



International Journal of Orthopaedics Sciences

ISSN: 2395-1958
IJOS 2017; 3(1): 40-42
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www.orthopaper.com
Received: 09-11-2016
Accepted: 10-12-2016

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Clinical profile of patients with fractures of lower end of radius

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DOI: <http://dx.doi.org/10.22271/ortho.2017.v3.i1a.09>

Abstract

Introduction: Fractures of the distal end of the radius continue to pose a therapeutic challenge. Intra articular and extra articular malalignment can lead to various complications like traumatic arthrosis, decreased grip strength and endurance, as well as limited motion and carpal instability

Methodology: On admission general condition of the patients were assessed and stabilized haemodynamically. All patients were evaluated clinically and radiologically. Xrays were taken in two planes, anteroposterior and lateral views including elbow and hand. After radiographs patient limb is temporarily immobilized in the form of above elbow POP slab and kept in elevation

Results: Out of 20 cases, 2(20%) of the fractures were of Type I Frykman's Classification, 2(10%) of Type II, 9(45%) of Type III, 3(15%) of Type IV, 3(15%) of Type V, and 1(5%) of Type VIII. There were no cases of Type VI and Type VII fractures

Conclusion: Road traffic accidents and fall on outstretched hand were the commonest mode of injury

Keywords: RTA, fracture, radius

1. Introduction

Incidence of fractures of distal radius are increasing due to more geriatric population and road traffic accidents. The fundamental goal of distal radius fractures treatment is restoration of normal or near normal alignment and articular congruity. Restoration of the anatomy and articular surface may prevent the onset of arthritis and improve function.

Fractures of the distal end of the radius continue to pose a therapeutic challenge. Intra articular and extra articular malalignment can lead to various complications like traumatic arthrosis, decreased grip strength and endurance, as well as limited motion and carpal instability. Restoration of radial length, radial tilt angle and congruity of articular surfaces is important for good functional results.

The anatomical nature of fracture and dislocations about the wrist were clearly identified prior discovery of the X-rays. Among the first to distinguish the impacted distal radius fracture from wrist dislocation was Pouteau of Lyon in 1780. In France and other parts of the world this fracture was called "Pouteau's fracture"^[1].

In 1814, Abraham Colles' (1773-1843) Professor of Anatomy and surgery at Trinity College in Dublin clearly identified the fracture of distal radius (at Royal College of Surgeons, Ireland). About the same time, Dupuytren also described this common fracture of the distal Radius and differentiated it from wrist dislocation. Colle's classic description of the fracture of distal radius and the outline of its treatment^[1] was published in the Edinburgh Medical & Surgical Journal^[2] (1814).

"This fracture takes place at about an inch and a half above the carpal extremity of the Radius. If the surgeon locks his hand in that of the patient's and make extension, he restores the limb to its natural form".

"Colles' fracture, the surgeon's shake hand: How often is it successful?"

Goyrand (1836) substantiated his clinical observations with the postmortem examinations of distal radial fractures of two types: some with dorsal displacement and some with volar displacement^[3].

In the USA, John Rea Barton (1838) of Philadelphia also described inter-articular fractures of radius both Volar and dorsal varieties. His descriptions of marginal articular fracture of these injuries were clear and precise [4].

Robert W. Smith (1854), junior colleague of Abraham Colle's described an injury that 'causes displacement of the lower Radial fragment along with the carpus forward'. But he offered no advice as to its treatment [5].

2. Methodology

Twenty patients with distal radius fractures treated by open reduction and internal fixation with Ellis plating were selected for a present study. Total of 1336 bony injuries were reported to Hospital casualty and orthopedic opd during the above period. Out of which 382 are upper limb fractures. Total number of distal radius fractures are 60. After exclusion for detailed study 20 patients were selected. Among 20 patients 11 are males and 9 are females. Of these 18(90%) were between the age of 25 years and 60 years. mean age of our patients is 42 years. Most common mechanism of injury is road traffic accidents. In females common cause is domestic fall on an outstretched hand.

On admission general condition of the patients were assessed and stabilized haemodynamically. All patients were evaluated clinically and radiologically. Xrays were taken in two planes, anteroposterior and lateral views including elbow and hand. After radiographs patient limb is temporarily immobilized in the form of above elbow POP slab and kept in elevation.

3. Results

Table 1: Age of the Patients with Distal Radius Fractures

Age in Years	No. of cases	Percentage
25-30	4	20
31-40	8	40
41-50	3	15
51-60	3	15
61-70	2	10

In this series 4 (20%) patients were between 25-30 years, 8 (40%) between 31-40 years, 3 (15%) between 41-50 years, 3 (15%) between 51-60 years and 2 (10%) patients between 61-70 years.

The age of the patients ranged from 16-70 years with an average of 42 years.

Table 2: Sex Incidence

Age in Years	No. of cases	Percentage
Male	11	55
Female	9	45

In the present study the fracture distal radius are more in males than females.

Table 3: Side of Involvement

Side	No. of Cases	Percentage
Right	12	60
Left	8	40

In the present study the fracture distal end of radius is more on the right side when compared to left.

Table 4: Mode of Injury

Mechanism of Injury	No. of Cases	Percentage
Road traffic accident (RTA)	14	70
Fall on outstretched hand (FOOH)	6	30

In our study there were 14(70%) patients with road traffic accidents and 6 (30) patients fell on their outstretched hand domestically.

Table 5: Type of Fracture according To Frykman's Classification

Type	No. of Cases	Percentage
I	2	20
II	2	10
III	9	45
IV	3	15
V	3	15
VI	0	0
VII	0	0
VIII	1	5

Out of 20 cases, 2(20%) of the fractures were of Type I Frykman's Classification, 2(10%) of Type II, 9(45%) of Type III, 3(15%) of Type IV, 3(15%) of Type V, and 1(5%) of Type VIII. There were no cases of Type VI and Type VII fractures

Table 6: Ao Classification

Type	No. of Cases	Percentage
A1	0	0
A2	2	10
A3	4	20
B1	1	5
B2	4	20
B3	4	20
C1	4	20
C2	1	5
C3	0	0

2(10%) of the fractures were of AO Type A2, 4(20%) of Type A3, 1(5%) of Type B1, 4(20%) of Type B2, 4(20%) of Type B3, 4(20%) of Type C1, 1(5%) of Type C2. There were no cases of AO type A1 and C3 fractures among the twenty cases in the present study.

4. Discussion

More than 190 years have passed since Colles' described the fracture of the distal end of the radius. It is remarkable that this common fracture remains one of the most challenging of the fractures to treat. Affected people are younger as well as elders. Some are in productive age group and are prone for economic and social burden to the families and society.

Distal radius fractures are the most frequently seen upper extremity fractures. The main objective of its treatment is the re-establishment of anatomic integrity and to maintain inter-articular integrity and the radial length. There by preserving good functions of wrist joint. This is not always possible with closed methods. Due to their intra-articular and unstable nature, open positioning and ELLIS plate fixation is the widely recognized surgical method in some of the fractures. These anatomical plates with screw-plate interlocking feature have more biomechanical strength against forces applied on the fracture surfaces. During the recent years, volar approach has become more popular.

During the period of December 2014 to June 2016, Over 60 (4.49%) cases of Distal radius fractures were treated in orthopedic department. For this study included cases between 25 years to 70 years. Out of 60 patients, 20 patients were subjected for detailed study. 12 out of 20 patients (60%) are between 3rd and 5th decade with an average age of 42 years which correlates with the fact that distal radius fractures are more common in the adults. The average age in our study is comparable to the studies of Ayhankilic *et al* (2009) ^[6], Kevin C. Chung *et al.*, (2006) ^[7] and R.E. Anakwe *et al.* (2010) ^[8] who had an average age of 45 years and 48 years respectively. In this study significant male dominance, 11 out of 20 (55%) was seen and the same pattern was also reported by Ayhankilic *et al* (2009) ^[6] (55%). Increased incidence in males is probably due to daily life activities, riding vehicles and heavy manual labour. Regarding the side of fracture right side (60%) is predominant as compared to left (40%) and same is reported in the series of Ayhankilic *et al.*, (2009) ^[6] (52%) Kevin C. Chung *et al.*, (2006) ^[7] (57%) R.E. Anakwe *et al.*, (2010) ^[8] 71%)

14 out of 20 (70%) cases are due to RTA in this study and the same outcome is shown by AyhanKilic *et al* (2009) (60%), R.E. Anakwe *et al.*, (2010) (67%). Out of 9 patients in females (66%), sustained fractures because of domestic fall showing the fact that osteoporosis is most common cause in the elderly females. 19 patients (95%) out of 20 have closed type of injury.

According to AO classification, type B2, B3, C1 constitute highest percentage. Kevin C. Chung *et al.*, (2006) ^[7] reported maximum number of C1 and C3 type of fractures. Admission – operation interval in our study varied from 1-5 days. Mean interval being 3 days which is less when compared to R.E. Anakwe *et al.*, (2010) ^[8] 4 days. Duration of hospital stay in our study was 13 days which is higher as compared to Ayhan Kilic *et al* (2009) where it was 9 days. 4-6 holed volar fixed angled plates are used for all the patients in the present study. 4 holed is the smallest and 6 holed is the longest plate used. Post operatively none of patients in this study had superficial infection.

5. Conclusion

1. Road traffic accidents and fall on outstretched hand were the commonest mode of injury.
2. Males were affected more than females.

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