Title
Musculoskeletal Ultrasound For the Orthopedic Surgeon: Foot and Ankle

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Musculoskeletal Ultrasound For the Orthopedic Surgeon: Foot and Ankle

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INTRODUCTION

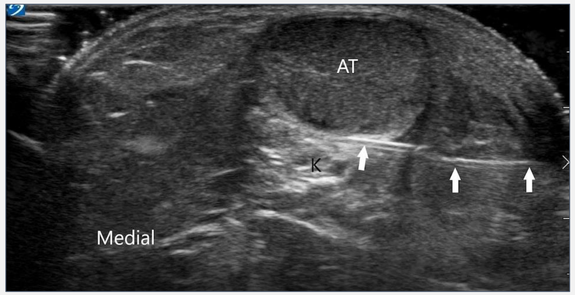
Ultrasound of the foot and ankle offers low cost, in-office real-time dynamic imaging without radiation. Given the complex and relatively smaller size of the many joints of the foot, ultrasound guidance can increase the accuracy of intra-articular aspirations and injections. Whether helping to establish a diagnosis, aid in nonoperative treatment or localize anatomy for postoperative pain control, ultrasound is an invaluable imaging technique for a foot and ankle surgeon.

ACHILLES HYDRODISSECTION

i. Indications: Chronic tendinopathy is quite common in the mid portion Achilles tendon due to the poor blood supply of this region. Blood vessels grow into the tendon as part of the healing process, however the nerves that travel with the vessels are frequently responsible for the associated pain. Ultrasound guided hydrodissection of these tissue layers is a low-risk procedure that can treat the tethering or reduce neovascularization in Achilles tendon problems.

ii. Injectate: 9 mL of D5W and 1 mL of local anesthetic for hydrodissection.

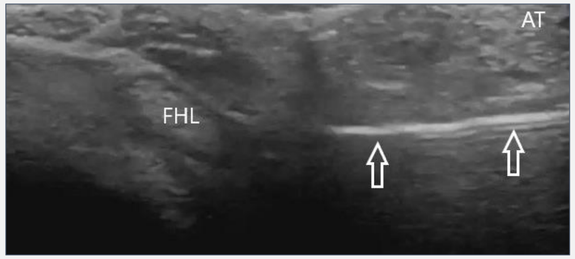
iii. Technique: Patient will lie prone with the foot hanging over the edge of the table. The Achilles tendon should be viewed in both short and long axis to identify the region of tendon thickening and possible hyperemia signifying neovascularization. The transducer will be in transverse plane with the tendon in short axis at the region of interest. The needle trajectory will be in plane, lateral to medial to target the tissue plane between the tendon and the Kager fat pad.



FLEXOR HALLUCIS LONGUS TENDON SHEATH INJECTION

i. Injectate: 1 mL of local anesthetic with or without 1 mL of corticosteroid or ketorolac.

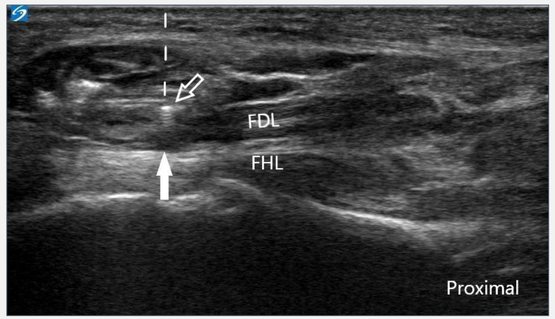
ii. Technique: Patient will lie prone with a towel roll under the anterior ankle or under the lateral ankle with the foot externally rotated. The transducer will be in the transverse plane over the medial malleolus and tarsal tunnel with a short axis view of the FHL tendon. Needle trajectory will be in plane with a posterior to anterior approach to the FHL sheath.



KNOT OF HENRY INJECTION

i. Injectate: 1 mL of local anesthetic and 1 mL of corticosteroid.

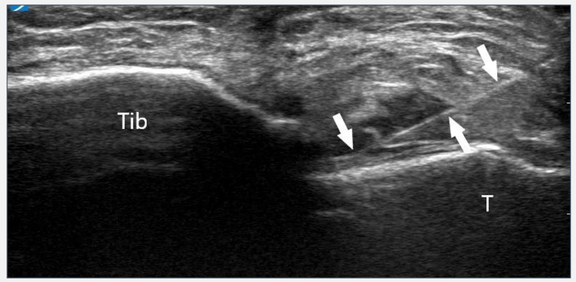
ii. Technique: Patient will lie in a lateral decubitus position with the affected medial ankle/foot facing upward and a towel roll under the lateral ankle. The transducer will be in a sagittal oblique plane in the medial arch of the foot distal to the sustentaculum tali to view the tendons in short axis as they cross. The needle trajectory will be in an in plane medial to lateral approach to the crossing point between the two tendons.



ARTHRITIS – TIBIOTALAR JOINT INJECTION

i. Injectate: 2-4 mL of local anesthetic with or without 1 mL of corticosteroid.

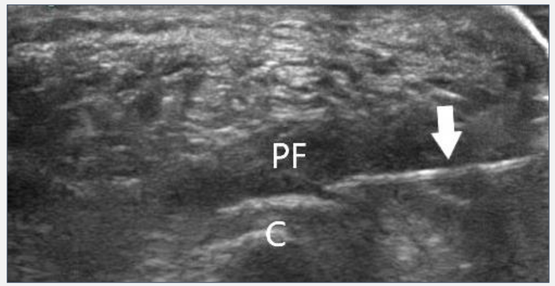
ii. Technique: The patient may be sitting or lying supine with their knee flexed to 90 degrees and foot flat on the table in approximately 40 degrees of plantar flexion to open the tibiotalar joint space. Using a linear array transducer in the parasagittal plane just medial to the tibialis anterior tendon, the tibiotalar joint is identified.



PLANTAR FASCIA INJECTION

i. Injectate: 1 mL of local anesthetic and 1 mL of corticosteroid or 1-2 mL of 25% dextrose solution or PRP for intrafascial injections.

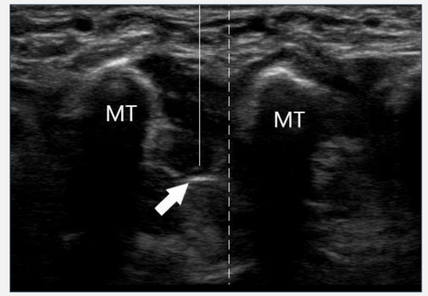
iii. Technique: Patient will lie in a lateral decubitus position with the medial heel facing upwards and a towel roll under the lateral foot. The transducer will be in a transverse plane over the plantar aspect of the heel with the plantar fascia in short axis. The target is at the origin of the plantar fascia on the medial calcaneal tubercle between the calcaneus and plantar fascia for peri-fascial injections. The needle trajectory will be medial to lateral.



MORTON'S NEUROMA INJECTION

i. Injectate: 0.5 mL of local anesthetic and 0.5-1 mL of corticosteroid.

ii. Technique: The patient will lie supine on the table with the knee flexed and foot flat on the table. The transducer will be in transverse axis over the dorsal metatarsal heads. The needle trajectory will be an out of plane distal to proximal approach with a walk down technique to the targeted deep inter-metatarsal space.



CONCLUSION

While most clinicians are less familiar with ultrasound as compared to other advanced imaging modalities, knowledge of ultrasound techniques can be invaluable. This chapter shows the vast breadth of uses for ultrasound for the foot and ankle.

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