

Additional Belly Of Flexor Carpi Ulnaris Muscle Found In A South Indian Male Cadaver

V Vollala, P Kumar

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Abstract

The flexor carpi ulnaris has been studied bilaterally in 50 South Indian cadavers. In one of the specimens an additional belly was observed unilaterally on the left side. The belly took origin from the medial side of the coronoid process and formed a tendon near its insertion to the tendon of flexor carpi ulnaris. The additional belly was supplied by a branch coming from the median nerve. The insertion of the tendon of flexor carpi ulnaris was normal. Morphologic features of the flexor carpi ulnaris muscle are important because of its role in sports persons especially in players of cricket, tennis, golf and hockey. The presence of such a variation may be beneficial. An understanding of this unusual finding may be clinically relevant in describing the anterior compartment of the forearm.

INTRODUCTION

Flexor carpi ulnaris is the most medial muscle of the superficial forearm flexors. It arises by two heads, humeral and ulnar, connected by a tendinous arch. The small humeral head arises from the medial epicondyle via the common tendon. The ulnar head has an extensive origin from the medial margin of the olecranon process and proximal two-thirds of the posterior border of the ulna, an aponeurosis (which it shares with the extensor carpi ulnaris and flexor digitorum profundus), and from the intermuscular septum between it and flexor digitorum superficialis. A thick tendon forms along its anterolateral border in its distal half. The tendon is attached to the pisiform, and thence prolonged to the hamate and fifth metacarpal bone by pisohamate and pisometacarpal ligaments. Acting with the flexor carpi radialis, it flexes the wrist and acting with the extensor carpi ulnaris it adducts the wrist [1]. Flexor carpi ulnaris is innervated by the ulnar nerve (C7, C8 and T1). The line between the medial humeral epicondyle and the pisiform, along the anterior palmar margin of the muscle, is used as a reference point for locating the ulnar neurovascular bundle. The ulnar artery reaches the muscle in its middle third, whereas the ulnar nerve is covered by the muscle throughout its entire course running under the tendon in the wrist region.

CASE STUDY

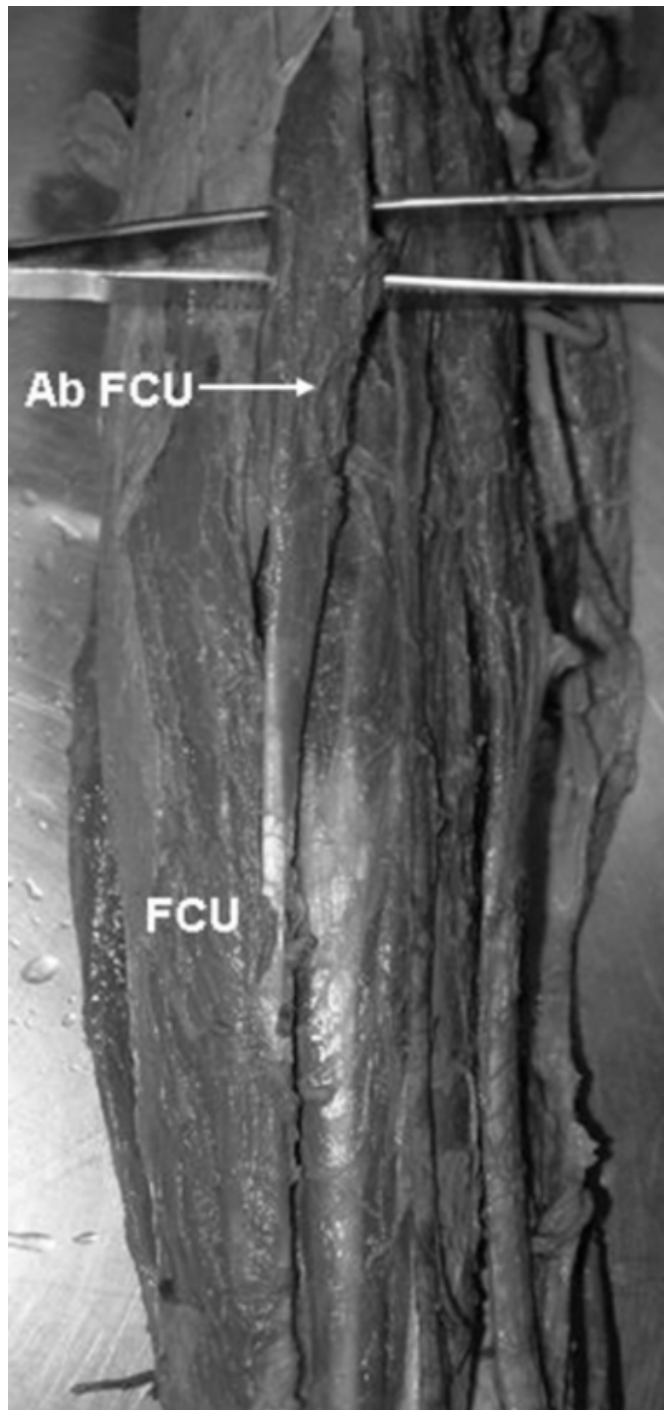
50 South Indian cadavers were dissected in the Melaka Manipal Medical College Anatomy Laboratory. One of the

specimens revealed an anomalous flexor carpi ulnaris (FCU) muscle on the left side. The FCU muscle was studied in detail with regard to its origin, insertion, attachments and innervation and was photographed (Figure 1). The dissections of upper limbs were carried out according to the instructions by Cunningham's manual of practical anatomy [2]. Both upper extremities (right and left) of the body were dissected. The dissections took place during 2005–2006. The bodies were preserved by the injection of a formalin - based preservative (10% formalin) and stored at – 4°C.

The present variation was found in the left upper extremity. However the right upper extremity was normal. The cadaver showed an anomalous flexor carpi ulnaris. There was an additional belly for the FCU which was taking origin from the medial side of the coronoid process and inserted into the tendon of FCU (Figure 1).

Figure 1

Figure 1: Anomalous flexor carpi ulnaris muscle



Ab FCU – additional belly of flexor carpi ulnaris, FCU – flexor carpi ulnaris

The additional belly was innervated by a branch coming from the median nerve, whereas the normal FCU was supplied by ulnar nerve. The insertion of the tendon of the FCU was normal.

DISCUSSION

Anatomical variations of the flexor carpi ulnaris that have been reported previously are (a) variations in musculo-tendinous junction of the flexor carpi ulnaris muscle [3] (b) variant flexor carpi ulnaris causing ulnar nerve compression [4] (c) an additional slip of flexor carpi ulnaris [5] as in the present case.

The FCU acts as an anatomical guideline for finding the neurovascular bundle (ulnar nerve, ulnar artery and accompanying venae comitantes), it can be easily palpated in its distal course if the wrist is flexed and adducted. The present variation needs to be taken into account when interpreting ultrasound and MR images, as well as during dissection of the ulnar neurovascular bundle when using FCU as a guideline.

The flexor carpi ulnaris is a useful local muscle flap in the forearm and elbow. It is, however, an important palmar flexor and ulnar deviator of the wrist, and functional loss may arise from the use of this muscle in its entirety. The flexor carpi ulnaris is made up of two distinct neuromuscular compartments. This arrangement allows for splitting of the muscle and the potential use of the larger ulnar compartment as a local muscle flap while maintaining the humeral compartment as an ulnar deviator and palmar flexor of the wrist [6].

After multiple efforts to heal an infected nonunion of the proximal ulna, Meals (1989) has used a flexor carpi ulnaris muscle pedicle flap to improve blood supply and soft-tissue coverage at the nonunion site and observed promoted bone healing and restoration of useful elbow function [7].

In many sports like cricket, tennis, golf and hockey, in which a ball is struck with a bat, club, or racket the wrist may be injured—either by overuse or by abrupt interference with the swing. The present variation may be useful to play the above sports since the additional belly of the FCU strengthens the muscle and helps in powerful movement of wrist.

CORRESPONDENCE TO

Venkata Ramana Vollala, MSc. Lecturer, Department of Anatomy, Melaka Manipal Medical College (Manipal Campus), International Centre for Health Sciences, Manipal-576104, Karnataka State, India. Email: ramana.anat@gmail.com Phone: 91-820-2922642 Fax: 91-820-2571905

References

1. Susan Standring. Gray's Anatomy, 39th edn. Elsevier Churchill Livingstone. 2005; 877.
2. Romanes GJ. Cunningham's Manual of Practical Anatomy. 15th edn, Volume One, Upper and lower limbs. Oxford University Press. 2003; 74 - 75.
3. Grechenig W, Clement H, Egner S, Tesch NP, Weiglein A, Peicha G. Musculo-tendinous junction of the flexor carpi ulnaris muscle. An anatomical study. Surg Radiol Anat 2000; 22: 255-260.
4. Al-Qattan MM, Duerksen F. A variant of flexor carpi ulnaris causing ulnar nerve compression. J. Anat 1992; 180: 189-190.
5. Bergman RA, Thomson SA, Afifi AK, Saadash FA. Compendium of human anatomic variations. Urban & Schwarzenberg, Baltimore - Munich. 1988; 13.
6. Lingaraj K, Lim AY, Puhaindran ME, Kumar PV. The Split Flexor Carpi Ulnaris as a Local Muscle Flap. Clin Orthop Relat Res 2007; 455: 262-266.
7. Meals RA. The use of a flexor carpi ulnaris muscle flap in the treatment of an infected nonunion of the proximal ulna. A case report. Clin Orthop Relat Res 1989; 240: 168-172.

Author Information

Venkata Ramana Vollala, M.Sc.

Department of Anatomy, Melaka Manipal Medical College (Manipal Campus)

Potu Bhagath Kumar, M.Sc.

Department of Anatomy, Kasturba Medical College