Additional belly of extensor carpi radialis longus muscle

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Abstract

Introduction
The extensor carpi radialis longus muscle is one of the lateral muscles of the extensor compartment of the forearm. Its tendon is used in reconstructive surgeries of the hand. The aim of this report is to bring awareness among the surgeons about possibility of such an additional muscle which can be used in muscle grafts.

Case report
During our dissection classes for medical students, we observed an additional belly of the extensor carpi radialis longus muscle. The tendon of additional belly was inserted to the bases of the second and third metacarpal bones. It was supplied by a branch of the radial nerve.

Conclusion
Knowledge of the presence of the additional muscle belly may be useful in muscle transplant surgeries and reconstructive orthopaedic surgeries.

Introduction
The extensor carpi radialis longus (ECRL) is one of the lateral muscles of the extensor compartment of the forearm. It originates from the distal third of the lateral supracondylar ridge of the humerus and the adjacent part of the lateral intermuscular septum.

It has a long tendon that gets inserted into the base of the second metacarpal bone. Before reaching the point of insertion, the tendon passes through the second compartment of the extensor retinaculum along with the tendon of the extensor carpi radialis brevis muscle (ECRB). It is innervated by the radial nerve. It is one of the chief extensors of the wrist joint. ECRL is one of the preferable muscles in the upper extremity reconstructions because of the presence of other extensors for the movement of the wrist¹⁻².

Additional tendons or fleshy bellies can be used in reconstructive surgeries without compromising the movement of the wrist joint. We report the presence of an additional belly of ECRL and discuss its clinical importance.

Case Report
During regular dissection classes for medical undergraduate students, we found an additional muscle belly of the ECRL in the right upper limb of an adult male cadaver aged about 65 years.

This belly was situated deep to the brachioradialis muscle. Its fleshy part was about 8 cm long and its tendon was about 30 cm long. Proximally, the fleshy belly merged with the ECRL on its lateral side (Figure 1 and Figure 2).

Distally, the tendon passed deep to the abductor pollicis longus and extensor pollicis longus tendons, crossed deep to the tendon of ECRL from the lateral to medial side and passed through the second compartment of the extensor retinaculum along with the tendons of ECRL and ECRB. In the compartment, the tendon was situated between the tendons of ECRL and ECRB (Figure 3).

The size of the tendon was approximately half the size of ECRL and ECRB tendons in thickness. It finally got inserted into the bases of the second and third metacarpal bones. Just before its insertion, the tendon was crossed superficially by the tendon of the extensor pollicis longus muscle.

Discussion
The knowledge of variations of ECRL and ECRB is important for orthopaedicians operating on the fractures of the lower end of the humerus and the distal ends for forearm bones and the wrist; for surgeons encountering entrapment or compressive neuropathies; anaesthetists involved in pain management therapies on the upper limb and physiotherapists performing electromyography for evaluating and recording the electrical activities of the forearm muscles.

The variations such as presence of an additional tendon or fleshy belly of ECRL are not very common but there are reports on some of its variation.

Figure 1: Dissected view of the posterior compartment muscles of the right upper limb. (ECRL – extensor carpi radialis longus; ECRB – extensor carpi radialis brevis; AB – additional belly; BR – brachioradialis; ED – extensor digitorum; APL – abductor pollicis longus; EPB – extensor pollicis brevis).

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When the additional tendon exists, it can pass either through the second compartment of the extensor retinaculum or through a separate compartment. In very rare cases the tendon of ECRL may split and get inserted into the fibrous flexor sheaths of the fingers. In such cases the biomechanics of the wrist might suffer.

A study reports the presence of an additional belly of ECRL similar to the current case in its origin but its tendon was inserted to the base of the third metacarpal bone only. A case of origin of the accessory slip from the ulnar side of the ECRL and crossing from the ulnar to radial side before insertion has also been reported.

Presence of an additional belly of ECRL on its ulnar side has also been reported by Chakravarthi. The tendon of this belly crossed from the medial to lateral side superficial to the tendon of ECRL and got inserted to the second metacarpal bone. Thus among the reported variations of the ECRL, the presence of an additional belly on the ulnar side is more frequent compared to the one on the radial side. The current case is a rare case due to the existence of an additional belly on the radial side of the ECRL.

The tendon of ECRL is being used extensively in hand reconstructive surgeries. Presence of additional bellies such as the one being reported here might prove to be a boon to the patient.

However a preoperative MRI scan of the forearm is required to confirm the presence of such a variation. The additional tendon at the wrist might congest the spaces deep to the extensor retinaculum leading to the compression of the posterior interosseous nerve indirectly. This may result in chronic wrist pain. The knowledge of occurrence of an additional belly may be of importance during injection of cortisol in cases for tennis elbow.

**Conclusion**

The accessory muscle being reported here may be useful in soft tissue graft or tendon transfer surgeries without compromising the wrist extension. Knowledge of this variation may be quite useful for orthopaedic surgeons and plastic surgeons in addition to radiologists.

**References**


Case report

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