Fixation not needed for undisplaced Colles´ fracture

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A series of 68 undisplaced or minimally displaced Colles´ fractures was randomized into two groups undergoing treatment with either a plaster cast or an elastic bandage. Pain, function, grip strength, and range of motion were evaluated 1 year later. There was a difference in the functional outcome in favor of the patients treated with an elastic bandage, who did not have more fracture redislocations than those treated with a plaster cast.

Although the functional end result in most cases of undisplaced or minimally displaced Colles´ fractures is satisfactory, functional impairment may persist a long time after the injury. The aim of our study was to compare treatment with an elastic bandage and conventional treatment with a dorsal plaster cast as regards functional outcome and fracture dislocation in minimally displaced Colles´ fractures.

Patients and methods

Our investigation included 80 undisplaced or minimally displaced Colles´ fractures in 80 patients who were treated at our hospital in 1985 and 1986. Minimal displacement was defined as dorsal angulation less than 95° or axial shortening less than 2 mm. The dorsal angulation was calculated on the lateral projection as the angle between the joint surface of the radius and the long axis of the radius shaft. The radial shortening was measured as the vertical distance between the joint surfaces of the radius and ulna (i.e., the degree of ulna plus).

The patients were randomly divided into two groups, and were treated for 4 weeks with either a dorsal plaster cast or an elastic bandage. Twelve patients were lost to follow-up, leaving 68 fractures (34 in each group) available for reexamination. There were 57 women and 11 men aged 62 (19–91) years, and there were no age differences between the two groups. All the fractures belonged to groups I and II according to Lidström´s (1959) classification, with an equal distribution between the two treatment groups. The distribution of the fractures, according to the classification of Frykman (1967), is shown in Table 1.

Table 1. Number of Colles' fractures treated with a plaster cast and an elastic bandage according to Frykman's classification

Treatment	Type								
	I	II	III	IV	V	VI	VII	VIII	Total
Plaster cast	8	1	5	0	11	4	4	1	34
Elastic bandage	8	2	5	0	9	6	3	1	34
Total	16	3	10	0	20	10	7	2	68

None of the 68 fractures were reduced before treatment. The patients in both groups were informed about the importance of mobilizing the fingers and the shoulder.

A radiographic examination was performed initially, after 11 days, and again after 8 weeks. Anteroposterior and lateral radiographs according to Friberg and Lundström (1976) were obtained. The first examination included radiographs of the contralateral wrist for comparison.

The initial mean displacement, expressed as radial shortening, was 0.12 mm in the group treated with a plaster cast and 0.05 mm in the group treated with an elastic bandage. The mean dorsal angulation was 89.5° and 86.5°, respectively.

The follow-up examination included subjective, objective, and radiographic evaluations. The patients were examined on the 11th day, 4 weeks, 8 weeks, and finally 1 year after the injury. The contralateral limb was used as a control; and the results were graded ac-

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Table 2. Results of treatment with a dorsal plaster cast and an elastic bandage

Follow-up time	Pain[a]		Strength[b]	
	Plaster cast	Elastic bandage	Plaster cast	Elastic bandage
11 d	4.7	4.0 (P= 0.09)	Not measured	
4 wk	3.7	3.4 (P= 0.4)	40	52 (P= 0.06)
8 wk	3.2	1.8 (P< 0.001)	60	67 (P= 0.25)
1 yr	1.9	1.3 (P= 0.06)	78	94 (P= 0.045)

[a] VAS 0–10.
[b] Strength in percentage of the uninjured wrist.

Table 3. Results of treatment with a dorsal plaster cast and an elastic bandage. Mean values in percentage of the uninjured wrist

Follow-up time	Extension + flexion		Radial + ulnar Deviation	
	Plaster cast	Elastic bandage	Plaster cast	Elastic bandage
4 wk	58	80 (P< 0.001)	Not measured	
8 wk	75	90 (P< 0.001)	66	86 (P< 0.001)
1 yr	89	98 (P= 0.002)	90	98 (P= 0.007)

cording to Lidström (1959) as excellent, good, fair, and poor. This system combines the subjective evaluations of pain and disability with the objective measurement of wrist motion, grip strength, and fracture dislocation.

The Student t-test and chi-square test were used, with $P < 0.05$ regarded as significant.

Results

One major complication occurred: 1 patient in the elastic bandage group was operated on with median nerve decompression after 4 weeks. Further, pressure sores from the plaster cast caused discomfort in 4 patients, necessitating exchanging the cast.

At 11 days and 4 weeks, there was no difference in the severity of pain between the two groups. Eight weeks after the injury, those treated with an elastic bandage had less pain (Table 2) and better subjective function than those treated with a plaster cast. Early mobilization did not increase the fracture displacement appreciably. At the 8-week radiographic examination, the mean radial shortening had increased 0.55 mm in the patients treated with a plaster cast and 0.15 mm in the patients treated with early mobilization (P= 0.02). The mean dorsal angulation had increased 4.5° and 2.9°, respectively (P = 0.17). At the final 1-year evaluation, the early mobilized group had less pain (Table 2) and better subjective function ($P < 0.05$); Table 4).

Table 4. Evaluation according to Lidström's grading 1 year after a Colles' fracture

Function	Plaster cast	Elastic bandage
Exellent	23	31
Good	9	3
Fair	2	0
Total	34	34

Chi-square test; P< 0.05.

Discussion

Early mobilization of fractures of the shoulder, elbow, and knee have proved to be an acceptable alternative to prolonged immobilization causing unnecessary stiffness and swelling (Sarmiento et al. 1975, Salter et al. 1980, and Dias et al. 1987).

Undisplaced Colles' fracture has a good prognosis with respect to the anatomic (De Palma 1952, Older et al. 1965, and Solgaard 1985) and functional (Lidström 1959) end result. Lidström found an unsatisfactory functional outcome in 9 percent of the undisplaced or minimally displaced fractures treated with a dorsal plaster cast. Our study shows that early mobilization of minimally displaced Colles' fractures hasten the early rehabilitation with respect to range of motion without increased inconvenience for the patients. There were significant differences between the groups regarding strength and range of motion after 1 year. These results

correspond to previous observations (de Bruijn 1987, Dias et al. 1987).

Treatment with an elastic bandage did not increase fracture displacement when compared with those fractures that were treated with conventional plaster splints despite the fact that almost one third of the fractures in both groups were classified as Frykman types VI–VII (Table 1).

We thus recommend functional treatment of the minimally displaced Colles´ fracture.

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