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Technical note

Percutaneous reduction of proximal radius fracture in adults. A 12-case series

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ABSTRACT

Fractures of the head or neck of the radius account for 5% of elbow fractures in adults. Treatment varies between authors. We report a retrospective series of 12 cases of percutaneous reduction of Mason II radial head fracture, without internal fixation. All fractures consolidated, without secondary displacement. There were no postoperative complications. Mean ranges of motion were 136° flexion–extension and 175° pronation–supination. Mean QuickDASH score was 11. Results in the present series were at least comparable to those for other techniques, validating percutaneous treatment as a solution for radial head fracture.

Type of study: Case series.
Level of evidence: IV.

1. Introduction

Radial head fracture is frequent, accounting for 5% of elbow fractures in adults [1]. Mason II fractures have good prognosis [2,3] but can be complicated by stiffness, instability or post-traumatic osteoarthritis [4].

The radial head is a key element in pronation–supination, flexion–extension and elbow stability.

Surgery is indicated for Mason II fractures with > 2 mm displacement [5–7].

For this, some authors recommend open internal fixation by simple screwing or screwed plate [8], but this entails specific complications: operative site infection, postoperative stiffness, injury to the motor branch of the radial nerve, avascular osteonecrosis of the radial head, posterolateral elbow instability, and peri-articular ossification [9–11].

Therefore, since 2008, we have treated these fractures by closed percutaneous reduction.

The objective of the present study was to assess clinical and radiographic results with percutaneous reduction of Mason II radial head fracture with > 2-mm displacement, at a minimum 6 months' follow-up.

2. Material and method

Between April 2008 and January 2014, 4 senior surgeons performed percutaneous reduction of 12 consecutive radial head fractures in 12 patients: 6 female, 6 male; mean age, 38 ± 13 years (range, 22–68 years) (Table 1). One fracture was Mason IV (Mason II associated with posterolateral dislocation) (Fig. 1). Forty-one percent of cases involved the dominant side. Initial diagnosis was founded on AP and lateral elbow views; in 2 cases, complementary CT with 3D reconstruction was performed. All patients were treated on the day of their fracture.

Percutaneous reduction was performed in the operating room under anesthesia (10 general, 2 locoregional) and fluoroscopic control. The patient was positioned supine on the standard table with a pneumatic tourniquet at the root of the limb, to be inflated as necessary. The fracture site was located fluoroscopically, imposing pronation–supination movements (Fig. 1). A 1/20 pin was introduced percutaneously and centered on the radial head under fluoroscopic control, using the posterolateral soft-point of the elbow to avoid radial nerve lesion (Figs. 2 and 3). Reduction was achieved by lever maneuver within the fracture site, under fluoroscopic control (Fig. 4). After removing the pin, reduction stability was checked fluoroscopically with flexion–extension and pronation–supination movements (Fig. 5).

All patients had same-day discharge, except for the case of primary dislocation. Clinical and radiographic check-up was performed before the patient left the recovery room. Discharge prescription comprised a simple sling to minimize pain,

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Table 1
Summary of data.

n	Age	Dominant/fractured side	Follow-up (months)	Mason	Complications	Sick leave (days)	QDash	MEPS
1	29	Right/right	25	Type 2	0	0	0	100
2	50	Right/left	80	Type 2	0	30	0	100
3	68	Right/left	20	Type 2	0	0	0	100
4	34	Right/left	40	Type 2	0	45	0	100
5	30	Right/right	22	Type 2	0	30	2.3	100
6	45	Right/right	24	Type 4	0	15	0	100
7	36	Right/left	33	Type 2	0	45	0	100
8	22	Right/right	20	Type 2	0	0	0	100
9	49	Right/left	12	Type 2	0	15	0	100
10	23	Right/right	12	Type 2	0	60	2.3	100
11	42	Right/left	6	Type 2	0	30	11	100
12	37	Left/right	6	Type 2	0	15	11	100
Mean	38.75		25			30	11.16	100
Range	22–68		6–80			0–60	11–12	100

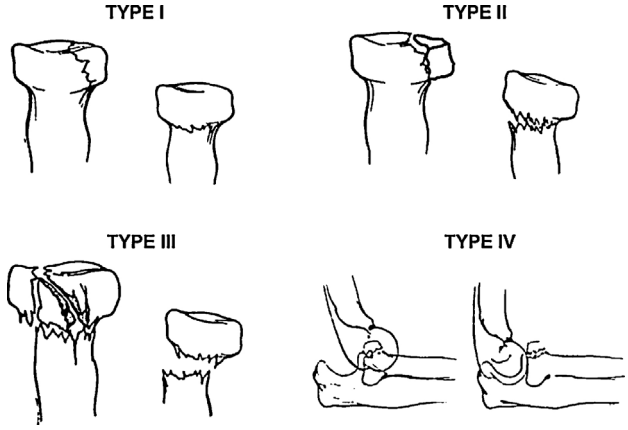

Fig. 1. Mason classification.

warning against lifting more than 2 kg, and infra-threshold self-rehabilitation.

Radiologic and clinical check-ups, to guide rehabilitation and detect any secondary displacement, were performed at day 15, 6 weeks, 3, 6 and 12 months and last follow-up. Radiologic and clinical assessment, on QuickDASH and Mayo Elbow Performance Score (MEPS) [12,13], was performed at last follow-up.

Fig. 2. Fracture identification under fluoroscopy centered on the radial head by pronosupination maneuver (patient 7).

Fig. 3. Insertion of the pin centered on the radial head under fluoroscopy (patient 7).

3. Results

Mean follow-up was 25 ± 20 months (range, 6–80 months), with no loss to follow-up.

Fig. 4. Photo of a pin insertion point (soft-point).

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