adults. The problem of subsequent avascular necrosis of the radial head, seen in one of our cases, is not completely resolved, but we consider that open reduction may increase the
incidence of this complication. Intramedullary reduction and stabilisation provide an elegant alternative which may help to preserve the radial head in some cases.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

REFERENCES


