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Original Article

Nonscaphoid carpal injuries – Incidence and associated injuries



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ABSTRACT

Aims: Nonscaphoid fractures comprise approximately 40% of all carpal fractures. But the exact incidence of these rare injuries is still not clear. Missed or late diagnosis can lead to serious ligamentous disruption and permanent wrist dysfunction.

Methods: A retrospective analysis of wrist X-rays and CT scans were carried out for a period of 3 years. Incidence and associated injuries from this study was compared with literature. A total of 33 patients were included in our study. Both wrist X-rays and CT scans were reviewed individually by two authors. DASH scores were recorded for each patient.

Results: There were 26 male and 7 female patients. Out of 33 patients 13 (35%) were Triquetral fractures, 10 (27%) were Hamate fractures, 5 (14%) were Capitate fractures, 4 (11%) were Lunate fractures, 3 (8%) were Trapezium fractures and 2 (5%) were Pisiform fractures. There were no Trapezoid fractures in our study.

Conclusion: Incidence of nonscaphoid carpal fractures in our study is considerably higher when compared to literature. We propose that high index of suspicion should always be borne in mind when dealing with carpal fractures and detailed examination of wrist should be conducted even when X-rays does not show any obvious bony injuries. CT scans and other specialized images should be judiciously used in areas of suspicion for early diagnosis, to initiate immediate treatment, for early mobilisation and good functional recovery.

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1. Introduction

Fall on an outstretched hand and injuring the wrist is a common presentation in A&E and also in Orthopaedic fracture clinic. Carpal fractures are more commonly seen nowadays but it is also easily missed. However the incidence of carpal fractures in UK is not clear. Carpal fractures worldwide account for 8%–19% among all hand injuries.¹ Nonscaphoid fractures account for 3.2%–7.7% (Bishop and Beckenbaugh,

1988).¹ Scaphoid fractures constitute around 62–87% of all carpal fractures and fractures of carpal bones excluding Scaphoid account for approximately 40% of all carpal fractures.² Nonscaphoid carpal fractures and the associated injuries which occur with them are frequently missed and difficult to diagnose due to difficult radiologic interpretation and the rarity in presentation. Studies have shown that missed or late diagnosis of these fractures can lead to serious ligamentous disruption and permanent wrist dysfunction.³

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This study aims at identifying the exact incidence of nonscaphoid carpal injuries in our institution and compared with literature. Also we looked into associated bony or ligamentous injuries which present along with them and compared the pattern with the literature. Our hypothesis was incidence of nonscaphoid injuries will be higher than what we think.

2. Patients and methods

A retrospective analysis of all wrist X-rays was carried out for a period of 3 years from 2008 to 2011 at Darlington memorial hospital. A total of 33 patients were included in our study. All isolated scaphoid fractures were excluded from this study. We have included all nonscaphoid carpal fractures and associated injuries. CT scans were done for all our 33 patients and were reviewed by authors (AR & PK). Casenotes were accessed to gather data pertaining to admission details, clinic reviews, examination findings, assessment of wrist function and presence of any residual stiffness or pain during discharge. Data including age, gender, occupation, dominant hand, mechanism of injury, type of fracture, presence of associated injuries, management, residual problems and DASH scores were recorded in a proforma and transferred to excel sheet for analysis. We also compared our incidence and associated injuries of these fractures with literature.

3. Results

There were 26 males and 7 female patients. Majority (72%) were right hand dominant. Mean age of those patients were 41.15yrs \pm 15.93 yrs (range 10–78 years). 10 patients out of 33 presented with a history of fall on outstretched hand which equaled to 30% of the study population. 4 patients slipped on ice and they all presented during the winter months during snowfall. 5 patients were seen after sports related injury (Golf, Rugby & Football). Among all nonscaphoid carpal fractures, Triquetral fractures are the most commonest found on our study.

Many studies have proven this frequency of Triquetral fracture presentation in literature.

Out of 33 patients 13 (35%) were Triquetral fractures, 10 (27%) were Hamate fractures, 5 (14%) were Capitate fractures, 4 (11%) were Lunate fractures, 3 (8%) were Trapezium fractures and 2 (5%) were Pisiform fractures (Tables 1 and 2). There were no Trapezoid fractures in our study. Vigler et al, 2006⁴ pointed that Trapezoid fractures actually account only for about 0.2% of all carpal fractures and their presentation is very rare.

Table 1 – Number of carpal fractures in our study excluding scaphoid.

Carpal bones excluding scaphoid	Number
Triquetrum	13
Hamate	10
Capitate	5
Lunate	4
Trapezium	3
Pisiform	2
Trapezoid	0

Table 2 – Comparison of incidence between our study and literature.

Fracture	Our study	Literature
Triquetrum	35%	4–31%
Hamate	27%	7%
Capitate	14%	1.3%
Lunate	11%	1%
Trapezium	8%	3–5%
Pisiform	5%	1–2%

3.1. Triquetral fractures

12–25% of Triquetral injuries are the result of Perilunate fracture dislocation as well as fracture of distal radius and ulna.^{5–7} Out of our 13 Triquetral fractures eight (8) of them had other associated injuries. 3 patients had associated scaphoid fractures, 4 had fracture of distal radius and ulna, and one patient had transscaphoid transcapitate perilunate dislocation (Fig. 1) and a Lunotriquetral dislocation. One was associated with a volar plate injury of ring finger. Incidence from various studies has quoted between 4 and 31% and our study showed an incidence of 35%.^{1,2,5,8}

2 patients had open reduction and internal fixation (one – Comminuted fracture Triquetrum with captitate fracture and another was fracture triquetrum associated with scaphoid fracture, transscaphoid transcapitate perilunate dislocation and a Lunotriquetral dislocation). Remaining 11 patients were managed conservatively. Average DASH score for these patients was 2.8. A total of 5 patients including operated patients developed stiffness at 4 months followup. But they got eventually better after physiotherapy.

3.2. Hamate fractures

These fractures are usually associated with dorsal fracture dislocation of 4th and 5th carpometacarpal (CMC) joints,⁹ Ulnar nerve injury¹⁰ and flexor tendon rupture especially of 4th and 5th 85 fingers.¹¹ There were a total of 10 Hamate fractures out of which 6 patients had associated injuries.

Incidence of this fracture is approximately 7%² although our study has shown an incidence of 27%.

3 patients had intraarticular fracture of distal radius, 2 with fracture dislocation of 4th and 5th CMC joint (Figs. 3 and 4) and one had subluxation of 3rd and 4th base of metacarpal. Although surgery was done for associated injuries, only one of our Hamate fractures had excision of hook. This was due to non-union and persistent symptoms of this fracture secondary to delayed presentation (4 months) as it was treated as soft tissue injury by local GP. Mean DASH score was 1.5.

3.3. Capitate fractures

Vigler et al, 2006 have quoted the incidence of this fracture to 1.3% which signifies the rarity of this injury.⁴ We had 5 Capitate fractures out of 33 accounting to an incidence of 14% among nonscaphoid carpal fractures. Most common associated injury is scaphoid fracture. Our study had 2 patients with associated scaphoid fracture and one with transscaphoid transcapitate perilunate dislocation (Figs. 1 and 2). All isolated

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