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Arthroscopic Management of Tennis Elbow

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By

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LIST OF ABBREVIATION

AAROM	Active assisted range of motion
AROM	Active range of motion
CEO	Common extensor origin
CRPS	Complex regional pain syndrome
EDC	Extensor digitorum communis
ECRB	Extensor carpi radialis brevis
ECRL	Extensor carpi radialis longus
Fig	figure
LCL	Lateral collateral ligament
LUCL	Lateral ulnar collateral ligament
MCL	Medial collateral ligament
PROM	Passive range of motion
ROM	Range of motion

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INTRODUCTION

Tennis elbow or also called Lateral epicondylitis was first described in the German literature by Runge in 1873.Ten years later, in 1883, Morris suggested an association of symptoms with the game of lawn tennis. This association led to the common term of ‘‘tennis elbow’’.(1)

Lateral elbow pain is a relatively common occurrence, affecting between 1% and 3% of the population, usually noted in patients aged between 35 and 50 years. Although originally thought to be associated with the playing of tennis, lateral elbow pain is currently less often associated with that sport.(1)

The etiology seems to be overuse or repetitive stress, often related to an increase in activity of some kind. It is most commonly managed by non operative measures, including medication, bracing, physical therapy, and injection with a variety of corticosteroid preparations.(1)

Originally, an inflammatory process was thought to be the cause of lateral epicondylitis. Researchers believed that partial tearing of the extensor carpi radialis brevis (ECRB) tendon and periosteum of the lateral epicondyle led to an inflammatory response resulting in symptoms. Although most studies focused on the extensor carpi radialis brevis tendon, the annular ligament, lateral capsule, radial nerve, and several different bands of the extensor digitorum communis have also been implicated as the causative factor of lateral epicondylitis. However, most microscopic studies of excised tissue demonstrate a failure of reparative response in the ECRB tendon, rather than an inflammatory response in any of these associated structures.(2)

The normal ECRB tendon tissue is invaded by immature fibroblasts and nonfunctional vascular buds, with adjacent tissue being disorganized and hypercellular. Nirschl and Ashman coined the term‘‘angiofibroblastic tendinosis’’ due to this microscopic appearance. As a result of their excellent investigative work, tennis elbow is now thought to be a dysvascular degenerative-type process termed ‘‘tendinosis’’ rather than a tendonitis .(1)(3)

Cyriax described observation as the primary treatment, stating ‘‘spontaneous cure is probable by the end of eight to twelve months.’’

Surgery is reserved for patients who fail to respond to an adequate course of nonoperative treatment.(2)

Recent series have also documented the effectiveness of shock wave therapy, platelet-rich plasma, and low-dose thermal ablation devices. Surgical management has usually been effective through a variety of approaches.(4)

Several surgical treatments for lateral epicondylitis were described in 1955 by Bosworth .Over the years, advances in surgical management have been made by Coonrad , Hooper and Baker et al, with each advance delineating improved results with recommended techniques. Many surgical techniques have been described, including open and arthroscopic procedures for the treatment of refractory lateral epicondylitis.(4)(5) (6)(7)

In 1955 Bosworth reported 4 types of surgical procedures for the treatment of lateral epicondylitis:

_ The first consisted of a complete division of the common aponeurotic origin of the extensor muscles.

_ The second procedure involved division of the extensor origin and removal of the synovial fringe between the capitellum and radial head.

_ The third type included complete division of the extensor origin and resection of the orbicular ligament from around the head of the radius.

_ The fourth procedure split the common extensor origin vertically, resected half of the orbicular ligament, and repaired the common extensor origin with suture over the radial head.(8)

Bosworth also identified an association of the orbicular ligament with symptoms of lateral epicondylitis and recommends the third type of procedure for operative treatment.(6)

Bosworth eventually reported the long-term follow-up of the surgical procedures noted above and again concluded that resection of the orbicular ligament and division of the common origin of the extensor muscles does not cause instability of the elbow and can provide relief of disabling pain.(8)

In 1979, Nirschl reported 1213 clinical elbow cases with 88 open surgical interventions. Their technique included open identification and excision of the tendinosis tissue within the ECRB, and decortication or drilling of the lateral epicondyle to stimulate blood flow. An anatomic

repair of the extensor carpi radialis longus (ECRL) and EDC was then performed. In their opinion, the ECRB did not retract due to the close fascial adherence to the ECRL and, therefore, did not require repair.(3)

Percutaneous release performed in the office setting was described by Yerger and Turner. The procedure is done with local anesthetic and the patient prone. A scalpel with a #11 blade is used to make a stab 2

mm anterior to the tip of the epicondyle parallel to the long axis of the humerus. After release of the ECRB, the patient is asked to flex and extend the elbow against resistance while the surgeon feels for a defect at the origin of the ECRB.(9)

Baker et al reported 40 patients (42 elbows) with refractory lateral epicondylitis who underwent arthroscopic debridement of pathologic tissue. A standard medial portal was used for viewing and a superior lateral portal for debriding. Many times, the lateral epicondyle was decorticated with a burr. Several reports of arthroscopic techniques have been published since that initial report by Baker et al, including a long-term follow-up of the initial group. All reports consistently document satisfactory results with the arthroscopic techniques.(5)(10)(11)

Aim of the Work

The aim of this study is to assess the role of elbow arthroscopy in management of tennis elbow , its advantages , recent advances , its technique and complications.

الهدف من الرسالة

تهدف هذة الرسالة إالى إلقاء الضوء على **دور المنظار الجراحى فى علاج مرفق التنس**

Anatomy Of The Elbow Joint

The elbow is composed of two independent uniaxial joints. One is the humeroulnar joint, which is a hinged, or ginglymoid, joint. The other consists of the humeroradial and proximal radioulnar articulations, a pivoted or trochoid, joint, allowing two degrees of freedom in the elbow joint. Motion in the elbow involves rotation of the ulna about the humerus during flexion and extension and rotation of the radius about the ulna during supination and pronation.["12"]

A common articular cavity incorporates the synovium, capsule and ligaments allowing the elbow joint to be considered a single anatomic element.["13"]

Articulating Surfaces

Humerus: fig. (1-1)

The distal humerus is divided into separate medial and lateral components, called condyles, each containing an articulating portion and non articulating portion, the non articulating portions include the epicondyles which are the terminal points of the supracondylar ridges. The lateral epicondyle contains a rough anterolateral surface from which the superficial forearm extensors arise; the medial epicondyle is larger and service as the origin of the forearm flexors. The posterior distal portion of the medial epicondyle is smooth and in contact with the ulnar nerve as it crosses the elbow joint.["14"]

The articulating surface of the lateral condyle is hemispherical and projects anteriorly, it is called the capitellum.. It is covered with hyaline cartilage, which is 2 mm thick anteriorly. A groove separates the capitellum from the trochlea and the rim of radial head articulates with this groove throughout the arc of flexion and during pronation and supination. ["14""15""16"]

The articulating surface of the medial condyle, the trochlea, it is spool like, it has very prominent medial and lateral edges. Between these ridges is central groove that articulates with the greater sigmoid notch of the ulna. The diameter of the trochlea at this groove is approximately half that of the medial ridge. The trochlea is covered by articulating cartilage over an arc of 300 degrees. ["16"]

In the lateral plane the orientation of the articular surface of the distal humerus is rotated anteriorly about 30 degrees with respect to the long axis of the humerus. "16"

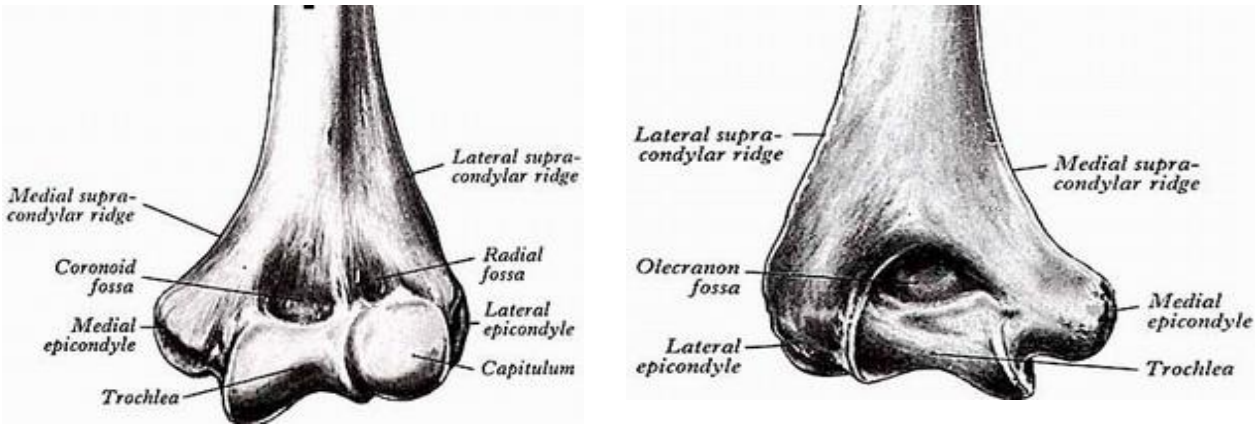

Fig.(1- 1) The distal end humerus, anterior and posterior views. "17"

Proximal Radius: fig. (1-2)

The proximal radius includes the radial head, which articulates with the capitellum and exhibits a cylindrical shape with a depression in the midportion to accommodate the capitellum. The disk is secured to the ulna by the annular ligament. Distal to the radial head, the bone tapers to form the radial neck. "18"

Hyaline cartilage covers the depression of radial head as well as 240 degrees of the outside circumference that articulates with the ulna. The anterolateral third of the circumference of radial head is void of cartilage. This part lacks subchondal bone and thus is not as strong as the part that is supports the articular cartilage. This part has been demonstrated to be the portion most often fractured. "17"

Proximal Ulna: fig. (1-2)

The proximal ulna provides the major articulation of the elbow that is responsible for its

inherent stability. It has large olecranon and coronoid processes and greater sigmoid and lesser sigmoid notches articulating with the humerus and radius. The olecranon, more proximal, is bent forwards at its summit like a beak, which enters the humeral olecranon fossa in extension. The coronoid process projects anteriorly distal to the olecranon, its proximal aspect forming the distal part of the greater sigmoid notch, distal to which, on the lateral surface, is a shallow smooth, oval lesser sigmoid notch for articulation with the radial head. The coronoid's anterior surface is triangular, its distal part being the tuberosity of the ulna. "17"

In the lateral plane the greater sigmoid notch forms an arc of 190 degrees. The contour is not a true semicircle but rather is epllipsoid. This explains the articular void in the mid portion. The opening of the greater sigmoid notch is orientated approximately 30 degrees posterior to the long axis of the ulna. This matches the 30 degrees of inferior angulation of the distal humerus. "16"

The lesser sigmoid notch consists of a depression with an arc of about 70 degrees and is situated just distal to the lateral aspect of cronoid and articulates with the radial head. "16"

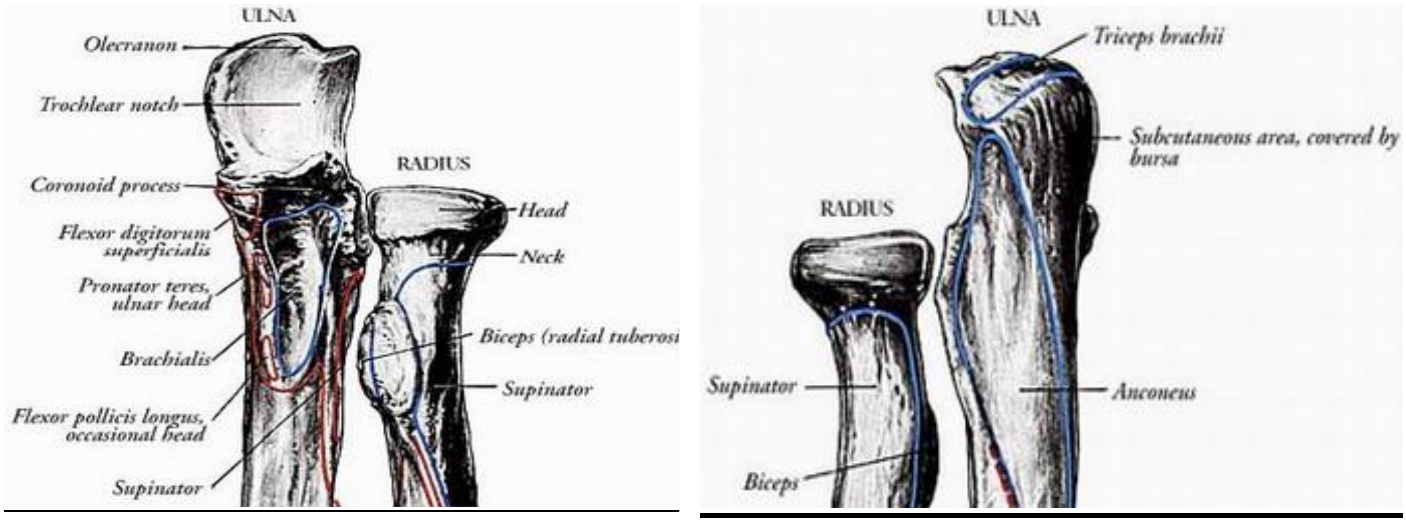

Fig. (1-2) Proximal end radius and ulna, anterior and posterior views. "17"