Combined Flexor Carpi Radialis Tear and Flexor Carpi Radialis Brevis Tendinopathy Identified by Ultrasound: A Case Report

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A 63-year-old right-handed office worker presented with acute right wrist pain after lifting a heavy file at work. Results of a clinical examination suggested flexor carpi radialis tendinopathy. Diagnostic ultrasound (US) not only detected a complete flexor carpi radialis tear but also revealed the presence of a concomitant flexor carpi radialis brevis (FCRB) tendon with associated tenosynovitis. The ability of US to correctly identify the FCRB has not been previously reported. Furthermore, the US appearance of FCRB tendinopathy and tenosynovitis has not been described. High-resolution US can identify the FCRB muscle-tendon in the wrist region. Sonologists and sonographers should be aware of the US appearance of the FCRB as well as the potential for the FCRB to contribute to radial wrist pain syndromes.

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INTRODUCTION

Ultrasound (US) has emerged as a powerful diagnostic tool in the wrist region due to its submillimetric resolution and dynamic imaging capabilities [1-3]. In certain clinical scenarios, US may be considered as a first-line soft tissue imaging modality for detection of suspected tendon disorders about the wrist [1,2]. The flexor carpi radialis brevis (FCRB) muscle is an uncommon anomalous muscle that typically arises from the distal volar radius and attaches to the carpal or metacarpal bones [4-8]. FCRB pathology is rare and, to date, has not been documented by US in published reports [6,8]. Herein we report a case of a complete flexor carpi radialis (FCR) tear combined with clinically unsuspected FCRB tendinopathy and tenosynovitis as detected on US.

CASE PRESENTATION

A 63-year-old right-hand dominant otherwise healthy office worker presented with a 3-week history of right volar wrist pain after an acute injury. While lifting a file at work, he experienced a "pop" with immediate volar-radial wrist pain followed by swelling and ecchymosis. He did not have any prodromal symptoms. Despite interim improvement, due to persistent weakness and pain, he presented for evaluation. Examination was remarkable for resolving ecchymosis over the volar-radial wrist crease, a nonpalpable FCR tendon, and tenderness to palpation in the region of the scaphoid tubercle and scaphotrapeziotrapezoidal joint. He had slightly limited active and passive wrist dorsiflexion accompanied by pain and painful resisted wrist palmar flexion. Sensory examination was normal, and results of thumb and finger flexor manual muscle testing were normal and nonprovocative. Radiographs revealed scaphotrapeziotrapezoidal and basilar thumb arthritis. An acute FCR tear was suspected, and diagnostic US was ordered.

US revealed a complete FCR tear with proximal retraction to the radioscaphoid joint. In addition, a second tendon was visualized paralleling the course of the FCR sheath but lying deep to it (Figure 1A). Further scanning along the anomalous tendon both proximally and distally revealed a muscular origin from the distal-volar radius, formation of the tendon at the radioscaphoid joint, a course through the FCR tunnel, and insertion onto the second

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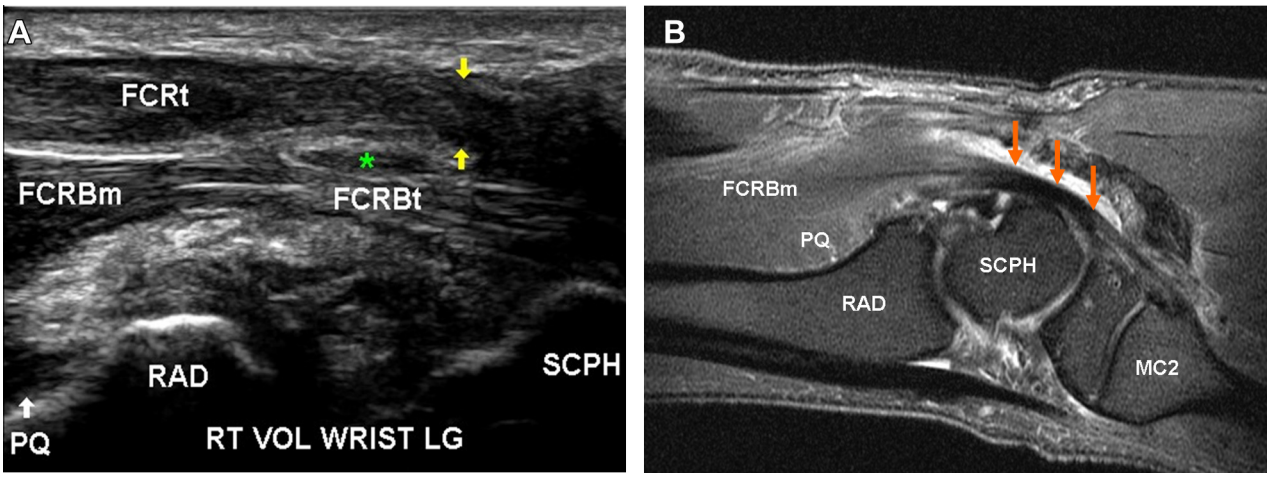

Figure 1. (A) LG ultrasound of the RT VOL wrist, demonstrating the distal stump of the torn and retracted FCRt (yellow arrows) lying palmar to the radioscaphoid joint. Deep and parallel to the FCR sheath, and separated from the FCR by a fibrous septum (green asterisk), lies a second muscle tendon unit, which consists of the anomalous FCRBm and FCRBt. Compare with magnetic resonance image in (B). (B) Correlative T2-weighted sagittal magnetic resonance image with a larger field of view compared with (A). The complete, retracted FCR tear was confirmed (not shown); note the presence of the large FCRBm arising from the volar distal RAD; the sagittal image selected to demonstrate distal FCRBt (orange arrows) insertion into the MC2. Top = volar-palmar; bottom = dorsal; left = proximal; right = distal. LG = longitudinal; RT VOL = right volar; FCRt = flexor carpi radialis tendon; FCR = flexor carpi radialis; FCRBm = flexor carpi radialis brevis muscle; FCRBt = flexor carpi radialis brevis tendon; RAD = radius; MC2 = second metacarpal base; PQ = pronator quadratus; SCPH = scaphoid.

metacarpal base (Figure 1B). The tendon was clearly distinct from the torn FCR, was located radial to the flexor pollicis longus (FPL) and carpal tunnel contents, and moved with wrist palmar flexion and dorsiflexion (Figures 2 and 3). The anatomic position and course were consistent with an FCRB muscle [6-9]. The FCRB coursed in its own fibro-osseous tunnel, and on US, appeared as a thick, heterogenous, and hypoechoic (ie, dark) ovoid structure surrounded by a small amount of fluid (Figure 3) [1-3]. No Doppler flow was seen. The overall US appearance was consistent with a complete

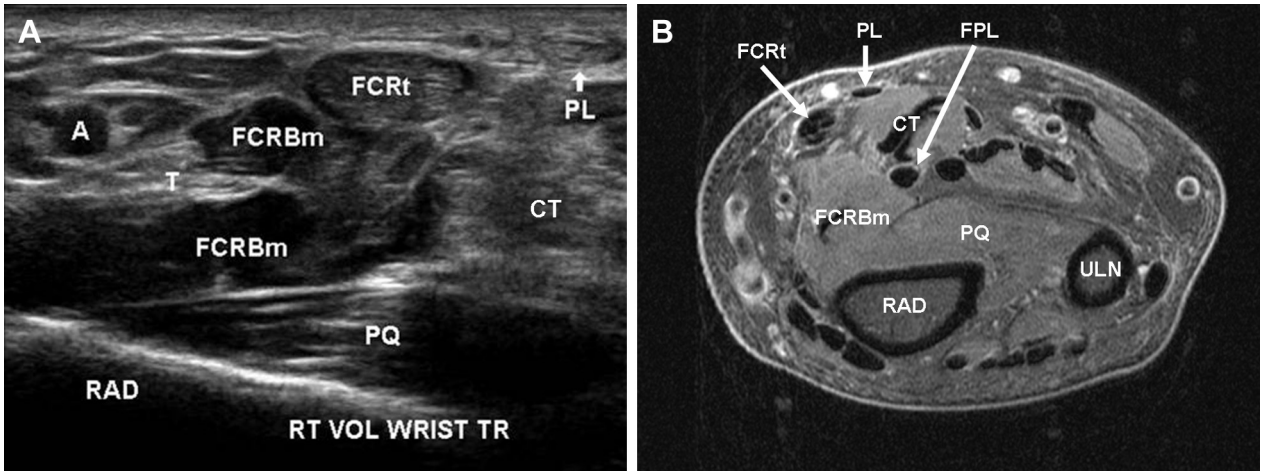

Figure 2. (A) TR (ie, axial) ultrasound of the RT VOL wrist at the level of the distal RAD, demonstrating a large, anomalous FCRBm bordered dorsally by the volar RAD and PQ, volarly and radially by the radial artery (A), volarly by an abnormally dark and thickened FCRt (proximal to the tear), and ulnarly by the CT lying deep to the PL; the FCRBt (T) is forming centrally within the muscle belly, a common finding for the musculotendinous junction of the FCRB. (B) Correlative T2-weighted axial magnetic resonance imaging oriented to coincide with ultrasound image; note the large FCRBm with its central tendon forming. Top = volar; bottom = dorsal; left = radial; right = ulnar. TR = transverse; RT VOL = right volar; RAD = radius; FCRBm = flexor carpi radialis brevis muscle; PQ = pronator quadratus; FCRt = flexor carpi radialis tendon; CT = carpal tunnel contents; PL = palmaris longus; FCRBt = flexor carpi radialis brevis tendon; FCRB = flexor carpi radialis brevis; FPL = flexor pollicis longus; ULN = ulna.