Disclosure

Relevant Financial Relationship(s)

None

Off Label Usage

None
Learning Objectives

• Describe common ultrasound guided procedures in the foot and ankle
Ankle (Talocrural) Joint
Anterolateral Approach

• Patient Position
  • Side-lying facing physician with towel under top ankle

• Transducer Position
  • Overlying ATFL

• Needle Orientation to Transducer
  • In-plane

• Needle Approach
  • Distal to proximal, through ATFL
Ankle (Talocrural) Joint
Anterolateral Approach
Ankle (Talocrural) Joint  
**Anterolateral Approach**

- **Target**
  - Lateral ankle joint recess between hyaline cartilage of talus and peri-articular fat

- **Pitfalls**
  - Identify and avoid lateral malleolar artery
Ankle (Talocrural) Joint
Anterolateral Approach
Ankle (Talocrural) Joint
Anterior Approach

- **Patient Position**
  - Supine with the foot plantarflexed

- **Transducer Position**
  - Anatomic sagittal plane between AT/EHL tendons

- **Needle Orientation to Transducer**
  - In-plane

- **Needle Approach**
  - Distal to proximal
Ankle (Talocrural) Joint
Anterior Approach
Ankle (Talocrural) Joint
Anterior Approach

- **Target**
  - Anterior ankle joint recess between hyaline cartilage of talar dome and peri-articular fat

- **Pitfalls**
  - Identify and avoid deep peroneal nerve and dorsalis pedis artery/veins
Ankle (Talocrural) Joint
Anterior Approach
Ankle (Talocrural) Joint

Anteromedial Approach

- **Patient Position**
  - Supine with the knee flexed/foot flat

- **Transducer Position**
  - Anatomic transverse plane over talar dome

- **Needle Orientation to Transducer**
  - In-plane

- **Needle Approach**
  - Medial to lateral, deep to ant tibialis tendon
Ankle (Talocrural) Joint
Anteromedial Approach
Ankle (Talocrural) Joint
Anteromedial Approach

• **Target**
  • Ant ankle joint recess between hyaline cartilage of talar dome and peri-articular fat

• **Pitfalls**
  • Identify and avoid deep peroneal nerve and dorsalis pedis artery/veins
Ankle (Talocrural) Joint
Anteromedial Approach
Subtalar Joint (Posterior Facet) 
**Anterolateral Approach**

- **Patient Position**
  - Side-lying with symptomatic side up

- **Transducer Position**
  - Identify sinus tarsi with an anatomic transverse plane over dorsolateral foot
  - Slide posterior to anterior margin of STJ posterior facet just anterior to lat malleolus

- **Needle Orientation to Transducer**
  - Out-of-plane

- **Needle Approach**
  - Anterior to posterior
Subtalar Joint (Posterior Facet)
Anterolateral
Subtalar Joint (Posterior Facet)  
**Anterolateral**

- **Target**
  - Subtalar joint using walk-down technique

- **Pitfalls**
  - Identify and avoid sural nerve
Subtalar Joint (Posterior Facet)

Anterolateral
Peroneal Tendon Sheath

- **Patient Position**
  - Side-lying with symptomatic side up

- **Transducer Position**
  - Anatomic transverse plane over peroneal tendons just proximal to lateral malleolus

- **Needle Orientation to Transducer**
  - In-plane

- **Needle Approach**
  - Anterior to posterior
Peroneal Tendon Sheath
Peroneal Tendon Sheath

- **Target**
  - Peroneal tendon sheath between tendon and fibula

- **Pitfalls**
  - Avoid intratendinious cortisone injection
Peroneal Tendon Sheath
Posterior Tibialis Tendon Sheath

- **Patient Position**
  - Side-lying with symptomatic side down

- **Transducer Position**
  - Anatomic transverse plane over posterior tibialis tendon at level of medial malleolus

- **Needle Orientation to Transducer**
  - In-plane

- **Needle Approach**
  - Anterior to posterior
Posterior Tibialis Tendon Sheath
Posterior Tibialis Tendon Sheath

• **Target**
  • Posterior tibialis tendon sheath between tendon and medial malleolus

• **Pitfalls**
  • Avoid intratendinious cortisone injection
  • Identify and avoid posterior tibial neurovascular structures
Posterior Tibialis Tendon Sheath
Flexor Hallucis Longus Tendon Sheath

- **Patient Position**
  - Prone with foot hanging over end of table

- **Transducer Position**
  - Anatomic transverse plane over FHL tendon at level of posterior process of talus

- **Needle Orientation to Transducer**
  - In-plane

- **Needle Approach**
  - Lateral to medial (deep to Achilles tendon)
Flexor Hallucis Longus Tendon Sheath
Flexor Hallucis Longus Tendon Sheath

• **Target**
  • FHL tendon sheath between tendon and talus

• **Pitfalls**
  • Identify and avoid sural and posterior tibial neurovascular structures
  • Avoid intratendinious cortisone injection
  • Be aware of tibiotalar joint communication
Flexor Hallucis Longus Tendon Sheath
Achilles Needle Tenotomy (Fenestration)

- **Patient Position**
  - Prone with foot hanging over end of table
  - Alt: Side-lying with symptomatic side down

- **Transducer Position**
  - Long (or short) axis to Achilles tendon

- **Needle Orientation to Transducer**
  - In- and out-of-plane

- **Needle Approach**
  - Proximal to distal (or medial to lateral)
Achilles Needle Tenotomy (Fenestration)
Achilles Needle Tenotomy (Fenestration)
Achilles Needle Tenotomy (Fenestration)

- **Target**
  - Repetitively fenestrate tendinopathic region

- **Pitfalls**
  - Identify and avoid sural nerve

- **Pearls**
  - Prescan crucial for planning approach
  - Use in- and out-of-plane views
  - "Oblique" LAX allows better ergonomics
  - Can combine with biologic agent (eg, PRP)
Achilles Needle Tenotomy (Fenestration)
Achilles Needle Tenotomy (Fenestration)
Achilles Needle Tenotomy (Fenestration)
Achilles Tendon Scraping
Retrocalcaneal (or RetroAchilles) Bursa

- **Patient Position**
  - Prone with foot hanging over end of table

- **Transducer Position**
  - Anatomic transverse plane over retrocalcaneal (retroAchilles) bursa

- **Needle Orientation to Transducer**
  - In-plane

- **Needle Approach**
  - Lateral to medial
Retrocalcaneal (or RetroAchilles) Bursa
Retrocalcaneal (or RetroAchilles) Bursa

**Target**
- Retrocalcaneal bursa between Achilles tendon and posterior calcaneus
- RetroAchilles bursa located superficial to Achilles tendon and deep to subQ tissue

**Pitfalls**
- Identify and avoid sural nerve
- Avoid injecting the Achilles tendon
- Do not overfill retrocalcaneal bursa
Retrocalcaneal Bursa
RetroAchilles Bursa
Plantar Fascia

- **Patient Position**
  - Side-lying with symptomatic side down

- **Transducer Position**
  - Anatomic transverse plane over plantar fascia origin

- **Needle Orientation to Transducer**
  - In-plane

- **Needle Approach**
  - Medial to lateral
Plantar Fascia
Plantar Fascia

• **Target**
  • Superficial or deep to plantar fascia origin

• **Pitfalls**
  • Avoid intrafascial cortisone injection
  • Identify and avoid the medial ankle neurovascular structures
    • Baxter's nerve passes deep to fascia
LT PLANTAR FASCIA
Plantar Fascia (deep)
First Metatarsophalangeal Joint (Indirect Sesamoids)

- **Patient Position**
  - Supine

- **Transducer Position**
  - Anatomic sagittal plane over dorsomedial joint

- **Needle Orientation to Transducer**
  - Out-of-plane

- **Needle Approach**
  - Medial to lateral
First Metatarsophalangeal Joint (Indirect Sesamoids)
First Metatarsophalangeal Joint (Indirect Sesamoids)

• **Target**
  - Dorsomedial aspect 1st MTP joint
  - Use walk-down technique

• **Pitfalls**
  - Stay dorsal to avoid medial hallucal nerve
First Metatarsophalangeal Joint (Indirect Sesamoids)
First Metatarsophalangeal Joint (Indirect Sesamoids)
First Metatarsophalangeal Joint (Indirect Sesamoids)
Morton Neuroma

• **Patient Position**
  • Prone

• **Transducer Position**
  • Plantar view - anatomic sagittal plane over neuroma/intermetatarsal space

• **Needle Orientation to Transducer**
  • In-plane

• **Needle Approach**
  • Distal to proximal
Morton Neuroma
Morton Neuroma

- **Target**
  - Adjacent to or into neuroma

- **Pitfalls**
  - Identify and avoid adjacent interdigital artery/veins
Morton Neuroma
Summary

• Practice basic USGI fundamentals
  • Find needle in periphery (jiggle/slide)
  • Look at your probe/needle alignment
  • Tip in view while advancing

• Small footprint, high frequency probe (eg, hockey stick) nice for foot/ankle injections

• Consider smaller gauge needles (27g) for patient comfort

• Knowing alternative approaches helps when access difficult (DJD)
References
