



A Rare Coexistence; Scaphoid and Triquetral Fracture without Perilunate Dislocation

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Authors' contributions

This work was carried out in collaboration between all authors. Authors HKT, EC, YAA and BKY wrote the draft of the manuscript. Authors EC, TO and DD managed the literature searches. Authors HKT, EC and GO designed the figures, managed literature searches and contributed to the correction of the draft. Author EC provided the case, the figures and supervised the work. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

The scaphoid is the most commonly fractured carpal bone, accounting for approximately 68 % of all carpal fractures. Triquetral fractures are the second most common carpal bone fracture and are usually ligamentous avulsion fractures. The aim of this paper is to report the co-existence of scaphoid and triquetral fractures with an adult patient.

Case: A twenty one years old man was admitted to the emergency department after falling on an outstretched hand. He was complaining about a mild pain in his wrist. There was swelling and tenderness of the anatomic snuff box and ulnar aspect of wrist, decreased range of motion in flexion and extension. X-ray showed fractures at both scaphoid and triquetral bones. Computed tomography showed that proximal fracture of scaphoid and fracture at triquetral body. The scaphoid fracture was treated with internal fixation and any complication was not observed.

Conclusion: Triquetral fractures are associated with carpal instability and there is an increased risk of avascular necrosis for scaphoid fractures. Emergency physicians should be careful at wrist injuries because of accompanied unclear fractures.

Keywords: Fracture; scaphoid; triquetrum; hand.

1. INTRODUCTION

Carpal bone fractures are usually caused by sport injuries and falling on the outstretched arm [1]. Carpal bone fractures constitute 6% of all bone fractures and 18% of hand fractures [2]. Scaphoid fractures are the most common fracture type with 60-70% ratio in the carpal bone fractures [2,3]. Scaphoid fractures may cause many complications such as scaphoid nonunion, advanced collapse, arthrosis of the wrist with nonunion of fracture, avascular necrosis, chronic pain, and long term injuries to adjacent tissues. Triquetral fractures are the third most frequent fracture type in carpal bone fractures with a ratio of 3-5% and usually associated with ligament avulsion.

To our knowledge, there is not any case report that scaphoid and triquetral fractures are seen together but without perilunate dislocation in current literature [4]. Our purpose of presenting this case is getting attention to diagnosis and treatment of the patients who come with suspect of carpal bone fractures and review the accompanying injuries [5].

2. CASE REPORT

A 21-year old male was admitted to emergency department (ED) with pain, swelling, and loss of function at his left wrist. He reported a fall two hours before admission onto his out-stretched arm while his hand was in pronation and extension. On physical examination, it was observed that there was a swelling in wrist and range of motion in wrist was decreased. There

was localized tenderness both in anatomical snuff box and ulnar side of his wrist. There was not a significant wrist deformity with inspection. Peripheral pulses were palpable and neurological examination was normal. Wrist radiograph showed two fractures. One was in the proximal scaphoid bone and the other was on triquetral body (Fig. 1). On computed tomography (CT) scan these fractures were confirmed and displacement was measured less than 1 mm for both of them. According to Russe Classification; the fracture is transverse on the other hand, according to Herbert Classification the fracture was defined as an unstable proximal pole (B3) fracture (Fig. 2). Closed reduction and percutaneous internal fixation were applied to the scaphoid fracture. Short arm cast was applied for the conservative treatment of triquetral fracture (Fig. 3). After postoperative three months, the wrist showed a normal range of motion in all planes and it was equal to the healthy wrist. Patient didn't suffer from pain and there was no instability.

3. DISCUSSION

Carpal bone fractures constitutes a less frequent group in upper extremity fractures. However, inadequate treatment and/or misdiagnosis of these fractures can result in major complications. [6,7].

Coexistence of carpal bone fractures is not a rare condition and has been reported in the literature. Fenton et al. [8] presented a coexistence of capitate and scaphoid fractures (naviculocapitate syndrome). Many cases with the

coexistence of trans-scaphoid and trans-capitate fractures were reported in current literature but all of them had also an additional component as perilunate dislocation. Our report is the first case that perilunate dislocation does not exist with trans-scaphoid and triquetral fractures.



Fig. 1. X-ray view of fracture

Luna-triquetral ligament failure is usually seen with triquetral fractures. This injury occurs when hypothenar zone hits hard ground via falling onto outstretched hand. A case was presented with trans-scaphoid, trans-capitate, trans-triquetral fractures and perilunate dislocation in the study of Garg et al. [9] On the other hand, Foley et al. [8] presented a case which mentions about three bone fractures without perilunate dislocation. However, trans-scaphoid and trans-triquetral fractures were occurred in our patient after falling on the outstretched arm while hand in pronation and extension.

Even though, the success rate of treating scaphoid non-displaced acute fractures with conservative method is 90%, fixing these fractures with percutaneous screw is spreading. Scaphoid proximal pole fractures and non-displaced or minimally displaced scaphoid waist region fractures are ideal indications for percutaneous internal fixation. A 100% success rate was reported in fixing the scaphoid fractures with this technique [10,11]. In our case, scaphoid fracture was treated successfully with insertion of cannulated screw via dorsal percutaneous technique.

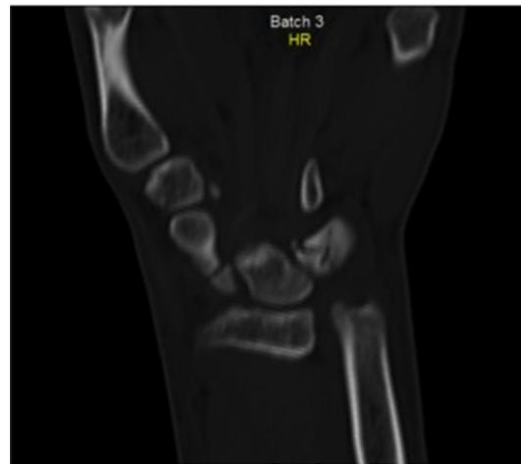


Fig. 2. CT view of scaphoid fracture

Immobilization with cast is recommended to triquetral fractures for 6 weeks. If displacement is more than 1 mm or there is a ligament failure with fracture internal fixation is recommended [10,11]. Since the displacement of triquetral body fracture was less than 1 mm, conservative treatment with cast was planned for triquetral fracture of our subject.

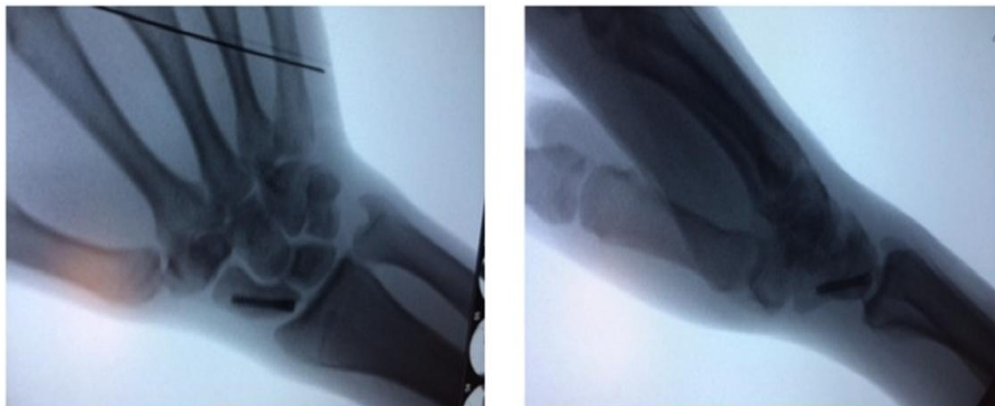


Fig. 3. Intraoperative fluoroscopic view of patient

4. CONCLUSION

Trans-scaphoid and trans-triquetral fractures are seen rarely but these fractures may have severe complications. Physicians should consider the coexistence of these two fractures for the true diagnosis and proper treatment.

CONSENT

All authors declare that 'written informed consent was obtained from the patient for publication of this case report and accompanying images.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

PRIOR PUBLICATION

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COMPETING INTERESTS

We declare that we have no commercial, financial, and other relationships in any way related to the subject of this article all that might create any potential conflict of interest.

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