Perilunate Dislocations

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Abstract

Perilunate wrist injuries are relatively rare but devastating injuries that can alter the lifestyles of those sustaining them. It is important to recognize the magnitude of the injury and to provide immediate and complete care to the patient. Two of the most important factors affecting outcomes are timing of the care provided and quality of the reduction and carpal alignment following definitive management. This review explores the anatomy, pathoanatomy, and biomechanics, as well as the diagnoses and different treatment options for perilunate wrist injuries available to date and their complications and outcomes.

Perilunate injuries usually occur by hyperextension mechanisms due to high energy trauma. Such trauma can come from numerous activities, such as sports, motor vehicle, and industrial accidents, as well as falls from height. Perilunate dislocations are frequently missed at initial presentation (up to 25%)[1] and if never treated may significantly alter outcome and quality of life. In perilunate dislocations, the capitate and remainder of the carpus dislocate around the lunate, which lies within the lunate fossa of the distal radius.

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The direction of the dislocation is dorsal in up to 97% of the cases.[2] Up to 10% of perilunate injuries are open and up to 65% are associated with scaphoid fractures.[2] While a lunate dislocation refers to the lunate as it dislocates from the lunate fossa of the distal radius, this is but one of the stages in the continuum of a perilunate dislocation.

Historical Perspective

The treatment of perilunate dislocations has a record of failure and poor outcome historically. In 1855, Joseph-Francois Malgaigne was the first to describe "perilunate dislocations." Up until the 1920s closed reduction and casting was the mainstay of treatment for these injuries. In 1923, Davis proposed a technique where he used a broomstick as a fulcrum on the palmar aspect of the wrist to reduce the lunate in its fossa.[3] In 1925, Conwell followed up on the broomstick technique but modified it by utilizing fluoroscopy to check for the quality of reduction.[4] Later in 1925, Adams advised against the use of a hard surface, which could result in damage to tendons and soft tissues within the wrist, and proposed using the thumb as a fulcrum.[5] Current improvements in the treatment of perilunate injuries have evolved into debates involving surgical correction and fixation.

Anatomy

The lunate is anchored within the lunate fossa of the distal radius by strong volar and dorsal interosseous (intrinsic) and extraosseous (extrinsic) ligaments. Interosseous ligaments refer to ligaments connecting carpal bones, whereas extraosseous ligaments connect the ulna and radius to the carpal bones. Important interosseous ligaments surrounding the lunate are the scapholunate interosseous ligament (SLIL) and lunotriquetral interosseous ligament (LTIL). The palmar extrinsic ligaments are arranged in a double V configuration with the apices

pointing distally. The proximal V links the distal radius and ulna to the proximal carpal row and is made up of the long radiolunate ligament radially and the short radiolunate and ulnolunate ulnarly. A ligamentous link exists between the distal carpal row to the proximal carpal row and distal radius and ulna forming the distal V. The radial limb is the radioscaphocapitate ligament, while the ulnar limb includes the triquetrocapitate and ulnotriquetral ligaments. Between the two limbs of radioscaphocapitate and long radiolunate ligaments at the capitolunate joint is a weak zone called the "space of Poirier" that is often involved in perilunate dislocations.[6]

Pathoanatomy and Classification

Disruption of interosseous ligaments within a row, causing abnormal motion in such a row is termed "dissociative carpal instability." Examples of such instability are injuries to the scapholunate (SL) and lunotriquetral (LT) interosseous ligaments. Disruption of capsular ligaments causes abnormal motion between the proximal and distal rows in the wrist and are termed "nondissociative carpal instability." Examples of such injuries are disruptions of the dorsal intercarpal (DIC) ligament, dorsal radiocarpal (DRC) ligament, and radioscaphocapitate (RSC) ligament. When both types of ligaments are injured, it is termed "carpal instability complex." This is the case in majority of dislocations, except for pure radiocarpal dislocations.[6]

In 1980, Mayfield staged a series of experiments where he forced 32 wrists into hyperextension by applying force to the thenar eminence and recorded the pattern of injury and sequence of events in perilunate dislocations. The results of these experiments led him to develop a new classification system of perilunate dislocations.[7] In stage 1, as the wrist is hyperextended, the distal carpal row is forced into hyperextension, and the scaphotrapeziotrapezoid ligaments pull the scaphoid into extension. The lunate, however, cannot follow because its extension is limited by the stout volar short radiolunate ligament. This results in injury to the SLIL. This is followed by stage II, where the distal row and the scaphoid may dislocate dorsal to the lunate, due to weakness in the space of Poirier. Such a dislocation is limited in part by the radioscaphocapitate ligament. In stage III, further extension causes the triquetrum to extend and an injury to the LT ligament. Finally, in stage IV, the lunate itself is dislocated volarly from the lunate fossa by the capitate that hinges on the still intact radioscaphocapitate ligament. The volar pole of the lunate is fixed by the strong short radiolunate ligament, and during dislocation it rotates out and around this hinge. Thus, Mayfield described volar lunate dislocation as a part of a continuum of dorsal perilunate dislocations, representing its final stage (Fig. 1).

In addition to Mayfield's classification, in 1980, Johnson[8] described the concept of "carpal arcs" in the wrist.[8] Specifically, a lesser arc injury represents a pure ligamentous injury around the lunate, and a greater arc injury involves the bones around the lunate (Fig. 2). Such bony involvement can include the scaphoid, triquetrum, capitate, hamate, and distal radial styloid. When a bony fracture is involved, a prefix "trans-" is used to describe the injury (as in trans-scaphoid perilunate fracture dislocation).
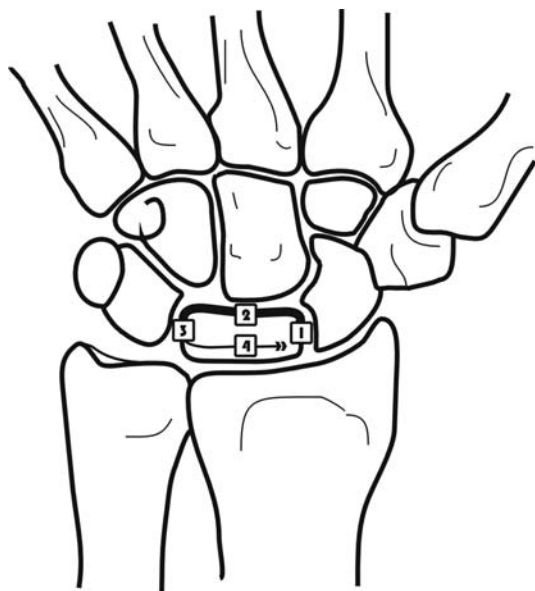

Figure 1 Mayfield classification of wrist injuries: Stage 1: injury to the SLIL. Stage II: the midcarpal joint. Stage III: injury to the LT ligament. Stage IV: lunate itself is dislocated volarly from the lunate fossa ("spilled teacup").
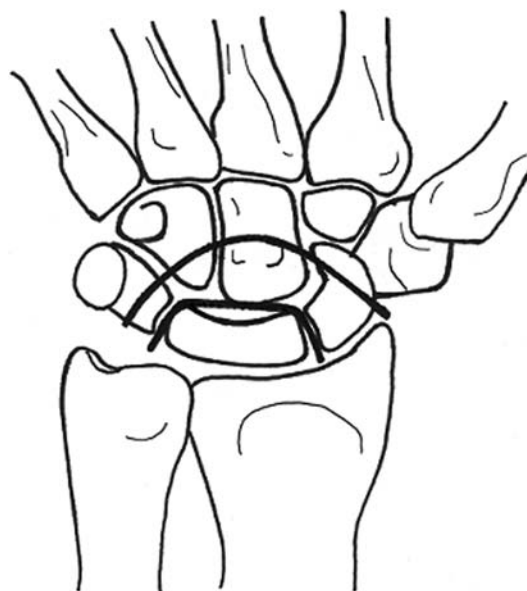

Figure 2 Arcs of the wrist: a lesser arc injury represents a pure ligamentous injury around the lunate and a greater arc injury involves the bones around the lunate.

Figure 3 PA radiographic view demonstrating a perilunate fracture dislocation.

Figure 4 Lateral radiographic view demonstrating a perilunate fracture dislocation.

Diagnosis

Diagnosis is made by history, physical and radiographic examination. The history will often reveal a high energy trauma involving motor vehicle, industrial, or a sports accident where the patient sustains violent wrist hyper-extension. Such an injury can also occur with a fall from height. These patients often suffer from other associated injuries. Herzberg and colleagues[2] found that up to 26% of perilunate dislocations and fracture dislocations can be associated with polytrauma and up to 11% can have concomitant upper extremity injuries.

Physical examination findings are often not very spe-cific. Patients will have a swollen wrist with significant pain on attempted limited range of motion. In addition, the usual bony landmarks will be obscured by the swelling or completely lost due to the dislocation itself. After obtain-ing the history and physical examination, radiographic imaging is performed. Plain radiographs should include PA and lateral views (Figs. 3 and 4). Knowledge and experi-ence are necessary in evaluating wrist radiographs. This is exemplified by the number of missed perilunate disloca-tions reported.[1] In 1984, Gilula and coworkers[9] described co-linear radiographic lines that are helpful in discovering carpal bony incongruities due to ligamentous and bony injuries in the wrist. Gilula's lines outline the proximal and distal edges of the proximal carpal row and the proximal cortical margins of the capitate and hamate (Fig. 5). Any

disruption in these lines is indicative of a perilunate injury. In addition, each of Mayfield's stages might have a differ-ent radiographic appearance that is helpful in identifying carpal injury and instability.
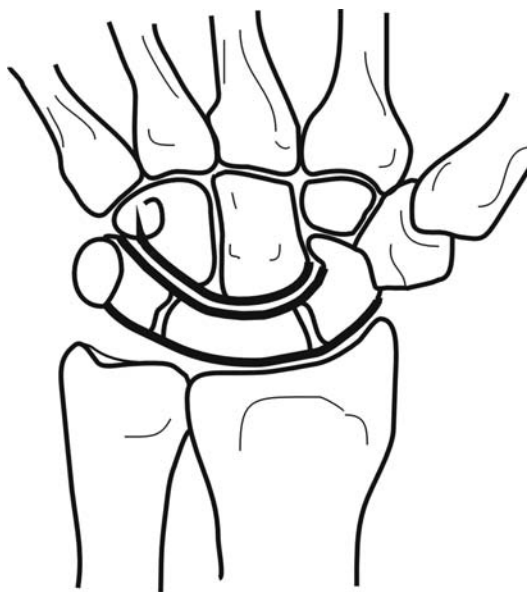

Figure 5 Gilula's lines: outline the proximal and distal edges of the proximal carpal row and the proximal cortical margins of the capitate and hamate.

Figure 6 Marking of the planned incision illustrating a dorsal approach to the wrist.

Figure 7 Marking of the planned incision illustrating a volar approach to the wrist.
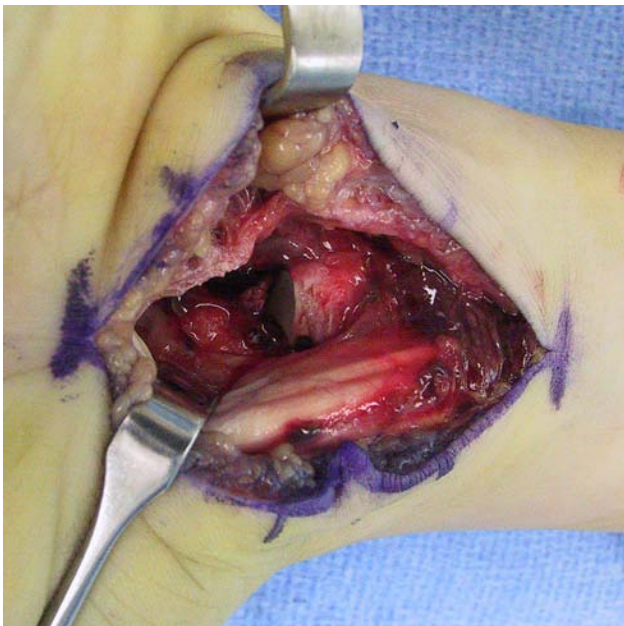

Figure 8 Intraoperative view, volar approach. The lunate is seen through a rent at the space of Poirier.
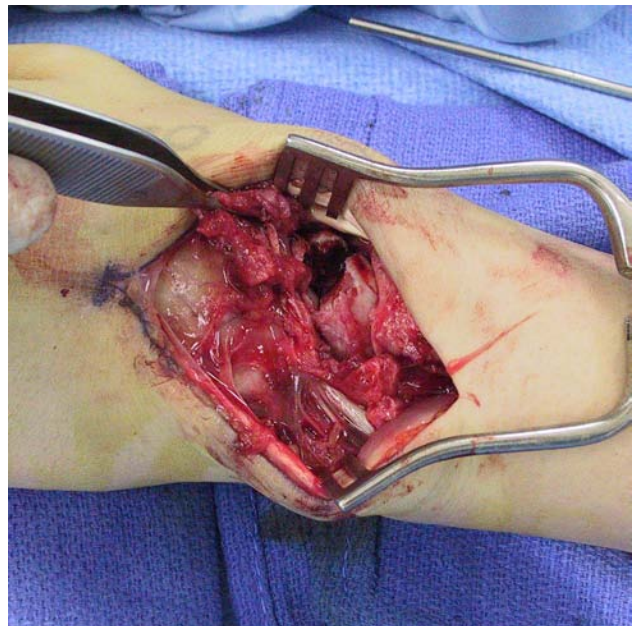

Figure 9 Intraoperative view, dorsal approach. The displaced scaphoid fracture is seen through a dorsal capsulotomy.

In stage I, the scapholunate is the most common ligamentous injury, which is subdivided into multiple levels of severity that are beyond the scope of this review. An asymmetric gap between the scaphoid and the lunate of the injured wrist compared to the contralateral side signifies SLIL injury. This is known as the "Terry-Thomas sign," named so after a British comedian who had a gap between his incisors.[10] Also, in stage I, a "scaphoid ring" sign may be seen that represents the superimposition of the proximal and distal poles. In addition, the lunate and triquetrum appear extended and their shadows project distally on the hamate. Scapholunate angle measured on the lateral view is another important radiographic landmark helping to identify severe SL instability. Normal SL angle

is between 30 and 60°. However, in severe SL injury this angle becomes greater than 70°. Scaphoid fracture can occur in addition to or instead of the SLIL disruption during the first stage of a perilunate dislocation. In fact, it is often misconceived that the energy causing the injury will either tear the SLIL or fracture the scaphoid. These injuries are not mutually exclusive and both can occur at the same time, as was shown by Herzberg, where both injuries occurred 3.8% of the time.[2] Stage II is less well defined. In addition to the SL injury, there is disruption of the scaphocapitate and lunocapitate articulation through the space of Poirier, the weak point in the volar capsule. In stage III there is injury to the LTIL. In both of these stages, the lunate assumes a triangular shape

on radiographic projections, normal co-linear carpal row lines are disrupted, and the capitate is dislocated on lateral projections. Finally, in stage IV the lunate is seen to be sitting volar to the articular surface of the distal radius, often in the carpal canal. This is known as the "spilled teacup sign." In stage IV injuries, strong volar ligaments remain attached to the lunate. They contain a significant portion of the blood supply to the lunate; therefore, osteonecrosis is rare following such injuries. However, transient ischemia of the lunate is possible. If subtle fractures of the surrounding bones or other injuries or dislocations are suspected, a CT scan may be obtained for further evaluation. Magnetic resonance imaging is not useful in acute settings.

Initial Treatment

Initial treatment begins in the emergency room and appropriate analgesia should be administered. A decision must be made as to whether the patient should go directly to the operating room or a closed reduction in the emergency room should be attempted. This decision is made based on the physical and radiographic examination. Immediate operative treatment is indicated for an open injury or if there are signs of progressive median nerve dysfunction.

If closed reduction is to be performed, it should be done with minimal delay and with either a regional block or conscious sedation with hematoma block for relaxation of muscle spasms and pain control. Herzberg and colleagues[11] reported that it is much more difficult to reduce a lunate dislocation if it is more than 90° rotated. The arm is suspended with finger traps with 10 to 15 lbs of traction for 5 to 10 minutes to overcome muscle spasms. This is followed by a reduction maneuver described by Tavernier,[12] in 1906, where traction is applied to the wrist as it is extended. Subsequently, the surgeon's thumb is placed on the lunate volarly to prevent creating a volar lunate dislocation. Then, the wrist is flexed with traction still maintained. This should result in an audible or palpable clunk signifying reduction of the capitate on the lunate and restoration of normal bony alignment. It is often necessary to apply significant but gentle and controlled force to achieve this reduction. If an attempt is made to reduce a volar lunate dislocation (stage IV), the wrist should be flexed first to relax volar ligaments, and the lunate should be manipulated back into its fossa. This is then followed by the steps described for a pure perilunate dislocation. After the reduction, the wrist is immobilized in a sugar-tong splint in neutral position and a post-reduction radiograph is taken. If reduction cannot be achieved by closed means, open reduction is indicated. If closed reduction is achieved, the definitive procedure can follow after a few days until the swelling decreases but no more than 7 days because it becomes more difficult to perform operative fixation.

Numerous studies have shown that ligamentous injuries lead to significant arthritis and impaired functional levels if left without stabilization. Apergis and colleagues[13] performed a study where 20 patients were treated by open reduction internal fixation (ORIF) and eight patients by closed reduction and casting. All patients treated by casting had poor to fair results, while 65% of ORIF patients had good and excellent results. In another study by Adkison and Chapman,[14] 59% of patients lost the reduction after anatomic closed reduction and casting of perilunate dislocations.

Median nerve dysfunction may be a cause for urgent operative intervention. Several mechanisms of injury to the median nerve exist. A direct blow during initial trauma can cause transient symptoms that should resolve spontaneously with time after closed reduction. Another is by volar lunate dislocation into the carpal canal causing nerve compression. A third mechanism is by hematoma formation compressing the nerve and causing gradual progression of symptoms. Median nerve compression due to the latter two reasons must be relieved surgically relatively acutely. Adkison and Chapman described 28% of patients in their series with median nerve symptoms after acute perilunate injury, and nearly 90% had resolution of symptoms after closed reduction. One patient required a carpal tunnel release.

Definitive Treatment

Different operative treatment methods include closed reduction and percutaneous pinning, ORIF, external fixation (that can be used either as a supplement or in patients unable to undergo the ORIF), and arthroscopically assisted repair.

Closed reduction and percutaneous pinning is usually used in polytrauma patients who may not be able to tolerate surgery. This method involves volar-flexing the lunate by flexing the wrist and pinning it with Kirschner (K) wires through the radius. Subsequently, the triquetrum is pinned to the lunate, and an attempt is made to reduce scaphoid in both the AP and lateral planes. Scaphoid reduction is technically difficult, and it is often poorly reduced with pins, making this a sub-optimal treatment. Moreover, reduction can be further complicated if the scaphoid is fractured.

The modern standard of care for perilunate dislocations is ORIF. It allows for direct anatomic reduction and appropriate fixation of most of the injured components. However, it has a time limit as to when it could be done successfully. According to Budoff, closed reduction should be attempted emergently in all patients who present within a few days of injury. After a few days, closed reduction will not be successful. Although a considerable delay between the injury and treatment will likely worsen the prognosis, the results of treatment may remain acceptable even if surgery is delayed up to 45 days. However, after 4 months, salvage procedures may be required.[15]

Three approaches include dorsal, volar, and combined

dorsal-volar. Each has advantages and disadvantages and is a subject of debate in the literature. The dorsal approach allows for the best direct exposure necessary for restoration of alignment and repair of injured dorsal ligaments (Figs. 6 and 9). The volar approach is usually not used alone but allows for carpal tunnel release and volar capsule and ligamentous (especially palmar portion of the LT ligament) repair (Figs. 7 and 8). The combined approach contains the advantages of both but increases operative time and has the risks associated with making a separate incision.

Budoff supports that the dorsal approach is sufficient as the volar capsule tear will heal when anatomic reduction is achieved after dorsal fixation. However, he does make a volar incision if carpal tunnel release or lunate excision becomes necessary. Herzberg argues that an additional incision in a swollen wrist can cause wound closure problems, as well as a delay in recovery of digital flexion and grip strength.[11] Inoue and Kuwahata have also argued for approaching only dorsally, as it is extremely difficult to repair volar ligaments directly. Furthermore, it is felt that these structures will heal once indirectly reduced.[16]

Combined dorsal-volar approach was first described by Dobyns and Swanson in 1973.[17] Melone and coworkers[18] proposed that a combined approach provides unparalleled visualization, with an enhanced capacity for comprehensive repair of the multicomponent soft tissue and skeletal disruptions. Sotereanos and associates[19] reported that it provides excellent exposure and enables complete restoration of both ligamentous and skeletal anatomy (Fig. 9). In addition, they concluded that its potential morbidity is far outweighed by the benefits gained.

Literature-Described Techniques

An extended carpal tunnel volar incision is made, and the transverse carpal ligament is incised, after which the distal volar forearm fascia is divided and the median nerve is thoroughly decompressed. A combined approach is especially helpful if the lunate is volarly dislocated and irreducible by closed means or if there are progressive carpal tunnel symptoms. Subsequently, the nerve with flexor tendons is retracted radially, to protect its recurrent motor branch, and the palmar transverse capsule rent is usually visualized. In a stage IV injury, the protruding lunate is seen through the rent. Traction is applied to the wrist with wrist extension, and the lunate is reduced back into lunate fossa of the distal radius with a Freer elevator.

Next, attention is turned to the dorsal side and an incision is made starting just proximal and ulnar to Lister's tubercle, in line with the third ray and extending to the metacarpal bases. Subsequently, the third extensor compartment is identified and entered, and the EPL is retracted radially. The terminal branch of the posterior interosseous nerve is identified on the radial floor of the fourth compartment, and a 2-cm segment is resected for pain reduction. Tears of the dorsal capsule, when present, are extended, or alternatively the authors' preferred technique is a ligament-sparing dorsal wrist capsulotomy as described by Berger and colleagues.[20] In this technique, the dorsal capsular incision is started ulnar to Lister's tubercle, splitting the dorsal radiocarpal ligament longitudinally to the triquetrum. The triquetrum is identified manually as it sits just dorsal to the pisiform. The capsular incision is then continued in the radial direction splitting the dorsal intercarpal ligament, aiming towards the base of the thumb, making a sideways "V" capsular incision, with the capsule ending up as a radially based flap.

After the carpal bones are exposed, cartilage damage is assessed, and soft tissue is debrided. It is important to inspect all the carpal bones for damage since chondral defects will be prognostic in long-term recovery. Often the
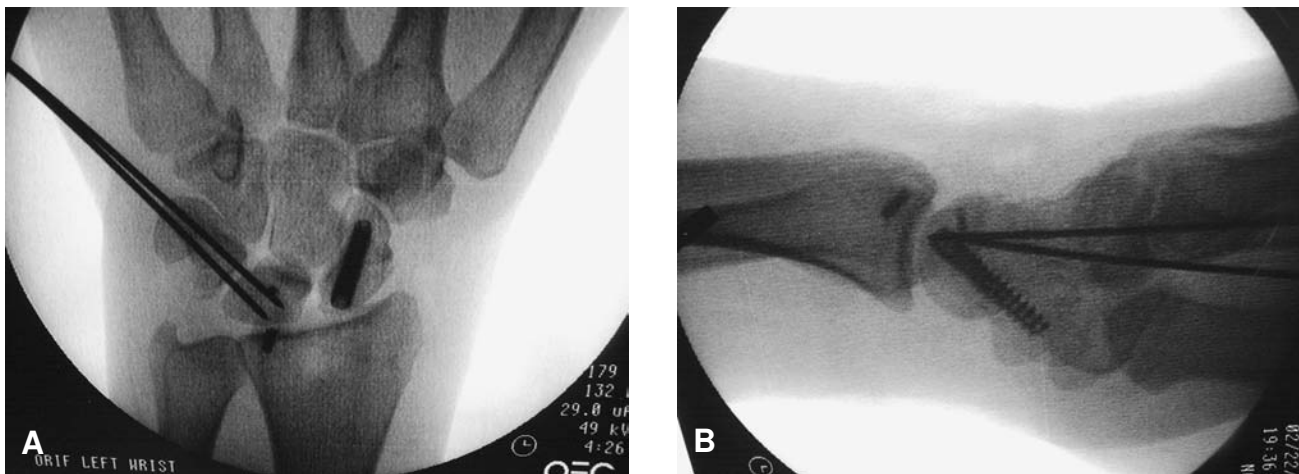
Figures 10 PA and lateral intraoperative fluoroscopic views demonstrating reduction and fixation of a perilunate fracture dislocation. The scaphoid bone is fixed with a headless compression screw. The LT interval is fixed with two 0.045-inch Kirschner wires. Bone suture anchors are present in the lunate for capsulodesis and in the dorsal distal radius for fixation of the dorsal radioulnar ligament tear concomitant injury.

capitate will have an injury in the cartilage due to dorsal lip impaction of the lunate during dislocation. The lunate may also have been damaged due to the same mechanism.

If a scaphoid fracture is present, it is reduced and then fixed with a differential pitch headless screw, usually from the dorsal side (Figs. 10 and 11). Radial styloid fractures, capitate fractures, and other injuries to surrounding bones are also fixed with pins or screws as necessary.

Treatment of the LT interval follows. The triquetrum is reduced to the lunate, compressed, and pinned percutane-

ously with two 0.045 inch Kirschner wires (Fig. 10). On the palmar side, the rent in the capsule is closed with 3-0 braided non-absorbable suture. The ulnar limb of the rent is the palmar LT ligament, the strongest and most important part of the LT ligament complex. The extensor retinaculum is closed with the extensor pollicis longus left out.

In lesser arc injuries (no fracture), the reduction and fixation starts with the SL interval. Joysticks are placed into the scaphoid and lunate bones. One 0.062 inch Kirschner wire is placed in the distal aspect of the scaphoid from the

Figure 11 Postoperative radiographs illustrating healed scaphoid and maintained carpal alignment.

dorsal side. The second 0.062 inch Kirschner wire is placed in the lunate on the ulnar proximal aspect of the bone. The carpus is reduced by a combination of manipulating the joysticks and by a palmarly directed force on the capitate neck, to allow the lunate to cover the capitate head into an anatomic position. Radiographically, the SL gap should be closed and the midcarpal joint should appear anatomic. Gilula's lines should be restored.

A small radial incision over the anatomic snuffbox is made and blunt dissection is carried down to the scaphoid bone to allow for pin insertion from the scaphoid into the lunate without damaging the superficial radial nerve and radial artery. A pointed reduction clamp may be applied to compress the SL interval. Pinning of the SL interval is usually accomplished with two 0.045-inch K-wires placed from the scaphoid to the lunate bone. Use of a drill guide or drilling in oscillate mode are techniques that can aid in soft tissue protection. One or two 0.045-inch Kirscher wires are then placed from the scaphoid to the capitate. The dorsal portion of the SL interosseous ligament, which is usually torn from the scaphoid, is assessed at this time. The SL ligament is repaired to the bone with bone suture anchors. The authors' preferred method of fixation is to use micro-Mitek bone suture anchors (Depuy, Raynham, Massachusetts). In our experience, larger bone suture anchors typically hit the SL K-wires. We and others believe that strong SLIL repair is key to a successful outcome.[21] Also, in addition to attempted repair of the SLIL, most surgeons perform an additional dorsal capsulodesis, for which there are different techniques, such as a Blatt, Szabo, and Berger-type dorsal capsulodeses. Our preference is a modified Berger capsulodesis, where three micro Mitek anchors are placed: one in the distal aspect of the scaphoid 3 mm proximal to the scaphotrapezial joint (from the dorsal aspect), the second in the proximal aspect of the scaphoid dorsally near the SL joint, and the third in the dorsal aspect of the lunate near the SL joint. Cartilage is removed with a no. 15-scalpel blade and small curette in the local area of these bones prior to anchor placement to facilitate healing of the capsule to the bones. The radially based capsule is then tied to each of these bone suture anchors, completing the capsulodesis. The same anchor that is used for the SL ligament repair is used for the capsulodesis.

It is important to evaluate for concomitant injury to the wrist, in particular to the triangular fibrocartilage complex. In higher energy injuries, the dorsal radioulnar ligament can be avulsed from the dorsal distal radius. This should be repaired with a bone suture anchor as well.

Alternative fixation methods exist that follow the same principles of repairing perilunate dislocations and fracture-dislocations. One alternative to Kirschner wire fixation for the SL is the use of temporary headed or headless screw inserted over a guidewire.[22] In a comparison study of the two methods of fixation on 18 patients (nine wrists in each group), results were comparable. One advantage of screw fixation is that the SL and LT intervals could be compressed with a screw, whereas K-wires cannot achieve this goal. However, the major disadvantage of such fixation is the need for screw removal, usually at 5 to 6 months.

Arthroscopy has been described as a treatment modality and aid to percutaneous fixation.[23] It can be used for debridement, evaluation of damage, and assessment of percutaneous reduction. However, it has a limited role if interosseous ligaments are injured because their repair requires open surgery. In addition, fluid used in arthroscopy may leak out through the torn capsule and cause problems such as compartment syndrome. No series treating perilunate dislocations arthroscopically have been reported to date.

External fixation may be used in several clinical scenarios: open injury, closed injury, with extensive soft tissue damage, concomitant severely comminuted distal radius fracture, and in cases where splint application is not possible.

Postoperative Care

Postoperatively, external fixation, pins, or casts are removed anywhere from 10 to 12 weeks, depending on the quality of fixation and healing. Gentle active and active-assisted range of motion exercises are then started and gradually progressed to grip strengthening exercises. Sports participation and heavy labor are usually delayed for at least 6 months. If screws are used, they are removed at 5 months to 1 year.

Late Treatment

Late treatment is sometimes necessary when patients present with pain and functional disability following a chronic injury. Some of the treatment options include delayed ORIF, proximal row carpectomy, and partial or complete wrist arthrodesis when extensive degenerative changes are present. A recent study by Komurcu and coworkers[24] compared six patients treated by early ORIF and six patients treated by ORIF delayed an average of 26 days (range: 10 to 40 days). Results showed early ORIF had improved grip strength, range of motion, and a higher functional score. In another study, Inoue and Shionoya evaluated 28 patients who were treated a minimum of 6 weeks after injury (range: 6 weeks to 23 years, with an average of 5 months). Their treatment involved ORIF, proximal row carpectomy, lunate excision, or carpal tunnel release with partial lunate excision. The investigators concluded that ORIF led to satisfactory results only if performed within the first 2 months after injury. After 2 months, they recommend proximal row carpectomy.[25] Rettig and Raskin assessed long-term outcomes after proximal row carpectomy for chronic perilunate dislocations in a group of 12 patients untreated or dislocated for at least 8 weeks. Treatment involved a

combined dorsal and volar approach and results were evaluated at an average of 40 months postoperatively (range, 28 months to 7 years). Results showed that all patients had marked relief of pain and median nerve dysesthesias and that their effective range of motion and grip strength were restored to acceptable values.[26]

Complications and Outcomes

There are multiple possible complications of perilunate dislocations and fracture-dislocations. These include missed injury, median nerve injury, transient ischemia of the lunate, osteonecrosis, chondrolysis, and complex regional pain syndrome. Even with proper fixation within acceptable time parameters, there is a risk of carpal instability, scaphoid nonunion or malunion, and early arthritis. The outcomes are difficult to assess due to the number of different injury patterns, fixation techniques, and outcome measurement scales. In general, however, prognosis is fair. Patients should be aware of the possibility of persistent pain, loss of grip strength, range of motion, and the risk of early arthritis. It is important to note that severity of radiographic arthritis has no correlation to a patient's subjective outcome.[1] Some of the poor prognostic indicators are surgical delay of greater than 4 to 6 weeks, open injury, persistent carpal malalignment, and presence of large osteochondral defects. It seems that there is no difference in outcomes between perilunate and lunate dislocations.[19] Some of the studies looking at outcomes reported modest success. Herzberg and associates [2] evaluated 166 perilunate dislocations and fracture-dislocations in a multicenter study and reported that 25% of the injuries were missed initially, and 56% of the fractures with early treatment developed posttraumatic arthritis at a mean of 6.25 years. Also, investigators have shown that almost all patients developed mid-carpal and radiocarpal arthritis by 8 years of follow-up. Furthermore, radiographic arthritis was related to the severity of injury and quality of reduction. In another study, Hildebrand and colleagues[27] reviewed 23 injuries after early ORIF by a dual approach an average of 3 years after fixation. Patients scored an average of 66 on Mayo Wrist Score, all had radiographic arthritis, their average flexion-extension arc was 57°, and their average grip strength was 73% of the opposite side. Seventy-three percent of patients returned to their previous occupation.[26] In another study, Herzberg and coworkers looked at 14 trans-scaphoid perilunate dislocations that had early treatment by ORIF and one proximal row carpectomy. The average follow-up time was 8 years, and results showed that 8 patients had good to excellent results with 5 fair and 1 poor. Average Mayo Wrist Score was 79%, and radiographic arthritis was universally observed but did not correlate with the functional score.

Summary

In summary, perilunate dislocations and fracture-dislocations are complex injuries that must be treated by prompt closed reduction, followed by ORIF with repair and reconstruction of bony and ligamentous structures. Patients must be counseled regarding the possibility of poor outcome after such severe injuries and that they will likely require significant rehabilitation and counseling. If an injury is missed for more than 6 to 8 weeks, proximal row carpectomy is the usual preferred treatment of choice.

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