Case report

ABERRANT ABDUCTOR DIGITI MINIMI MUSCLE FOUND DURING OPEN SURGICAL DECOMPRESSION OF THE CARPAL TUNNEL: CASE REPORT

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RESUMEN

En este artículo reportamos un caso interesante de músculo hipotenar aberrante encontrado durante una descompresión del túnel carpiano. La variante muscular surgía de la fascia antebraquial voloradial, y pasaba sobre la arteria y el nervio ulnar en el canal de Guyón, y se insertaba en la cara ulnar hipotenar. La tensión en el vientre muscular produjo ligera abducción de la quinta articulación metacarpofalángica, lo que confirmó que el músculo era abductor digiti minimi aberrante. Observamos asimismo las diferentes variaciones de este músculo y ponemos énfasis en su potencial implicancia clínica.

***Palabras clave**: Abductor digiti minimi aberrante, canal de Guyón, descompresión del túnel carpiano*

ABSTRACT

Herein, we present an interesting case of an aberrant hypothenar muscle found during carpal tunnel decompression. The variant muscle arised from the voloradial antebrachial fascia and coursed over the ulnar artery and nerve in the Guyon canal, and inserted into the ulnar aspect of the hypothenar. Tension on the muscle belly provided slight abduction of the fifth metacarpophalangeal joint, which confirmed it to be an aberrant abductor digiti minimi muscle. We also discuss different variations of this muscle and emphasize its potential clinical implications.

***Key words**: Aberrant abductor digiti minimi muscle, Guyon canal, carpal tunnel decompression*

INTRODUCTION

The variations of the hypothenar muscles are numerous, many of them described during anatomical rather than surgical dissection (Macalister, 1875; Le Double, 1897; Saadeh and Bergman, 1988; Jeffery, 1971; Pribyl and Moneim, 1994; Spinner et al, 1996; Georgiev and Jelev, 2007; Georgiev et al, 2007; Georgiev and Jelev, 2009; Georgiev and Jelev, 2011). In livings, most of the aberrant muscles are usually asymptomatic or may occasionally simulate a soft-tissue tumor (Simodynes and Cochran, 1981). Other variant hypothenar muscles may cause ulnar nerve and artery compression at the wrist, as described in some clinical reports (Jeffery, 1971; Simodynes and Cochran, 1981; Pribyl and Moneim, 1994; Spinner et al, 1996).
Herein, we present an unusual case of an aberrant hypothenar muscle and emphasize its potential clinical importance.

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Figure 1: Intraoperative photograph presenting the aberrant abductor digiti minimi muscle (asterisk).

CASE REPORT

An 81-years old Caucasian male was admitted to our institution for surgical decompression of the carpal tunnel of the non-dominant left hand for slowly aggravating bilateral carpal tunnel syndrome and distal ulnar tunnel syndrome over the past ten years on the basis of chronic tenosynovitis of the flexor tendons of the wrist and fingers. During surgery, which was performed through a modified Inglis incision for wider exposure and partial synovectomy of the tendons in the distal forearm, an aberrant muscle was found arising from the voloradial ante-brachial fascia and coursing distally and ulnarward over the flexor tendons of the carpal tunnel and over the ulnar artery and nerve in the Guyon canal, and inserting into the ulnar aspect of the hypothenar (Fig. 1). The variant muscle belly was fusiform, 5 mm wide, 2 mm thick, and at least 40 mm long as reasonable surgical dissection could reveal. Tension on the muscle belly provided slight abduction of the fifth metacarpophalangeal joint, *which confirmed it to be an aberrant abductor digiti minimi muscle*. After the muscle was divided in line with the incision, surgery was continued as planned.
There was complete resolution of symptoms in all digits in the early postoperative period followed by uneventful wound healing

DISCUSSION

Compression neuropathies at the wrist are frequent and have been well described. They can be provoked by ganglia, neoplastic masses, vascular abnormalities, ligamentous attachments, and also different anomalous muscles (Shea and McClain, 1969; Santoro et al, 2000). The reported muscular variations most commonly involved in the compression neuropathies at the wrist included those of abductor digiti minimi, flexor digiti minimi brevis manus, and palmaris longus muscles (Jeffery, 1971; Pribyl and Moneim, 1994; Spinner et al, 1996; Santoro et al, 2000; Harvie et al, 2004). According to Dodds et al (1990) the most common aberrant muscle in Guyon's canal is the abductor digiti minimi, with an incidence of 22.4%.
The reported variations of the abductor digiti minimi muscle are absence, presence of a second head, variant origin (from the pisiform bone, forearm fascia, palmaris longus tendon, reversed palmaris longus, fascia of the flexor carpi radialis, intermuscular fascia, flexor carpi ulnaris, flexor retinaculum, both from the flexor retinaculum and antebrachial fascia), fusion with the flexor digiti mnimi brevis, presence of "deep abductor-flexor", and also triple origin (Macalister, 1875; Le Double, 1897; Saadeh and Bergman, 1988; Jeffery, 1971; De Smet, 2002; Al-Qattan, 2004; Georgiev et al, 2007; Georgiev and Jelev, 2009). Usually, the accessory abductor digiti minimi muscle is innervated by a separate branch of the ulnar nerve and supplied by ulnar artery muscular branches (Dimitriou and Natsis, 2007).
Although such an aberrant muscle is usually asymptomatic, an injury or muscle hypertrophy due to overuse in manual workers may be the causative factor for developing symptoms of nerve compression (Turner and Caird, 1977). Despite its uncertain clinical significance in this case, involvement of aberrant muscles of the hypothenar in compression neuropathies of the wrist has been reported on some occasions (Jeffery, 1971; Simodynes and Cochran, 1981; Spinner et al, 1996; Al-Qattan, 2004). This could be of special consideration in distal ulnar tunnel syndrome when the variant muscles insert in the medial aspect of the hypothenar because the ulnar nerve normally lies medial to the artery in Guyon's canal (Hoppenfeld and deBoer, 1994). In the cases of ulnar nerve and artery compression, ultrasound scanning and/or MRI could be used as imaging techniques which clearly identify the variant muscle around Guyon's canal (Zeiss et al, 1992; Ruocco al, 1998; Harvie et al, 2004). Resection of the anomalous muscle results in long-lasting resolution of symptoms. (Dimitriou and Natsis, 2007).
In conclusion, knowledge of this anatomical variant of the abductor digiti minimi muscle should be born in mind by clinicians in relation to compression neuropathies, tendon harvests, or muscle transpositions.

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