

# Chiropractic management of elbow tendinopathy following a sports related trauma

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**Objective:** *This report describes chiropractic management of a case of sub-acute elbow pain and swelling with Active Release Technique® and acupuncture.*

**Case presentation:** *A 41-year-old male presented to a chiropractic clinic with a primary complaint of elbow pain and swelling following a fall while playing basketball five weeks prior.*

**Intervention and Outcome:** *Treatment consisted of two sessions of needle acupuncture and one treatment of Active Release Techniques® (ART) applied to the left elbow region.*

**Conclusions:** *The patient's outcomes indicated a quick resolution of subjective complaints and objective findings with the chosen treatment. Further research is needed to demonstrate safety, clinical effectiveness, and cost effectiveness when compared to other treatments.*

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**KEY WORDS:** chiropractic, acupuncture, Active Release Techniques (ART)®, elbow pain

**Objectif :** *Ce rapport décrit la gestion chiropratique d'un cas de douleur subaiguë et de gonflement au coude grâce à la technique Active Release Technique<sup>MD</sup> et à l'acupuncture.*

**Exposé de cas :** *Un homme de 41 ans s'est présenté à une clinique de chiropratique se plaignant principalement de douleurs et de gonflement au coude à la suite d'une chute lors d'un match de basketball cinq semaines auparavant.*

**Intervention et résultat :** *Le traitement consistait en deux séances d'acupuncture et d'un traitement par la technique Active Release Technique<sup>MD</sup> (ART) appliquée à la région du coude gauche.*

**Conclusions :** *Les résultats indiquent une résolution rapide des plaintes subjectives du patient et des constatations objectives grâce au traitement choisi. D'autres recherches s'imposent pour démontrer l'innocuité, l'efficacité clinique et la rentabilité de cette méthode par rapport à d'autres traitements.*

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**MOTS CLÉS :** chiropratique, acupuncture, Active Release Techniques (ART)<sup>MD</sup>, douleur au coude

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## Introduction

Forearm extensor tendinopathy is commonly seen between the fourth and fifth decades of life, with higher incidence in men than women, and more commonly of the dominant arm.<sup>1,2</sup> The onset of symptoms predominately arises from repetitive movement with wrist extension and alternating pronation and supination of the forearm. It is likely to be a self-limiting pathology and approximately 80% of patients newly diagnosed report improvement at one year.<sup>1,2</sup> An estimated 4-25% of patients are non-responsive to conservative management and will require surgical intervention.<sup>1,2</sup> Recognized poor prognostic factors for non-operative care include manual labor, dominant arm involvement, long duration of symptoms with high baseline pain levels, and poor coping strategies.<sup>3</sup>

Pathology of the extensor tendon is thought to originate with the extensor carpi radialis brevis (ECRB) and may additionally incorporate the extensor carpi radialis longus (ECRL), and extensor carpi ulnaris (ECU) muscles. Upon suffering a tendinopathy injury, these tendons appear to undergo a degenerative process characterized by immature fibroblasts, the appearance of nonfunctional vascular buds and the presence of disorganized collagen.<sup>4</sup>

The purpose of this report is to describe the successful chiropractic management of a case of elbow pain and swelling. This case appears to be the result of a sports related trauma as opposed to an overuse mechanism.

## Case

A 41-year old-Caucasian male presented with a primary complaint of generalized left elbow pain and swelling. The complaint began approximately five weeks prior following a fall while playing basketball. The patient described tripping and falling forward, landing on his left elbow, pointing to his left olecranon process. Medical consultation was sought at an orthopedic medical physician's office a few days following the injury. At that time, plain film radiographs were performed on the left elbow, revealing no abnormal findings and no treatment was rendered. Despite self-administered massage and use of non-specified over-the-counter non-steroidal anti-inflammatory medication, he continued to experience pain and swelling around the left elbow joint. He denied any sensation of numbness, tingling, burning, night time pain and/or muscles weakness. The patient described his elbow pain as a dull ache with the pain rated 5/10 on a numerical

pain rating scale. The patient further described his complaint as constantly "bothersome" on a daily basis and preventing him from engaging in pain-free recreational athletic activities, particularly basketball. The patient expressed that all activities that engaged his left elbow intensified his pain. The patient additionally noted a secondary complaint of minimal pain in the mid-back that began soon after the described fall. The patient failed to describe this complaint on a numerical pain rating scale. Review of past medical, health and family histories revealed no previous history of related complaints, no additional co-morbidities or additional items of note.

Physical examination revealed postural forward rotation of the shoulders bilaterally, a moderate decrease in left elbow extension due to pain, a moderate restriction in movement with thoracic spine flexion, extension and rotation bilaterally, and normal upper extremity deep tendon reflexes and muscle strength testing. Static palpation of the left elbow region revealed multiple areas of tenderness in the common wrist extensor muscles just distal to their insertion site. Static palpation of the thoracic spine revealed hypertonic erector spinae musculature bilaterally in the regions of T3-T8. Motion palpation of the thoracic spine revealed a lack of motion in the sagittal plane at the T3-4 and T6-7 vertebral motor units. Provocative testing revealed pain at the left lateral epicondyle upon resisted wrist extension (Cozen Test), and was unremarkable for resisted wrist flexion, varus and valgus stress testing of the left elbow. Marked swelling about the left elbow was noted particularly at the olecranon process and common wrist extensor musculature. He was diagnosed with sub-acute left elbow tendinopathy and thoracic spine segmental dysfunction secondary to a low-impact trauma.

Upon completion of examination, four acupuncture needles were superficially inserted into palpated areas of tenderness, just distal to the insertion site of the common wrist extensor muscles, for fifteen minutes. High velocity, low amplitude (HVLA) spinal manipulation was applied to the thoracic spine, with treatment area based upon restricted movements found in the examination. A home exercise program consisting of Brugger's exercises (A description of Brugger's exercises is beyond the scope of this paper and is described elsewhere)<sup>5</sup> were given to address postural dysfunction. The patient reported immediate elbow pain relief with moderately reduced swelling noted following acupuncture treatment. At the one week

follow-up session, the patient reported his swelling to have drastically reduced. The patient rated his elbow pain at a 1/10 on a numerical pain rating scale. He indicated that he had not yet attempted to engage in recreational athletic activities since the prior visit, but felt like he could do so with minimal pain. Physical examination revealed minimal swelling and hypertonicity of the left wrist extensor muscles. Static palpation of the left elbow region revealed multiple areas of tenderness in the common wrist extensor muscles just distal to their insertion site. Four acupuncture needles were superficially inserted into the left elbow just distal to the insertion site of the common extensor muscles for fifteen minutes. Additional treatment was administered consisting of the Active Release Techniques (ART)<sup>®</sup> wrist extensor group protocol, incorporating the extensor carpi ulnaris, extensor digiti minimi, and extensor digitorum muscles. Status post-treatment left elbow swelling and left wrist extensor muscle hypertonicity was decreased and the patient reported no pain. The patient was instructed to return for follow-up upon return of swelling or on as needed basis. Further treatment was not administered to the thoracic spinal region due to a lack of related subjective and objective findings at time of the follow-up visit.

The patient was contacted via telephone for follow-up at one week and six weeks post-treatment and reported no symptoms and full function of the left elbow. He reported a return to normal recreational athletic activities including basketball.

## Discussion

The differential diagnosis in lateral elbow pain includes lateral epicondylitis, radial tunnel syndrome, occult fracture, lateral synovial plica, injury to the lateral collateral ligament, and radiohumeral joint disease (synovitis, osteoarthritis).<sup>4</sup> A thorough workup of the patient with lateral elbow pain should include provocative testing, orthopedic maneuvers, neurological examination, neurodynamic testing, and when clinically indicated diagnostic imaging.

Provocative testing of elbow injuries should include Mill's, Cozen's, Varus/Valgus and Milking Maneuver. Mill's test is performed by palpating the lateral epicondyle and passively pronating the patient's forearm, flexing the wrist fully, and extending the elbow. Pain over the lateral epicondyle of the humerus indicates a positive test for lateral epicondylitis.<sup>6</sup> Cozen's test is performed by

asking the patient to actively make a fist, pronate the forearm, and radially deviate and extend the wrist while the examiner resists the motion. A sudden severe pain in the area of the lateral epicondyle of the humerus is a positive sign for lateral epicondylitis.<sup>6</sup> Valgus and varus testing of the elbow alternatively stresses the medial and lateral collateral ligaments respectively. The patient's elbow is flexed to 20 to 30 and stabilized with the examiners hand, a varus force is applied to test the lateral collateral ligament or a valgus force is applied to test the medial collateral ligament.<sup>6</sup> Milking Maneuver is an additional test for the medial collateral ligament. It consists of the patient sitting with the elbow flexed to 90 degrees or more and the forearm supinated. The examiner grasps the patient's thumb under the forearm and pulls it imparting a valgus stress to the elbow. Reproduction of symptoms indicates a positive test and a partial tear of the medial collateral ligament.<sup>6</sup> If the examiner suspects neurological involvement it would be wise to continue provocative movements with neurodynamic testing.<sup>7</sup>

Therapeutic modalities for lateral elbow pain vary widely and lack definitive evidence.<sup>8</sup> Non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroid injections have traditionally been used for the management of these patients. However, they have not been shown to be more effective than watchful waiting in the long-term.<sup>9,10</sup> Studies using NSAIDs to treat individuals who have a tendinopathy show minimal, if any, improvement in pain.<sup>11</sup> Based on a meta-analysis of physical interventions for lateral epicondylitis, exercise, manipulation techniques (including cross-friction massage), and acupuncture have shown significant short-term relief.<sup>9</sup> The same meta-analysis indicated that forearm strapping, taping, laser therapy, extracorporeal shock wave therapy, electromagnetic field and ionization, ultrasound, and phonophoresis either did not demonstrate a significant effect or showed an inconsistent effect on outcomes.<sup>9</sup>

A combination of acupuncture, ART<sup>®</sup> and spinal manipulation seemed to have been effective at resolving the patient's complaints and allowing him to return to normal activities. Traditional acupuncture theory acknowledges the notion of qi, described as life force or energy. Therefore, treatments seek to recognize energetic imbalances and attempt to restore the identified disharmonies.<sup>12</sup> Acupuncture treatments consist of the stimulation of specific points located on any of twelve main "meridians" which



Figure 1.

*Four acupuncture needles were superficially inserted into the common wrist extensor musculature region just distal to the lateral epicondyle. Two sessions of acupuncture were completed in this fashion for fifteen minute duration.*

control the flow of qi throughout the body. Traditional theory holds that restoration of energy flow subsequently encourages healing and decreases symptoms. For localized problem areas, a technique known as “surround the dragon” is commonly implemented. In this case, the “surround the dragon” technique was utilized. (Figure 1) This technique is performed by first palpating the area, particularly local “ah shi” or tender points, and stimulating the sites of tenderness. Studies have attempted to understand the physiological mechanisms to explain the benefits appreciated following acupuncture. Multiple theories on the analgesic mechanism of action have been concluded, including such theories as: release of endogenous opioids, stimulation of descending anti-nociceptive pathways, release of inhibitory neurotransmitters such as norepinephrine and serotonin, release of beta-endorphins, deactivation of multiple limbic areas subserving pain association, modulating the hypothalamic-limbic system, activation of the pain neuromatrix, and placebo.<sup>13-15</sup> Acupuncture has also been shown to initiate other systemic behaviors such as regulating central and peripheral blood distribution and microcirculation.<sup>16-18</sup> However, the mechanisms of these actions are yet to be fully understood.



Figure 2.

*One session of Active Release Techniques® wrist common extensor group protocol was performed. In order to treat the wrist extensor group, the clinician applies proximal tension distal to the lateral epicondyle while the patient extends the elbow and pronates and flexes the wrist.<sup>25</sup>*

ART® is described as a hands-on touch and case-management system that allows a practitioner to diagnose and treat soft-tissue injuries. This therapy is based on the observation that the anatomy of the forearm has traversing tissues situated at oblique angles to one another that are prone to reactive changes producing adhesions, fibrosis and local edema and thus pain and tenderness.<sup>19, 20</sup> During ART® therapy, the clinician applies a combination of deep digital tension at the area of tenderness and the patient actively moves the tissue through the adhesion site from a shortened to a lengthened position.<sup>19</sup> It is performed by applying a specific contact to the effected tissue and taking the tissue from a shortened position to a fully lengthened position while contact passes longitudinally along the soft tissue fibers.<sup>21</sup> In this case, in order to treat the wrist extensor group, the clinician applies proximal tension distal to the lateral epicondyle while the patient extends the elbow and pronates and flexes the wrist.<sup>21</sup> (Figure 2) This procedure is conducted several times until the practitioner sub-



jectively determines the tissue is moving properly and the adhesions are no longer palpated.<sup>20</sup> To date, there is little data regarding outcomes of ART® management of soft-tissue injury and no models describing the mechanism of action of this therapy has been established.<sup>22</sup>

HVLA spinal manipulation is an intervention commonly administered by chiropractors with the goal of restoring proper joint function and decreasing pain. In this case, HVLA manipulation was administered to the thoracic spine. Spinal manipulation is performed by applying a small thrust of specific magnitude in a controlled fashion to a targeted spinal joint. Although the mechanism of spinal manipulation has yet to be fully understood, data suggests the use of spinal manipulation as an option for the management of different types of spine related disorders, particularly of cervical and lumbar origin.<sup>23-25</sup> According to a 2010 report by Bronfort et al, spinal manipulation is considered inconclusive, yet favorable, for the management of mid-back pain.<sup>23</sup>

Although some studies have been conducted concerning acupuncture and manual therapies, such as Active Release Techniques (ART)®, for the management of certain musculoskeletal conditions, there is a lack of data regarding their use in sub-acute pain and swelling following low-grade trauma. In this case, the patient reported a substantial decrease in subjective symptoms and objective findings following one visit and full relief of symptoms following the second visit. No adverse effects were reported and the patient was able to gain sustained resolution of his condition within approximately one week of initial presentation to a chiropractic office. This case offers support for the use of chiropractic related therapies for the management of sub-acute elbow pain and swelling following a low-grade sports related trauma. To the best of our knowledge this is the first report describing a combination of acupuncture needling and active release technique for the treatment of elbow pain and tendinopathy.

### Limitations

A fault of this study is a lack of objective outcome measurements throughout the case. The treatment was multimodal and there is no way to determine the extent to which any individual treatment modality may or may not have contributed to the perceived beneficial outcome. The findings from one case may not necessarily be applicable to others.

### Conclusion

A case is presented with sub-acute elbow pain and swelling following a sports related trauma. The patient's clinical outcomes indicated a quick resolution of subjective complaints and objective findings with the chosen treatment. Further research in the form of additional case reports, case series, and clinical trials need to be performed to demonstrate the safety, clinical efficacy, and cost effectiveness of Active Release Techniques and acupuncture when compared to other treatments.

### Consent

Written informed consent was obtained from the patient for publication of this case report. A copy of written consent is available for review by the Editor-in-Chief of this journal.

### Authors' Contributions

JG cared for the patient, performed the literature review, and prepared the manuscript. CD performed the literature review and assisted in preparation of the manuscript. Both author's read and approved the final manuscript.

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