



Isolated carpal scaphoid dislocation

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Isolated scaphoid dislocations are very rare. Options for the treatment of dislocation of the scaphoid include closed reduction and casting, closed reduction and percutaneous pinning, and open reduction and ligament repair. We report a case of this rare injury which was treated with open reduction, pinning and ligament repair.

Key words: Dislocation; ligament repair; scaphoid.

Isolated scaphoid dislocation without fracture or dislocation of the associated carpal bones is rare, with only 32 published reports in the literature.^[1-13] Carpal scaphoid dislocations result from a dorsiflexion-supination force upon the hand.^[3,9] Reduction is difficult to achieve through manipulation and usually requires open reduction.

Most dislocations are caused by violent dorsiflexion of the wrist with the hand grasping a fixed object in ulnar deviation. Such injury provokes the disruption of the scapho-radial, scapho-lunate, and scapho-hamate articulations, allowing the scaphoid bone to dislocate and often rotate out of its correct anatomical position while maintaining the integrity of the ligaments supporting the lunate, triquetrum, and hamate. Correct anatomic positioning of both the scapholunate articulation and angulation can be difficult, necessitating conventional closed reduction methods with wire fixation. Ligament reconstruction may provide improved results, especially for long-term outcomes.

We report a case of a rare isolated scaphoid dislocation which was treated with open reduction, percutaneous pinning and ligament repair.

Case report

A 25-year-old male damaged his right wrist as a passenger in a road accident in May 2008. At presentation within a few hours of the accident, the patient complained of a painful wrist and restricted movement. There was an abnormal tender bony prominence distal to the radial styloid process and a slight general swelling, but no nerve lesion. Active and passive movements of the wrist were painfully restricted. Radiographs showed a volarly dislocated scaphoid, but there was no evidence of displacement or fracture of the other carpal bones (Fig. 1).

Initially, closed reduction using traction, ulnar deviation and manual pressure over the scaphoid was attempted under general anesthesia. Closed reduction was not successful and a volar incision was made. Exploration revealed rupture of the scapholunate ligament. The scaphoid was reduced and fixed with two Kirschner

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Fig. 1. (a) Initial anteroposterior radiograph demonstrating the dislocation with complete dislocation of the scaphoid and normal anatomic arrangement of the distal carpal row. (b) Initial lateral radiograph demonstrating isolated complete volar dislocation of the scaphoid.

wires. (Figs. 2 and 3) The ligament was then attached to the lunate. After closure of the wound, the wrist was immobilized for six weeks in a scaphoid type cast.

Pins were removed and physiotherapy started at the postoperative 6th week. Twenty-four months postoperatively, the patient was asymptomatic with no pain or carpal instability. Motion was measured using a standard goniometer. On the injured side, dorsiflexion measured at 50°, compared to 65° on the uninjured side (Figs. 4 and 5). Pronation, supination and palmar flexion were equal on both sides. Radiographs demonstrated no avascular necrosis (Fig. 6), as did magnetic resonance taken at 34 months after the surgery (Fig. 7).

Discussion

Scaphoid dislocations are rare.^[1,3,4,6-8,10] These injuries are divided into two types; isolated dislocations (Type

1) and scaphoid dislocations associated with axial disruption of the capito-hamate joint (Type 2).^[11] The exact mechanism of scaphoid dislocation is not known but is generally believed to involve dorsiflexion and ulnar deviation with or without rotational forces.^[8] Scaphoid dislocation represents a wide spectrum of injuries with varying extent of ligamentous damage. From an anatomical and biomechanical standpoint, there are three major periscaphoid ligaments that stabilize the scaphoid: the scapholunate ligament, the radioscaphocapitate ligament and the long radiolunate ligament.

Options for the treatment of dislocation of the scaphoid include closed reduction and casting or closed reduction and percutaneous pinning.^[12,13] Secondary dislocation of the scaphoid, following closed reduction and pinning, has led to more persua-



Fig. 2. Postoperative anteroposterior radiograph with Kirschner wire fixation and ligament repair.



Fig. 3. Postoperative lateral radiograph.



Fig. 4. Photo from the 24th month follow-up. Slight limitation in dorsiflexion of the wrist is seen. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]



Fig. 5. Normal flexion movement of the wrist. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

sive case reports advocating for primary repair with open reduction and ligament repair.^[5,7,9]

As isolated scaphoid dislocations are so rare, few case reports advocate open reduction with ligament repair.^[9,11] In a retrospective review by Inoue and

Maeda,^[1] ligament repair with internal fixation was shown to maintain the anatomy of the scapholunate joint better than closed reduction and pinning. A case report by Horton et al.^[9] suggested that ligament repair within the context of isolated scaphoid dislocation pro-



Fig. 6. (a-c) X-ray views from the 24th month follow-up.



Fig. 7. (a-c) MR images taken 34 months after the surgery.

vides excellent anatomic and functional results. The most significant risk factor for poor prognosis is delayed diagnosis and treatment.^[12]

In addition, there have been no reported cases of avascular necrosis complicating these injuries. The scaphoid receives the majority of its blood supply via the dorsal vessels at or just distal to the waist area; these vessels perfuse the proximal pole in a retrograde fashion and supply 70 to 80% of the bone. A second group of vessels arise from the palmar and superficial palmar branches of the radial artery and enter the carpal scaphoid in the region of its distal tubercle; it perfuses distal 20 to 30% of the bone. It is proposed that there are intact intraosseous channels inside the intact scaphoid bone that allow rapid revascularization from the surrounding soft tissues.^[8] This may be an explanation for the absence of avascular necrosis despite the total loss of blood supply resulting from the complete disruption of all ligamentous attachments.

We preferred to use a volar incision to better visualize the scaphoid.^[14] On the other hand, the volar approach provides better cosmetic results as the dorsal blood supply and the superficial branch of radial nerve is not injured.^[15]

In conclusion, isolated dislocation of the scaphoid carries a good prognosis provided early treatment is started. We suggest open reduction and ligament repair using a volar approach.

Conflicts of Interest: No conflicts declared.

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