

## Case Report

# Midcarpal Joint Loose Body, Where Does It Come from? 腕中骨關節游離體是從那裏來的呢?

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## ABSTRACT

We report a case of intra-articular loose body in the mid-carpal joint following the fracture of the distal radius. The patient fell from a height of 5 ft. The radiographs and computed tomography scan showed a bony fragment in the midcarpal joint. It was associated with dorsal scapholunate ligament tear. The intra-articular bony fragment originated from the fracture distal radius. The possible relationship of the intrusion of the bony fragment and SL ligament injury is discussed.

## 中文摘要

我們報告一宗橈骨遠端骨折伴隨有腕中關節游離體的個案。患者從5呎高處墮下。X光和電腦掃描檢查顯示腕中關節中有骨碎片及伴隨的背側舟月韌帶撕裂。關節內的骨碎片起源於橈骨遠端骨折處。我們就骨碎片的入侵與舟月骨韌帶損傷的可能關係進行了討論。

## Introduction

We report a rare case of mid-carpal joint loose body following the fracture of the radial radius. There was also concomitant scapholunate (SL) ligament tear. The coincidence of distal intra-articular radius fracture and SL ligament tear is well documented in the literature, with the incidence rate ranging from 32% to 59%.<sup>1</sup> Though this is a commonly encountered condition, the true mechanism and natural history is not well known.

## Case report

A heavily built 50-year-old gentleman was admitted to our department in 2008 for left wrist injury. According to him, he fell from a 5-ft height with his left hand landing on the ground in an outstretched position. Immediately, he noticed severe pain with swelling in his left wrist. There was no other injury. Clinical examination showed that his left wrist was swollen and deformed. The sensation of all five digits was intact, and the radial pulse was strong.

The radiographs (Figure 1) revealed a comminuted intra-articular fracture of left distal radius. There was loss of radial height, decrease in radial inclination, 20° of dorsal tilting and dorsal cortical

comminution of the left distal radius. It could be classified as Frykman Type VII or AO type C31 intra-articular fracture.<sup>2</sup> The Gilula's lines at the wrist were not congruent, and there was widening of the SL interval with a bony fragment in the midcarpal joint.

In view of the severity of comminution and the presence of a midcarpal loose bony fragment, a computed tomography scan was performed. The computed tomography scan (Figure 2) demonstrated that a fragment of cortical bone had migrated into the midcarpal joint. There was no other carpal bone fracture. We suspected the fragment was coming from the distal radius.

Operation with open reduction and internal fixation was performed under general anesthesia. Since the comminuted fractures and the intra-articular fragment originated from the dorsal cortex of radius, a dorsal approach was employed for the exposure. Intraoperative findings confirmed that a fragment of the dorsal cortex of the distal radius had jammed into the midcarpal joint. There was partial rupture of the extrinsic ligament and intrinsic ligament of the wrist dorsally. The extrinsic dorsal radiolunotriquetral ligament arising from the dorsal ridge of distal radius and running transversely to the dorsal cortex of triquetrum was partially ruptured. The dorsal part of the SL ligament, which is an intrinsic ligament, was also ruptured.

The fracture of distal radius was openly reduced. A 2.4-mm titanium right angle L-locking plate was employed to fix the intermediate column, whereas another 2.4-mm titanium radial locking plate was used to secure the radial column. The bony

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**Figure 1.** Injury X-ray films of left wrist, with arrows pointing to the intra-articular fragment.

fragment was removed from the mid-carpal joint. It was 1.8 cm in length with sharp pointed edge, thus facilitating its penetration into the midcarpal joint. Due to the comminution, it was not placed back to the fracture site. Bone substitute was not used. The partially ruptured extrinsic radiolunotriquetral ligament was extended to facilitate the repair of SL ligament. Then, the SL junction was closed down and fixed with two K wires. The SL ligament was repaired with one Mini Mitek suture anchor. The extrinsic ligament was

repaired with Ethibon suture. A complete short arm Dynacast was then applied (Figure 3).

The K-wires and the cast were taken off 8 weeks after the operation. Active mobilization exercise was started. Clinically, there was no tenderness over the SL ligament. The Watson shift test was negative. The radiographs taken at 5 months after the operation showed solid bony union with palmar tilting maintained. However, there was residual increased SL angle.

After 5 months of vigorous stretching and muscle strengthening exercise, the active range of wrist motion returned to 50° of flexion and 50° of extension, 70° supination and 75° pronation. The grip power of his left hand was 20 kgf compared to 40 kgf on the right (d) hand. He was able to resume his duties as a decoration worker 7 months after the operation. The overall clinical outcome was satisfactory. A similar finding was also reported by other authors.<sup>3,4</sup>



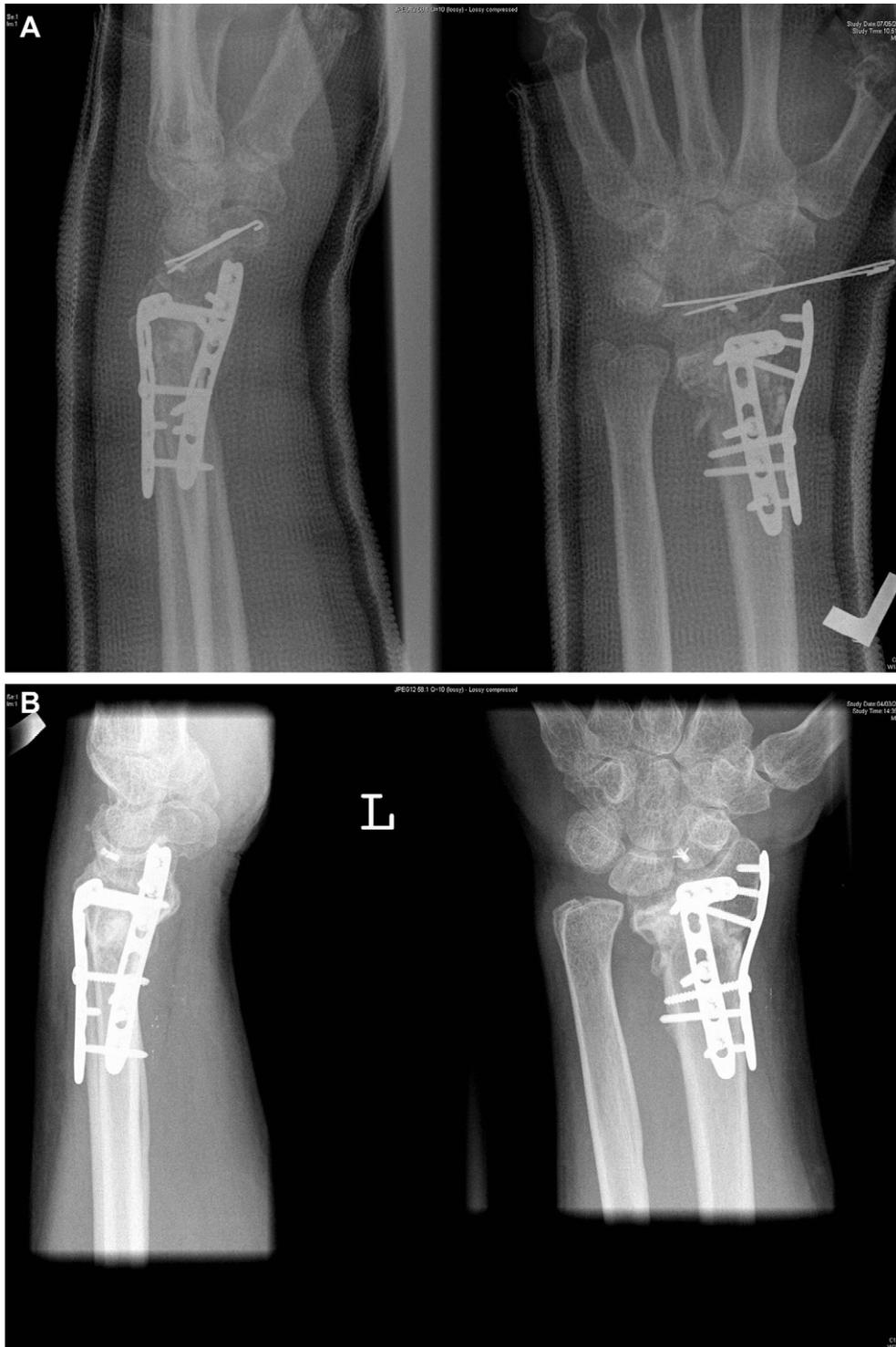
**Figure 2.** The computed tomography scan of left wrist after close reduction, the arrow points to the intra-articular bony fragment.

## Discussion

Carpal bones injuries are easily missed.<sup>5</sup> Indeed, studies showed that 47.8% of SL injury was missed in the intra-articular fracture of the distal radius, and subsequent arthritis was documented.<sup>5</sup> It is of paramount importance to pay attention to the alignment of the midcarpal bones including the Gilula's lines, the SL interval in the posterior anterior crunched-fist views of the radiographs of the wrist, and the lateral SL angle in the lateral radiograph.<sup>5</sup>

Intra-articular fracture of distal radius with SL ligament injury was not uncommon. However, the intrusion of a bony fragment of the dorsal cortex of distal radius into the midcarpal joint was extremely rare. We could not find similar cases reported in the English literature.

According to Mayfield,<sup>1,6,7</sup> the SL ligament injury without fracture of distal radius was caused by hyperextension of the scaphoid on the dorsal axis of the SL joint. The tear of SL the ligament started at the volar side with intact dorsal part of SL ligament. However, in cases of SL ligament injury with intra-articular fracture of distal radius, there was no well-documented mechanism of injury.<sup>8</sup>



**Figure 3.** The radiographs of the left wrist (A) immediately and (B) 5 months after the operation.

The finding of fracture fragment in the midcarpal joint in our case led us to think about the relationship of this sharp bone with the dorsal extrinsic and SL ligament injury.

When the patient fell on the ground, he had his left hand in an outstretched position. The axial loading force from the ground resulted in the distal radius fracture with dorsal comminution. With the wrist in hyperextension, there was a possibility of the sharp bony fragment from the dorsal side of radius gaining entry into the midcarpal joint by penetrating through the extrinsic

ligament (dorsal radiolunotriquetral) and the intrinsic ligaments. Lastly, when the wrist returned to neutral position, the bony fragment might be trapped inside the midcarpal joint by the soft tissue around. The shape of the bony fragment might also contribute to the entrapment. It may be more likely to happen in patients with healthy and strong bones because osteoporotic bone fragments tend to collapse into the metaphysis of the distal radius during injury and are not strong enough to lacerate the dorsal ligaments.

In summary, this case illustrates a rare condition of SL ligament injury associated with a bone fragment from the fractured distal radius.

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