

Results of Perilunate Dislocations and Perilunate Fracture Dislocations With a Minimum 15-Year Follow-Up

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Purpose To evaluate the long-term clinical, functional, and radiological outcomes in 30 patients with at least 15 years of follow-up.

Methods We performed a retrospective study that identified 73 patients. Thirty patients agreed to participate and were included. The mean follow-up was 18 years (range, 15–24 years). There were 14 cases of perilunate dislocation and 16 cases of perilunate fracture-dislocation (including 13 transscaphoid perilunate fracture-dislocations). At the last follow-up, the clinical and functional evaluation was based on the range of motion, grip strength, the Mayo wrist score, the Quick Disabilities of the Arm Shoulder and Hand score, and the Patient-Rated Wrist Evaluation score. Radiological abnormalities, according to the Herzberg classification, were 5 type A1 cases, 7 type B, 16 type B1, and 2 type C.

Results The mean flexion–extension arc, radial–ulnar abduction arc, and pronation–supination arc were, respectively, 68%, 67%, and 80%, relative to the contralateral side. The mean grip strength was 70%, relative to the contralateral side. The mean Mayo wrist score was 70, and the mean Quick Disabilities of the Arm Shoulder and Hand and Patient-Rated Wrist Evaluation scores were, respectively, 20 and 21. Five patients had secondary procedure. Six patients had a complex regional pain syndrome type 1.

Conclusions Although arthritis occurred in 70% of cases, its clinical and functional impact appeared to be low. However, the 2 lowest Mayo wrist scores corresponded to the patients with the most advanced arthritis. Complex regional pain syndrome appeared to have an impact on long-term outcomes. (*J Hand Surg Am.* 2015;40(11):2191–2197. Copyright © 2015 by the American Society for Surgery of the Hand. All rights reserved.)

Type of study/level of evidence Therapeutic IV.

Key words Arthritis, fracture dislocation, perilunate dislocation, wrist.

PERILUNATE DISLOCATION (PLD) and perilunate fracture-dislocation (PLFD) are rare but occur most frequently in young patients who sustain high-energy trauma.^{1,2} Although PLD and PLFD are

severe injuries, an incorrect or missed diagnosis may delay treatment in up to 25% of the cases and thus lead to poor clinical outcomes.²

At present, many authors^{1–5} recommend open reduction to perform a direct assessment of potential ligamentous and osteochondral injuries and to obtain anatomic reduction. The medium-term prognosis for these lesions remains poor, and well-known complications of the injury include joint stiffness, loss of strength, and posttraumatic intercarpal arthritis. Radiographic posttraumatic arthritis occurs in 50% to 100% of cases of PLD or PLFD.^{2,4–6}

In series with medium-⁷ and long-⁶-term follow-up, there is a discordance between radiological signs of

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arthritis and functional outcome. It is our assumption that degenerative changes worsen over time, affecting long-term functional outcome.

The aim of our study was to evaluate the clinical, functional, and radiological outcomes in patients with carpal PLD and PLFD after at a minimum of 15 years after injury.

MATERIALS AND METHODS

We obtained institutional review board approval for a retrospective study of patients treated in our institution for PLD or PLFD between 1977 and 1999. Although we identified 73 patients treated for these injuries, 43 of them were excluded because 9 refused to participate in the study, 16 had moved, 14 could not be located, and 4 had died. The remaining 30 patients agreed to participate. There were 28 men and 2 women. The mean age at the time of injury was 32 years (range, 18–48 years). Right wrists were injured in 12 and left wrists were injured in 18 cases. The dominant hand was involved in 13 cases. There were 13 heavy manual workers. Injuries occurred because of motor vehicle accident (15 cases), sports activity (1 case), and fall from height (14 cases). The average time period until surgery was 1 day (range, 0–6 days). The mean follow-up was 18 years (range, 15–24 years). The mean age at the last follow-up was 52 years (range, 37–67 years). Of the 30 patients, 13 had associated injuries treated in the same surgical session. Five patients had lower extremity fractures, 5 patients had lumbar vertebral fractures, and 1 patient had a closed head injury. Preoperative median nerve compressive symptoms were found in 2 patients. These symptoms were severe, progressed to acute carpal tunnel syndrome, and required urgent median nerve release.

The lesions were categorized according to the radiological classification of Herzberg (Table 1).² This classification system depends on the dislocation of capitate and lunate. There were 14 PLD, 13 trans-scaphoid PLFD (TSPLFD), with 1 transradial styloid fracture, and 1 trans-scaphocapitate fracture-dislocation. There were 3 PLFD with 2 fractures of the transradial styloid and 1 fracture of the ulnar styloid. All lesions involved dorsal displacement. There were 11 stage I and 19 stage II (17 stage IIa and 2 stage IIb). Associated avulsion fractures (fracture of the tip of the ulnar styloid or the tip of the radial styloid) were observed in 5 cases.

According to the Herbert classification⁸ for acute scaphoid fractures, we observed 13 type B4. Two patients had a rare combination of injuries.⁹ One of these

TABLE 1. Classification of Perilunate Dislocations and Fracture-Dislocations According to Herzberg²

	Dorsal Displacement of Capitate With Respect to Lunate	Palmar Displacement of Capitate With Respect to Lunate
Stage I	Lunate remains in place under the radius	Lunate remains in place under the radius
Stage IIa	The lunate is palmarly dislocated but rotated by less than 90°	The lunate is dorsally dislocated but rotated by less than 90°
Stage IIb	The lunate is palmarly dislocated and rotated more than 90°	The lunate is dorsally dislocated and rotated more than 90°

TABLE 2. Distribution of the Various Treatments According to the Injuries

	PLD	TSPLFD	PLFD
Closed reduction and cast immobilization	2	0	0
Closed reduction and percutaneous pinning	7	1	2
Open repair via volar approach	1	9	0
Open repair via dorsal approach	4	2	1
Open repair via volar and dorsal approach	0	1	0

was a TSPLFD with concurrent scapholunate (SL) ligament disruption. The other was an open injury.

Two patients were treated with closed reduction and cast immobilization, 10 with closed reduction and percutaneous pinning, and 18 with a dorsal and/or volar approach (Table 2). The associated scaphoid fracture was treated using 1 screw (10 cases) or 1 K-wire (3 cases). For the TSPLFD treated by volar approaches, the scaphoid screw was placed from volar to dorsal. The SL ligament was repaired in 6 cases. The state of the lunotriquetral (LT) joint and the existence of osteochondral damage observed during the surgery were not noted. Associated fractures were treated during the same surgical session.

The wrist was immobilized in a plaster cast for 6 weeks. After removal of the cast and pins in all cases at 6 weeks after surgery, hand therapy was initiated. Good reduction was observed in 17 cases (57%), according to the criteria published by Forli et al⁶ (SL space inferior or

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