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Case Report
Published: 11 Oct, 2018

Journal of Clinical Case Reports

Unilateral Reversed Palmaris Longus Muscle - Anatomical Variation: A Case Report

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Abstract

Palmaris longus muscle is one of the superficial flexor muscles of upper extremity that is the most liable to anatomical variation as compared other muscles of upper limb. The most commonly encountered anatomical variation is completely absent from bilateral upper limb, followed reversed, unilateral absence. The reversed palmaris longus muscle denotes a structure that is tendinous proximally and muscular distally. The present case study describes a case of reversed palmaris longus muscle that elucidates the wide range of anatomical variation for its clinical and surgical significance

Keywords: Anatomical variation; Palmaris longus; Case report

Introduction

Palmaris longus muscle (PLM) is a fusiform superficial forearm muscle with short belly that arises from the medial epicondyle of humerus at a common flexor origin and its long tendon passes to the palm above flexor retinaculum to become palmar aponeurosis. PLM tendon is located between the tendons of flexor carpi radialis (laterally) and flexor carpi ulnaris (medially) at the distal middle ventral surface of forearm. It is innervated with a branch of median nerve and its function is to tense the palmar aponeurosis and to weakly flex the wrist joint synergized by flexor carpi radialis, flexor carpi ulnaris and flexor digitorum superficial is muscles [1,2].

Anatomical variation are common features and might be expected to discover them during routine cadaver dissect for teaching purpose. Although, this muscle is little function for upper limb, it is very important clinically for tendon grafting by donors transfer. Palmaris longus muscle is one of the most variable muscle in the body that varies in frequently absent in both or unilateral side, bifid terminale end , Muscle belly may be central, distal or digastric (proximal and distal muscle belly connected by a central tendon) in position, It may be completely muscular from origin to insertion or only a fibrous strand. (v) Either the muscle belly or tendon may be bifid or both, Deviation of the tendon to be inserted to the pisiform bone or abductor pollicis brevis muscle [3-7].

Palmaris longus is a well thought out to be an unessential tendon because its nonappearance does not significantly affect the function of the wrist. It is therefore very useful in reconstructive surgery. It is commonly used by hand surgeons for tendon transfers, second stage tendon reconstruction, pulley reconstruction as well as tendon grafts. Plastic surgeons also utilize the Palmaris longus in restoration of lip and chin defects. Many surgeons agree that the Palmaris longus tendon is the first choice as a donor tendon because it fulfills the necessary requirements of length, diameter and availability, and can be used in reconstructive surgery for a wide variety of procedures including lip augmentation, ptosis correction and in the management of facial paralysis without producing any functional deformity [8,9].

The distribution of the palmaris longus agenesis and other aspects of variations of the muscle are studied in different ethnic groups and populations of the world. But, the presence of inversed palmaris longus muscle in the population of Ethiopia is not well investigated.

Case Presentation

In the right arm, I observed a major significant variation in the morphological pattern of PLM In routine cadaveric dissection of the right upper limb of unknown medical history of adult male Ethiopian cadaver in dissection room of department of human anatomy at university of Gondar (Gondar, Ethiopia) that displayed a rare anatomical variation of palmaris longus muscle. During dissection and identification of structures, it was revealed that the palmaris longus muscle in right upper limb of this cadaver was reversed with proximal part being tendinous and distal portion

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Received Date: 13 Aug 2018
Accepted Date: 09 Oct 2018
Published Date: 11 Oct 2018

Citation: Tenaw B. Unilateral Reversed Palmaris Longus Muscle - Anatomical Variation: A Case Report. J Clin Case Rep. 2018; 1(2): 1014.

ISSN 2643-8194

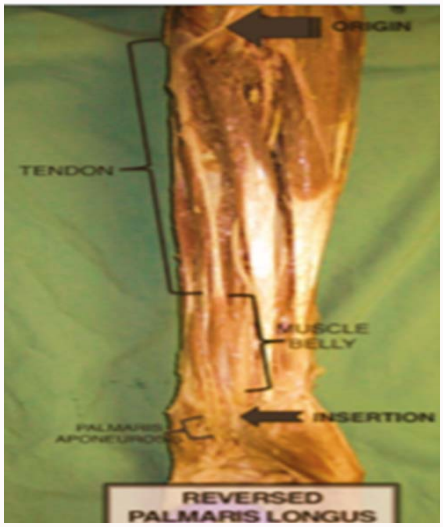

Figure 1: Cadaveric photogram of palmaris longus muscle with neighboring structures.

being muscular. No anatomical variation were observed in left upper extremity. In this present case, the palmaris longus muscle is originated at the common origin of flexor muscles from medial epicondyle .however the origin was a long thin tendon, instead of being muscular belly part. Normally the proximal two third is muscular and the distal one third is tendinous that extends and terminates to palm as palmar aponeurosis (Figure 1).

Discussion

The normal anatomical origin of the Palmaris longus is the common flexor origin at the medial epicondyle as of other superficial flexors muscles of forearm. The standard anatomical insertion is the palmar aponeurosis just distal to flexor retinaculum.

In this dissection, the reversed palmaris longus muscle of right upper extremity exhibited a tendinous origin at the site of the medial epicondyle and a muscular insertion at the site of the palmar aponeurosis. These findings associate with the description in the literature regarding this type of variation [3].

As the PLM's muscular belly passes over the flexor retinaculum, it may produce symptoms because of compression on the median nerve before it becomes inserted in the carpal tunnel. When used excessively, this may cause a compartment syndrome (effort-related compartment syndrome) [8]. In the case of the reversed PLM, it is the antebrachial fascia that creates a closed muscular compartment. As a result of this, compression is transferred to all adjacent structures [10-13].

The correlation between the presence of a reversed PLM and carpal tunnel syndrome has been confirmed in the literature. The symptoms developed by patients include inflammation on the palmar surface of the wrist, reduced muscle strength in the hand, and pain and numbing in the area of distribution of the median nerve [14].

In recent studies, MRI has been used to evaluate the cause of symptoms and oedemas in patients in whom the diagnosis of a reversed PLM was problematic [10,12]. This may be explained because of the fact that the reversed PLM's muscular belly shows the same signs in the MRI as the rest of the muscles. Therefore, the reversed PLM variation must be considered not only while evaluating a possible median nerve neuropathy but also while evaluating an ulnar nerve neuropathy in the wrist, such as Guyon's canal syndrome [15,16].

Last of all, finding of anatomical variations in cadavers dissected with educational purposes at our Anatomy Department laboratory room poses great educational value to our undergraduate medical students and post graduate human anatomy students who get to experience first hand the human body's immense variable that able to appraise the implications of this anatomical knowledge in their daily clinical work. Also, it allows us to contribute to the knowledge of anatomical vitiations and their medical and clinical implications.

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