Soft Tissue Ultrasound Cheat Sheet

Clinical Application

Basics
- Helps differentiate cellulitis vs abscess (98% sensitive for abscess)
- Allows one to see the size, proximity to vessels, and complexity of abscess before draining
- Can identify foreign bodies that are radiopaque or too small for xray and enhance their removal
- It’s one of the easiest ultrasound scans to learn!

Anatomy

Normal
- Epidermis/dermis: thin, hyperechoic layer
- Hypodermis: less echogenic than epidermis, contains vessels, nerves, and septa
- Fascia: hyperechoic thin stripes deep to dermis
- Muscles: organized fiber bundles with hyperechoic muscle sheaths
- Lymph nodes: oval hypoechoic structures that has echogenic hilus with some color flow

Technique

Basics
- Use linear probe
- Probe marker orientation should match the screen marker
- Start over adjacent normal tissue & move to area of concern
- Examine area in two planes
- Keep probe perpendicular to skin to prevent false echogenicity
- Use light pressure & generous gel to reduce pain
- Consider using a water bath for the hand/foot
- Water bath: place hand/foot in water with probe also in water just above area of interest

Pathology

Cellulitis
- Has characteristic “cobblestone” appearance
- Cobblestoning: hypoechoic edema surrounding relatively hyperechoic subcutaneous fat

Abscess
- Discrete pocket of hypoechoic or anechoic material (with varying internal echogenicity)
- Swirl sign: swirling of purulent material with compression (also known as “pus-istatis”)
- Color flow should be used to confirm area is not a blood vessel or lymph node

Necrotizing Fasciitis
- Presence of ≥ 4 mm overlying deep fascial layer that is thickened and distorted
- Air or dirty gas shadowing can be present in infected soft tissue

Foreign Bodies
- Foreign bodies typically appear hyperechoic
- Metal usually has reverberation artifact (multiple hyperechoic lines deep to actual structure)
- Wood & plastic often have posterior shadowing
- Glass can have reverberation artifact or posterior shadowing
- Halo sign: hypoechoic ring surrounding foreign object after > 24 hrs (host response to FB)
- Removal: insert needle under US guidance to FB and incise along needle or insert hemostat along needle to grab object

Tips and Tricks
- Step off pads (like a bag of saline or water filled glove) can be useful for soft tissue imaging
- False echogenicity can result if probe not perpendicular to skin (not the best time to fan)
- Cobblestoning is not specific to cellulitis & can also represent edema
- Be aware of abscess mimics: inflamed lymph node, blood vessel, hematoma, tumor
- Scar tissue can appear hyperechoic, so don’t confuse it for a foreign body

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