Proximal row carpectomy in perilunate dislocations and lunatomalacia

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Proximal row carpectomy was performed in 13 wrists with old unreduced perilunate dislocations and in 4 wrists with Kienböck's disease. One failure was converted to wrist arthrodesis, and 2 patients were lost to follow-up. The remaining 14 patients were reexamined after 11 (3–19) years. Average ranges of wrist motion were 37° of dorsiflexion, 30° of palmar flexion, 5° of radial deviation, and 24° of ulnar deviation. Grip strength averaged two thirds of the uninvolved hand. Pain relief was achieved in 12 patients, who all returned to their previous occupations. The results according to Cooney's criteria were 1 good, 8 fair, and 5 poor.

Although there have been many favorable reports of proximal row carpectomy for the management of wrist disorders, it has not been a widely used procedure. Stamm (1944) was the first to report this procedure, stating that it provided a new and simplified wrist joint.

This article discusses our experiences of proximal row carpectomy in different wrist disorders.

Patients and methods

Between 1969 and 1987, we performed proximal row carpectomy in 17 patients, all of whom were men. There was one failure that was converted to wrist arthrodesis, and 2 patients were lost to follow-up. The remaining 14 patients were reexamined after 11 (3–19) years. Their average age was 30 (16–51) years. The lesions for which the operation was done included 11 perilunate dislocations that had been unrecognized or incompletely reduced, and three with Kienböck's disease with carpal collapse deformity. Ten cases involved the dominant hand and 4 were in the nondominant hand. In 4 of 11 cases, the perilunate dislocations were caused by a crush injury; 3 of them had lasting contracture of the hand. Median nerve injuries were recognized in 5 patients, but all of them were asymptomatic at the final examination. The time from injury to operation varied from 2 months to 10 years, with an average of 14 months (Table 1).

The operation was performed through a dorsal transverse incision. The dorsal cutaneous nerves were exposed and retracted. After incision of the extensor retinaculum, the extensor tendons were retracted and the dorsal capsule incised in a T-shaped fashion. Three proximal carpal bones were removed piecemeal, care being taken not to damage the dome of the capitate and lunate fossa of the radius. In 7 of 14 cases in our series, the distal pole of the scaphoid was left in, as advocated by Steinhäuser (1969). In the remaining 7 cases, all three bones were completely removed. The radial styloid was not removed.

In cases of old, unreduced perilunate dislocations, we used a Kirschner wire to temporarily stabilize the new radiocarpal joint. The capsule and the extensor retinaculum were repaired. After skin closure and a bulky dressing application, all the wrists were immobilized in short-arm cast for 4 weeks, allowing full movement of the fingers and thumb. The follow-up examination comprised a clinical evaluation scoring system described by Cooney et al. (1987; Table 2). A score of 90–100 was considered excellent, 80–90 good, 65–80 fair, and less than 65 poor.

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Nine months after injury. The fracture of the scaphoid is seen on the posteroanterior projection, and the unreduced dorsal perilunate dislocation is shown on the lateral projection.

Seventeen years after proximal row carpectomy, with no signs of degenerative changes of the radiocarpal joint. The patient has two-thirds normal wrist motion, almost normal grip strength, and no pain.

Figure 1. Case 2.

Figure 2. Case 12. Radial and ulnar motion of the wrist 18 years after proximal row carpectomy for Kienböck's disease. No degenerative changes in the radiocarpal joint can be seen. Note the radial styloid-trapezium impingement in radial deviation of the wrist.

Table 1. Materials and results

Case	Age	Wrist	Occupation[a]	Diagn[b]	Duration of symptoms (mo)	Follow-up (yr)	Clinical score					Clinical results[c]	Comments[d]
							Pain	Function	Motion	Grip	Total		
1	48	R	1	P	4	19	25	25	5	5	60	3	1
2	39	R	2	P	9	17	25	25	10	15	75	2	
3	31	L	3	P	120	16	15	25	10	10	60	3	2
4	23	R	4	P	5	16	25	25	10	15	75	2	
5	21	R	1	P	12	15	25	25	10	0	60	3	1
6	21	L	5	P	12	10	20	25	10	15	70	2	
7	51	R	1	P	2	5	20	20	0	5	45	3	1, 2
8	21	R	1	P	4	4	25	25	5	10	65	2	
9	20	L	2	P	2	4	25	25	10	10	70	2	
10	45	R	1	P	6	3	15	20	5	10	50	3	2
11	30	R	1	P	2	3	20	25	10	15	70	2	
12	27	L	1	K	48	18	20	25	10	10	65	2	
13	16	R	6	K	15	14	25	25	15	15	80	1	
14	30	L	1	K	36	10	20	25	10	10	65	2	

[a] Occupation: 1 laborer, 2 office worker, 3 carpenter, 4 driver, 5 motorcycle racer, 6 student.
[b] Diagnosis: P perilunate dislocation, K Kienböck's disease.
[c] Clinical results: 1 good, 2 fair, 3 poor.
[d] Comments: 1 finger contracture, 2 degenerative changes.

Measurements of grip strength were compared with those of the uninvolved side regardless of hand dominance. Radiographs were made at follow-up to evaluate the presence of degenerative changes.

Results

Wrist motion averaged 37° of dorsiflexion (62 percent of normal), 30° of palmar flexion (43 percent of normal), 5° of radial deviation (19 percent of normal), and 24° of ulnar deviation (72 percent of normal). The average grip strength measured was 64 (11–95) percent of the uninjured hand. There were 3 patients with a preoperative contracture of the involved hand following a crush injury in whom the grip strength was less than 30 percent of normal. In the remaining 11 patients, the average grip strength was 77 percent of normal. Seven patients had no pain at all, and 5 had mild pain with strenuous use of the wrist. The remaining 2 patients had moderate pain due to postoperative arthrosis. All the patients except 2, who required a lighter type of work, have been able to resume and continue their previous occupations. The overall clinical evaluations were 1 good, 8 fair, and 5 poor (Table 1).

Follow-up radiographs showed degenerative changes of the radiocarpal joint in 3 patients in whom there was some damage to the articular surface of the radius or the dome of the capitate before the operation as a result of the perilunate dislocation. There was no radiographic evidence of degenerative changes of the radiocarpal joint in the remaining 11 wrists (Figure 1), but six of them had sclerotic change and/or deformity on the radial styloid, which appeared to be due to impaction of the scaphoid remnant or trapezium (Figure 2).

Table 2. Clinical scoring chart (Cooney et al. 1987)

Pain	25	No pain
	20	Mild occasional pain
	15	Moderate, tolerable pain
	0	Severe to intolerable pain
Functional status	25	Returned to regular employment
	20	Restricted employment
	15	Able to work, unemployed
	0	Unable to work because of pain
Range of motion		Percentage of normal
	25	100
	15	75–100
	10	50–75
	5	25–50
	0	0–25
		D + P arcs if only injured hand reported
	25	120° or more
	15	90–120°
	10	60–90°
	5	30–60°
	0	30° or less
Grip strength		Percentage of normal
	25	100
	15	75–100
	10	50–75
	5	25–50
	0	0–25

D dorsiflexion, P palmar flexion.

Discussion

Proximal row carpectomy has been advocated for the treatment of Kienböck's disease (Crabbe 1964, Steinhäuser 1969, Jorgensen 1969, Inglis and Jones 1977, Gèrard and Schernberg 1985), old unreduced perilunate dislocations (Stack 1948, Campbell et al. 1965, Neviaser 1983, Gèrard and Schernberg 1985), nonunion of the scaphoid (Crabbe 1964, Jorgensen 1969, Neviaser 1983, Gèrard and Schernberg 1985), scapholunate dissociations (Inglis and Jones 1977, Neviaser 1983, Green 1987), and flexion deformity of the wrist (Omer and Capen 1976).

The literature indicates some controversies concerning excision of the radial styloid. Neviaser (1983) and Green (1987) recommended a limited styloidectomy with a view of improving radial deviation. On the other hand, Gèrard and Schernberg (1985) stated that there were no advantages in terms of mobility. In our series there were 6 cases in which the scaphoid remnant or trapezium abutted the radial styloid, preventing radial deviation of the wrist. Therefore, we now must agree with Neviaser and Green's opinion.

Steinhäuser (1969) emphasized the importance of leaving the distal part of the scaphoid intact to preserve the radial collateral ligament; however, all the other authors in the reviewed literature advocated total removal of the scaphoid. We have usually left the distal pole of the scaphoid intact in long-standing unreduced perilunate dislocations because of the difficulty of removing it.

Crabbe (1964) and Inglis and Jones (1977) stated that mild degenerative changes of the wrist did not appear to affect the results. In our series, however, all 3 patients who had some damage to the articular surface of the radius or the dome of the capitate before the operation had poor results due to progression of degenerative changes of the radiocarpal

joint. We agree with Stamm (1944), Gèrard and Schernberg (1985), and Green (1987) that this procedure should be reserved for patients with good articular cartilage both on the dome of the capitate and on the lunate fossa of the radius.

The results of this procedure varied with the type of cases. The results in the treatment of Kienböck's disease were superior to the results in the perilunate dislocations (average clinical scores 70 and 64, respectively), reflecting the severity of the primary condition. The results in perilunate dislocations following crush injuries were inferior to the results in those following the outstretching injury (average clinical scores 54 and 70, respectively). Although most patients may feel some discomfort and/or weakness in the involved wrist, a functional wrist without significant pain and stiffness may be obtained by this procedure when the radiocarpal articulation has remained intact.

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