

A Variation of Flexor Carpi Ulnaris Muscle: A Case Report

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Abstract

Purpose: Flexor carpi ulnaris muscle (FCUM) is one of the muscles of the superficial flexor group which is located most medially in the forearm. This study aimed to emphasize the importance of variations of the FCUM in clinical diagnosis and surgical procedures.

Methods: While performing routine gross anatomy dissection of an adult male formaldehyde fixed cadaver in laboratory of Anatomy Department, we observed a unilateral variation of FCUM in the left upper extremity.

Results: FCUM was originated with one common tendon and separated into two bellies at the distal half of forearm, and extended with two tendons. The connecting tendons were inserted to pisiform, hamate bones, and proximal of the fifth metacarpal bones.

Conclusion: The detection of FCUM variations is significantly important not only in the treatment of pressure related symptoms which they cause but also in reconstructive and orthopedic surgery.

Keywords: Flexor carpi ulnaris muscle, variation, forearm

INTRODUCTION

Flexor carpi ulnaris muscle (FCUM) is an important muscle in the forearm belonging to the anterior flexor compartment, and it provides strength to wrist flexion and ulnar adduction. Besides, it is used for flap surgery (1).

The prevalence of anomalies related to FCUM is rare. No anomalies of the FCUM were found among 5000 cadaver specimens which were surveyed (1). However, a number of reported FCUM anomalies have been established via ultrasound, during surgery, or cadaver dissection (2, 3). Therefore, the knowledge of possible major anomalies which may give rise to misidentification of anatomical structures during surgical procedures on the forearm and wrist is of crucial importance (4).

CASE REPORT

A variation of FCUM on the left forearm of an adult male cadaver was observed during anatomical dissection. The cadaver belonging to the Anatomy Laboratory of Dokuz Eylül University, School of Medicine was fixed with %10 formalin solution.

The anomalous FCUM was arising with the common tendon from the medial epicondyle; however, the belly of the muscle was split

into two parts proximally at the forearm, and extended with two tendons through the distal forearm (Figure 1). The fibers of these tendons were attached to the pisiform, the hamate and proximal of the fifth metacarpal bone anterior to flexor retinaculum (Fig. 2). Ulnar nerve and artery were located lateral to the tendon of the variant muscle (Figure 2). We did not observe any other variations on the left upper extremity of the cadaver. This case was examined morphologically, and photographed.

DISCUSSION

The flexor carpi ulnaris muscle (FCUM), positioned most medially in the forearm, belongs to the superficial flexor group of muscles (5). FCUM is a genuinely bipennate muscle and possesses an independent nerve and has its own vascular supply (6). Its humeral head is small, and originates from the medial epicondyle; the origin of the ulnar head is extensive, and it attaches to the medial margin of the olecranon and proximal two-thirds of the posterior border of the ulna. At its anterolateral border, in its distal half, it forms a thick tendon which is attached to the pisiform, and extends to the hamate and fifth metacarpal (5).

Soft tissue defects of the posterior elbow may develop secondary to trauma and wound dehiscence due to burns, chronic

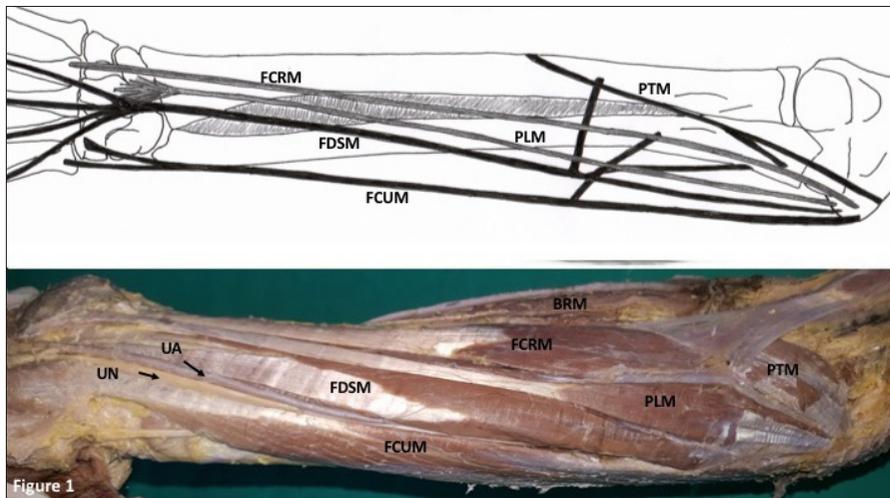


Figure 1. Normal placement of the forearm muscles in the upper right extremity (BRM: Brachioradialis muscle, FDSM: Flexor digitorum superficialis muscle, PTM: Pronator teres muscle, FCRM: Flexor carpi radialis muscle, PLM: Palmaris longus muscle, FCUM: Flexor carpi ulnaris muscle, UA: Ulnar artery, UN: Ulnar nerve).

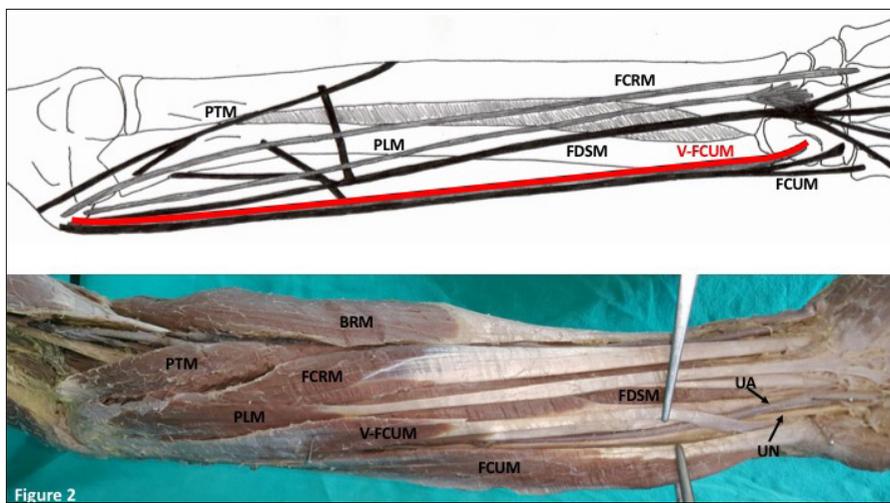


Figure 2. The flexor carpi ulnaris muscle with variation on the upper left extremity (BRM: Brachioradialis muscle, FDSM: Flexor digitorum superficialis muscle, PTM: Pronator teres muscle, FCRM: Flexor carpi radialis muscle, PLM: Palmaris longus muscle, FCUM: Flexor carpi ulnaris muscle, V-FCUM: flexor carpi ulnaris muscle with variation, UA: Ulnar artery, UN: Ulnar nerve).

inflammation, and bursitis (7-9). The larger ulnar and smaller humeral heads comprising the FCUM are both able to affect independently with one being confined for wrist flexion and ulnar deviation strength while the other is for tendon transfer or soft tissue coverage of the region (10, 11).

The rare anatomic variations which exist emphasize the importance of appropriate preoperative planning, and the need for the consideration of alternative reconstructive options (12).

These anomalies may be clinically asymptomatic, and may be detected incidentally during anatomical dissections or surgical treatment of lacerations (13). They may rarely be accompanied with pain, mass in forearm, or with symptoms of ulnar nerve compression (2). Bhardwaj et al. (13) propose a system for the classification of FCUM variations based on reviews of literature, and they define three major groups of anomalies:

Type 1: Single muscle with two tendons (split tendon): the presence of a single muscle with two separate tendons.

Type 2: Each head forming separate muscle and tendon (Digastric FCU): the presence of two heads each forming a separate muscle and tendon.

Type 3: Extra muscle in addition to normal FCUM (accessory FCU): the presence of an extra muscle in alongside the normal FCUM

Ciftcioglu et al. (14) reported a FCUM that possessed only a humeral head; another muscle belly originating from medial epicondyle lying between flexor digitorum superficialis and FCUM and was attached to triquetral, hamate bones, and flexor retinaculum.

Sawant et al. (15) reported a FCUM which had separate humeral and ulnar heads, and combined tendons just before their insertion to pisiform. In both of these studies the muscular anomalies observed were classified as type 2 described by Bhardwaj et al. (13).

We observed the anomalous FCUM which has a separate muscle belly extending from the proximal part of the forearm, and form a separate tendon inserting to the to the pisiform, the hamate and proximal of the fifth metacarpal bone. We interpreted it as type 2 (Fig. 1 and 2) according to classification described by Bhardwaj et al. (13).

The detection of FCUM variations is significantly important not only in the treatment of pressure related symptoms which they cause but also in reconstructive and orthopedic surgery.

Informed Consent: Written informed consent was obtained from patient who participated in this case

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - MG; Design - MG; Supervision - MG, GNY; Literature Search - GNY, SC, SS, CE; Writing - GNY, SC; Critical Reviews - GNY, MG; Cadaver Dissection - GNY, SC, SS, CE

Conflict of Interest: The authors declare that there are no conflicts of interest.

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