Extensor digitorum brevis manus: a rare muscle on the dorsum of the hand

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Abstract

The extensor digitorum brevis manus is one of the rare anatomic variations which occur on the dorsum of the hand. Only some 295 articles were found worldwide in an extensive bibliographic review carried out in 2003. This muscle was dissected bilaterally on a male corpse at the Human Anatomy Laboratory of the Morphophysiological Department of the "Faculty of Medical Sciences of Minas Gerais". It is an elongated, small muscle, originating at the carpal bones and at the *extensor retinaculum* and inserting into one of the tendons of the finger's extensor muscle. Even though it does not present an essential function in the movement of the fingers nor the hand, it can lead to pain when hypertrophied, creating the need for clinical or even surgical treatment.

Keywords: extensor digitorum brevis manus, anatomic variations.

1 Introduction

Muscles and tendons with anatomic variations are frequently found during surgery on the forearm and hand. However, classic anatomical studies present inaccurate information on this matter. A rare variation found in the dorsum of the hand is the presence of the extensor digitorum brevis manus. This muscle is not cited in any of the main textbooks of anatomy (TESTUT and LATARJET; SPENCE; DIDIO; HOLLINSBEAD; DANGELO and FATINI; HAMILTON; WARWICK; GARDNER (DALLEY and MOORE, 2001; GARDNER, GRAY and O'RAHILLY, 1988; KOPT-MAIER, 2000; NETTER, 2000; PUTZ and PABST, 2000)).

In his extensive bibliographic review, Nakano (2003) found approximately 295 cases since the first description of this anomalous muscle by Albinus in 1734. Subsequent citations were made by Wood (1864), Quain (1892) and Smith (1897). Thirty-eight articles were found in world literature that emphasize the rareness of this occurrence (ALBINUS, s.n; BUHLER, 1902; GAMA, 1976; EGAWA and HASHIMOTO, 1966; REEF and BRESTIN, 1976).

Some authors mention that the presence of this muscle can lead to constant pain during manual labor. Through examination, an elongated mass with local edema was observed on the dorsum of the hand. Therefore, knowledge of this phenomenon is of great practical importance in making a correct diagnosis and using proper surgical procedures at the radium carpal joint and the hand (GAMA, 1983; ROSS and TROY, 1969).

2 Material and methods

In our anatomic study, 172 hands of 86 corpses, 68 male and 18 female, were dissected at the Human Anatomy Laboratory of the Morphophysiological Department of the "Faculdade de Ciências Médicas de Minas Gerais" during the period from 1995 to 2007. The dissection method was based on the techniques described by L. Testut et al.. A longitudinal median incision was performed on the dorsum of the hand, followed by two transversal incisions: one proximal, located on the radium carpal joint region, and one distal, on the metacarpalphalangeal joints, from the second to the fifth finger.

The bibliographic review was based on text books, anatomic atlases as well as international scientific articles on this subject.

3 Results

The *e*xtensor digitorum brevis manus was observed bilaterally in only one corpse, presenting an occurrence of 1.15%. On the dorsum of the hand, it appeared as a muscle filament, originating on the fourth compartment of the *extensor retinaculum* at the capitate's bone level. The insertion occurs on the radial side of the third finger's extensor tendon at the level of the metacarpalphalangeal joint. The right muscle center is 5.5 cm long, 1 cm wide and its insertion tendon is 3 cm long, indicating it is hypertrophied at this side (Figure 1). The left muscle center is 5 cm long, 1 cm wide and its insertion tendon is 3.5 cm long (Figure 2). No observed muscle innervation or irrigation was observed.

4 Conclusion

The finger's short extensor muscle, also called anomalous muscle (SAUSER, 1935) is an extranumerary muscle of the dorsum of the hand, potentially misdiagnosed as a lymphonodule on the carpal dorsum, exostosis or synovial cyst. In other published studies, the most frequently cited

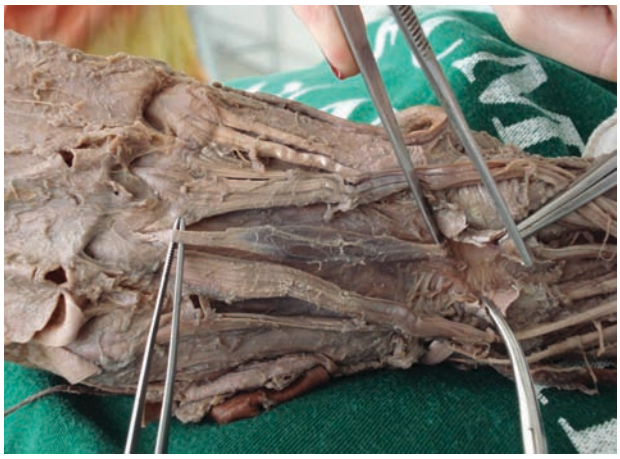

Figure 1. Photograph of *extensor digitorum brevis* manus in right hand.

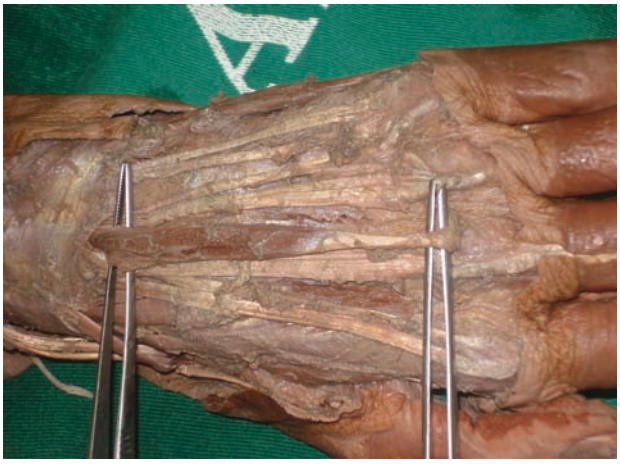

Figure 2. Photograph of *extensor digitorum brevis manus* in left hand.

origin is the *extensor retinaculum* near the dorsal carpal ligament at the level of the scaphoid, semilunar, capitate or hamate bones or, occasionally, at the distal level of the *radium epiphysis*. The most common insertion is the ulna bone side of the third finger's extensor tendon at the level of the metacarpalphalangeal joint. Occasionally the insertion can be found on the radium bone side of the same extensor tendon, at the fourth finger's extensor tendon. The muscle center is approximately 3 to 7 cm long, and its tendon 2 to 4 cm long. When it is found bilaterally, the muscle appears hypertrophied on the dominant hand. In all cases the muscle is enervated by the posterior interosseous nerve and irrigated by the posterior interosseous artery (BHADKAMKAR and MYSOREKAR, 1960; STITH and BROWNE, 1979; ROSS and TROY, 1969; VARIAN and PENNINGTON, 1977; BOYES, 1964)

Symptomatic patients seek medical assistance, complaining of pain and edema on the dorsum of the hand during manual exertion. It is more intense in the dominant hand. The pain complaint is observed in patients that present a hypertrophied muscle, so that the frequency of this symptom is greater in manual workers than in children. Edema can be observed in the proximal region of the dorsum of the hand between the extensor tendons of the second and third fingers through physical examination. Generally, it is poorly defined and more evident through the finger extension against resistance. Complementary tests can be useful for the proper diagnosis, such as electromyography, ultrasound and magnetic resonance imaging (GAMA, 1983).

Conservative treatment is recommended except when there is pain or limitation to the grasping movement. Minor surgery can relieve the symptoms but, if unsuccessful, the need for further operation is indicated. A partial section of the distal portion of the *extensor retinaculum* allows muscle contraction and decreases the cause of the pain during hand movement. This technique presents better results when there is muscle hypertrophy. Muscle resection with partial section of the *extensor retinaculum* has proved to be the most efficient procedure to relieve symptoms, and has been used successfully when other techniques have failed (ROSS and TROY, 1969).

In conclusion, the extensor digitorum brevis manus is a muscle structure without essential function for delicate movements of the hand. However rare its occurrence, one must remember it as a possible diagnosis when there are pain and edema symptoms on the dorsum of the hand. To know this anatomic variation is important for the upper limb specialist not only for surgical procedures at the level of the hand but also because its hypertrophy can cause incapacitating symptoms.

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