Fractures of the distal radius in low-demand elderly patients

Closed reduction of no value in 53 of 60 wrists

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ABSTRACT – To determine the value of reduction of fractures of the distal radius in the very elderly and low-demand or demented patient, we assessed 60 fractures in 59 patients for the reduction achieved and maintained. The mean patient age was 82 (65–93) years. All fractures were initially reduced under regional or general anaesthesia.

In 44 dorsally displaced fractures, reduction failed in 7 cases initially, and 37 lost reduction during the following weeks of immobilisation in plaster. In 9 wrists with volarly displaced fractures, reduction was achieved in 6; all malunited. A total of 53/60 fractures healed in a malunited position. We found no correlation between fracture classification, initial displacement, and final radiographical outcome.

On the basis of these observations we conclude that reduction of fractures of the distal radius is of minimal value in the very old and frail, dependent or demented patient.

Displaced fractures of the distal radius may be considered to be primarily unstable due to axial compression, metaphyseal comminution and increasing age of the patient (Abbaszadegan et al. 1989, Mackenney et al. 2000) or secondarily unstable due to loss of reduction. In fit, independent patients, unstable fractures may be treated by various surgical methods including internal and external fixation. In the very elderly or demented patient who is not capable of independent living, this treatment is not recommended since the demands on the wrist are low. Re-reduction of these fractures, after loss of reduction, combined with further cast management has been shown to be ineffective (McQueen 1986, 1996, Schmalholz 1989), particularly in the older patient. Therefore elderly low-demand patients with a displaced fracture of the distal radius usually undergo reduction of the fracture once, after which the commonly-occurring redisplacement is accepted.

We investigated how well primary reduction of distal radius fractures is maintained in the frail elderly patient and assessed whether primary reduction of these fractures is worthwhile.

Patients and methods

751 patients above 60 years of age with a fracture of the distal radius were treated in the 3-year period 1996–1998. In this group, 59 patients (57 female) with 60 distal radial fractures were considered unfit for or unable to co-operate with definitive treatment if their fracture was unstable because of dementia or multiple medical co-morbidities. All these 59 patients sustained their fracture after a simple fall on the outstretched hand. Their mean age was 82 (65–93) years. Closed reduction under either regional (28) or general anaesthesia (31) was performed in all. None of these patients suffered median nerve symptoms.

Fractures were classified according to the AO classification (Müller et al. 1990, Table 1). We measured carpal alignment (Taleisnik and Watson 1984, McQueen et al. 1996), dorsal angle (Van der Linden and Ericson 1981), and radial shortening

Table 1. The AO class distribution of the 60 fractures

AO class	n
A3.2	35
C2.1	17
C3.2	6
C2.2	1
C2.3	1

Table 2. Radiographical outcome of 60 fractures of the distal radius in low-demand elderly patients

	Dorsal displaced	Volar displaced	Total
No reduction	7	3	10
Loss after 1 week	35	4	39
Loss week 2–5	2	2	4
Satisfactory position at end of treatment	7	0	7
Malunion	44	9	53

Table 3. Loss of reduction in 44 dorsally displaced fractures

	Mean dorsal angle (range)	Mean radial shortening (range)	Number with carpal alignment
Initial prereduction	21 (6–45)	3 (0–13)	0
Postreduction	-2 (-10–10)	1 (-2–3)	44
1 week	9 (-19–35)	3 (-2–12)	9
6 weeks	15 (-27–35)	4 (-2–13)	7

Table 4. Loss of reduction in 9 volarly displaced fractures

	Mean dorsal angle (range)	Mean radial shortening (range)	Number with carpal alignment
Initial prereduction	10 (-35–45)	5 (2–8)	0
Postreduction	-3 (-10–2)	3 (0–6)	6
1 week	3 (-23–15)	5 (0 –10)	2
6 weeks	6 (-28–24)	6 (2–11)	0

(Melone 1984). Reduction of the fracture was considered to be acceptable when volar or dorsal tilt did not exceed 10 degrees, radial shortening was not more than 3 mm, and carpal alignment was present. The correlation between final outcome and possible predictive factors was determined by linear regression analysis using SPSS software.

Results

Malunion occurred in 53 of the 60 fractures. In 10 wrists (7 dorsal displaced and 3 volar displaced fractures) no initial reduction was achieved. During the first week 39 more wrists lost reduction. None of the volar displaced fractures healed in a satisfactory position. (Table 2). The 95% confidence interval showed no difference in outcome between the dorsal (0.74–0.94) and volar (0.66–1.00) displaced groups. We found no correlation between fracture classification, initial displacement, and final outcome. Malunion occurred in 44 wrists with reduced dorsal displaced fractures (Table 3). The primary reduction had only achieved a mean improvement of 6º in the final dorsal angle and had no influence on the final radial shortening despite initially satisfactory reductions. The data for the patients with volar displaced fractures show similar results (Table 4).

Discussion

The value of primary reduction of fractures of the distal radius in low-demand elderly patients has never been examined. However, if a good anatomical position cannot be maintained without surgery in most of these frail patients then the role of primary reduction should be questioned.

Since it is difficult or impossible to study functional outcome in demented and frail patients, we have chosen to study radiographical outcome as the parameter of the usefulness of reduction. The correlation between functional outcome and radiographical parameters has been studied in the past. In active patients, malunion has been found to result in a weak, deformed and probably painful wrist (McQueen and Caspers 1988) and carpal malalignment and ulnar variance have been shown to have a substantial influence on functional out-

come (Villar et al. 1987, McQueen et al. 1996). It would seem reasonable to assume that a similar relationship would exist between radiographical and functional outcome in the frail elderly patient if similar demands were placed on their wrists. However, the dependent elderly do not generally use their hand and wrist for activities requiring strength so the anatomical position may be less relevant to them.

Fractures of the distal radius are best reduced under regional or general anaesthesia when compared to a haematoma block (Abbaszadegan et al. 1990) so that our elderly low-demand patients underwent Biers block or general anaesthesia for reduction of their displaced fracture. Nevertheless no reduction could be achieved in 10 wrists, which was probably due to poor bone quality.

Our study shows that in a minority of frail elderly patients primary reduction cannot be achieved. But even if satisfactory reduction is achieved as in most cases, it is not possible to maintain this position in the elderly patient. On the basis of the 95% confidence interval, one may expect that at least three quarters of all fractures will revert to a position similar to or worse than the initial deformity. This is similar to findings after re-reduction in the older patient (McQueen et al. 1986, 1996, Schmalholz 1989) where re-reduction was impossible to maintain without more invasive techniques that are not justified in this category of low-demand frail elderly patient. It is likely that this high failure rate is due to osteopenia since instability of the distal radius has been shown to increase with age and metaphyseal comminution (Abbaszadegan et al. 1989, Mackenney et al. 2000) both of which imply osteopenia.

On the basis of our results we believe that reduction of fractures of the distal radius in the low-demand elderly is ineffective. As we could not find a parameter to predict satisfactory final outcome we recommend that primary reduction in this group of patients should be performed only if there is a specific indication such as median nerve symptoms.

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