Regional anesthesia preferable for Colles' fracture

Controlled comparison with local anesthesia

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In a prospective randomized study of 99 displaced Colles' fractures, regional intravenous block was compared with local anesthesia in the fracture hematoma. Patients treated with regional intravenous block had less pain during the manipulation of the fracture and better grip strength at the 6-month follow-up. The anatomic end result (dorsal angulation) was better after regional anesthesia.

At our hospital, we routinely use local anesthesia in the fracture hematoma when reducing Colles' fractures. Regional intravenous block is widely used in many other hospitals because it is assumed to give better anesthesia.

We have compared local and regional anesthesia with regard to anatomic and functional end results.

Patients and methods

The study includes 99 consecutive patients with a displaced Colles' fracture. Excluded were severely displaced fractures with a shortening of 5 mm or more (Abbaszadegan et al. 1989) and patients with hypertension. After the initial radiographic examination, the patients were randomly divided into two groups.

Forty-nine patients had their fractures reduced under local anesthesia (15–20 mL prilocain) and 50 patients had a regional intravenous block (3 mg prilocain/kg) before reduction.

All the patients were treated in a below-the-elbow cast for 4 weeks.

There were 88 women and 11 men with a mean age of 64 (21–86) years, and there were no age differences between the two groups. The distribution of the fractures according to Older et al. (1965) and Frykman (1967) are shown in Table 1.

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Radiographic examination with an anteroposterior and a lateral projection according to Friberg and Lundström (1976) was made initially after 10–12 days and finally after 8 weeks. The first examination included radiographs of the contralateral wrist for comparison.

The mean radial shortening (Table 2) initially was 2.6 mm for the local anesthesia group and 3.3 mm for the group tested with regional intravenous block. The mean dorsal angulation was 113° and 110°, respectively.

The patients in both groups were examined clinically at 10–12 days, 1, 2, 3 months, and finally after

Table 1. Classification of 99 Colles' fractures according to Older and Frykman

	Regional i.v. block	Local anesthesia
Older's classification		
1	0	0
2	9	5
3	17	21
4	24	23
Frykman's classification		
I	2	3
II	7	14
III	1	3
IV	5	3
V	4	0
VI	12	6
VII	9	5
VIII	10	15
Total	50	49

Table 2. Mean radial shortening and dorsal angulation during treatment of 99 Colles' fractures

	Radial shortening			Dorsal angulation		
	R	L	*P*	R	L	*P*
Initially	3.3	2.6	*0.09*	113	110	*0.2*
After reduction	0.18	0.6	*0.1*	84	91	*< 0.0001*
10 days	1.7	1.9	*0.5*	90	96	*0.004*
8 weeks	3.3	3.0	*0.3*	94	100	*0.004*

R regional intravenous block; L local anesthesia.

Table 3. Results of treatment according to pain (VAS 0–10; median values) and strength as percentage of the uninjured wrist

	Pain			Strength		
	R	L	*P*	R	L	*P*
Initially	1	2.5	*0.002*	Not measured		
8 weeks	3	3	*0.7*	25	18	*0.2*
12 weeks	2	2	*0.3*	48	37	*0.05*
24 weeks	0	2	*0.005*	65	53	*0.01*

R regional intravenous block; L local anesthesia.

6 months. The follow-up examinations included subjective, objective, and radiographic evaluations. The contralateral wrist was used as a control.

The Student's *t*-test and Mann-Whitney test were used for statistical analysis.

Results

The patients in the local anesthesia group had more pain during the manipulation of the fracture (Table 3). At 2, 3, and 6 months, there was no pain difference between the two groups. Grip strength (measured with a balloon vigorometer) was the same at 2 and 3 months, but after 6 months the regional intravenous group was stronger.

The range of motion was similar in both groups.

Reduction under regional intravenous block gave a greater initial improvement of dorsal angulation and axial compression. There was a progressive increase in radial shortening and dorsal angulation in both groups (Table 2).

Complications. Two patients in each group were operated on for a median nerve decompression after 3 months. Four fractures in the local anesthesia group redislocated to such an extent after 10 days that rereduction and external fixation of the fractures were performed.

A rupture of the extensor pollicis longus tendon in a patient with rheumatoid arthritis in the regional intravenous group occurred, but she refused an operation.

Discussion

The redisplacement during cast treatment was of the same magnitude in the two groups. The better anatomic end result, notably dorsal angulation, after regional block was thus due to a better position after reduction. The better anesthesia and muscle relation with regional block allows the surgeon to align the fracture fragments more properly. The importance of the initial reduction for the functional end result has previously been discussed by van der Linden and Ericson (1981). In our study, 4 patients in the local anesthesia group had to be treated with rereduction and external fixation after 10 days.

Cooney et al. (1980) and Kongsholm and Olerud (1986) have reported increased pressure in the carpal canal after reduction with local anesthesia. This is not supported in our study, because 2 patients in each group had median nerve symptoms necessitating decompression.

Regional block seems better than local anesthesia for reducing a Colles' fracture.

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