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A Detailed Analysis Of Elbow Radio-Lateral View For Distinct Visualization Of Radial And Ulnar Head Fracture

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ABSTRACT

Background: The elbow joint, a complex articulation of the humerus, radius, and ulna, is frequently subjected to traumatic injuries, particularly fractures and dislocations. Accurate radiographic assessment is crucial for effective diagnosis and treatment planning. Among the various radiographic projections employed, the radio-lateral view plays a vital role in visualizing specific anatomical structures and identifying subtle pathologies.

Method: This is the cross-sectional study of 50 patients with traumatic elbow pain, suspected with occult fracture and fat pad sign, patient including RTA, Assault injuries, Sports injuries and other trauma occurs in elbow. All the patients in this study underwent x- ray.

Result: 50 Patients reported for the trauma to the elbow, whereas 22 patients had fracture, which can identified in conventional radiographic image and only 9 patient had radial-head fracture, that only can identified by the radio-lateral view projection.

Conclusion: Radio-lateral view has the diagnostic value to show all the fracture that all missed on the routine screening. Overall this view is suggested when a fracture is suspected on the basis of clinical signs but no radiographic evidence is seen on conventional screening.

Keywords: *Elbow joint, Radio-lateral view, fracuture, epicondyles, humerus, radius, ulna, x-ray.*

1. BACKGROUND

The complete visualization of Radio-Lateral view is a projection where the radial head fractures are common during traumatic injuries. A combination of views is chosen, comprising of routine elbow series screenings and modified techniques of elbow that can show fractures and dislocation of elbow joint. This projection is used mainly to demonstrate the identification of occult fractures and fat-pad signs that were missed by other projections. This Elbow Radio Lateral View should be mainly recommended for the diagnostic accuracy of proximal radius and ulna separately without overlapping on each other. The detection of proximal lateral condyles of Tibia and Fibula fractures or any other anomalies can be visualized. There is benefit over risk to the participant with minimal discomfort.

Methods

This study was conducted in department of radio diagnosis, A.C.S medical college and hospital, Chennai from period of January 2024 to July 2024 after getting the clearance from institutional ethical community, informed was obtained from all patients prior to examinations. 50 patients were included in this study. Inclusion criteria includes patients with RTA (Road Traffic Accident) Patients with severe elbow pain and Traumatic injury. All patients underwent X-RAY ALLENGERS (325R-SR).

Inclusion Criteria:

RTA (Road Traffic Accident) Patients with severe elbow pain and Traumatic injury.

Exclusion Criteria:

Non elbow complaint patients and pregnant women.

2. RESULT

A cross-sectional study of 50 patients with elbow trauma revealed that 22 (44%) patients had fractures diagnosed radiographically. Conventional lateral x-ray views identified 13 (26%) of these fractures. However, 9 (18% of the total, 40.9% of those with fractures) patients exhibited occult radial head fractures, which were only visualized using the elbow radio-lateral projection.

Specifically, a patient presenting with significant elbow pain following a fall, whose initial conventional radiographs were negative for fracture, was subsequently found to have a proximal radial head fracture upon radio-lateral view examination. This view effectively eliminated the overlap between the proximal ulna and radius, thereby revealing the previously undetected fracture.

In the total cohort of 50 patients, 22 (44%) demonstrated fractures detectable by both conventional and radio-lateral views. Notably, within this group, 9 (18% of the total, 40.9% of those with fractures) presented with radial head fractures that were only visible through the radio-lateral projection.

Table 1: Classification As Per Gender

GENDER	COUNT	PERCENTAGE
MALE	33	66%
FEMALE	17	34%
TOTAL	50	100%

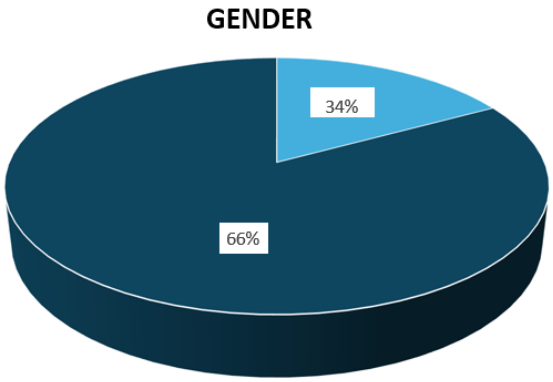

Chart 1. Gender Distribution of Patients

The above pie chart shows the number of patients who are grouped on thebasis of sex from the study population.

Table 2: AGE DISTRIBUTION: Showing the distribution of patients based on age.

AGE	COUNT	PERCENTAGE
0-10	05	10%
11-20	07	14%
21-30	19	38%
31-40	07	14%
41-50	04	8%
51-60	02	4%
61-70	02	4%
71-80	04	8%

TOTAL	**50**	**100%**

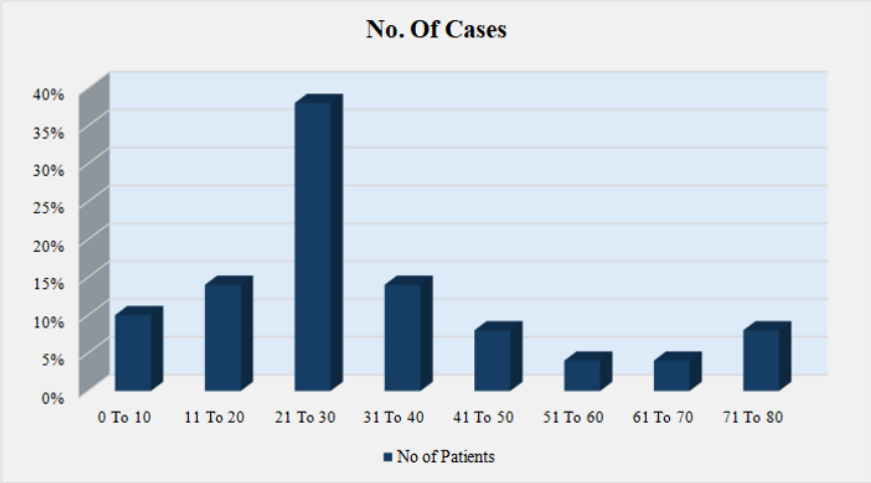

Chart 2. Age Gender of Patients

The above chart shows the number of patients who are grouped on the basis of age from the study population

CHART 3. IDENTIFICATION OF FRACTURES

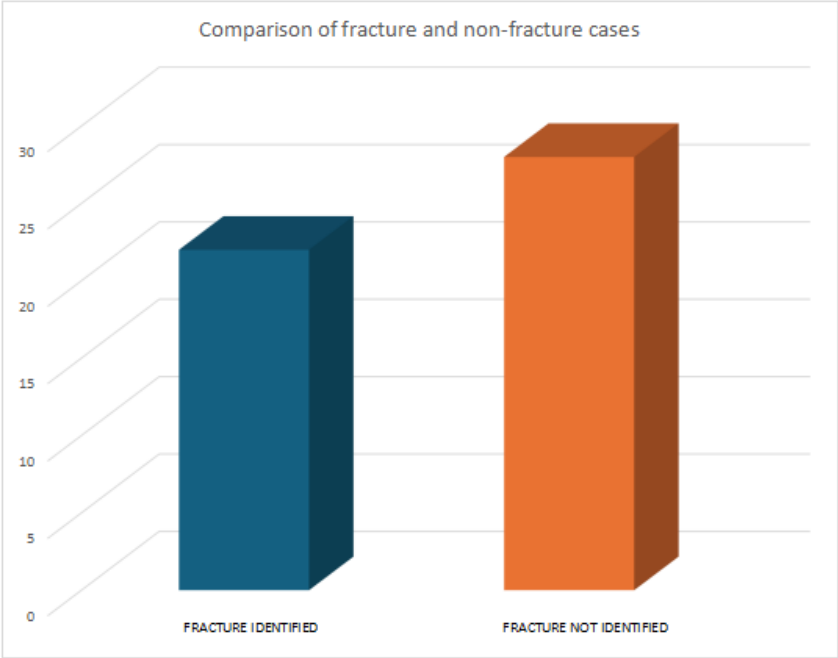

Chart 3. Identification of Fractures

The above bar chart represents the number of fracture cases identified in both conventional radiographic view and elbow Radio-lateral view

CHART 4. COMPARISON OF LATERAL AND RADIO-LATERAL VIEW

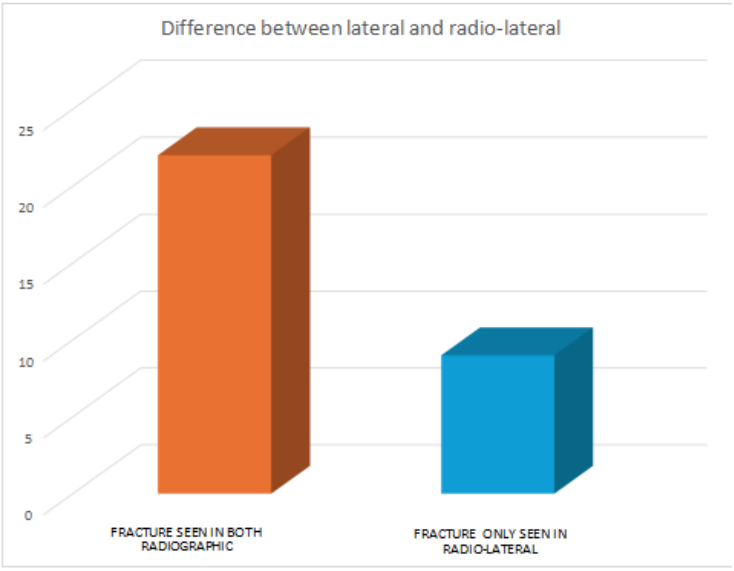

Chart 4. Comparison of Lateral and Radio-Lateral View

The above chart that represents the number of fractures that can be seen only in the radio-lateral view, where 9 patients has been seen only through radio-lateral view and they were missed by conventional radiographic view

3. DISCUSSION

The study is a cross-sectional study involving 50 patients who presented with elbow trauma. Among these patients, 22 had fractures that were diagnosed using conventional x- ray techniques, specifically the lateral view.

Within the group of 22 patients with fractures, 9 had occult fractures, specifically radial head fractures, which were only identified through the radio-lateral view projection.

A patient with severe elbow pain, following a slip and fall incident, was initially assessed using conventional radiography, which did not reveal any fractures.

However, upon further evaluation using elbow radio-lateral views, an occult fracture was detected in the proximal end of the radius. This type of fracture was not visible in the normal lateral view due to overlap between the proximal heads of the ulna and radius.

Elbow radio-lateral views provide clearer visualization of fractures in the region where the proximal ends of the ulna and radius are not overlapped, making it easier to identify occult fractures, especially those occurring at the proximal end of the radius.

4. CONCLUSION

The study demonstrates the importance of utilizing the radio-lateral projection technique for diagnosing fractures in the radial head and distal end of humeral epicondyles.

Through a cross-sectional study design conducted over a duration of six months and a sample size of 50 cases, the research aimed to confirm the diagnostic.

By employing standardized equipment and positioning protocols, the anticipated outcome is enhanced visualization of the proximal radio-ulnar joint without overlapping structures.

Overall, the study holds potential to contribute valuable insights into the diagnostic value of the radio-lateral projection, aiding in more precise and efficient.

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