ARTHROSCOPIC MANAGEMENT OF ARTICULAR INJURIES OF THE ELBOW

Essay

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By

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Abstract and Key words

The elbow is probably one of the most sensitive human joint in its response to trauma. Thus, one can appreciate the special importance of arthroscopy and arthroscopically assisted internal fixation and implant removal in the elbow.

Recent investigators have established safe portals of entry into the elbow joint. Portals for elbow arthroscopy include anterior portals and posterior portals.

As a diagnostic tool, elbow arthroscopy provides information regarding the presence or absence of loose bodies, the condition of synovium and intraarticular joint capsule, the quality of articular cartilage and any degree of instability.

The most common therapeutic indications for elbow arthroscopy are excision of osteochondral loose bodies, treatment of osteochondritis dissecans, synovitis, excision of marginal osteophytes, and adjunctive treatment of intraarticular fractures.

Key words:

- Elbow arthroscopy
- Osteochondritis dissecans
- Loose bodies

Chapter 1

Anatomy of the elbow joint

Anatomy of the elbow joint

This is a synovial joint of the hinge variety [1]. The elbow joint includes two articulations: humeroulnar, between the trochlea of the humerus and the ulnar trochlear notch and humeroradial, between the capitellum of the humerus and the radial head. Its complexity is increased by continuity with the superior radioulnar joint [2].

The lower end of the humerus:

It is compressed from before backwards and is divided into medial and lateral columns; each of them is roughly triangular in anteroposterior projection. The divergence of these columns increases the diameter of the distal humerus in the coronal plane[1,3]. The two columns end distally in the condyles; each represents articulating and non-articulating portions.

A: Non-articulating portion:

1. Medial epicondyle:

It represents the non-articulating portion of the medial column. It is subcutaneous and easily felt under the skin. Its posterior surface is smooth and grooved by the ulnar nerve which can be felt and rolled against the bone.

The lower part of the anterior surface of the medial epicondyle bears an impression for attachment of the common tendinous origins of the superficial group of the forearm flexor muscles [4]. The medial supracondylar ridge gives origin to the pronator teres muscle [2].

2. Lateral epicondyle:

It is the lateral part of non-articulating portion of the lateral column, but it does not project beyond the lateral supracondylar ridge as that of the medial epicondyle.

The lateral epicondyle lies at a higher level than the medial epicondyle. The lateral epicondyle bears on its anterior surface a well marked impression for the common tendinous origin of the superficial group of the forearm extensor muscles. Its posterior surface is slightly convex and can be easily felt subcutaneously at the back of the elbow [1]. From this surface the anconeus muscle takes a tendinous origin. Also, the lateral epicondyle gives an origin to the supinator muscle [2].

B: Articular portion:

The articular surfaces are the humeral trochlea and capitellum and the ulnar trochlear notch and captello-trochear sulcus [2].

1. Trochlea:

It constitutes the articulating portion of the medial condyle. It is similar to a pulley in shape [1]. It lies medial to the

capitellum from which it is separated by the shallow capitulotrochlear sulcus for the articulation with the peripheral ridge of the radial head [3].

The trochlea has medial and lateral lips, the former being more prominent distally which shares in the formation of the carrying angle [1, 5]. The medial and lateral ridges of the trochlea are very important factors in maintaining the medial and lateral stability of the elbow during flexion and extension. Between the medial and lateral ridges of the trochlea there is a wide groove that articulates with the greater sigmoid (semilunar) notch of the proximal ulnar. The depth of the trochlea at this groove is approximately half of that of the longer medial ridge [3].

Proximal to the trochlea there are two fossae, which are intra-articular structures, one is anterior called the coronoid fossa which lodge the coronoid process when the elbow is flexed, and other fossa is posterior called the olecranon fossa which lodges the olecranon process when the elbow is fully extended. The bone that separates these two fossae is extremely thin and occasionally absent [5].

2. Capitellum:

It is the articulating portion of the lateral condyle and covers only its anterior and inferior surfaces but does not extend to its posterior surface.

It articulates with the disc-like head of the radius which lies in half contact with its anterior surface when the elbow is fully flexed [1].

Proximal to the capitellum anteriorly there is a small radial fossa, which is intra-articular, which receives the radial head when the elbow is fully flexed [3].

The articular surface of the trochlea and the capitellum are tilted downwards and forwards from the end of the humerus at angle of approximately 45 º called the lower humeral angle [3, 5].

A bony spur called the supracondylar process occasionally projects downwards from the anteromedial surface of the humerus. It arises approximately 5cm superior to the medial epicondyle and is attached to it by a fibrous band. The process, the shaft of the humerus and the fibrous band form a foramen through which the median nerve and brachial artery pass forwards. The spur gives an origin to part of the pronator teres muscle and may receive a lower portion of the insertion of coracobrachialis muscle [3].

Proximal end of the ulna:

It is composed of the olecranon process and two articular surfaces; the trochlear and radial notches which articulate respectively with the trochlea of the humerus and the radial head[1, 2].

Olecranon:

The olecranon is the uppermost part of the ulna and is bent forwards at its summit to form a prominent peak. Its posterior surface is smooth and triangular in outline and can be felt easily through the skin. Its upper border forms the point of the elbow. The articular anterior surface of the olecranon is smooth and forms the upper part of the trochlear notch [(2)]. The triceps muscle is inserted in the most posterior part of the upper surface of the olecranon by an aponeurotic insertion. The anconeus muscle is inserted by its fleshy fibers in the lateral side of the olecranon.

Coronoid:

It projects from the front of the upper ulna immediately below the olecranon. Its upper articular surface forms the distal part of the trochlear notch. The proximal part of the lateral surface present the shallow radial notch for articulation with the side of the head of the radius.

The bone below the radial notch is hollowed out to make a room for the tuberosity of the radius during the movement of the proximal radioulnar joint [(2)].

The anterior surface of the process is triangular in shape and bears on its lower part the rough tuberosity of the ulna which gives an insertion to the brachialis muscle. The ulnar heads of

the flexor digitorum superficialis and the pronator teres muscle take origins from the medial side of the coronoid [2].

Trochlear notch:

It is called also the great sigmoid notch [3]. It articulates with the trochlea of the humerus. It is formed by the anterior surface of the olecranon and the superior surface of the coronoid process. The bone is constricted at the junction between these two areas and the two articular surfaces may be separated completely by a narrow roughened strip [2].

Radial notch:

It is an oblong articular depression on the proximal part of the lateral aspect of coronoid process. It forms a joint (superior radioulnar) with articular circumference of the radial head and is separated from the lateral part of the trochlear notch by a smooth ridge.

Fibrous capsule (figure 1, 2):

The anterior part of which is broad and thin, it is attached, above, to the front of the medial epicondyle, and to the front of the humerus just above the coronoid and radial fossae, below, to the anterior surface of the coronoid process of the ulna and to the orbicular ligament, being continuous at the sides with the ulnar and radial collateral ligaments [1].