

# Sauvé-Kapandji operation for disorders of the distal radioulnar joint after Colles' fracture

Good results in 12 patients followed for 1.5–4 years

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Controversies continue concerning the treatment of the posttraumatic caput ulna syndrome. We have treated 12 patients, mean age 42 (23–77) years, with arthrodesis ad modum Sauvé-Kapandji of the distal articulation between the radius and ulna, combined with resection of the ulnar neck. Before the operation, all patients had persistent ulnar wrist pain and

restricted pronation-supination movement. At follow-up, after a mean of 2 (1.5–4) years, 8 patients had an excellent outcome, 3 a good, and 1 patient had a fair outcome. 10 patients had no wrist pain. The average grip-score improved from 53% preoperatively to 76% at the follow-up.

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Ulnar wrist pain is common after a Colles' fracture (Taleisnik 1992). Since 1989 we have treated 12 patients with arthrodesis of the distal articulation between the radius and ulna, combined with resection of the ulnar neck (Sauvé-Kapandji 1936).

## Patients and methods

We operated on 12 wrists in 12 patients with chronic ulnar wrist pain after Colles' fractures. The mean age of the patients was 42 (23–77) years and there were 7 women. 8 patients had surgery on the dominant side, and 5 patients on the nondominant side. The preoperative symptoms were wrist pain, limitation of pronation-supination, limitation of extension-flexion of the wrist, weakness of grip strength, and instability of the radioulnar joint.

Wrist deformity, measurement of flexion, extension, radioulnar deviation of the wrist, pronation and supination of the forearm were recorded preoperatively. Grip strength was measured with a Martin® Vigorometer and expressed as the percentage of grip strength on the injured side compared to that on the uninjured side (Table).

## Operative procedure

Under regional or general anesthesia and with a bloodless arm, a 15-cm longitudinal incision was made along the medial side of the wrist from the ulnar process and proximally. The dorsal sensory branch of

the ulnar nerve was preserved and the extensor retinaculum incised to the extensor digiti minimi making a proximal retinacular flap, and the capsule was incised making an ulnar capsular flap. The compartment of the extensor carpi ulnaris was preserved. The ulnar head was grasped with a Kirschner wire to facilitate peroperative manipulation of the ulnar head. The articular surfaces between the distal radioulnar joint were decorticated down to the cancellous bone and an osteotomy of the ulnar neck was performed, removing 1–1.5 cm segment of the ulna. The ulnar head was thereafter replaced in its proper position and fixed with a cortical screw. (Figure).

## Clinical data

Pt	Grip-score (%)		Supination + pronation		Flexion + extension	
	Preop	Postop	Preop	Postop	Preop	Postop
1	65	46	130	160	140	160
2	80	82	100	125	145	170
3	65	87	150	170	60	135
4	1	130	15	170	15	155
5	0	20	10	170	10	125
6	86	87	150	170	110	125
7	70	100	150	170	160	145
8	23	54	0	130	15	60
9	68	74	125	170	105	130
10	101	100	90	165	110	105
11	55	100	170	170	135	120
12	27	40	140	170	50	90



Case 8. The wrist after 18 months in a 43-year-old woman treated 3 years after a Colles' fracture. The arthrodesis is healed and there is no ulnar translocation.

The arm was immobilized in a short below-the-elbow splint, for 10-14 days. A follow-up examination was made 2 (1.5-4) years after the operation. The outcome was scored, according to Lucas and Sachtjen (1981).

Data are expressed as mean ( $\pm$ SEM) and were analyzed using Wilcoxon's test (one-sample rank sum test). P-values less than 0.05 were considered as significant.

## Results

All patients were satisfied with the operation and none was unchanged or worse. No patient complained of deformity of the wrist. The result was excellent in 8 patients, good in 3 and fair in 1 patient. There were no poor results. 2 patients had slight pain with hard work. The grip score improved from the preoperative status ( $p < 0.01$ ). The pronation-supination improved by  $33^\circ$  ( $p < 0.005$ ) and flexion-extension improved by an average of  $19^\circ$  ( $p < 0.01$ ) (Table). Radio-ulnar deviation was post-operatively unchanged.

## Discussion

Pain originating from the distal radioulnar joint is common after a Colles' fracture (Overgaard and Solgaard 1989, Mikkelsen and Lindblad 1990), and has been treated by resection of the distal ulnar head, the

so-called Darrach procedure. (Boyd and Stone 1944, Albert et al. 1963, Kessler and Hecht 1970, Hartz and Beckenbaugh 1979). However, Darrach's operation changes the contact pressures and load at the radio-carpal joint, changes the transmission of the forearm load, and disturbs the function of the triangular fibrocartilage complex, giving rise to ulnar instability and ulnar translocation (Dingman 1952).

In 1936, Kapandji suggested another technique, in which the head of the distal end of the ulna was fused to the distal radius by a screw (Sauvé and Kapandji 1936). In 1986, Kapandji described the technique and gave the indications for radioulnar arthrodesis in non-rheumatoid diseases with ulnar wrist pain (Kapandji 1986). This procedure has several advantages compared to Darrach's procedure. First, an uninterrupted surface for articulation with the carpal condyle is maintained. Secondly, a more physiological pattern of transmission of forces from the hand to the forearm is preserved. Thirdly, there is no dislocation of the extensor carpi ulnaris tendon, which is held in situ in its compartment. Fourthly, preservation of the ulnar head results in a normal wrist contour. The disadvantage of the Sauvé-Kapandji technique is that the proximal ulna may give rise to pain and instability (Bowers 1985, Taleisnik 1992). In our study, 2 patients had discomfort at the ulnar site after heavy work, but not at rest or with normal daily activity. We agree with previous authors that the procedure is indicated also in young patients with painful posttraumatic radioulnar joint function (Sauvé and Kapandji 1936, Goncalves 1974, Drewniany and Palmer 1986, Dell 1987). The latter patients may, however, need a less wrist-demanding job.

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