

ORIGINAL RESEARCH

ASSESSMENT OF CASES OF RADIAL NECK FRACTURE

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ABSTRACT:

Background: In 90% of proximal radial fractures, the fracture line comprises of radial neck or physis. The present study was conducted to assess cases of radial neck fracture.

Materials & Methods: 85 patients of radial neck fracture of both genders were enrolled. Radiographic assessment included standard radiographs (antero-posterior and lateral view). Additional radiocapitellar views or computer tomography (CT) scans were performed. Radiologic scoring was performed according to Johnston's modification of the Mason classification.

Results: Out of 85 patients, males were 45 and females were 40. Type I was seen in 64, type II in 15, type III in 4 and type IV in 2 patients. Radial head angulation found to be type IV a in 35 and type IV b in 50 cases. Left side was involved in 42 and right side in 43 cases. Associated injuries were undisplaced lateral condyle fracture in 4 cases and displaced lateral condyle fracture in 1 case.

Conclusion: Results of the study showed that Mason type I was seen in maximum cases.

Key words: Adult, Mason, Radial neck fractures

INTRODUCTION:

Radial neck fractures account for 5–10% of paediatric elbow trauma and 1% of total childhood fractures. In 90% of proximal radial fractures, the fracture line comprises of radial neck or physis.¹ The management of radial neck fractures is based on fracture angulation, displacement and skeletal maturity. There is a consensus in the literature to reduce radial neck fractures with angulation more than 30° whereas fractures with less than 30° of angulation can be immobilized as they can remodel well.²

Radial fractures can be classified by the Mason Johnston classification. According to this classification, radial head fractures can be divided into 3 types: a type I fracture is a nondisplaced fracture, a type II fracture is a displaced fracture, and a type III fracture is a

comminuted fracture. Johnston added a fourth type: a radial head fracture with dislocation of the elbow.³

Restoration of radial neck angulation and displacement is essential to restore the normal biomechanics and stability of the elbow.⁴ Most minimally displaced radial neck fractures are treated conservatively with early initiation of physical therapy.⁵ Conservative treatment might result in secondary displacement, malunion and cubitus valgus, whereas open reduction and internal fixation (ORIF) is associated with non-union, implant-related complications, reduced range of motion (ROM).⁶ Various maneuvers have been described for close reduction of displaced radial neck fractures but these are mostly successful in fractures with incomplete translation and angulation less than 60°.⁷ The present study was conducted to assess cases of radial neck fracture.

MATERIALS & METHODS:

The present study comprised of 85 patients of radial neck fracture of both genders. The consent was obtained from all enrolled patients.

Data such as name, age, gender etc. was recorded. A thorough physical and clinical examination was carried out. Radiographic assessment included standard radiographs (antero-posterior and lateral view). Additional radiocapitellar views or computer tomography (CT) scans were performed. Radiologic scoring was performed according to Johnston's modification of the Mason classification. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS:

Table I Distribution of patients

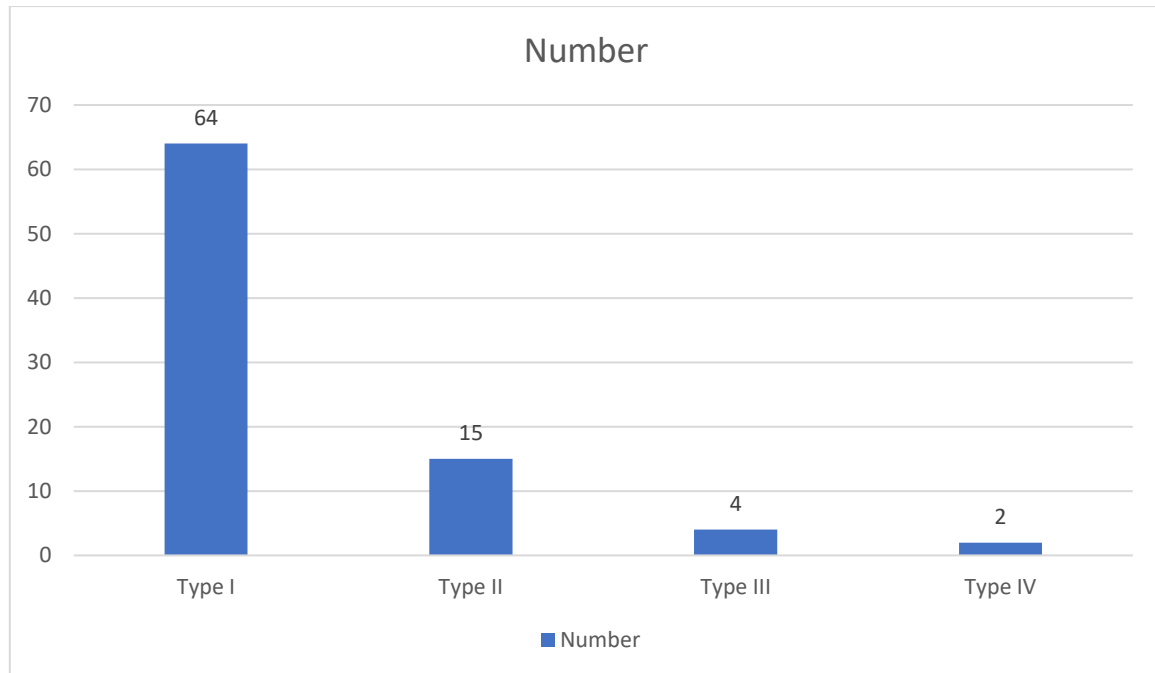
Total- 85		
Gender	Males	Females
Number	45	40

Table I shows that out of 85 patients, males were 45 and females were 40.

Table II Distribution of fracture based on Mason classification

Type	Number	P value
Type I	64	0.01
Type II	15	
Type III	4	
Type IV	2	

Table II, graph I shows that type I was seen in 64, type II in 15, type III in 4 and type IV in 2 patients. The difference was significant (P < 0.05).

Graph I Distribution of fracture based on Mason classification**Table III Assessment of parameters**

Parameters	Variables	Number	P value
Radial head angulation (Judettype)	Type IV a	35	0.05
	Type IV b	50	
Side	Left	42	0.92
	right	43	
Associated injury	Undisplaced lateral condyle fracture	4	0.04
	Displaced lateral condyle fracture	1	

Table III shows that radial head angulation found to be type IV a in 35 and type IV b in 50 cases. Left side was involved in 42 and right side in 43 cases. Associated injuries were undisplaced lateralcondyle fracture in 4 cases and displaced lateralcondyle fracture in 1 case. The difference was significant ($P < 0.05$).

DISCUSSION:

Conservative treatment might result in secondarydisplacement, malunion and cubitus valgus, whereas open reduction and internal fixation (ORIF) is associated with non-union,implant-related complications, reduced range of motion (ROM),posterior interosseous nerve palsy, heterotopic bone formation andavascular necrosis of the radial head. The standard procedureaccepted for isolated radial neck in paediatric age group iscentromedullary pinning (Metaizeau technique).^{8,9}While treating radial neck fractures, achieving anatomically

acceptable reduction is of paramount importance to avoid forearm rotational restriction.¹⁰The present study was conducted to assess cases of radial neck fracture.

We found that out of 85 patients, males were 45 and females were 40. Shah et al¹¹ studied close reduction in ten consecutive children with average age of 8.59 ± 1.68 years who presented with severely displaced radial neck fracture (Type IVa and IVb Judet). There were five girls. All patients had close injuries and presented to us within 24–48 hours. One of the patients had associated undisplaced lateral condyle fracture. Close reduction was performed within 48 hours of initial injury. None of the patients required fixation of fracture. At 1 year of follow-up, (12 ± 2.07 months, range 9–16 months) all patients demonstrated almost full range of elbow and forearm motion. Final radiographs revealed complete union without any evidence of avascular necrosis

We found that type I was seen in 64, type II in 15, type III in 4 and type IV in 2 patients. Harna B et al¹² evaluated the use of Metaizeau technique in the treatment of radial neck fracture in adults. All the patients suffered isolated radial neck fracture. Fracture morphology in all the patients had angulation more than 30 and were displaced, tilted with the impacted articular fragment. All the patients had Mason's type III or Judet's type II or III fracture. The mean age of patients was 31.3 years, and all were operated within 7 days of suffering the injury. The mean follow-up was 9 months. For subjective evaluation, patients rated their satisfaction for elbow use on a scale of 1e6. Objective assessment includes Mayo elbow performance score, active range of motion of flexion and extension and forearm rotation. The active ranges of motion and hand grip strength were comparable in both upper limbs. Similarly, the range of flexion/extension and pronation/supination were identical. In all cases, the titanium elastic nails had already been removed after 8 weeks with osseous healing of the radial neck. Patients rated their satisfaction for elbow function as very good in six cases and good in two cases.

We found that radial head angulation found to be type IV a in 35 and type IV b in 50 cases. Left side was involved in 42 and right side in 43 cases. Associated injuries were undisplaced lateral condyle fracture in 4 cases and displaced lateral condyle fracture in 1 case. Flexion of the elbow in pronation leads to obliteration of posterior capsule and lateral collateral ligament complex. This biomechanical ligamentotaxis leads to anatomic reduction of radial head. Stability of reduction can be checked under image intensifier in full range of flexion and extension while keeping forearm in pronation. The role of ligamentotaxis by lateral collateral ligament complex can be further emphasized by the fact that radial head has a tendency to re-translate laterally on supination of the forearm.

Kovar et al¹³ performed analysis of clinical records revealed 1047 patients suffering from fractures of the radial head or neck classified according to Mason. For clinical examination, range of motion, local pain and overall outcome were assessed. The incidence of one-sided fractures was 99.2% and for simultaneous bilateral fractures 0.8%. Non-operative treatment was performed in 90.4% ($n = 947$) of the cases, surgery in 9.6% ($n = 100$). Bony union was achieved in 99.8% ($n = 1045$) patients. Full satisfaction was achieved in 59% ($n = 615$) of the patients. A gender related significant difference in Mason type distribution-type III fractures were more prominent in male patients vs type IV fractures in female patients.

CONCLUSION:

Authors found that Mason type I was seen in maximum cases.

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