Sonographic Evaluation of Trigger Finger at the Wrist and Carpal Tunnel Syndrome Resulting From a Deep Soft Tissue Leiomyoma

Trigger finger at the wrist is a unique condition in which finger motion results in triggering at the wrist. Suematsu et al classified this condition into 3 types: type A is caused by a tumor on the flexor tendon or flexor tendon sheath; type B is from an anomalous muscle belly; and type C is from a combination of a tumor and an anomalous muscle belly. The etiology is typically identified with imaging and confirmed on surgical exploration. We present a case of a deep soft tissue leiomyoma triggering at the distal margin of the flexor retinaculum, causing both triggering of the fingers at the wrist and carpal tunnel syndrome.

A 30-year-old right-hand-dominant woman presented with a 3-month history of atraumatic right volar wrist pain, “clicking” at the wrist with finger flexion, intermittent shooting pain and numbness into her fingers, and mild grip weakness. She otherwise denied persistent sensory loss or shooting pain and numbness into her fingers, and mild grip weakness. She otherwise denied persistent sensory loss. Physical examination of the right wrist and hand were only remarkable for a palpable click over the volar wrist with active finger flexion and extension and a positive Tinel sign. There were no palpable masses. Her range of motion, strength, and sensation were normal. Radiographs of the right wrist did not reveal any abnormalities.

Sonography of the right wrist revealed a well-defined, noncompressible, heterogeneous, relatively hypoechoic mass measuring 18 mm in diameter (long axis) at the level of the carpal tunnel and in the vicinity of the second and third flexor tendons (Figure 1A and B). The mass did not show any increased signal on power Doppler imaging. On dynamic evaluation, flexion and extension of the fingers caused the mass to abruptly translate in and out of the carpal tunnel (Videos 1 and 2). The median nerve measured at the pisiform was mildly enlarged, with a cross-sectional area of 12 mm². A cross-sectional area of greater than 10.5 to 11 mm² at the level of the pisiform bone has been considered indicative of carpal tunnel syndrome.

Magnetic resonance imaging (MRI) of the right wrist with contrast was obtained for further characterization and surgical planning. It revealed a 13 × 6 × 16-mm hyperintense T1 and mildly hyperintense T2 lesion with diffuse enhancement just distal to the carpal tunnel (Figure 1C). The lesion appeared to be localized between the flexor tendons and base of the third metacarpal. The patient was subsequently scheduled for an open excision of the soft tissue mass and carpal tunnel release.

Surgical exploration through a longitudinal incision over the volar aspect of the wrist with complete release of the transverse carpal ligament revealed a 2 × 1-cm well-encapsulated, gray-white soft tissue mass that was adherent to the finger flexors (Figure 1D). Substantial inflammation of the tenosynovium was also noted within the carpal tunnel, prompting tenosynovectomy of the finger flexors. The mass was sharply excised without difficulty and sent for pathologic analysis. Histologic examination of the mass revealed spindle cells, and immunohistochemical analysis yielded positive results for α-smooth muscle actin and showed absence of nuclear β-catenin and S100 protein. These findings were most consistent with a leiomyoma. The patient followed up 12 days postoperatively and reported complete resolution of clicking, pain, and finger paresthesias.

There have been 2 prior case reports that presented leiomyomas at the wrist, one resulting in triggering of the middle finger at the wrist and the other resulting in carpal tunnel syndrome. Our case is unique in that this individual had both triggering of the finger at the wrist and carpal tunnel syndrome. Furthermore, we were able to correlate sonographic characteristics with MRI and surgical pathologic findings.

Sonographic characterization of soft tissue masses typically includes assessment of the size, depth, margins, echogenicity, consistency, vascularity, and relationship with surrounding structures. These features help differentiate between simple cystic, complex cystic, and solid lesions. Characteristic features of cystic lesions include sharp margins, internal hypoechoegenicity or anechoegenicity with a homogeneous echo texture, the presence of posterior acoustic enhancement, and the absence of intrallesional vascularity. However, it is not uncommon for solid lesions to be mistaken as cystic. Lee et al reviewed 23 soft tissue masses incorrectly interpreted by sonography to be cystic lesions. It was noted that small masses (1–2 cm in diameter) tended to appear avascular on color Doppler imaging and were more likely to be mistaken as cystic. Additionally, although not uniformly observed, avascularity appeared to be evident in giant cell tumors of the tendon sheath, schwannomas, fibromas of the tendon sheath, gran-
ular cell tumors, and eccrine spiradenomas. Distinction is further complicated in the wrist because an evaluation for posterior acoustic enhancement is often limited by the close proximity of bony structures. Sonography remains nonspecific in the identification of solid lesions and is unable to accurately distinguish between benign and malignant lesions.

The most common hand and wrist soft tissue masses are ganglia. Also described are vascular aneurysms, vascular malformations, giant cell tumors of the tendon sheath, fibromas of the tendon sheath, lipomas, hemangiomas, schwannomas, neurofibromas, and synovial chondromatosis. Somatic leiomyomas are considered a relatively rare finding. A leiomyoma is a benign tumor of smooth muscle and can be categorized on the basis of its location as superficial (ie, cutaneous and subcutaneous) or deep. Billings et al completed a retrospective review of surgical pathologic cases over an 11-year period and noted that 32% of leiomyomas were of the deep soft tissue type, with the remainder classified as retroperitoneal or abdominal. Of the soft tissue leiomyomas, equal incidence was observed in male and female patients, with a predilection for the lower extremities. At a mean follow-up of 58.7 months, no recurrence or metastasis was noted.

Here, we have reported the case of an individual with a type A trigger finger at the wrist and carpal tunnel syndrome. Sonography revealed a well-defined, noncompressible, small, relatively hypoechoic avascular mass that was observed to snap in and out of the carpal tunnel with finger flexion and extension. Given these sonographic features and the location of the mass, it was initially suspected to be a cystic lesion. The median nerve displayed characteristic features of median neuropathy, which was consistent with the patient’s clinical presentation of carpal tunnel syn-

Figure 1. Leiomyoma at the right wrist in a 30-year-old woman. A, Long-axis sonogram of the right volar wrist in the region of the carpal tunnel revealing a hypoechoic mass deep to the flexor tendons. B, Short-axis sonogram showing the hypoechoic mass (arrow) within the carpal tunnel. C, Axial MRI of the right wrist just distal to the carpal tunnel showing T1 postcontrast enhancement of the mass. D, Intraoperative image of the resected mass.
drome. Magnetic resonance imaging later revealed diffuse enhancement suggesting vascularity and thus a solid lesion. The patient subsequently underwent surgical excision, and histopathologic examination confirmed the diagnosis of a leiomyoma.

Sonography was helpful as an initial low-cost imaging modality to identify the presence of a mass in a patient with trigger finger at the wrist and carpal tunnel syndrome. It offered an additional benefit over MRI by allowing for a dynamic evaluation. However, caution must be taken when evaluating small masses in the wrist, as they can appear to have characteristics of cystic lesions.

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References