



A case of acute lunotriquetral dissociation with static volar intercalated segment instability

Bir olguda statik volar interkalar segment instabilitesine yol açan akut lunotriquetral ayrışma

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A 58-year-old man developed lunotriquetral dissociation with static volar intercalated segment instability (VISI) by a mechanism of hyperflexion of the dorsum during a fall on his left wrist. Wrist motion was greatly restricted. He refused open reduction, and was treated with closed reduction and capitulate external fixation under axillary block anesthesia and continuous traction. The postoperative course was uneventful, and the fixator was removed after eight weeks. However, radiographs obtained four weeks after the removal of the fixator revealed recurrence of the deformity, at a time when the patient was completely asymptomatic. On clinical examination, there was no difference between the grip strengths of the hands. Compared to the normal side, the ranges of flexion, extension, and radial deviation of the left wrist were decreased, but there was an increase of 5° in the range of ulnar deviation. The presented case has several unique features, including the acute form of lunotriquetral dissociation with VISI deformity, mechanism of injury, the reduction technique, and the development of recurrence when the patient was fully asymptomatic.

Key words: Carpal bones/surgery; external fixators; lunate bone; joint instability; wrist injuries/surgery.

Elli sekiz yaşında bir erkek hastada, sol el bileği üzerine düşme sonucu, dorsumun hiperfleksiyona gelmesiyle lunotriquetral ayrışma ve beraberinde statik volar interkalar segment instabilitesi gelişti. El bileği hareketi büyük ölçüde kısıtlıydı. Hasta açık redüksiyonu kabul etmediğinden, aksiller blok anestezisi ve sürekli traksiyon altında, kapalı redüksiyon ve kapitulat eksternal fiksasyon ile tedavi edildi. Ameliyat sonrası süreç sorunsuz geçti ve eksternal fiksatör sekiz hafta sonra çıkarıldı. Ancak, bundan dört hafta sonra çekilen radyografilerde deformitenin nüks ettiği görüldü; bu sırada hasta tümüyle semptomsuzdu. Klinik muayenede, kavrama kuvveti açısından iki el arasında fark yoktu. Normal el ile karşılaştırıldığında, sol el bileğinde fleksiyon, ekstansiyon ve radial deviyasyon azalmış olmasına karşın, ulnar deviyasyonda 5 derecelik bir artış vardı. Olgumuz, lunotriquetral ayrışma ve statik volar interkalar segment instabilitesinin akut travmatik bir olayla gelişmesi, yaralanmanın hiperfleksiyon zorlamasıyla olması, redüksiyon tekniği ve hastanın tümüyle semptomsuz olduğu bir sırada nüks gelişmesi gibi benzersiz özellikleri nedeniyle sunuldu.

Anahtar sözcükler: Karpal kemikler/cerrahi; eksternal fiksatör; lunat kemiği; eklem instabilitesi; el bileği yaralanması/cerrahi.

Lunotriquetral dissociation usually occurs by a fall on the outstretched hand and volar intercalated segment instability (VISI) represents a chronic and more extensive continuation of this injury.^[1-3] Treatment modalities include ligament reconstruction and carpal fusion, as well as conservative measures, but unfortunately, the results are not promising.^[2-4]

This report is the first acute case of lunotriquetral dissociation with static VISI deformity. Based on a comprehensive review of the literature, the present case is the first to occur following hyperflexion injury.

CASE REPORT

A 58-year-old man presented with a history of a fall on his left wrist that happened a day before.

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While falling down on the outstretched right hand, the dorsum of the left wrist was forced to hyperflex. He had marked swelling, tenderness of the lunotriquetral joint, and deformity in the wrist joint. Wrist motion was greatly restricted. A standard posteroanterior radiograph showed disruption of the normal convex arc of the proximal carpal row as a step-off between the lunate and the triquetrum (Fig. 1a). A lateral view demonstrated a marked VISI pattern, with the scaphoid flexed to 75°, the capitate almost free from the lunate cup, and the scapholunate and capitolunate angles being 12° and 50°, respectively (Fig. 1b). He had no

past history of injury, complaint, or deformity for the left wrist, and the radiographs of the right hand were normal. The patient refused open reduction because he had undergone open heart surgery two months before. Under axillary block anesthesia and continuous traction, the wrist was forced to hyperflexion and ulnar deviation, and normal capitolunate alignment was achieved. Then, while the wrist was in dorsal flexion, the lunatum was pushed from dorsum to volar direction. Two pairs of Kirschner wires were inserted percutaneously into the dorsal surfaces of the capitate and lunatum, and a mini external fixator



Fig 1. (a, b) Preoperative and (c, d) postoperative standard posteroanterior and lateral plain radiograms of the wrist joint.

was applied and compressed. The step-off between the lunate and the triquetrum disappeared (Fig. 1c) and reduction of VISI deformity was successful (Fig. 1d). No other immobilization was applied, and the patient was encouraged to use his hand freely. The postoperative period was uneventful, and the fixator was removed after eight weeks. However, radiographs obtained four weeks after the removal of the fixator revealed recurrence of the deformity, at a time when the patient was completely asymptomatic. On clinical examination, there was no difference between the grip strengths of the hands. Compared to the normal side, the ranges of flexion, extension, and radial deviation of the left wrist were decreased by 7, 10, and 5 degrees, respectively. Interestingly, there was an increase of 5° in the range of ulnar deviation.

DISCUSSION

Lunotriquetral dissociation with static VISI deformity represents a more extensive form of injury. Garcia-Elias^[5] reported that he never encountered acute lunotriquetral ligament disruption resulting in a static VISI deformity. In addition, carpal dissociation is considered acute if it occurs in less than a week when the healing potential of the injured ligaments is optimal.^[4] This case seems to be the first acute traumatic case with its mechanism of hyperflexion, because all previously reported cases were associated with hyperextension injuries.^[1-4,6,7]

The maneuver used in the reduction of this patient was also different. In the literature, VISI deformities were reduced in marked ulnar deviation in the physiologic dorsal intercalated segment instability position.^[1,3,6] However, this maneuver was not successful in this case, and reduction was possible via a different and more complex maneuver. This may be due to the diverse mechanism of the injury.

Open repair of ligament injuries of the wrist often results in less than desired range of motion and the stability has been unpredictable.^[4] Closed reduction and cast immobilization also decrease the final range of motion. Upon the refusal of open reduction by the patient, capitulate external fixation was applied with limited immobilization

because of the excellent results of external fixation in fractures and instabilities.^[5,8,9] However, the deformity recurred four weeks after the removal of the fixator. Surprisingly, the patient was asymptomatic with full grip strength and an acceptable range of motion, which is somewhat quite rare for recurrent deformities.^[2,7] Recurrence was attributed to insufficient immobilization period and it was thought that, however benign nature the deformity had, the best treatment was open reduction and ligamentous repair.

In conclusion, the presented case has several unique features, including the acute form of lunotriquetral dissociation with VISI deformity, mechanism of injury, the reduction technique, and the development of recurrence when the patient was fully asymptomatic.

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