

Case report

Cannulated screw fixation of fractured capitellum: surgical technique through a limited approach

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1. Introduction

We describe a limited anterolateral approach for open reduction of a displaced capitellar fracture. Fixation is achieved by percutaneous insertion of an ante-grade cannulated screw guided by a wire passed from posterior to anterior aspects to avoid damage to the articular surface. No soft tissue dissection is performed posteriorly or laterally.

2. Surgical technique and case reports

An eight-cm lateral skin incision is centred over the lateral humeral epicondyle. The elbow joint is opened longitudinally anterior to the lateral condyle. The fracture surfaces are inspected, irrigated and reduced. A 1.25 mm threaded guide wire is placed on the radial aspect of the elbow joint perpendicular to the fracture line. Through a small stab wound over the posterolateral aspect of the elbow, a similar wire is inserted parallel to the outside wire until it is about to elevate the articular cartilage of the reduced fragment. The position of the wire is checked and the required screw is measured. The posterior cortex is perforated by a 3.5-mm cannulated drill bit and a 3.5-mm cannulated tap. The guide wire, drill bit and tap are used within their appropriate sleeves. A short threaded 3.5-mm cannulated screw is inserted over the wire from the posterior aspect. The stability of the fracture is tested. The pos-

ition of the screw is checked using image intensification. The 1.25-mm guide wire is removed and the wound closed in layers with a small size drain in the joint. The arm is placed in a removable splint with the elbow at 90°. The drain is removed after 24 h and gentle active mobilization of the elbow started. Sutures are removed, the splint discarded within two weeks and active exercises continued.

2.1. Case 1

A 37-year old lady injured her right elbow from a fall on the outstretched hand. Radiographs demonstrated a displaced fracture of the capitellum (Fig. 1a). Open reduction and cannulated screw fixation were performed. Follow-up radiographs showed union of the fracture (Fig. 1b). The elbow remained stable with a painless full range of movement. The screw was removed after one and a half years through the small posterior incision.

2.2. Case 2

A 32-year old manual worker fell and sustained a fracture of the left capitellum (Fig. 2a). The fracture surfaces being flat providing no interlocking at the fracture interface, one screw was not enough to hold the fracture firmly. Two screws were therefore used (Fig. 2b). Follow-up at 3 and 6 months revealed a full range of movement, normal power and a stable elbow.

2.3. Case 3

A 24-year old lady sustained a fracture of the left capitellum from a fall on the outstretched left hand.

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(a)



(b)

Fig. 1. Case 1. (a) The large fractured capitellar fragment appears as a displaced half-moon on the lateral radiograph of the elbow. (b) Follow-up radiograph with screw fixation. The fracture has united with no signs of avascular necrosis.



(a)



(b)

Fig. 2. Case 2. (a) Fractured capitellum with flatter fracture surfaces. (b) Follow-up radiographs showing fixation with two cannulated screws.



Fig. 3. Case 3. Post-operative radiographs with one cannulated screw fixation.

Fixation with one cannulated screw was performed (Fig. 3). At 3 and 6 months postoperatively, she lacked the last 10° of elbow extension.

3. Discussion

The relatively common Hahn–Steinthal fracture with a large capitellar fragment was described as type 1 by some authors [1] and type 2 by others [2]. Open reduction and internal fixation of this fracture is technically demanding [3]. The lateral Kocher approach with detachment of the common extensor origin is the standard exposure used by many surgeons [1,4]. Provisional fixation is performed with transarticular wires passed through the joint surface. Definitive fixation is achieved by screws, which are inserted either from the anterior or the posterior surfaces. In some reports it was also necessary to reflect the lateral collateral ligament [1] to gain enough access for reduction and fixation by noncannulated 4-mm cancellous or Herbert screws [5]. In a modified technique on five elbows, two parallel wires were inserted from the lateral cortex into the reduced fragment and small fragment 4.0-mm screws were inserted from the posterior aspect. Two

out of the five elbows were re-explored because of problems with screw position and length [4].

In this report, we use a limited exposure as the guide wire and cannulated screws are inserted from the posterior to the anterior aspects. This technique limits soft tissue dissection. Passing the wire and screw in an antegrade manner requires a smaller space and avoids damage to the articular cartilage. The use of one or two cannulated screws guided by wires will confirm accurate positioning before screw insertion and reduces the chances of multiple trials.

References

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