Postfracture loss of extension of the interphalangeal joint of the right thumb: What can a musculoskeletal ultrasound tell us?

Sir,

A 58-year-old female had suffered from right distal radius fracture [Figure 1a] after a fall episode with the outstretched hand on the ground. She received an open reduction and internal fixation with the volar locking plate for the Frykman classification type VIII fracture. After the operation, however, she had been unable to extend the right thumb interphalangeal (IP) joint in addition to limited supination and pronation of the forearm. Locking plate impingement was suspected, and she had undergone implant removal after the union of the fractured segments. While supination and pronation improved gradually, the loss of right thumb IP extension had persisted. Accordingly, the patient was referred for an ultrasound (US) examination which was performed throughout the forearm [Figure 1b]. The extensor pollicis longus (EPL) muscle was atrophic [Figure 1c] and was stretched over the displaced bone at the fracture site [Figure 1d and e]. The power Doppler imaging revealed no increased blood flow near the fracture site. During passive flexion and extension of her right thumb IP joint, dynamic US imaging revealed the movement of the distal EPL tendon but not its proximal muscular portion [Video 1]. The posterior interosseous nerve was also scanned and its size was normal along the whole course within the supinator muscle. The patient was later referred back to the orthopedic department for surgical removal of the spur and adhesiolysis.

Ruptures of the EPL tendon following distal radius fractures are not rare, with an incidence varying from 0.2% to 5%.[1] In patients receiving a volar locking plate for fixation of distal radius fractures, the incidence rate of EPL tendon rupture was reported to be around 0.29%.[2] Furthermore, a higher incidence of EPL tendon injury up to 88% was observed at the time of distal radius fractures.[3] The mechanism of EPL tendon rupture in distal radius fractures is still unknown, but some studies suggested minimally displaced fractures leading to an increase in the third compartment pressure and reduced vascularization for the EPL tendon, leading to degenerative necrosis or rupture.[1,3] The sharp bony edge near the fracture line might also abrade the EPL tendon, leading to a decrease in the tendon tensile strength.[3] Moreover, iatrogenic causes such as locking screws and plates protruding to the tendon floor can also cause EPL rupture.[2,3]

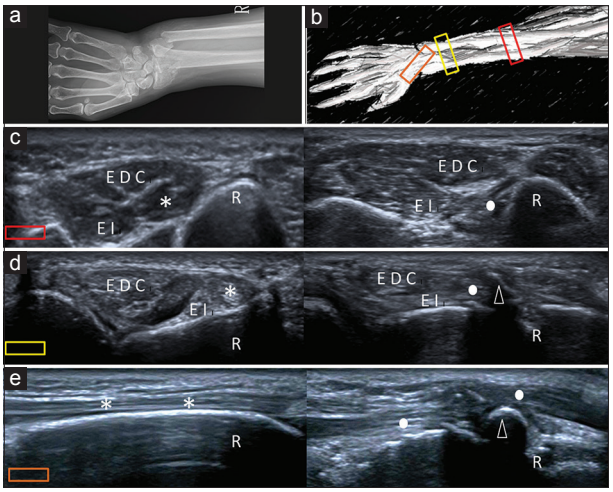

Figure 1: Plain radiography of the affected forearm after the accident (a). The drawing shows the transducer placement during the ultrasound evaluation (b). Short-axis images at the middle (c) and distal (d) forearm levels. Long-axis images at the wrist level (e). White asterisk = Extensor pollicis longus muscle/tendon at the normal side; White circle = Extensor pollicis longus muscle/tendon at the affected side; Black arrow = Bony spur. EI = Extensor indicis muscle/tendon; EDC = Extensor digitorum communis muscle/tendon

In this sense, US provides great accuracy for determining the injury site and visualizing the retracted ends, which are crucial during preoperative assessment, i.e., for surgical navigation.[4] US is more rapid than computed tomography or magnetic resonance imaging to diagnose EPL tendon disorders as well as the estimation of tendon stump separation and muscular atrophy.[4] Likewise, in our case, we exploited the US to determine the cause of inability in thumb extension and demonstrated the cause of tendon immobility by means of dynamic imaging. For sure, these findings help orthopedic surgeons promptly plan the details of surgery. In conclusion, we would like to call the attention of all clinicians/surgeons to the usefulness of static and dynamic US evaluations during the management of posttraumatic hand/finger dysfunctions.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Received: 01-03-2019; **Revised:** 28-08-2019;
Accepted: 06-10-2019; **Published:** 20-01-2020

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DOI: 10.4103/jrms.JRMS_145_19

How to cite this article: Lin MT, Chang KV, Wu WT, Özçakar L. Postfracture loss of extension of the interphalangeal joint of the right thumb: What can a musculoskeletal ultrasound tell us? J Res Med Sci 2020;25:2.