

ORIGINAL ARTICLE

Influence of the thickness of the transverse carpal ligament in carpal tunnel syndrome[☆]



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KEYWORDS

Magnetic resonance;
Tunnel carpal
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Abstract

Objective: To determine if the thickness of the transverse carpal ligament measured by T2 axial magnetic resonance imaging actually influences the onset of carpal tunnel syndrome.

Material and method: 94 patients between January 2015 and June 2016, of whom 28 had carpal tunnel syndrome, underwent magnetic resonance imaging, 37 with discomfort in different carpus regions without symptoms of carpal tunnel and 29 healthy subjects. Two observers performed 3 measurements in 3 different levels, and in the 3 groups of patients.

Results: No statistically significant differences in transverse carpal ligament thickness measurements between the carpal tunnel syndrome group and the group without carpal tunnel involvement became apparent, but statistical differences between the control group and the carpal tunnel syndrome group, and between the control group and the group without involvement of the carpal tunnel were observed. In both these groups, the thickness of the transverse ligament was higher than in the control group.

Discussion: An increase in the thickness of the transverse ligament in was found in this study in subjects with involvement of carpal tunnel syndrome as evidenced by numerous studies in the literature. There is no certain causative factor, but rather a set of facts that make onset of the syndrome possible in a specific group of patients.

Conclusion: Carpal tunnel syndrome is multifactorial. The thickness of the transverse ligament does not directly affect the onset of symptoms.

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PALABRAS CLAVE

Resonancia magnética;
Síndrome del túnel carpiano;
Retináculo flexor

Influencia del espesor del ligamento transverso del carpo en el síndrome del túnel carpiano**Resumen**

Objetivo: Determinar si el espesor del ligamento transverso del carpo medido en el corte axial T2 en resonancia magnética influye realmente en la aparición del síndrome del túnel carpiano.

Material y método: Se realizó resonancia magnética de la región de la muñeca a 94 pacientes entre enero del 2015 y junio del 2016, de los cuales 28 presentaban síndrome del túnel carpiano, 37 con molestias en diferentes regiones del carpo, sin síntomas de túnel carpiano y 29 sujetos sanos. Dos observadores realizaron 3 medidas en 3 niveles diferentes y en los 3 grupos de pacientes.

Resultados: No se evidenciaron diferencias estadísticamente significativas en las medidas del espesor del ligamento transverso del carpo entre el grupo de síndrome del túnel carpiano y el grupo sin afectación del túnel, pero sí hubo diferencias estadísticas entre el grupo control y el grupo afecto de síndrome del túnel carpiano y entre grupo control y grupo sin afectación del túnel carpiano. En estos dos grupos, el espesor del ligamento transverso fue mayor al grupo control.

Discusión: En este estudio se evidencia un aumento del ligamento transverso en sujetos con afectación de síndrome del túnel carpiano como demuestran numerosos estudios de la literatura, pero no existe un factor causal determinado sino un conjunto de hechos que hacen posible la aparición de dicho síndrome en un determinado grupo de pacientes.

Conclusión: El síndrome del túnel carpiano es multifactorial, sin intervenir directamente el espesor del ligamento trasverso en la aparición de los síntomas.

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Introduction

The carpal tunnel is a fibre-bone channel in the volar part of the carpal bone. It is composed of the carpal bones, while the bottom of the tunnel consists of the transverse ligament. This ligament band is 3–4 cm wide¹ and from 0.8 to 2.5 mm thick,² in a range from 1.3 to 3 mm depending on the point at which it is measured.

The carpal tunnel syndrome (CTS) is the most frequent neuropathy of the peripheral nerve. It is caused by compression of the median nerve in the wrist³ against the carpal transverse ligament, which swells.⁴ It is particularly common in middle-aged women³ and in people who are in work, although a clear cause in its etiopathology has yet to be ascertained.

In the majority of cases it is idiopathic, although it may occur in cases of systemic disease or conditions (rheumatoid arthritis, diabetes, pregnancy, etc.). It may also be secondary to lesions that occupy space: ganglions, fibromas, lipomas, osteophytes and gout tophi.³ On other occasions it is secondary to injury, and it is associated with hard manual labour.⁵

The most significant symptom is tingling in the area of the carpus and fingers.⁶

There is a lack of agreement in the different publications on the definition of the transverse carpal ligament (TCL) and the flexor retinaculum, as both terms refer to the same thing. We have chosen the description by the authors Pacek and Manley^{7,8} for our work. According to them the flexor retinaculum refers to a volar fascial plane that is under the palm fascia and which is comprised of 3 parts: (a) proximal, the

continuation of the antebrachial fascia; (b) medial, corresponding to the TCL itself, which is thicker than the first part with 4 connections to bones, the trapezium, scaphoid tubercle, the pisiform bone and the hook of the hamate bone, and (c) distal, corresponding to the aponeurosis between the thenar and hypothenar musculature.^{7,8}

The aim of this study is to evaluate the influence of the thickness of the transverse ligament in the appearance of carpal tunnel syndrome. This is due to the existence of certain disagreements that have arisen between the traumatologists and radiologists in our hospital.

Material and method

Study design: a prospective and descriptive study of a series of patients undertaken from January 2015 to June 2016. It was approved by the Ethics Committee of the institution.

Patients: 94 patients were included and classified in three groups. 28 had the typical clinical symptoms of CTS (group A), 37 had discomfort in different parts of the carpus without carpal tunnel syndrome symptoms (group B) and 29 were healthy subjects (group C). All of the patients in the study signed their informed consent so that they could be included in it.

Patients who had been operated for any reason in the carpus were excluded, as were those with a history of distal radiocubital joint fracture or carpus fracture, patients with rheumatoid arthritis, diabetes mellitus, those who were pregnant and those who due to movement or lack of cooperation could not give reliable ligament measurements.

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