Acute Lunate Dislocation in a Collegiate Football Player
A Case Review

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ABSTRACT
A male collegiate football player sustained a lunate dislocation during a blocking drill. He underwent scapholunate ligament repair 3 days after injury. Complications following the initial surgery required 2 additional surgeries to remove a cyst, perform a neurectomy, and reconstruct the scapholunate ligament.

Wrist injuries are common in contact sports and comprise between 3% and 9% of all athletic injuries. The most common mechanism for wrist injuries in sports is falling on an outstretched arm; the forced hyperextension may cause multiple injuries within the carpus. High-energy hyperextension loading of the wrist may disrupt the intrinsic scapholunate and lunotriquetral ligaments, dislocating the lunate. Disruption of the scapholunate ligament integrity may cause chronic lunate instability and associated wrist pain and dysfunction. Due to the relatively high incidence of chronic instability following scapholunate ligament injury, the ligament commonly requires acute repair or subacute reconstruction to restore normal function. We present a case of an acute lunate dislocation and its associated complications.

CASE REVIEW
On March 20, 2010, a 19-year-old male Division I football player reported to an athletic trainer during practice with complaint of extreme left wrist pain. He reported that he pushed a blocking bag during a blocking drill, and his left wrist was forced into hyperextension. The athlete stated that he felt a pop and immediately noticed swelling; pain prevented his continued participation in practice. During on-the-field examination, signs and symptoms included mild swelling over the proximal row of carpals and severe pain with any wrist and finger motion. Abnormally low strength and range of motion was noted in both his hand and wrist. The athlete reported paresthesia of his index, middle, and ring fingertips of his left hand, which progressed to anesthesia of his entire left hand. The athlete initially had 3/5 grip strength (assessed through manual muscle testing), which deteriorated as the examination progressed. On the basis of the on-field physician examination, the athlete was placed in a splint and sent for radiographic imaging.

Plain-film radiographs of his left wrist revealed lunate displacement and rotation in a volar direction. The capitae was aligned with the articulating surface of the radius and rested against the dorsal surface of the lunate (Figure 1). No fractures were identified on the radiographic images, and the radiologist reported a diagnosis of a lunate dislocation.

Three days after the initial injury, the athlete underwent an open scapholunate ligament repair to restore stability of the scapholunate articulation. His wrist was placed in a cast for 8 weeks following surgery, during which time he performed finger flexion, extension, and opposition exercises. Swelling was managed by the frequent use of massage therapy and other modalities. Following cast removal, postoperative rehabilitation...
(focusing on forearm and grip strength) was performed with a certified hand specialist 3 times per week. Manual therapy emphasized scar tissue reduction, edema reduction, and restoration of passive motion.

Four months following the scapholunate repair, the athlete had limited range of motion, lacking both active and passive wrist extension. The athlete reported pain during passive wrist extension from 10° to 50°, with discomfort on the radial side of his wrist and localized pain over the capitate. He was referred to the orthopedic surgeon for additional radiographic imaging. The computerized tomography scan revealed cystic changes near the capitate. The athlete received an injection with a local anesthetic in an attempt to produce long-term pain relief; however, the injection proved to be unsuccessful. To determine the root cause of the pain, a nerve-block injection was administered to the posterior interosseous nerve.

On August 3, 2010, the athlete underwent a diagnostic arthroscopy with debridement of the capitate and open posterior interosseous nerve neurectomy. Following the arthroscopic debridement surgery, the athlete reported a significant reduction in pain. He was cleared on August 22, 2010 (5 months after the initial injury) to return to limited practice with using a brace, and he returned to full participation on August 30, 2010.

One and a half months following the arthroscopic debridement, the athlete reported wrist pain, although less severe compared with his initial scapholunate ligament repair surgery. The pain (over the scapholunate joint) manifested primarily during blocking drills, which inhibited his performance. The athlete had full finger range of motion but lacked full wrist extension. Plain-film radiographs showed slight lucency of the surgical anchors (Figure 2); however, he could participate as tolerated with a functional brace.

On October 26, 2010, the athlete underwent a third surgery for scapholunate ligament reconstruction (Figure 3). His wrist was placed in a cast for 4 weeks before starting a third rehabilitation regimen.

The athlete complained of pain and discomfort 3 weeks after surgery. On examination by the orthopedic physician, a large granulation bed was present at one of the external pin sites. Therefore, external pins were removed 1 week early to reduce the possibility
of infection. His hand was placed in a thumb spica cast for the next week, and antibiotics with pain medication were prescribed. The athlete had an adverse reaction to the antibiotics and was seen in the emergency department for care. While in the cast and thumb spica, he performed active and passive finger exercises, similar to those following his initial surgery. Five weeks after surgery, the athlete had evidence of tissue healing, no signs of infection, and his hand was placed in a Delta-Cast (Smith & Nephew, London, United Kingdom) thumb spica. Ten weeks after surgery, the athlete complained of pain and discomfort with motion and at rest. After further consideration, the orthopedic physician recommended a scaphoidectomy and 4-corner fusion. As a result, the athlete was medically disqualified from participation in football.

**CONCLUSION**

After sustaining an acute lunate dislocation, the athlete underwent an open scapholunate ligament repair. Although the surgery was performed 3 days after the initial injury, the athlete had substantial cartilaginous damage to the lunate and capitate bones. We suspect this may be due to the lunate malalignment. The cartilage degeneration may be the root cause of the pain and a possible etiology for the capitate cyst that subsequently developed. The literature suggests that the most beneficial treatment for scapholunate dissociation is an early repair of the scapholunate interosseous ligament, which occurred in this case. Although positive outcomes after lunate dislocations require a timely diagnosis and immediate surgical intervention, the extent of cartilage damage or associated wrist complex trauma may complicate recovery.

**IMPLICATIONS FOR CLINICAL PRACTICE**

One of the unique aspects of this case is the mechanism of the injury. Lunate dislocations occurring in sport typically result from high-magnitude forces (eg, falling on an outstretched arm with the wrist extended). However, the athlete in our case presented with injury from a low-load force applied to a blocking bag during a practice drill.

Athletes sustaining lunate dislocations can experience varying levels of pain and swelling, which may be misleading during an assessment. In the current case, the athlete presented with extreme pain during hand or wrist movement but had only mild swelling over the carpal bones. Because the magnitude of reported pain did not correlate with the mechanism, we believe our case reinforces the concept that the complexity of the anatomy in the wrist and hand warrants thorough assessment and timely referral for imaging to properly diagnose injuries to this area.

Although the lunate bone is the most commonly dislocated of the carpal bones, acute scapholunate surgical repair typically resolves the dysfunction, allowing patients appropriate recovery for return-to-sport participation. However, in the current case, this athlete required multiple surgical interventions to restore function (eg, scapholunate reconstruction), manage secondary complications (eg, capitate cyst, early pin removal, infection prevention), and reduce painful symptoms (eg, neurectomy). Although full resolution of this case has yet to occur, lunate dislocations typically require 4 to 6 months for full recovery if managed surgically.

**REFERENCES**


