Pattern of Wrist Injuries in Riyadh, Saudi Arabia

Hazem M. I. Al-Khawashki, FRCS Ed

During the 5-year period from January 1986 to December 1990, 135 wrist injuries were diagnosed in 84 patients admitted to Riyadh Central Hospital, Saudi Arabia. Analysis of these injuries showed that the scaphoid fractures are the most common (40%) followed by distal radius (28%). The percentage of dislocation was found to be more than that reported by others; reaching 27%. Perilunate dislocations accounted for 10% of which 79% were transscaphoid perilunate dislocations. Lunate dislocation accounted for 7.5%. Associated injuries were found in 47% of injuries and combined wrist injuries occurred in 44% of patients. The rate of missed injuries was 8%. Most injuries were due to occupational accidents (33%) and occurred in males (93%), between 20 and 39 years of age (61%). This study showed higher incidence of dislocation in wrist injuries (27%) than previously reported. It also shows the importance of examining wrist in other limb and axial injuries as the incidence of associated and combined injuries was high.

Keywords: Wrist injuries. Occupational accidents. Dislocation.

Accidental injuries are a major problem in Saudi Arabia.\textsuperscript{1,2} Injuries of the hand bones make up 17% of all skeletal injuries in Saudi Arabia and distal radius fractures, account for 52% of radius and ulna fractures.\textsuperscript{3}

The scaphoid is the most commonly fractured carpal bone accounting for 51–62% of all carpal bone injuries.\textsuperscript{5,6} About 10% of all carpal injuries are dislocation or subluxations,\textsuperscript{7} of which anterior lunate dislocation are the most common.\textsuperscript{8} Other less common injuries are known as isolated radiocarpal dislocations\textsuperscript{4} as well as the rare carpo–metacarpal dislocation.\textsuperscript{9}

In an attempt to identify the patterns of wrist injuries in Riyadh, a retrospective analysis of those patients admitted with such injuries between 1986 and 1990 was studied and presented in this paper.

Patients and Methods

Of the 138 fractures and dislocations of the wrist in 87 patients admitted in the 5-year period from January 1986 to December 1990, three patients with three fractures were excluded because diagnosis of a fracture was never confirmed on the X-ray, these included two scaphoid and one hamate fractures. The wrist injuries studied covered the area from the carpo–metacarpal joint to the distal radius, following the definition of wrist injuries by others.\textsuperscript{7}

The patient’s notes and X-rays were reviewed. The X-ray of 14 (26%) scaphoid fractures were not available
and diagnosis was made depending on the Specialist’s notes. The following variables were studied: age, sex, nationality (Saudis and non-Saudis), cause of injury, type of injury (open or closed), combination injuries (more than one type of wrist injuries in the same patient), associated injuries (other limb and axial injuries), and time of diagnoses.

The injuries were divided into five main groups; scaphoid, distal radius, lunate, perilunate and other wrist and hand injuries. Some hand bone injuries were included as they occurred in combination with wrist injuries.

The time of diagnosis was divided into three categories; within 24 hours, within 2 weeks and more than 2 weeks.

The injuries were categorized according to cause, into those due to road traffic accidents, occupational, domestic and sports injuries. The age was divided into those less than 10 years, 10–19 years, 20–39 years, 40–60 years and more than 60 years of age.

Results

The study showed the scaphoid to be the most commonly injured carpal bone (40%) followed by distal radius (28%), (Table 1). Of scaphoid fractures in which the site of fracture line was known, 36 fractures were through the waist of scaphoid (90%) and four were through the tubercle (10%). Scaphoid fractures combined with other carpal bone injuries accounted for 57%. Comminuted distal radius fractures were seven, of which four were intraarticular. The total intraarticular distal radius fractures were six. Those distal radius fractures combined with radiocarpal dislocations were four (13%). One distal radius fracture was combined with distal radioulnar dislocation.

There were 14 perilunate dislocations (10%) of which 11 were transtrapezial perilunate dislocations (79%). Lunate dislocations were ten (7.5%) of which five were combined with scaphoid fractures. ‘Other’ injuries accounted for 14% and included two proximal interphalangeal dislocations, six radiocarpal dislocations of which two were isolated injuries (1.5% of wrist injuries), four ulnar styloid fractures, two distal radioulnar dislocations, two metacarpal fractures, two carpometacarpal dislocations (first and fifth) and one triquetrum fracture (1.3%) which was combined with lunate dislocation and scaphoid fractures on the same side (Table 1). This group of injuries was combined with other carpal injuries except for two radiocarpal and one first carpometacarpal dislocations and one patient with distal radioulnar dislocation and ulnar styloid fracture.

The patients who had bilateral wrist injuries were one with isolated distal radius fracture (more than 90 years of age) and another with bilateral distal radii and scaphoid fractures and proximal interphalangeal joint dislocation of index on one side.

Open injuries were 15 (11%) occurring with injuries to the scaphoid in three, perilunate in two, distal radius in six, and four among ‘other’ injuries (Table 1).

Closed injuries occurred in 37 patients (44%). Of these 27 had two different injuries and 10 patients had three different injuries.

Associated injuries occurred in 63 (47%) of the wrist injuries; 30 (48%) occurred with the scaphoid and 21 (35.5%) with the distal radius. Associated upper limb injuries occurred in 23 (37%) wrist injuries; of which 10 (43%) were associated with scaphoid injuries (Table 2).

Injuries among adults and the middle aged (20–39 and 40–60 years respectively) constituted 115 (86%), while in patients below 10 years and above the age of 60 injuries were rare (1.5% and 2.2% respectively) (Fig. 1). Injuries which occurred in males were 126 (93%) and those which occurred in non-Saudis were 100 (74%).

The majority of injuries were occupational (33%), followed by injuries due to domestic accidents (30%) and injuries due to road traffic accidents (27%). Sport related injuries constituted 24%, while the cause of injury was not known in 8% of patients.

In 124 injuries (92%) diagnosis was achieved in the first 24 hours, seven fractures (5%) were diagnosed after 1 week and four fractures (3%) after 2 weeks. These missed injuries were three scaphoid fractures, three perilunate dislocations, three lunate injuries, one triquetrum fracture and one first carpometacarpal dislocation. These patients were diagnosed after being missed in other hospitals.

Discussion

The scaphoid remains the most common bone fractured in the carpal. In an earlier study of fractures in Saudi Arabia,3 it was shown that scaphoid fractures made up 17% of hand fractures. In the present study, the scaphoid fractures constituted 40% of wrist injuries and 55.7% of carpal fractures (excluding distal radius). This correlates with other workers.5,6,10 The fracture line in scaphoid fractures was through the wrist in 90% of cases and through the tubercle in 10%. This correlates with other reports.11-13

Fractures of distal radius were seen in 28.1% of wrist injuries. This study includes distal radius fractures in the wrist injuries, as postulated by other workers.7 In his study,3 Shaheen has included the distal radius in the forearm fractures and found them to be 52% of radius and ulna fractures. The rate of associated injuries in distal

<table>
<thead>
<tr>
<th>Groups of injuries</th>
<th>No. (%)</th>
<th>Type of injuries</th>
<th>Closed</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scaphoid</td>
<td>54 (40)</td>
<td></td>
<td>51</td>
<td>3</td>
</tr>
<tr>
<td>Perilunate</td>
<td>14 (10)</td>
<td></td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Lunate</td>
<td>10 (7.5)</td>
<td></td>
<td>10</td>
<td>—</td>
</tr>
<tr>
<td>Distal radius</td>
<td>38 (28)</td>
<td></td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td>Others</td>
<td>19 (14)</td>
<td></td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>135 (100)</td>
<td></td>
<td>120</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 2
Associated injury

<table>
<thead>
<tr>
<th>Other injuries</th>
<th>Scaphoid (% of total)</th>
<th>Perilunate (%</th>
<th>Lunate (%)</th>
<th>Distal radius (%)</th>
<th>Others (%</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spine</td>
<td>5 (8)</td>
<td></td>
<td></td>
<td></td>
<td>8 (12.5)</td>
<td>5 (8)</td>
</tr>
<tr>
<td>Upper limb</td>
<td>10 (16)</td>
<td>2 (3)</td>
<td></td>
<td></td>
<td>3 (5)</td>
<td>23 (37)</td>
</tr>
<tr>
<td>Lower limb</td>
<td>7 (11)</td>
<td>1 (1.5)</td>
<td>1 (1.5)</td>
<td>5 (8)</td>
<td>2 (3)</td>
<td>16 (25.5)</td>
</tr>
<tr>
<td>Pelvic</td>
<td>3 (5)</td>
<td>1 (1.5)</td>
<td></td>
<td>3 (5)</td>
<td></td>
<td>7 (11)</td>
</tr>
<tr>
<td>Skull</td>
<td>3 (5)</td>
<td>1 (1.5)</td>
<td></td>
<td>3 (5)</td>
<td></td>
<td>7 (11)</td>
</tr>
<tr>
<td>Face</td>
<td>1 (1.5)</td>
<td></td>
<td></td>
<td></td>
<td>1 (1.5)</td>
<td>4 (6)</td>
</tr>
<tr>
<td>Ribs</td>
<td>1 (1.5)</td>
<td></td>
<td></td>
<td></td>
<td>2 (3)</td>
<td>1 (1.5)</td>
</tr>
<tr>
<td>Total</td>
<td>30 (48)</td>
<td>4 (6)</td>
<td>2 (3)</td>
<td>21 (35.5)</td>
<td>5 (9.5)</td>
<td>63 (100)</td>
</tr>
</tbody>
</table>

radius fracture was only second to that of the scaphoid fractures making 35.5% (Table 2).

The incidence of various dislocations of carpal bones varies in the literature. In this study dislocations in wrist bones were seen in 27% of the wrist injuries, the commonest of which was the perilunate dislocations and fracture dislocations. The combined perilunate and lunate dislocations accounted for 70% of all dislocations. The transscaphoid perilunate dislocations were seen in 79% of perilunate injuries and 31% of all dislocations. This study shows higher incidence of wrist dislocations than that reported by others, who have estimated this to be around 10%.[7] This high incidence may be attributed to severe trauma as most of these patients were employed in construction and heavy industry. The incidence of perilunate and lunate dislocations differ in literature, Speek, and Campbell, reported more common perilunate dislocations. Milford[8] in his review considered the lunate dislocations to be the most common type. Dobyns & Linsheld[7] reported an incidence of perilunate and lunate dislocations between 30 and 40% of carpal dislocations and transscaphoid perilunate dislocations of about 30%. Among the other dislocations in this review were two carpometacarpals; these are rare injuries and should be diagnosed early to prevent impaired wrist function.[9] Also two isolated radiocarpal dislocations were found and these are known to be rare injuries.[17,18]

In search for the person at risk it was found that injuries occurred more commonly in young adults (61%) and that males were much more prone to injury than females (93%). This high incidence of males affected is more than that reported by others,[5,19] but could be explained by the fact that injuries at work as well as road traffic accidents were the main causes of wrist injuries and these types of activities are almost exclusively carried out by males in Saudi Arabia.

High numbers of associated injuries in scaphoid and wrist injuries have been reported.[12,20–23] In this study, wrist injuries associated with other limb and axial injuries were seen in 63 cases (47%), of which those associated with upper limb injuries were 37%. This emphasizes that wrist injuries should not be overlooked in presence of more serious injuries. This fact becomes even more evident when we recall the 11 missed cases (8%) of wrist injuries, of which perilunate and lunate injuries were responsible for more than 50%.

Conclusion

Fracture of the scaphoid remains to be the most common of the wrist injuries and fractures through the waist of scaphoid remains the most common site. Productive young males are the most common category of population affected. In this study the incidence of wrist dislocation was found to be higher than previously reported. The transscaphoid perilunate fracture dislocations made up about one-third of these dislocations. This could be attributed to occupational and severe trauma. The unusually high incidence of associated and combined injuries in wrist trauma in Riyadh reflects in part the severity of accidental injuries, and shows the importance of careful examination of the wrist clinically and radiologically with other limb and axial trauma, and that scaphoid fracture should be excluded in all upper limb fractures as it proved to be a common association.
References