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"AN OBSERVATIONAL STUDY EXPLORING THE RELATION BETWEEN MRI ABNORMALITIES OF THE COMMON EXTENSOR TENDON AND CLINICAL SYMPTOMS"

Radio-Diagnosis

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ABSTRACT

Aim: The aim of the present study was to investigate whether there is a potential relationship between MRI abnormalities of the common extensor tendon (CET) and its clinical symptom. **Methods:** This observational research was performed in the Department of Radiology, evaluating 30 consecutive patients diagnosed clinically with persistent lateral epicondylitis. All individuals underwent MRI evaluation of the afflicted limbs utilizing a 1.5-Tesla MR system with a specialized surface coil. All individuals had a standardized clinical assessment with a validate instrument called Patient-Rated Tennis Elbow Evaluation (PRTEE) the questionnaire. **Results:** 68 percent were men, 32 percent women. Patients aged 30-40 were most common, followed by 20-30 and 40-50. MRIs analyzed 30 elbows, showing 13 (44%) grade 1, 9 (30%) grade 2, and 8 (26%) grade 3 tendinopathy. Both VAS pain intensity and functional impairment ($r = 0.47$, $p < 0.001$) are positively connected with MRI abnormalities, as per Pearson's correlation coefficients. MRI abnormalities were inversely linked with symptom duration ($r = -0.24$, $p = 0.012$), suggesting that longer-lasting symptoms may have milder abnormalities.**Conclusion:** The findings support the basic hypothesis that MRI is a powerful diagnostic and prognostic tool for CLE. After identifying CLE patients at higher risk of severe symptoms by MRI, clinicians may give more individualized treatment regimens to enhance patient outcomes and quality of life.

KEYWORDS

Chronic Lateral Epicondylitis, Common Extensor Tendon, Magnetic Resonance Imaging, Pain, Structural Abnormalities, Tennis Elbow

INTRODUCTION

Lateral epicondylitis (LE) is a tendinopathy affecting the common extensor tendon (CET) of the forearm[1,2], with a frequency estimated at 1.1–4.9% in the general population [3,4].Recent investigations indicated that the lateral collateral ligament (LCL) of the elbow was concurrently damaged with the common extensor tendon (CET) in lateral epicondylitis (LE) [5,6].

Imaging modalities can identify degeneration and injury to the CET/LCL complex; ultrasonography and magnetic resonance imaging (MRI) are employed in routine assessments. Ultrasonography reveals edematous alterations and degeneration at the CET/LCL complex as hypointense changes or thickening, with a sensitivity of 64% and a specificity of 82% [7]. The accuracy of ultrasonography is contingent upon the examiner's expertise, leading to diminished inter-examiner dependability [8]. CLE often results in pain, physical limitations, and diminished occupational and recreational performance, significantly impacting an individual's quality of life and work productivity [9,10]. Despite the straightforward clinical diagnosis of CLE based on its distinctive symptoms, researchers and physicians remain focused on the underlying pathological alterations inside the CET, particularly as revealed by advanced imaging modalities like as Magnetic Resonance Imaging (MRI) [10]. Examining the relationship between MRI abnormalities of the common extensor tendon and the symptoms experienced by persons with CLE is crucial [11].

The definitive diagnosis of lateral epicondylitis is mostly based on clinical history and examination. Patients report discomfort in the lateral elbow, which is generally worse by digital resistance and wrist extension. During the physical examination, patients exhibit localized soreness at the common extensor tendon (CET) [12]. Magnetic resonance imaging (MRI) has superior contrast resolution for soft tissue and has shown satisfactory levels of sensitivity, specificity, and accuracy in diagnosing lateral epicondylitis.

The objective of this study was to assess magnetic resonance imaging (MRI) in patients with chronic lateral epicondylitis and to examine the possible correlation between MRI abnormalities of the common extensor tendon (CET) and clinical symptoms.

MATERIALS AND METHODS

This is an observational study where 30 consecutive patients with a clinical diagnosis of chronic lateral epicondylitis were assessed.

Inclusion Criteria

- Individuals who have been clinically evaluated and documented as having Chronic Lateral Epicondylitis.
- Patients for whom MRI scans of the injured elbow are available.

Exclusion Criteria

- Patients who have had elbow surgery in the past.
- Patients have other illnesses (such as rheumatoid arthritis or neuropathies) that might affect the study's findings.

Methodology

A preliminary radiographic examination of the elbow was conducted for all patients to rule out bone pathologies, including osteoarthritis or intra-articular loose bodies. All individuals underwent MRI evaluation of the afflicted limbs utilizing a 1.5-Tesla MR system with a specialized surface coil. The examination was conducted in a supine posture with the afflicted elbow extended and the palms supinated.

A grading system was developed to assess the degree of tendinopathy at the lateral epicondyle; this method was a modification created by Walz et al. [13]. All participants underwent a standardized clinical examination utilizing a validated tool known as the Patient-Rated Tennis Elbow

Evaluation (PRTEE) [14]. The questionnaire comprises two sections: Section 1 addresses pain (5 questions rated from 0 to 10), and Section 2 pertains to functional impairment (10 questions rated from 0 to 10). Section 2 is categorized into particular tasks (e.g., turning a doorknob) and routine activities (e.g., dressing, washing). Functional ratings are then divided by two and summed with pain scores. The lowest achievable score is 0 (indicating no pain or impairment), while the highest is 100 (indicating severe pain and disability).

Statistical Analysis

The statistical analysis was conducted utilizing SPSS version 22. The MR score for each observation from three experts was averaged, and the resultant value was correlated with the standardized clinical evaluation measure using Spearman's rank correlation test. The p-value was set at 5%.

RESULTS

Table 1: Demographic details of the study population

Gender	N	Percentage
Male	20	66.6
Female	10	33.3
Age (years)		
Below 20 years	1	< 1
20-30	8	28
30-40	14	44
40-50	6	20
Above 50	1	< 1

68% were male and 32% were females. Majority of the patients belonged to 30-40 years followed by 20-30 years and 40-50 years.

Table 2: Assessment of tendinopathy on MRI

Parameter	N	Percentage
Grade 1	13	44
Grade 2	9	30
Grade 3	8	26

30 elbows had MRI assessed tendinopathy, that includes 13 (44%) with grade 1, 9 (30%) with grade 2, and 8 (26%) with grade 3.

Table 3: Association between MRI Abnormalities and Clinical Symptoms

Clinical Symptom	Pearson's Correlation Coefficient (r)	p-value
Pain Severity (VAS)	0.64	<0.05
Functional Impairment	0.47	<0.05
Symptoms (Duration)	-0.24	0.021

Both pain intensity (as measured by the Visual Analogue Scale, VAS) and functional impairment ($r = 0.47$, $p < 0.001$) are positively correlated with MRI abnormalities, as shown by Pearson's correlation coefficients. Symptom duration was negatively correlated with MRI abnormalities ($r = -0.24$, $p = 0.012$), suggesting that patients who have experienced symptoms for longer may have less severe abnormalities on MRI.

On MRI: All the patients showed variable amount of increased signal intensity at the attachment of common extensor tendon to lateral epicondyle (Figure 1). 8 patients with acute symptoms showed minimal joint effusion and focal edema in lateral aspect of elbow.

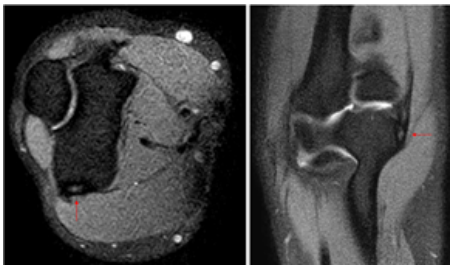

Figure 1: Axial and Coronal section of PD weighted images showing right elbow of a 27 year male depicting increased signal intensity of common extensor tendon at its attachment to lateral epicondyle.

DISCUSSION

Lateral epicondylitis, often referred to as "tennis elbow," is the predominant cause of pain or dysfunction in the elbow [15]. Lateral epicondylitis, resulting from repetitive contraction of the forearm extensor muscles, leads to micro-tearing, subsequent degeneration, inadequate healing, and tendinosis, especially at the proximal region of the common extensor tendon (CET) [16].

The diagnosis of lateral epicondylitis is often established by clinical evaluation; patients display a spectrum of symptoms that vary from minor, although persistent, discomfort during daily activities to severe and substantially debilitating manifestations affecting nearly all aspects of life. The Patient-rated Tennis Elbow Evaluation (PRTEE) questionnaire was created by MacDermid and associates, specifically targeting individuals with lateral epicondylitis. 68% were male and 32% were female. The majority of patients were aged 30-40 years, followed by those aged 20-30 years and 40-50 years. Thirty patients underwent MRI evaluation of elbow for tendinopathy, including 13 (44%) with grade 1, 9 (30%) with grade 2, and 8 (26%) with degree 3. Both pain intensity, as quantified by the Visual Analogue Scale (VAS), and functional impairment ($r = 0.47$, $p < 0.001$) have a positive link with MRI abnormalities, as indicated by Pearson's correlation coefficients. The length of symptoms exhibited a negative correlation with MRI abnormalities ($r = -0.24$, $p = 0.012$), indicating that individuals with prolonged symptoms may present with less severe MRI abnormalities. The studies by Potter et al. and Steinborn et al. indicated that magnetic resonance examination of lateral epicondylitis had a strong correlation with surgical and histological results [17]. A meta-analysis research corroborated that 90% of patients with lateral epicondylitis exhibited aberrant signals in the common extensor tendon of the afflicted elbows, in contrast to 14% of the control group [18].

CONCLUSION

The results confirm the idea that MRI is a good diagnostic and prognostic tool for CLE. After MRI tests identify CLE individuals at high risk of severe symptoms, clinicians can improve patient outcomes and quality of life by delivering more tailored treatment. We need more research to understand this relationship and improve therapy for this complicated condition. Our findings add to the evidence that MRI can explain and treat CLE.

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