CASE REPORT
OLGU SUNUMU

Reverse palmaris longus: A benign cause of swelling on the forearm

Ters palmaris longus: Ön kolda benign bir şişlik nedenifi

Tuba Akdag[1], Aynur Turan[1], Can Emre Bas[2]
[1]Department of Radiology, University of Health Sciences, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara, Turkey
[2]Department of Hand Surgery, University of Health Sciences, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara, Turkey

Correspondence: Tugba Akdag
Department of Radiology, University of Health Sciences, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara, Turkey
e-mail: tubakayi@gmail.com

ORCID ID:
TA 0000-0001-5902-5913
AT 0000-0001-6654-3129
CEB 0000-0003-2734-1756

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SUMMARY

As a normal anatomic structure, the palmaris longus muscle originates from the medial epicondyle of the humerus and descends obliquely through the wrist. It has a flattened tendon distally and, after passing over the flexor retinaculum, inserts to the palmar aponeurosis superficially. As the exact opposite of this normal anatomy of palmaris longus muscle, reversed palmaris longus (RPL) has a tendinous part proximally and a muscular portion distally. RPL is a rare muscular abnormality. On MRI, RPL muscle belly is typically evident at the volar aspect of forearm, medial to the flexor carpi radialis tendon, which is of muscle signal on all sequences. Familiarity with the variant, ultrasound and MRI appearance of RPL and accurately describing relevant imaging findings is essential for guiding effective management decisions and optimizing treatment outcomes.

Keywords: Palmaris longus, muscle, reversed, ultrasound, magnetic resonans imaging

ÖZET

Normal bir anatomik yapı olarak palmaris longus kası, humerusun medial epikondilinden köken alır ve ön kol boyunca ilerleyerek distalde fleksör retinakulumu geçtikten sonra yüzeyel bir tendon olarak palmar aponevroza yapışır. Bu normal palmaris longus kas anatomisinin tam tersi olarak, ters palmaris longus proksimalde tendinöz bir kısma ve distalde kaslı bir kısma sahiptir. Ters palmaris longus nadir görülen bir kas anomalisidir. MRG'de, ters palmaris longus kasına ait kas öbeği fleksör karpi radialis tendonunun medialinde, ön kol volar yönünde tüm sekanslarda kas ile eş sinyalli olarak karşımıza çıkmaktadır. Bu anatomik varyantın ultrason ve MR görünümüne aşina olmak ve görüntüleme bulgularını doğru bir şekilde tanımlamak, tedavi kararlarına rehberlik etmek ve tedavi sonuçlarını optimize etmek için esastır.

Anahtar kelimeler: Palmaris longus, kas, ters, ultrason, manyetik rezonans görüntüleme

INTRODUCTION

Reversed palmaris longus (RPL) is a rare muscular abnormality. As a normal anatomic structure, the palmaris longus muscle (PLM) originates from the medial epicondyle of the humerus and descends obliquely through the wrist. It has a flattened tendon distally and, after passing over the flexor retinaculum, inserts to the palmar aponeurosis superficially. As the exact opposite of this normal anatomy of PLM, RPL has a tendinous part proximally and a muscular portion distally. The muscle shows significant anatomical variance such as agenesis, hypertrophy, duplication, bifid, and variations in its origin and insertion (1). These variations of PLM can be symptomatic in some cases involving peripheral nerve compression and effort-related compartment syndrome (2).

Even ultrasound (US) and magnetic resonance imaging (MRI) are frequently used in the workup, little has been previously described in the literature regarding ultrasound and MRI findings of RPL. In this case report, we present a patient with the complaint of forearm swelling and pain who was ultimately diagnosed with RPL.

CASE REPORT

A 38-year-old woman presented with a history of persistent swelling on her right forearm since her childhood. She had no health complaints other than the disorder involving her arm. She is the first of three children born to non-consanguineous healthy parents. Her sibling and parents do not have any skeletal disorders. The patient reported effort-related pain on the swelling side. On physical examination, Mishra's test was applied to the patient. While the fingers are hyperextended, the patient was asked to flex the wrist (3). The test demonstrated palmaris longus muscle (PLM) tendon on the distal forearm which is the normal anatomical location. On the other hand, her right wrist has shown no superficial tendinous structure, but a palpable lump was visible on her forearm measured approximately 8 cm long and 2 cm in diameter (Figure 1). The patient reported having undergone the US and MRI scans three years ago and received conflicting reports such as muscle herniation or lipoma.

Figure 1 (a). Examination of the patient's left wrist and forearm revealed PLM's tendon which has a superficial lying. This is the normal anatomic extension of the tendon (black arrow). **(b)** Examination of the patient's right wrist and forearm showed absence of PLM's tendon. There's a swelling which represent reverse muscle belly instead of the tendon of PLM.

Antero-posterior and lateral radiograph of right forearm revealed no pathology. For further evaluation, the patient underwent to ultrasound and MRI. Antebrachial fossa ultrasound demonstrated a muscle belly located superficially on the flexor compartment of the wrist (Figure 2). A wrist MRI revealed an extra muscle belly located anterolaterally of the flexor retinaculum as well as adjacent to the median nerve (Figure 3).

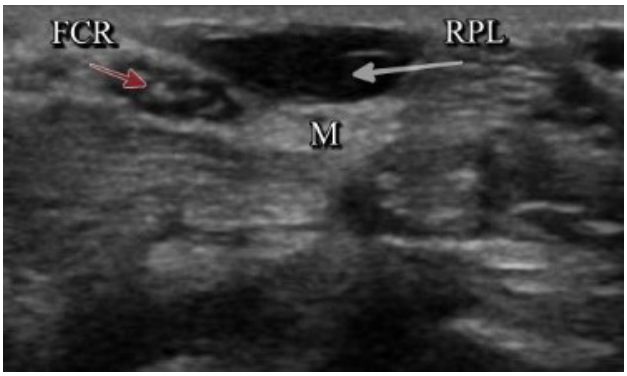

Figure 2. Transverse US images of the right wrist showing the flexor tendons (FT) and median nerve (M). On the volar surface of the forearm show the distal belly of the reversed palmaris longus (RPL) lying in a superficial position, adjacent to the flexor carpi radialis (FCR) tendon. The median nerve is deeper than the RPL.

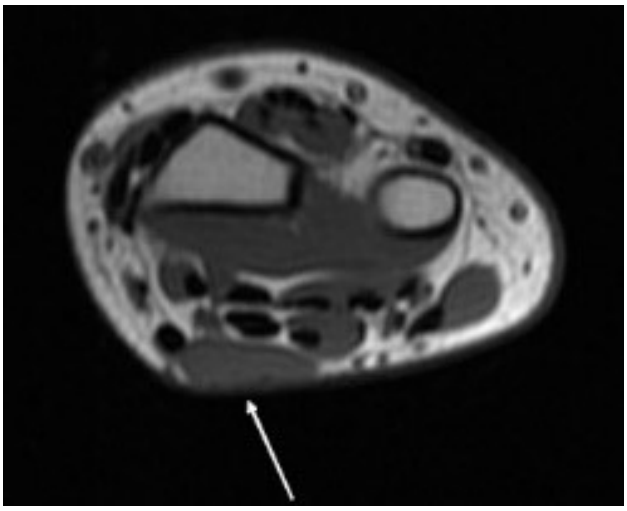

Figure 3. Axial T1-weighted image at the level of flexor tendons shows reverse palmaris longus muscle belly isointense to the adjacent muscles (white arrow).

DISCUSSION

RPL is a rare muscular abnormality and was first described as an anatomic variant through the dissection in 1868 at King's College London (4). Subsequently, in 1993, Giunta et al. first described a symptomatic case of a 21-year-old male who had suffered from median nerve compression

that was treated with surgical excision (5). It is generally known that palmaris longus is the most variable muscle in human anatomy (6). PLM agenesis has been described as the most common anatomical variation observed in about 2% to 25% of the population. All other anatomical variants are found in about 9% of the population, which includes duplicated PLM, triple-headed PLM, accessory PLM, and RPL (7,8). Approximately 70% of RPL cases present in the right forearm, while near 30% were found in the left and no significant correlation was reported between gender and RPL (6).

For the initial diagnosis, the history of the patient and a careful physical examination are helpful. Swelling on the forearm has been present for a long time in patients with RPL. The clinical presentation of RPL widely ranges from asymptomatic swelling to pressure on the ulnar nerve, ulnar artery, and median nerve proximal to the carpal tunnel (9). The pathophysiology of symptomatology is thought to be due to the compression of nerves beneath the reversed muscle. The case presented here occurred effort-related land unlike the findings of other reported cases of RPL (1,7,10) our patients did not complain of paresthesia. We believe that hypertrophy of the RPL muscle belly within the unyielding ante-brachial fascia resulted in an effort-related compartment syndrome (2).

Radiographs are the first-line imaging modality for patients with forearm complaints in these cases are almost always nondiagnostic. Ultrasound combines the excellent ability for deep penetration into soft tissues with good spatial resolution and can be helpful in the diagnosis. Nevertheless, cross-sectional imaging is generally needed to confirm the diagnosis. On MRI, RPL muscle belly is typically evident at the volar aspect of forearm, medial to the flexor carpi radialis tendon, which is of muscle signal on all sequences (1). Even, ultrasound and MRI are frequently used in the workup of wrist and forearm complaints, little has been previously described in the literature with regard to ultrasound and MRI findings of RPL (10,11). Ultrasound and MRI are not also particularly useful incorrect diagnosis but also very accurate in highlighting the etiology of the pain by detecting arterial or neural pathologies such as edema or pressure in the adjacent soft tissues.

Recommended treatment for symptomatic RPL is surgery and generally involves excision of the muscle. Prompt and accurate diagnosis of RPL is crucial as delayed treatment can lead to progressive muscle atrophy and nerve impingements with disability (12). Surgical outcomes are excellent with reduction in symptoms and no residual physical limitations (13). It is important that the hand surgeon is aware of the RPL to prevent intraoperative confusion and allow appropriate intervention in the case of clinical symptomatic. It should be noted that RPL may be symptomatic and that a high index of clinical suspicion should be used in conjunction with ultrasound and MRI.

CONCLUSIONS

RPL is rare based on a limited number of published case reports, but the prevalence may be higher than originally thought when more cases are recognized by advanced imaging methods. Definitive diagnosis is made almost exclusively by ultrasound and cross-sectional imaging and radiologists play a key role in initial diagnoses. Familiarity with the variant, US, and MRI appearance of RPL and accurately describing relevant imaging findings, including peripheral nerve abnormalities and flexor retinacular structures is essential for guiding effective management decisions and optimizing treatment outcomes.

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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