

Osteopathic Approach to Treatment of Radial Head Dysfunction: The Radial Head Range of Motion Technique

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ORIGINAL RESEARCH

Abstract

Falls on an outstretched hand, overuse, and restriction of motion at the wrist can all contribute to the formation of a radial head somatic dysfunction. Radial head somatic dysfunctions may contribute to or cause painful conditions of the forearm, elbow, and wrist and impact the proper balance of muscular, neural, and circulatory influences. The radial head range of motion technique is a simple and effective osteopathic manipulative treatment (OMT) that can be utilized to address discomfort of the lateral elbow, proximal forearm, and wrist.

Introduction

The radius is a bone of the forearm that functionally links the elbow to the wrist via the interosseous membrane and synovial radioulnar joints located both proximally and distally.¹ This connection explains how overuse can strain not only the forearm muscles, but also the wrist, elbow, and interosseous membrane. Following the diagnosis of a radial head somatic dysfunction, osteopathic manipulative treatment (OMT) with the radial head range of motion technique (see Supplemental Material: Video), is a simple and effective non-surgical procedure that can be utilized to address discomfort of the lateral elbow, proximal forearm, and wrist.

Anatomic Review

The joints of the elbow have four main movements that allow for normal range of motion (ROM): elbow flexion, elbow extension, forearm supination, and forearm pronation.¹⁻³ The radial head is involved in elbow flexion, forearm pronation and forearm supination due to its proximal articulations with the ulna via the radial notch and the capitulum of the humerus.¹⁻³ Passing anterior to the lateral epicondyle of the humerus, the radial nerve travels through the cubital fossa and divides into 2 branches.^{4,5} The deep branch, known as the posterior interosseous nerve, passes between the posterior muscles of the forearm and the muscles responsible for supination. Located between the radius and ulna, the interosseous membrane becomes taut during forearm supination.³ As the radial head glides posterior and anterior with pronation and supination respectively, the long bone mechanics of the radius crossing over the ulna results in 180 degrees of rotation at the proximal forearm.³ The lateral collateral ligament and annular ligament help to stabilize the radial head throughout its ROM.

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Disclosures: none reported.

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Submitted for publication April 7, 2021; manuscript accepted for publication June 22, 2021.

Keywords: tennis elbow, elbow pain, forearm pain, radial head somatic dysfunction, osteopathic manipulative treatment video, OMT, radial head range of motion technique

Impact of Radial Head Dysfunction

Common causes of radial head somatic dysfunction stem from the long-bone mechanics of the radius and include falls on an outstretched hand, overuse, and restriction of motion at the wrist.¹ The dysfunctional long-bone mechanics of the radius is implicated in lateral epicondylitis, radial tunnel syndrome, and carpal tunnel syndrome.^{1,3} Tenderness and increased tension of the forearm musculature is often related to increased sympathetic tone stemming from overuse.¹ A radial head somatic dysfunction can also result in a spiral strain pattern through the interosseous membrane extending from the proximal forearm to the wrist. According to the teachings of J. Gordon Zink, DO, this fascial strain results in local tissue tightness of the forearm creating a tourniquet effect, as lymphatic fluid and venous return are decreased and proper arterial flow is impeded as well (G. Bradley Klock DO, FAAO, written correspondence, March 2021). Management of radial head somatic dysfunction can be beneficial for not only painful conditions of the forearm, elbow, and wrist, but it can also help balance the neural and circulatory influences of the aforementioned conditions.

Assessing for Radial Head Dysfunction

One way to assess for a somatic dysfunction of the radial head, is with the patient seated, with their elbows flexed to 90 degrees and forearms at 0 degrees of pronation/supination with their wrists in

continued on page 33

continued from page 32

a neutral position.^{3,6} The patient is instructed to fully supinate and pronate their forearm as the physician assesses for asymmetry. A restriction from full supination of the forearm is termed a posterior radial head, while a restriction from full pronation is an anterior radial head.^{3,6,7}

Radial Head Range of Motion Technique

As an articulatory technique, the radial head range of motion technique takes the radial head through full excursion of flexion, extension, pronation, and supination, thus addressing restrictive anterior or posterior motion of the radial head. With the patient in a supine position, the physician sits on the table between the patient's arm and body. The patient's posterior elbow is placed across the physician's thigh, which acts as a fulcrum. The physician's thumb is placed over the anterior aspect of the radial head and their index and middle fingers are placed on the posterior aspect of the radial head. The physician's other hand grasps the patient's supinated wrist. While monitoring the radial head, the physician moves the forearm into full pronation and full elbow flexion. The physician continues to move the forearm into circumduction, followed by full supination and full extension. If the physician does not feel an articulation, the procedure may be repeated a few times with an increase in the velocity of the arc of motion near extension. This corrective procedure has a great deal of mechanical advantage, and care should be utilized to prevent strain of the elbow. To ensure a correction was achieved, the physician will recheck for the presence of a somatic dysfunction by repeating the diagnostic procedure and looking for improved symmetry.

Summary

Effective treatment of a radial head somatic dysfunction with radial head range of motion (see Supplemental Material: Video) can help reduce pain, balance neural influence, and increase circulation to the forearm ultimately helping to address complaints of the elbow, forearm, and wrist.¹

Supplemental Material

Video: To view the accompanying video for this article, please visit the following link www.youtube.com/watch?v=AzD2Bj2ml2Q.

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