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DIAGNOSTIC METHODS: Editorial

Musculoskeletal ultrasound in orthopedic practice

Point-of-care ultrasound brings great value to patient care in orthopedic practice, especially for soft tissue problems. It offers safe, cost effective, and real time evaluation for soft tissue pathologies and helps narrow down the differential diagnosis.

There are varieties of soft tissue lesions in orthopedic practice with classic clinical presentations that may not necessitate ultrasound examination for confirmation of diagnosis, for example ganglion cysts. However, there is value in performing ultrasound scans for these common soft tissue lesions.

Ganglion cysts on the dorsum of the wrist or radial-volar aspect of the wrist are confirmed based on clinical examination and presentation. Adding ultrasound examination can help differentiate a classic ganglion cyst from different, sometimes rare findings such as lipomas, anomalous muscles, or soft tissue tumors. Ultrasound examination may also be helpful in finding the source or stalk of the ganglion cyst.

This type of procedure can help pre-surgical planning if resection of the ganglion is desired by the patient and recommended by the surgeon, because arthroscopic or traditional surgical approaches may be needed based on the location of the stalk or neck of the cyst.

Fig. 1a, b, 2a & 2b, show examples of two different patients with similar presentations of a slow growing mass on the digit. Fig. 1a & b from patient 1 show a solid tumor overlying the flexor tendons of the digit, where the mass was palpated.

Fig. 2a & b from patient 2, shows a cystic mass overlying the

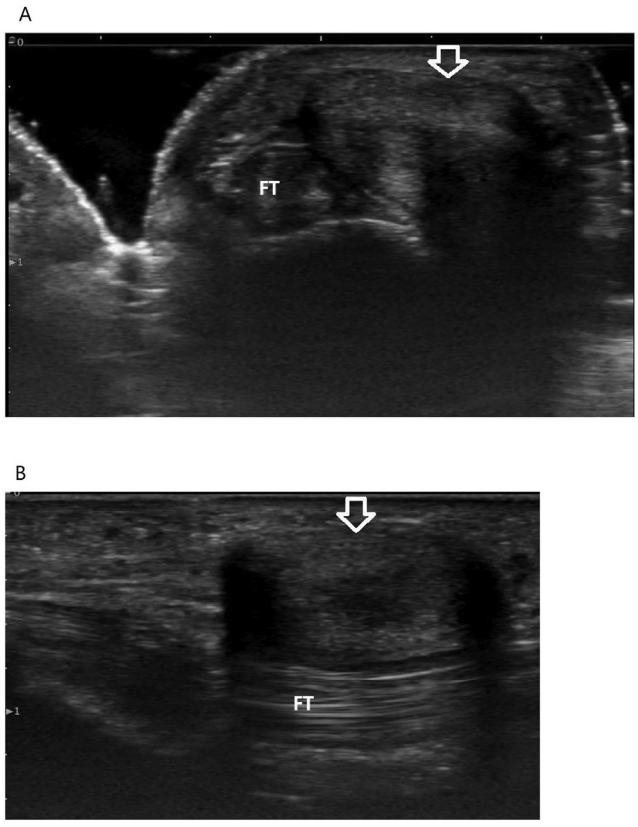

Fig. 1. Solid tumor overlying the flexor tendons of the digit, where the mass was palpated.

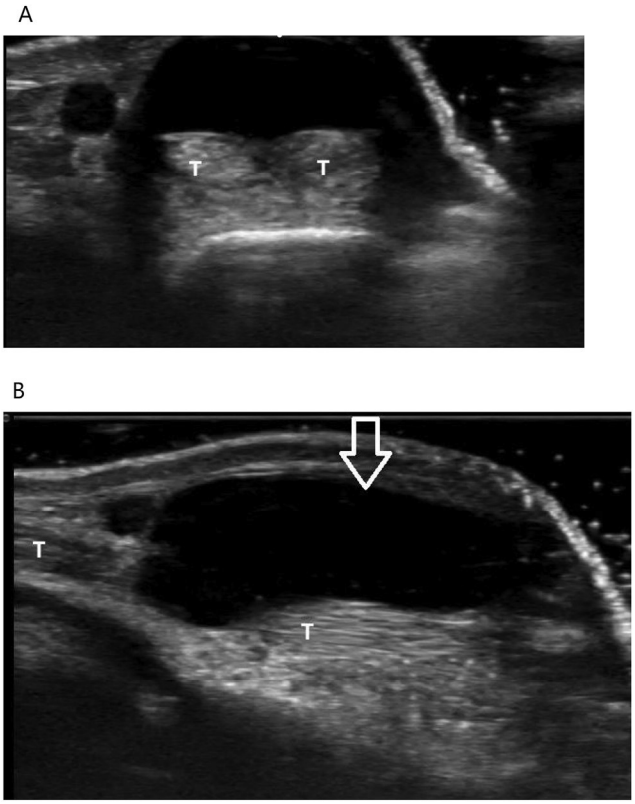

Fig. 2. Cystic mass overlying the tendons of the digit.

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tendons of the digit. In both cases the masses were painless and slow growing, with minimal to no discomfort. Ultrasound is a useful tool for differentiating solid versus cystic lesions and can help avoid attempted aspiration of a solid mass when it presents in an area of classic ganglion cyst's usual presentation.

Another soft tissue condition where ultrasound is a superior imaging tool is tendon pathology. Ultrasound can help differentiate tendinosis, tenosynovitis or tendon tears.

In tenosynovitis, the tendon itself shows normal echotexture and uniform appearance, but the tenosynovium that surrounds the tendon becomes inflamed and appears as a hypoechoic halo around the tendon. For example in Fig. 3a & b, the tendons of the first dorsal compartment of the wrist show uniform thickness and fibrillar echotexture; however, there is hypoechoic swelling around the tendons. This is an example of tenosynovitis of the first dorsal compartment of the wrist.

In tendinosis, the tendon loses its fibrillar pattern, appearing swollen, and may show vascularity on color ultrasound, which is suggestive of neoangiogenesis or angiofibroblastic proliferation. For example, in Fig. 4a, b & 4c, the tendons of the first dorsal compartment of the wrist show focal enlargement, hypoechoic swelling and loss of normal fibrillar echotexture, while the tendon appears disorganized with evidence of increased vascularity on color ultrasound. This is an example of tendinopathy or tendinosis.

Focal tendon tears appear as anechoic or hypoechoic focal defects in the tendon substance. Fig. 5a & b shows a partial tear of the triceps tendon from the olecranon process. The partial tear appears as a focal hypoechoic defect in the tendon which is confirmed in long and short axis scans of the tendon.

In full thickness tears, the tendon is seen retracted proximally with no fiber attachment at the tendon footprint. Fig. 6 shows an example of a full thickness complete tear of the supraspinatus tendon from its bony attachment at the greater tubercle. The

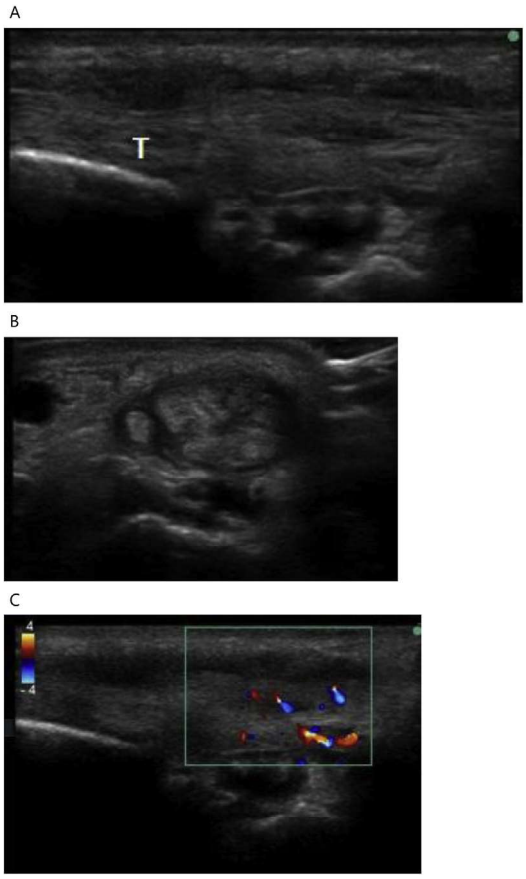

Fig. 4. Example of tendinopathy or tendinosis.

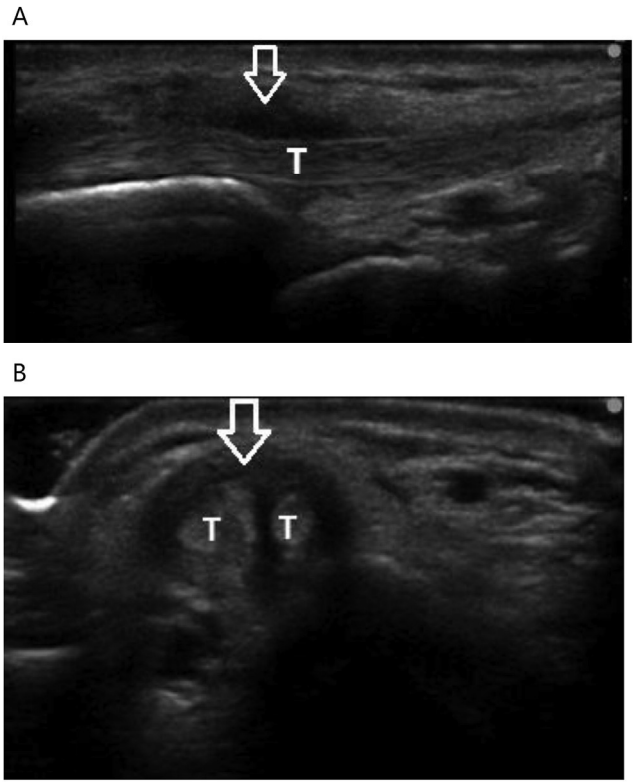

Fig. 3. Tenosynovitis of first dorsal compartment of wrist.

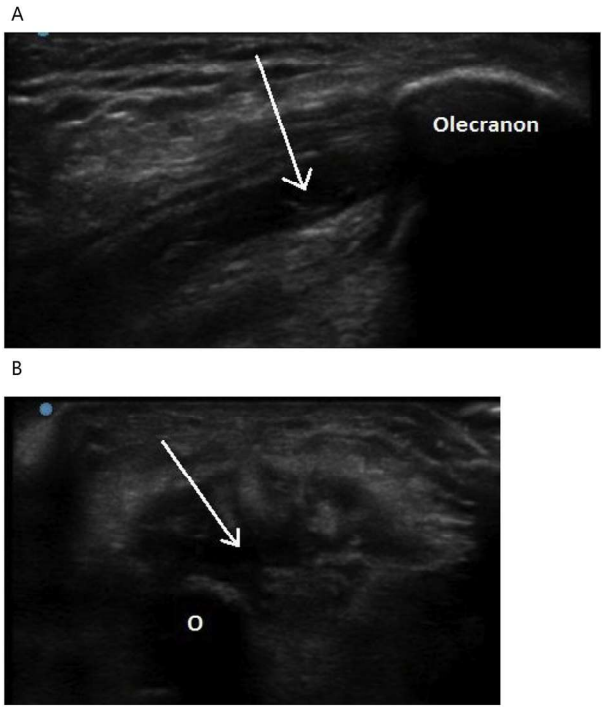

Fig. 5. Partial tear of triceps tendon from the olecranon process.

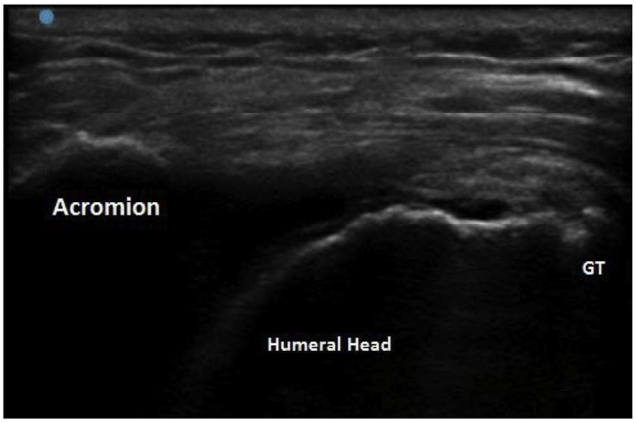

Fig. 6. Full-thickness complete tear of the supraspinatus tendon from its bony attachment at the greater tubercle.

tendon has retracted proximally and the retracted stump is not visible on ultrasound examination.

These examples provide practical, real-world examples as to how and why point-of-care ultrasound adds significant value to clinical examination in orthopedic settings. It enhances the understanding of patient's conditions, increases confidence in the care provided, and high patient satisfaction.

Dimitrios Kostopoulos*
Hands-On Companies, Board Certified in Clinical Electrophysiology, 66 Mineola Ave, #1342, Roslyn Heights, NY, 11577, USA

Mohini Rawat
ABPTS Board Certified in Clinical Electrophysiology, Registered in Musculoskeletal Sonography, APCA Point-of-Care MSK Soft Tissue Clinical Certificate, USA

* Corresponding author.
E-mail address: dimi@handsonpt.org (D. Kostopoulos).

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