

Clinical case

doi: 10.35366/112990

Anterior dislocation of the lunate due to a high-energy trauma

Luxación anterior del semilunar debido a un traumatismo de alta energía

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ABSTRACT. Semilunate and perilunate dislocation is an injury that mostly occurs when the subject is exposed to a high-energy trauma. Considered severe, it compromises the stability and function of the wrist. The case presented is that of a 50-year-old male patient who after having a motorcycle accident arrived at the ER with neurovascular affection, swelling, deformity and a considerable decrease of the wrist joint movement. He was also referring severe pain. A Henry (Volar) intervention was done with the help of external fixation of the lunate, followed by K-wire fixation, once a prior closed reduction was unsuccessfully attempted. The scaphoid was connected to the semilunate, and then the latter with the capitate. Ligament reconstruction followed, and stability was clinically confirmed with an X-ray. Although improvement of symptomatology was observed during the follow-up analysis, motion of the wrist remained limited. Even with the best treatment, in terms of functionality, this type of injury presents a poor prognosis.

Keywords: surgery, trauma, sports medicine, accidents, injuries.

RESUMEN. La luxación semilunar y perilunar es una lesión que se produce principalmente cuando el sujeto está expuesto a un traumatismo de alta energía. Considerada grave, compromete la estabilidad y la función de la muñeca. El caso presentado es el de un paciente varón de 50 años que tras sufrir un accidente de motocicleta llegó a urgencias con afectación neurovascular, tumefacción, deformidad y una considerable disminución del movimiento articular de la muñeca. También refería fuertes dolores. Se realizó una intervención de Henry (Volar) con la ayuda de fijación externa del lunar, seguida de fijación con agujas de Kirschner, una vez que se había intentado sin éxito una reducción cerrada previa. El escafoide se conectó con el semilunar y luego éste con el capitato. A continuación se reconstruyó el ligamento y se confirmó clínicamente la estabilidad con una radiografía. Aunque se observó una mejora de la sintomatología durante el análisis de seguimiento, el movimiento de la muñeca seguía siendo limitado. Incluso con el mejor tratamiento, en términos de funcionalidad, este tipo de lesión presenta un mal pronóstico.

Palabras clave: cirugía, trauma, medicina del deporte, accidentes, lesiones.

Introduction

Acute semilunate and perilunate bone dislocation, although uncommon, is considered to provoke the most severe carpal distress and wrist instability.^{1,2,3}

Associated directly with high-energy trauma, such as sport-related accidents, it may frequently occur among

young adults and is mostly seen in patients who experienced falls with hyperextended wrists.^{1,2,4,5}

An optimal clinical approach is the prevention of complications (necrosis, median nerve injury and chronic carpal instability) through the continuity of early treatment. A thorough clinical evaluation supported by imaging will ensure such prevention as well as a correct diagnosis.^{1,2,6,7}

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Received: 12-27-2022. Accepted: 08-10-2023.

How to cite: Jasqui-Remba S, Jasqui-Bucay A, Portman-Santos D. Anterior dislocation of the lunate due to a high-energy trauma. Acta Ortop Mex. 2023; 37(2): 106-108. <https://dx.doi.org/10.35366/112990>



According to literature, 25% of these cases end either untreated or misdiagnosed.²

Main radiology findings include:^{1,8}

1. Spilled teacup sign (Volar dislocation of the lunate).
2. Interruption of Gilula's lines.
3. Piece of pie sign (lunate overlapping the capitate).
4. Abnormal scapholunate angle of > 70 or < 30 degrees.

Case presentation

After a motorcycle accident, a 50-year-old male patient is brought to the ER by the EMS.



Figure 1:

Preoperative X-ray of the left hand, demonstrating semilunate dislocation.

Results of a first evaluation indicated deformity, swelling, neurovascular compromise, and a decreased wrist movement. The patient also referred severe pain.

X-ray results showed a radial styloid fracture and semilunate dislocation of the left wrist (*Figure 1*). In addition to these findings, a lateral condyle fracture of the left femur and a radial styloid fracture of the right wrist were also appreciated.

Treatment

The patient was taken to the OR in which under general anesthesia, three 6.5 mm cannulated screws were used to perform a closed reduction of the lateral condyle of the left femur. In addition, a percutaneous fixation of the left radial styloid and the right radial styloid were performed (*Figure 2*).

The intention was to bring the bone through the carpal tunnel with the aid of the closed reduction of the lunate. After having proved unsuccessful, a Henry (Volar) approach was made. Later on and with the use of K-wire fixation, the lunate was reduced through the carpal tunnel, thus connecting the scaphoid with the semilunate and then the latter to the capitate.

Stability was verified with an intraoperative X-ray, once ligament reconstruction was performed (*Figure 3*).

Outcome and follow-up

Considerable improvement was obtained. Pain and swelling disappeared completely; nevertheless, limited motion range remained within the wrist.

Patient's perspective

I'm a 50-year-old male who enjoys motorcycle driving. One day while riding on my bike, I had an accident after which I experienced severe pain in my limbs. I was driven to the



Figure 2:

Intraoperative volar exposure of the wrist showing the lunate dislocated in the carpal tunnel.



Figure 3: Post-surgical X-ray, representing both anterior-posterior and lateral view.

ER at the nearest hospital and after careful examination and X-rays were taken, it was revealed that I had suffered three different fractures as well as a dislocation in my right wrist.

The pain was really unbearable and soon after the accident, my hands became very swollen, both factors made it almost impossible for me to move my hands as I normally do.

I grew increasingly worried because my job entails the complete use of both hands. I had to undergo a surgical procedure, and although the swelling and pain disappeared after several weeks, my worst fears became a reality as a limited motion range remained.

Discussion

While the patient waits for surgical intervention, closed reduction should immediately be attempted. Such measure will lower the necrosis risk and relieve pressure on the median nerve.^{2,9}

Both the volar and dorsal approaches are normally chosen as a first approach and are done using K-wires to obtain internal fixation.^{2,3,7} The dorsal approach is essential

in obtaining long-term successful results.² These are assured with the repair of the scapholunate interosseous ligament, as well as the alignment of the carpus.^{2,3}

Even so, there is a poor prognosis recorded for these injuries. Among other consequences, patients experience loss of strength and motion.^{1,2,3,6} Persistent carpal misalignment, open injuries, and delay in treatment, are key factors that promote a poor prognosis.^{1,2,3,7}

Further complications such as residual carpal instability, complex regional pain syndrome, to name a few, are often associated to the original trauma.^{1,2,3,5,7}

Learning points/take home messages

1. Semilunate dislocation is a frequently unrecognized injury that needs to be discarded especially in polytraumatized patients.
2. Closed reduction should be attempted promptly to avoid necrosis risk and relieve pressure on the median nerve.
3. This injury has been presented to have a very poor prognosis due to loss of strength and motion.

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