

An Unusual Variety Of Simultaneous Fracture Pattern: Fracture Of Radius(Colles) With Scaphoideum And Capitulum

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Citation

S Inal, F Celikyay, S Turan, A Atik, A Demir, M Topuzlar. *An Unusual Variety Of Simultaneous Fracture Pattern: Fracture Of Radius(Colles) With Scaphoideum And Capitulum*. The Internet Journal of Orthopedic Surgery. 2008 Volume 14 Number 1.

Abstract

The association of a capitate fracture with a scaphoid fracture has been termed the naviculocapitate syndrome. The existence of some nondisplaced fractures of scaphoid and capitate with or without the fracture of lunate or radius suggests that there is a spectrum of these injuries, and this confuses the terminology. With our case; we want to report an unusual variety of this naviculocapitate syndrome with distal radial colles fracture addition to the nondisplaced fractures of scaphoid and capitate and the dorsal lip of radial fracture. When we look at the literature there is no another colles fracture reported together with undisplaced scaphocapitate syndrome. The coronal and sagittal images that obtained from the MDCT(Multidetector computed tomography) is useful and effective imaging modality in using the diagnose of complex wrist fractures with more details that are not dedected in X-rays.

INTRODUCTION

The association of a capitate fracture with a scaphoid fracture has been termed the naviculocapitate syndrome. In general, however "the naviculocapitate syndrome" has been defined by Fenton and Rosen(1,2) as associated fractures of the scaphoid and capitate with rotation of the head of the capitate through 90 or 180; the existence of some nondisplaced fractures of scaphoid and capitate with or without the fracture of lunate or radius suggests that there is a spectrum of these injuries, and this confuses the terminology(3).

With our case; we want to report an unusual variety of this naviculocapitate syndrome with distal radial colles fracture addition to the nondisplaced fractures of scaphoid and capitate and the dorsal lip of radial fracture.

CASE REPORT

We are reporting a case report of a 21 years old soldier who fell down-stairs probably with his left hand outstretched during the pentathlon training period. Initial X-ray examination(Figure 1) showed a Colles and dorsal lip fracture of distal radius with undisplaced scaphoid and capitate fractures. After the closed reduction in the emergency room; long arm cast applied in pronated forearm,

flexed and radial deviated wrist position with the elbow flexed at 95 degrees. Control X-rays(Figure 2) and wrist CT(Figures 3-4-5-6) were taken to see the position of the fracture sides for more details and the management decision.

There was no rotation of capitate to the articular surface of lunate or other direction. It was nondisplaced and impacted. Also there was no displacement greater than 1 mm in all position radiographs of the waist fracture of the scaphoid. Scapholunate and lunocapitate angles were all in normal ranges.

There was no dorsal angulation or radial shortening in the reduction position of the colles fracture and the comminuted fracture of the dorsal lip of radius did not involve more than the one third of the articular face. Because of these criterias conservative long arm cast management decided for the treatment.

REVIEW OF THE LITERATURE AND DISCUSSION

The mechanism of the injury is debatable. Stein and Siegel(4) suggested that the fracture of the capitate was caused by impaction on the dorsal lip of the radius, when the wrist was dorsiflexed, a view that was supported by Monahan and Galasko(5). However, Aitken and Nalebuff(6)

stressed that hyperflexion could produce peri-lunate dislocation and this mechanism was thought to be important in three of the cases reported by Vance et al(7).

In general; the cause of scaphocapitate syndrome is hyperextension of the wrist, in which the dorsal ridge of the distal radius acts as a fulcrum, fracturing the scaphoid through the waist and the capitate through the neck region. As the wrist continues to hyperextend, the head of the capitate and the proximal fragment of scaphoid rotate together, and the distal portion of the capitate translates dorsally on the proximal pole. When the wrist returns to a neutral position, the distal segment of capitate spins the capitate head by as much as 180(Figure 7). As a result, the fracture surface of the capitate head comes to lie adjacent to the articular surface of the lunate. Obviously, the capitate will not unite in this malreduced position. This is a difficult diagnosis to make and must be looked for carefully on radiographs. CT may be of value in assessing the degree of displacement, and in identifying associated injuries.

Whatever the mechanism, most authors think that the scapho-capitate syndrome is a variety of trans-scaphoid transcapitate peri-lunar fracture dislocation which has usually reduced spontaneously. The associated wrist fractures reported in the literature would tend to support this view and suggest that ligamentous injuries are frequently underestimated. Although naviculocapitate fracture syndrome is rare, it should be considered among those associated injuries that can occur with a fracture of scaphoid(8).

Up to 1993, 25 cases of scaphocapitate syndrome reported as the review of the literature and in nearly one-third of the cases there was a delay of more than 15 days in diagnosis. In 13 cases there was an initial peri-lunate dislocation, which was dorsal in 11. Eight patients had other carpal and wrist fractures(Four of the radius, two of the ulnar styloid, and two of the triquetrum.). Other major fractures occurred in seven as a result of high-energy injury(9,10). From 1993 to now; 22 cases of scaphocapitate syndrome reported in the literature with a an average of 6 days delay in diagnosis(11,12,13,14). These delays in diagnosis shows that this syndrome is a result of a complex injury pattern and must be diagnosed more carefully.

According to our idea, the decrease of delaying in the diagnosis in the last 16 years may be the result of the improvement in radiologic imaging techniques. In our case,

we used the MDCT(Multidetector computed tomography)to see the configuration and also not to misdiagnose the other wrist injuries(15,16,17). We saw that the dorsal lip of the radius was fractured and undisplaced fractures of scaphoid and capitate tended us that this could be a scaphocapitate syndrome. Because of this reason, we are offering that; every complex injury of the wrist with minimal two bone fractures must also be evaluated with MDCT for not to misdiagnosis. The coronal and sagittal images that obtained from the MDCT is useful and effective imaging modality in using the diagnose of complex wrist fractures with more details that are not dedected in X-rays.

With our report we wanted to show this rare syndrome with colles fracture. When we look at the literature there is no another colles fracture reported together with undisplaced scaphocapitate syndrome. Also using MDCT is an effective imaging method for diagnosing the fractures of the hand especially in complex wrist fractures.

Figure 1

Figure 1



Figure 2

Figure 2

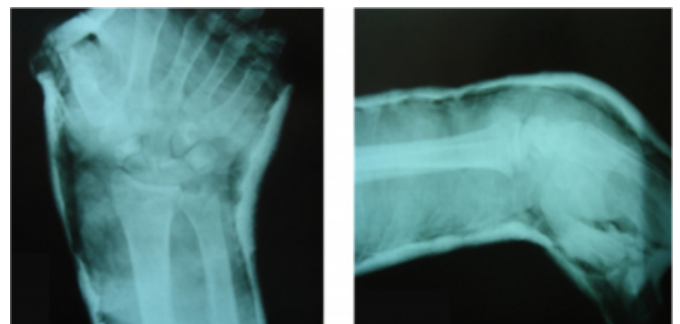


Figure 3

Figure 3

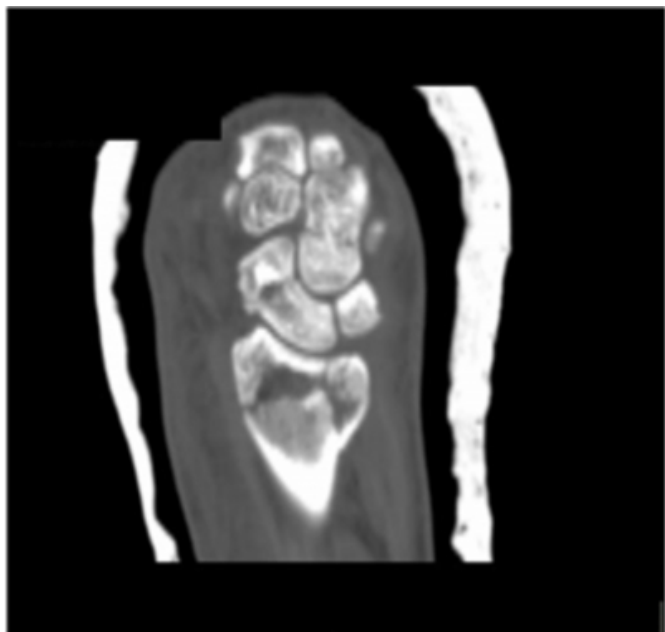


Figure 5

Figure 5

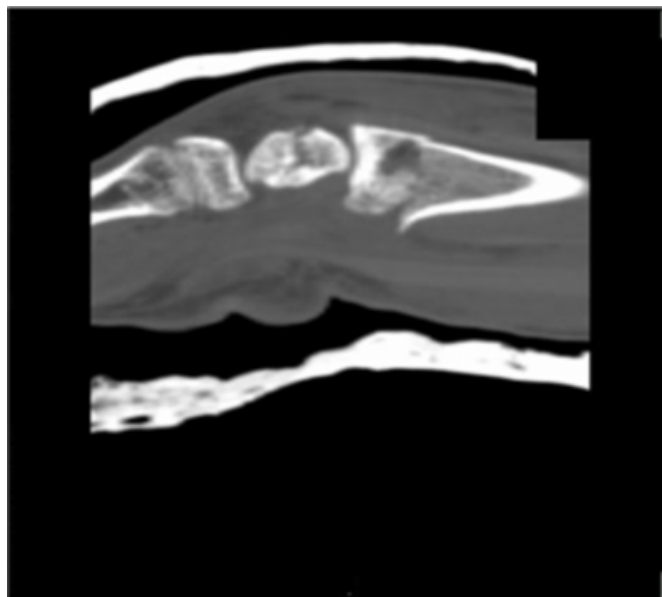


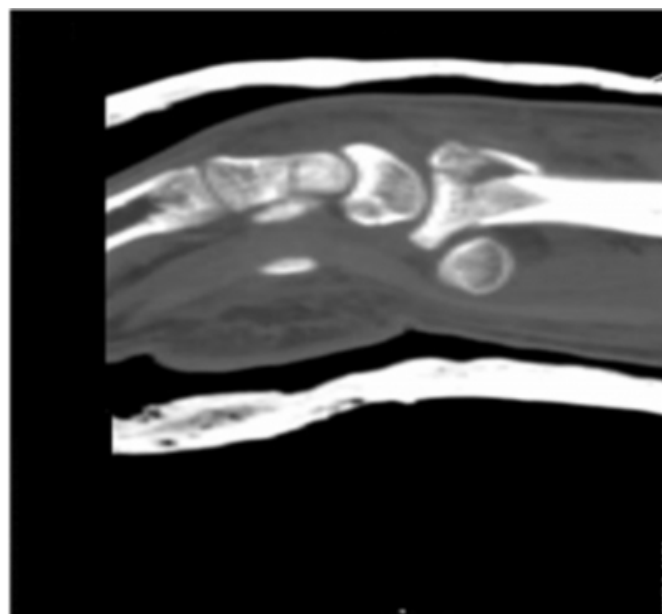
Figure 4

Figure 4



Figure 6

Figure 6

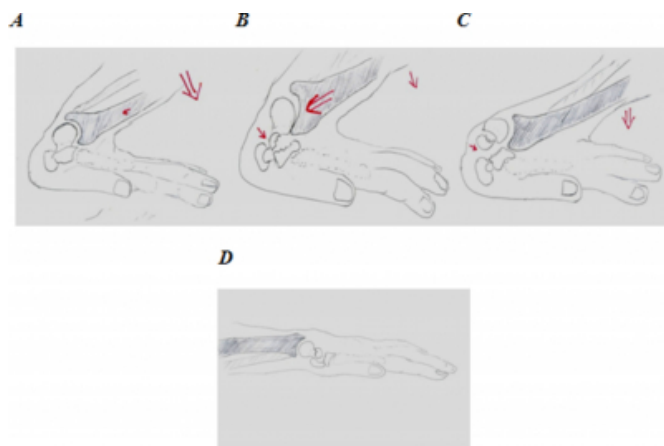


MDCT showed us the fracture of scaphoid and capitate with more details as seen in figures 3 and 4.

MDCT also showed us the nondisplaced fracture of the scaphoid in figure 5 and capitate in figure 6 in lateral views.

Figure 7

Figure 7



Mechanism of carpal fractures from falls on outstretched hand with wrist going into marked dorsiflexion. A, Wrist in marked dorsiflexion. Note that capitate is at 90-degree angle to radius. Scaphoid fractures as result of increased dorsiflexion at midcarpal joint. B, Dorsal lip of radius strikes capitate, causing it to fracture. C, Proximal fragment of capitate is rotated 90 degrees. D, Return of wrist to neutral position. Note that proximal fragment of capitate is now rotated 180 degrees.

References

1. Fenton RL, Rosen H.: Fracture of the capitate bone- report of two cases. Bulletin of the Hospital for Joint Diseases Orthopaedic Institute 1950; 11:134-139.
2. Fenton RL.: The naviculo-capitate fracture syndrome. Journal of Bone and Joint Surgery 1956; 38A:3:681-684.
3. Apergis E, Darmanis S, Kastanis G, Papanikolaou A.: Does the term scaphocapitate syndrome need to be revised? A report of six cases. Journal of Hand Surgery(British and European Volume) 2001; 26B:5:441-445.
4. Stein F, Siegel MW.: Naviculocapitate fracture syndrome:

- A case report: New thoughts on the mechanism of injury. Journal of Bone and Joint Surgery 1969; 51A:2:391-395.
5. Monahan PRW, Galasko CSB.: The scaphocapitate fracture syndrome. Journal of Bone and Joint Surgery 1972; 54B:1:122-124.
 6. Aitken AP, Nalebuff EA.: Volar transnavicular perilunar dislocation of the carpus. Journal of Bone and Joint Surgery 1960; 42A:6:1051-1057.
 7. Vance RM, Gelberman RH, Evans EF.: Scaphocapitate fractures: Patterns of dislocation, mechanism of injury and preliminary results of treatment. Journal of Bone and Joint Surgery 1980; 62A:2:271-276.
 8. Johnson RP.: Acutely injured wrist and its residuals. Clin Orthop 1980; 149:33-44.
 9. Milliez PY, Dallaserra M, Thomine JM.: An unusual variety of scaphocapitate syndrome. Journal of Hand Surgery(British and European Volume) 1993; 18B:53-57.
 10. Rand JA, Linscheid RL, Dobyns JH.: Capitate fractures: A long-term follow-up. Clin Orthop 1982; 165:209-216.
 11. Arbter D, Piatek S, Wichlas F, Winckler S.: The scaphocapitate fracture syndrome(Fenton). Handchir Mikrochir Plast Chir 2009 Mar; 25.
 12. Wodecki P, Guigui P, Masmejean E.: Volar transcapitate perilunate dislocation of the carpus: a new variety, a new approach. Chir Main 2002 Mar; 21(2):143-147.
 13. Hildebrand KA, Ross DC, Patterson SD, Roth JH, Macdermid JC, King GJ.: Dorsal perilunate dislocations and fracture-dislocations; questionnaire, clinical and radiographic evaluation. J Hand Surg(Am) 2000 Nov; 25(6):1069-1079.
 14. Pandit R.: Proximal and palmar dislocation of the lunate and proximal scaphoid as a unit in case of scaphocapitate syndrome. A 32-month follow up. J Hand Surg(Br) 1998 Apr; 23(2):266-268.
 15. Masmejean E, Cognet JM.: Bipolar dislocation of the forearm: elbow and perilunate dislocation. Rev Chir Orthop Reparatrice Appar Mot 2001 Sep; 87(5):499-502.
 16. Yasin MN, Talwalker SC, Henderson JJ, Hodgson SP.: Segmental radius and ulna fractures with scaphocapitate fractures and bilateral multiple epiphyseal fractures. Am J Orthop 2008 Apr; 37(4):214-217.
 17. Najeb Y, Essadki B, Latifi M, Fikry T.: Bipolar dislocation of the forearm. Chir Main 2007 Feb; 26(1):62-64.

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