Manipulative Therapy in the Management of Lateral Epicondylitis

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By
Yasser Saleh Galal Mousa
M.B., B.Ch., Faculty of Medicine, Ain Shams University

Under Supervision of

PROF. DR./ MAHMOUD EL TAYEB NASSER
Professor of Physical Medicine, Rheumatology and Rehabilitation
Faculty of medicine Ain Shams University

PROF DR./ MONA LOTFY ZAMZAM
Professor of Physical Medicine, Rheumatology and Rehabilitation
Faculty of Medicine Ain Shams University

DR./ NEVINE AHMED SHAKER
Assistant professor of Physical Medicine,
Rheumatology and Rehabilitation
Faculty of Medicine Ain Shams University

Faculty of Medicine
Ain Shams University
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List of abbreviations

A	Activity
DOMS	Delayed onset molecular soreness
ECRB	Extensor carpi radialis brevis muscle
ECRL	Extensor carpi radialis longus
ECU	Extensor carpi ulnaris
EDC	Extensor digitorum communis
ESWT	Extracorporeal shock wave therapy
Ex.	Examination
F.M	Friction massage
HS	Highly significant
I.U	International unit
LE	Lateral epicondylitis
mamp.	Milliampere
MGF	Maximum grip force
MIA	Manipulation induced analgesia
MWM	Mobilization with movement treatment technique of elbow
NS	Non-significant
NSAIDs	Non-steroidal anti-inflammatory drugs
PFGF	Pain-free grip force
PMGF	Maximum grip force on the painful side
PSI	Pound square inch
RA	Rest and activity
S	Significant
SOMC	Severity of the main complaint
SMGF	Maximum grip force on the sound side
ttt	treatment
U/S	Ultrasound therapy
VAS	Visual analog scale
+ ve	Positive
- ve	negative

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INTRODUCTION

Lateral epicondylitis is characterized by pain on the lateral side of the elbow that is aggravated with movements of the wrist, by palpation of the lateral side of elbow or by contraction of the extensor muscles of the wrist (**Struijs et al., 2003)**. Pain is also manifested during activities involving the hand in gripping or manipulating an object, which signal to most practitioners the provisional diagnosis of tennis elbow **(Vicenzino & Wright, 1996)**.

The incidence of lateral epicondylitis in medical general practice is approximately 4 to 7 cases per 1000 patients a year, with peak incidence in the fifth decade **(Struijs et al., 2003)**.

Workplace activities contribute 35-64% of all cases **(Dimberg, 1987)**. It has been estimated that 10% to 50% of people who regularly play tennis, will develop the condition at some time during their careers **(Nirschl, 1992)**.

In most cases of lateral epicondylitis, the lesion involves the junctional tissue at the common extensor tendon, primarily the extensor carpi radialis brevis (ECRB) **(Wadsworth, 1987)**.

Although the term epicondylitis implies that inflammation is present, it is in fact only present in the very early stages of the disease. Recently, researchers have come to prefer the term tendinosis **(Baker & Nirschl, 2001)**.

Treatment is aimed at altering activities and preventing overuse of the forearm musculature. Ice packs, heat and non-steroidal anti-inflammatory drugs (NSAIDs) are of some benefit. A forearm brace also can be used. Isometric strengthening is important as the initial part of a rehabilitation program **(Cyriax, 1982)**.

Several interventions for the management of lateral epicondylitis have been described, including corticosteroid injections, use of orthotic devices, surgery, use of thermal and electromagnetic modalities, ultrasound, laser, massage and electrotherapy **(Assendelft et al., 1996).**

Manipulation has frequently been used successfully for management of back and neck complaints and is thought to free motion segments that have undergone disproportionate displacement or are felt to be hypomobile and cause muscle relaxation. These mechanisms are thought to be associated with distribution of abnormal stresses within the joint, resulting in pain, restriction of motion and potential inflammation **(Struijs et al., 2003)**.

Interestingly, for a condition that is conceptualized as being predominantly a soft tissue injury, there are several manipulative therapy treatments that appear to provide useful short-term pain relief and restoration of function **(Mulligan, 1999)**.

Mill's manipulation for tennis elbow is the most common manipulative technique used. The aim of this technique is to elongate the scar tissue by rupturing adhesions within the teno-osseous junction, making the area mobile and pain free **(Wright & Sluka, 2001)**.

Ultrasound is assumed to have thermal and mechanical effects on the target tissue resulting in an increased local metabolism, circulation, extensibility of connective tissue and tissue regeneration **(Schweitzer, 1994)**. Therapeutic ultrasound is used frequently in the treatment of musculoskeletal disorders **(Roebroeck et al., 1998)**.

Aim of the work

The aim of our study is to evaluate the effectiveness of manipulation of the elbow in the management of lateral epicondylitis (tennis elbow).

LATERAL EPICONDYLITIS

Tennis elbow was described in **1883** by **Major** as a condition causing lateral elbow pain in tennis players. Over the years, this term has become synonymous with all lateral elbow pain, despite the fact that the condition is most often work-related and many patients who have this condition do not play tennis **(Coonrad & Hooper, 1973)**. The prevalence ranges from 1% to 3% in the overall population **(Allander, 1974)**. Workplace activities contribute 35-64% of all cases **(Dimberg, 1987)**. It has been estimated, however, that 10% to 50% of people who regularly play tennis will develop the condition at some time during their careers **(Nirschl, 1992)**.

Lateral epicondylitis occurs much more frequently than medial-sided elbow pain, with ratios reportedly ranging from 4:1 to 7:1 **(Gabel & Morrey, 1998)**. In the general population, the incidence is equal among men and women, and in tennis players, male players are most often affected than female players. The disorder occurs more often in the dominant extremity. The average age of the patient who has lateral epicondylitis is 42. An acute onset of symptoms occurs more often in young athletes, and chronic symptoms typically occur in older patients.

A study on biomechanics demonstrated that the eccentric contractions of the extensor carpi radialis brevis (ECRB) muscle during backhand tennis swings, especially in novice

players, are the likely cause of repetitive microtrauma that causes tears in the tendon and lateral epicondylitis **(Riek et al., 1999)**. Some other studies suggested that the causes of tennis elbow, or lateral epicondylitis, are due to trauma to the lateral region of the elbow, fluoroquinolone antibiotics **(LeHuec et al., 1995)** and relative hypovascularity of the region **(Schneeberger & Masquelet, 2002)**.

In most cases of lateral epicondylitis, the lesion involves the junctional tissue at the common extensor tendon, primarily the ECRB. Pain with resisted extension of the middle finger with the elbow in full extension along with tenderness at the lateral epicondyle suggests involvement of the ECRB **(Wadsworth, 1987)**.

Extensor carpi radialis longus (ECRL) originates from the lower one-third of the lateral supracondylar ridge of the humerus, the front of the lateral intermuscular septum and the common extensor origin attached to the lateral epicondyle. Tenderness at the supracondylar ridge, which is also a common finding, will indicate that the ECRL is involved. Extensor digitorum communis (EDC) takes its origin from the anterior aspect of the lateral epicondyle by the common extensor tendon. The humeral head of the extensor carpi ulnaris (ECU) arises from the most medial aspect of the common extensor tendon. Involvement of the EDC or the ECU is considered to be rare **(Bosworth, 1965)**.

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Pathophysiological Mechanisms

The first publication on lateral epicondylitis was written in 1873 by the German physician Runge, who ascribed the symptoms to periostitis. Subsequently, several pathophysiological hypotheses were put forward. In 1936, Cyriax listed 26 possible mechanisms that can be categorized into three groups involving a neuroirritative process, referred pain or tendon damage, respectively **(Bar et al., 1988)**. There is still no consensus on the exact nature of the anatomic structures involved. However, damage to the tendons that extend the wrist and attach to the lateral epicondyle is often incriminated. Although the term “epicondylitis” seems to indicate an inflammatory mechanism, many studies have failed to find inflammatory cell infiltrates, particularly at the chronic phase of the disease **(Alfredson et al., 2000)**. Thus “epicondylalgia” may be a better term than “epicondylitis”, and another acceptable alternative may be “elbow tendinosis”, which indicate a degenerative process **(Khan et al., 2000)**.

In 1936, Cyriax postulated that microscopic or macroscopic tears of the common extensor origin were involved in the disease process **(Cyriax, 1936)**. Subsequently, other authors demonstrated that the disease process is actually a