Short Report

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Percutaneous treatment of de Quervain's disease using Sono-Instruments®: A feasibility study

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Abstract

We investigated the safety and effectiveness of percutaneous release for de Quervain's disease using Sono-Instruments® in cadaveric specimens. The mean procedure duration was 4 minutes, and complete release was achieved in all specimens.

Keywords

Anatomical visualization, cadaveric study, de Quervain's tenosynovitis, first extensor compartment, percutaneous treatment, Sono-Instrument®, ultrasonography, retinaculum release

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This anatomical study explored percutaneous ultrasound-guided treatment of de Quervain's disease. Given its similarities to trigger finger such as sheath thickening, impaired tendon gliding and the risk of local nerve injury, the Trigger Finger Sono-Instrument® (TF-SI) of Spirecut® (Spirecut SA, Muttenz, Switzerland; https://spirecut.com/trigger-finger-sono-instrument-tf/) appeared suitable for the percutaneous release of the first extensor compartment.

In nine fresh-frozen cadaveric hands, we used an 18 MHz linear ultrasound probe after thawing to assess the presence of a bony ridge, a septum in the first compartment and the visibility of superficial nerves. We then carried out the release. A 14-gauge intravenous catheter was inserted at the level of the scaphotrapeziotrapezoid joint. The TF-SI cutting instrument was inserted through this puncture to progressively release the dorsal compartment. We then introduced the rounded end probe provided by the manufacturer to assess the release, observing it passing freely from the tendon compartment to the subcutaneous plane. If any fibres remained, the TF-SI was reintroduced for further release (Figure 1).

No bony ridges or septations were found in any specimen and the superficial radial sensory nerves were always clearly visible on ultrasound. The TF-SI and the rounded end probe were well visualized throughout the procedure. The mean duration of the release was 4 (SD 1.2) minutes. One passage was required in seven specimens and a second passage in two, owing to remaining fibres. Complete sonographic sectioning of the first dorsal compartment was achieved in all nine cases. Audible cracks were noted during release in all cases. Open control dissection confirmed full sheath release in all specimens, with intact superficial sensory branches of the radial nerve (Figure 2). A small abrasion was found on one abductor pollicis longus slip in one specimen.

Percutaneous ultrasound-guided release of the first dorsal compartment using the TF-SI appears to be efficient and safe, pending confirmation in clinical studies for patients with thickened

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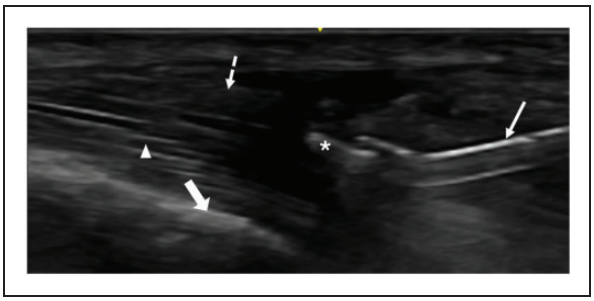

Figure 1. Long axis ultrasound view of first extensor compartment. The Trigger Finger Sono-Instrument® (TF-SI) (thin solid arrow) is introduced from distal to proximal through the entry point. Note the cutting part of the instrument highlighted by an hyper-echoic line (*). The instrument is progressively introduced over the tendon (arrowhead) up to the limit of the extensor retinaculum (dashed arrow). Distal radial cortex (heavy arrow).

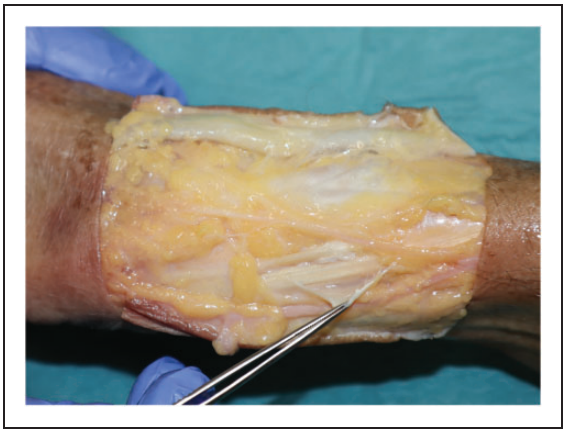

Figure 2. Complete release of the first compartment with preservation of the radial sensory branches.

compartment and impaired tendon gliding owing to de Quervain's disease. Currently, the TF-SI is approved in Europe only for trigger finger release in adults. The advantages of this technique are that it is suitable for office surgery, has minimal morbidity and allows patients to resume daily activities the next day without a dressing (Moungondo et al., 2024). In de Quervain, forceful hand functions in wrist flexion should be avoided. Compared with open surgery, the risk of iatrogenic nerve injury may be lower. Exposing the radial sensory branches in open surgery can lead to painful perineural fibrosis. In a meta-analysis, Bosman et al. (2022) reviewed 963 first compartment release procedures and nerve injuries were reported in 15 of the 21 studies reviewed, affecting 53 cases (3%) with incidences varying between 0 and 36%. Other complications, such as hypertrophic or painful scarring, may also be avoided by percutaneous release.

Septation and sub-compartmentalization of the first extensor compartment are well documented, with some studies reporting a 65% incidence, and the presence of septations has been linked to de Quervain's disease (Choi et al., 2011). None of our specimens had septation so the efficacy of the TF-SI in releasing sub-compartments is unknown.

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• Fabian Moungondo, MD, PhD discloses that he will receive royalties from the Spirecut company,
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