

Palmar Divergent Dislocation of Scaphoid and Lunate

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A 28-year-old man presented with a palmar divergent dislocation of the scaphoid and lunate. He was treated with an open reduction and an internal fixation with two Kirschner's wires after the 25th day of trauma due to a neurological injury. The results were satisfactory after 18 months follow up without any evidence of avascular necrosis and traumatic arthritis of the scaphoid and lunate. The patient had no limitation in motion or intermittent wrist pain. We reported this case with a brief review of relevant literatures.

Key Words: Scaphoid, lunate, palmar divergent dislocation

INTRODUCTION

Fractures and dislocations of the carpal bones usually present as a lunar or perilunar dislocation. A palmar dislocation of the scaphoid and lunate as a unit is a rare injury. Taleisnik et al.¹ reviewed the literature in 1982 and added their own sixth case. Since then, only a few other cases has been reported. However, a palmar divergent dislocation of the scaphoid and lunate is extremely rare. Baulot et al.² reviewed the literature in 1996 and reported a fourth case. We report the fifth case of a palmar divergent dislocation of the scaphoid and lunate with a complete separation at the scapholunate joint that was treated with an open reduction and internal fixation.

CASE REPORT

A 28-year-old right-handed man fell from a

three-story building. He was also diagnosed with an epidural hematoma on the right temporal lobe as well as a basal skull fracture at the department of neurosurgery. He was referred to the department of orthopaedic surgery due to a painful swelling of his right wrist after the 3rd week of trauma. An examination of his right wrist showed severe tenderness, edema and bony prominence on the palmar aspect of the distal forearm. The motion of the right wrist caused severe pain. There were no signs of any neurovascular involvement.

The initial anterior-posterior X-ray revealed an abnormal increase in the scaphoid-lunate distance overlapping the scaphoid-distal radius and lunate-capitate-trapezium. A lateral X-ray revealed an anterior dislocation of the scaphoid and lunate (Fig. 1A). Three-dimensional computed tomography revealed a palmar divergent dislocation of the scaphoid and lunate with a large gap between the two bones (Fig. 1B).

Surgery was performed on the 25th day of trauma due to the neurological condition. The surgical operation site was approached from the palmar side. A skin incision was made just above the bony prominence using a lacy S incision along the flexor carpi radialis. The scaphoid had migrated proximally at the radiocarpal joint line. The waist of the dislocated scaphoid was incarcerated over the palmar carpal ligament in a buttonhole shape. An additional incision was made along the proximal 2/3 transverse carpal ligament to expose the scaphoid and lunate. The median nerve was stretched by the dislocated lunate (Fig. 2). A triangle shaped that was approximately 3 mm from the triquetrum was removed. Although the scaphoid and lunate showed a divergent palmar dislocation, the palmar soft tissue attachment of the distal portion of the

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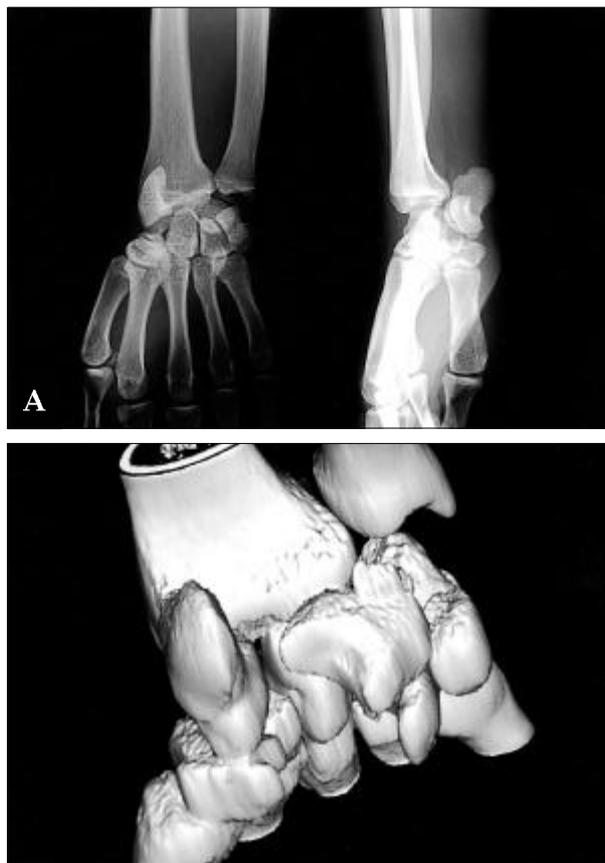


Fig. 1. (A) Anteroposterior plain radiographs showing that the scapholunate distance was abnormally increased. The scaphoid overlapped the distal radius. The lateral radiography shows that the scaphoid and lunate was dislocated anteriorly. (B) Three-dimensional computed tomography showing that the scaphoid and lunate were dislocated divergently in the palmar side. The proximal portion of dislocated scaphoid was placed proximal to the radiocarpal joint line.

scaphoid and lunate remained intact and the scaphotrapezium joint was subluxated. Anatomically, there were complete ruptures of the long radiolunate ligament, the short radiolunate ligament, the radioscapolunate ligament, the radioscapocapitate ligament, the scapholunate ligament, the radiolunotriquetrum ligament, as well as the lunotriquetrum interosseous ligament and scaphocapitate ligament. A reduction of the scaphoid and lunate was possible without any dorsal incision. The soft tissues that corresponded to the capsule of the wrist joint were tied using purse-string sutures. Under a fluoroscope, two Kirschner's wires, which were used to stabilize the scaphoid-



Fig. 2. The median nerve was tented by the dislocated lunate. The waist of the dislocated scaphoid was incarcerated over the palmar carpal ligament at surgery.



Fig. 3. (A) The postoperative anteroposterior radiograph shows the scaphoid, lunate and capitate fixed with two Kirschner's wires. The lateral radiograph shows that the scaphoid and lunate were reduced anatomically. (B) 18 months after surgery, the plain radiograph shows a normal carpal relationship with no evidence of a collapse or degenerative changes in the surrounding intercarpal joint.

lunate and scaphoid-capitate joint with proper interval and angle, were fixed (Fig. 3A). The lunate-triquetrum joint was not fixed because it was stable. After surgery, he was treated with a long arm thumb spica cast for 6 weeks. After 6 weeks, the two Kirschner's wires were removed and gentle passive and active ROM exercise was performed.

After 12 months, a bone scan showed no evidence of avascular necrosis on the scaphoid or on the other carpal bones. At 18 months, the X-ray films showed a normal carpal relation. There was no evidence of collapse of the scaphoid and lunate. No degenerative changes in the surrounding intercarpal joint or carpal instability were found (Fig. 3B). However, the patient complained intermittent wrist pain. A physical examination at that time showed a full range of extension, flexion, ulnar deviation and radial deviation.

DISCUSSION

An isolated palmar dislocation of the scaphoid is rarely observed. An isolated palmar dislocation of the lunate is relatively more common. However, a palmar divergent dislocation of the scaphoid and lunate without fractured or dislocated carpal bones is also uncommon. Baulot et al.² reported a case of a palmar dislocation of the scaphoid and lunate. This case demonstrated that even with early treatment with a good position of the carpal bones in a sole cast, the healing of the ligamentous system without losing the reduction state is very difficult. Therefore, they recommend combined palmar and dorsal approaches for repairing the anterior and posterior ligaments, associated with a stabilization of the entire carpus by a scaphoid-lunate, a triquetrum-lunate, and a capitate-lunate Kirschner's wire fixation. Our case was a palmar divergent dislocation of the scaphoid and lunate. After the failure of the closed reduction, an open reduction was done through the palmar approach, and an internal fixation with two Kirschner's wires was used for the scaphoid-lunate and scaphoid-capitate. Coll³

reported a case of a palmar dislocation of the scaphoid and lunate, which was complicated by a delay in the diagnosis (34 days after the injury) and the avascular necrosis of the lunate. Kupter et al.⁴ reported a case of a palmar dislocation of the scaphoid and lunate as a unit that was treated with closed reduction. They suggested that an early open reduction and internal fixation be done to prevent a dorsiflexed intercalated segmental instability deformity. Although the operation was performed after the 25th day of trauma, our case did not show any carpal instability until the 18 months follow up. Therefore, an open reduction and internal fixation was considered in order to prevent any carpal instability. Rawlings⁵ reported two cases of an avascular necrosis of the lunate after 30 cases of a palmar lunate dislocation. He reported that the source of the revascularization of the lunate is the intact scapholunate ligament. However, in our case, the scapholunate ligament was completely ruptured. It is supposed that the remaining palmar soft tissue attachments of the distal portion of the scaphoid and lunate might have contained vessels that were able to supply blood to the scaphoid and lunate. There was no evidence of traumatic arthritis or avascular necrosis of the scaphoid and lunate until 18 months after surgery, although a long-term follow-up will be needed.

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