POSTEROLATERAL INSTABILITY OF THE ELBOW JOINT

Essay

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(سُبْحَانَكَ لا عِلْمَ لَنَا إلاَّ مَا
عَلَّمْتَنَا إنَّكَ أَنْتَ العَلِيمُ الحَكِيْمُ)

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ABSTRACT

the forearm complex rotates externally in relation to the humerus, causing posterior subluxation or dislocation of the radial head. The lateral ligament complex, radial head and coronoid process are important constraints to posterolateral instability, and their disruption is involved in the pathogenesis of this condition. The diagnosis relies on a high index of clinical suspicion, active and passive apprehension tests, and examination under anaesthesia.

KEY WORDS

POSTEROLATERAL _ STABILITY _ ELBOW

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INTRODUCTION

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Posterolateral instability of the elbow joint is one of the most frequently missed causes of recurrent elbow problems and is associated with transient rotatory instability and periodic elbow dislocations. Posterolateral elbow instability, first described by **O'Driscoll** in 1991, occurs secondary to laxity on the ulnar part of the lateral collateral ligament resulting in transient rotatory subluxation and occasional dislocations of the elbow joint.

Most commonly posterolateral elbow instability and recurrent elbow dislocations are secondary to traumatic falls on the outstretched hand causing lateral collateral ligament complex disruption and more specifically damage to the lateral ulnar collateral portion of the structure (LUCL).

Posterolateral elbow instability is now much more commonly recognized and currently follows only valgus instability as a cause of recurrent elbow instability problems **(Beingessne et al., 2007).**

In this condition the forearm complex rotates externally in relation to the humerus, causing posterior subluxation or dislocation of the radial head. The lateral ligament complex, radial head and coronoid process are important constraints to posterolateral rotatory instability, and their disruption is involved in the pathogenesis of this condition. The proximal radioulnar joint is intact and both forearm bones rotate as a single unit. This differentiates posterolateral rotatory instability from isolated dislocation of the radial head, where the

proximal radioulnar joint is disrupted and the ulnohumeral articulation is intact.

Since the term was originally coined in 1991, our understanding of this condition has expanded **(Charalambous and Stanley, 2008).**

The diagnosis of this condition remains clinical, with examination under anaesthesia being useful. Open surgical reconstruction of the lateral ligaments restores stability in most patients, with arthroscopic techniques emerging as a potential alternative **(Md.Qumar Azam et al., 2009).**

The aim of this work is to describe our current knowledge of the pathogenesis, presentation, diagnosis and management of posterolateral rotatory instability of the elbow joint.

ANATOMY OF ELBOW JOINT

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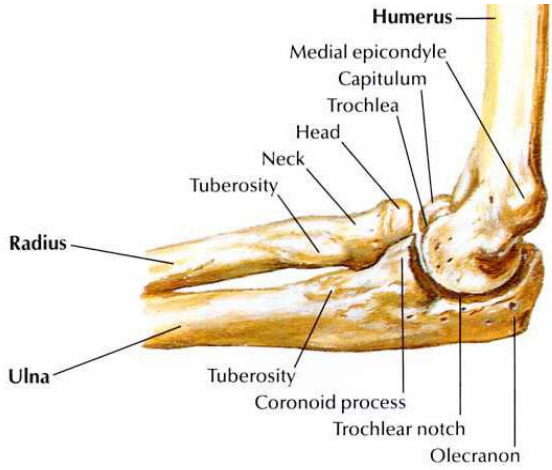
The elbow joint is a synovial hinged joint composed of three distinct articulations:

(1) The radio-capitellar joint: between the facet on the head of radius and the capitulum of humerus.

(2) The ulno-humeral joint: between the trochlear notch of ulna and the trochlea of humerus.

(3) The proximal radio-ulnar joint: between the head of radius and the radial notch of ulna **(McMinn, 2004).**



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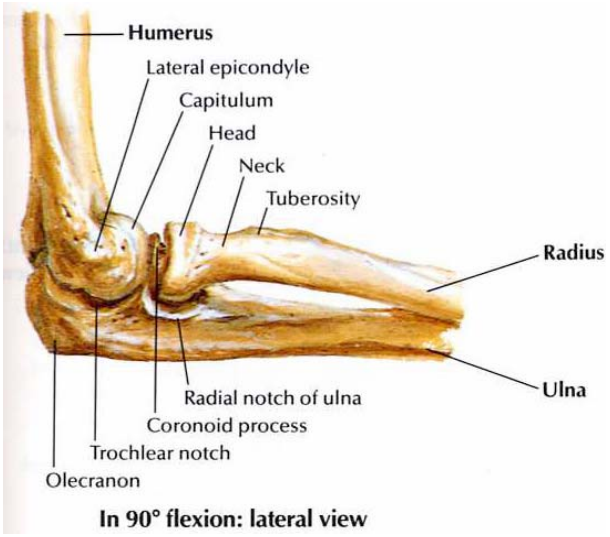

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Fig. (1): (a) Elbow: medial view. (b) Elbow: lateral view **(McMinn, 2004)**

All three joints are enclosed within a common fibrous and synovial capsule, which is thickened medially and laterally to form the collateral ligaments **(Gray's, 1973).**

The medial collateral ligament complex is composed of three parts:

(1) An anterior oblique ligament.

(2) A fan shaped posterior oblique ligament.

(3) A transverse oblique ligament, which is relatively nonfunctional in terms of stability. Both the anterior and posterior ligaments originate on the anterior aspect of the medial humeral epicondyle, with the anterior ligament extending distally to insert on the medial aspect of the coronoid process **(Fig. 2) (Tullos et al., 1981).**

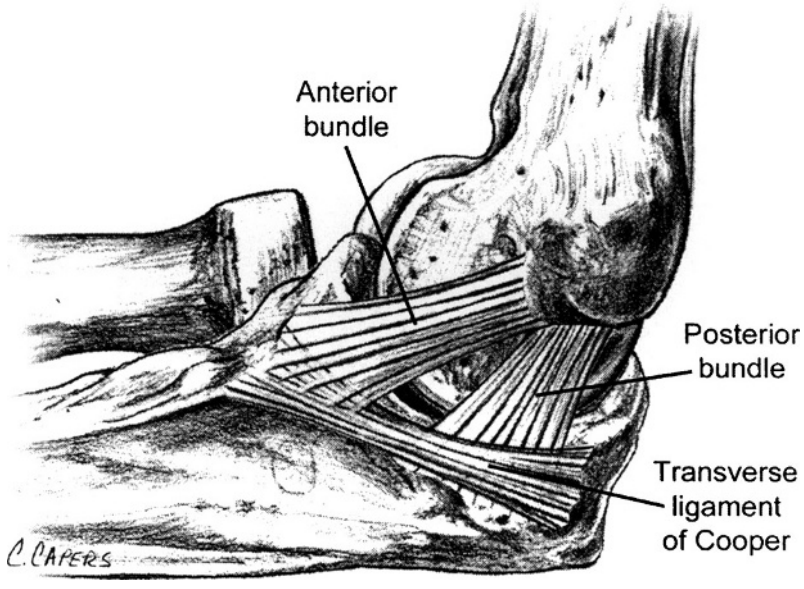

Fig. (2): Medial collateral ligament complex. From Bain GI, Mehta JA. Anatomy of the elbow joint and surgical approaches **(Roger et al., 2006)**.

The anterior ligament is further subdivided into two functionally distinct bands, under valgus load; the anterior band is under tension from 0 to 85 degrees, while the posterior band is under tension from 55 degrees throughout the rest of flexion.

The posterior oblique ligament inserts into the posteromedial aspect of the olecranon and is tight in flexion of more than 60 degrees. The results of various sectioning studies indicate that the anterior oblique ligament is the primary stabilizer of the elbow against valgus stress **(O'Driscoll et al., 1992).**

The lateral collateral ligament complex shows greater variability than the medial collateral ligament complex. It is composed of four structures:

(1) Radial collateral ligament.
(2) Lateral ulnar collateral ligament.
(3) Annular ligament.
(4) Accessory collateral ligament.

Its primary function is to provide stability against varus stress **(Morrey et al., 1991) (Fig. 3)**.

The radial collateral ligament arises from the anteroinferior aspect of the lateral epicondyle and distally to the annular ligament and lies deep to the common extensor tendon.

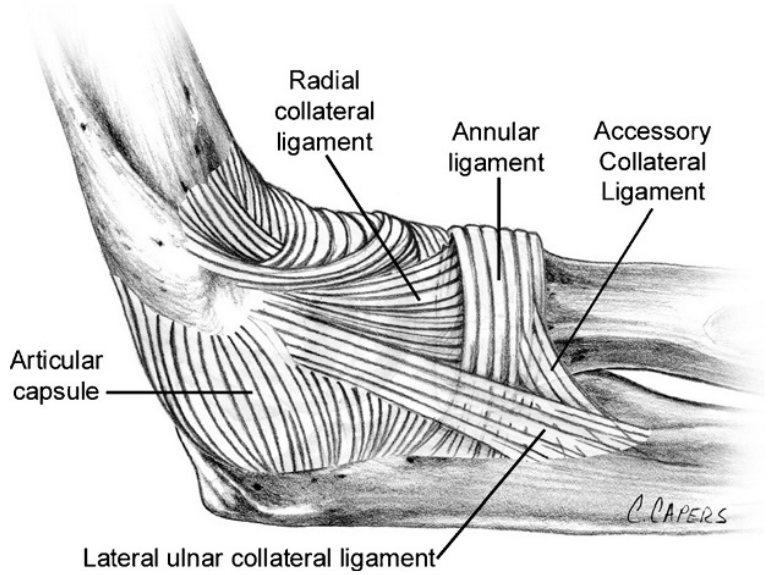

Fig. (3): Lateral collateral ligament complex. From Bain GI, Mehta JA. Anatomy of the elbow joint and surgical approaches **(Roger et al., 2006)**.

The lateral ulnar collateral ligament arises from the lateral epicondyle just distal to the radial collateral ligament and extends distally to cover the annular ligament and insert on the lateral side of the ulna and coronoid process **(Gray's, 1973).**

The annular ligament is attached anteriorly and posteriorly to margins of radial notch of ulna which forms one forth of circle and the ligament forms three forth, it is cup shaped being of smaller circumference below than above. The head of radius cannot be with drawn from it **(Basmajian, 1989).**