

Carpal Tunnel Ultrasound

Basics

- Use when concern for median nerve compression
- Symptoms of nerve compression include: decreased grip strength, numbness, and tingling in palm or fingers
- Nerves look like a bundle of hyperechoic spaghetti (in long axis) or a honeycomb (in short axis)

Anatomy

- Flexor retinaculum forms roof of the carpal tunnel
- Proximally: flexor retinaculum attaches from the pisiform to the scaphoid
- Distally: flexor retinaculum attaches from the hamate to the trapezium
- Proximal carpal tunnel:
 - Radial border- scaphoid
 - Ulnar border- pisiform
 - Floor- lunate
- Distal carpal tunnel:
 - Radial border- trapezium
 - Ulnar border- hamate
 - Floor- capitate
- Tunnel contents:
 - 4 deep flexor tendons
 - 4 superficial flexor tendons
 - Flexor pollicis longus tendon (on radial aspect)
 - Median nerve (superficial and more radial)
- Flexor pollicis longus tendon (on radial aspect) borders scaphoid and can be identified by flexing the thumb
- Ulnar nerve and ulnar artery run together in Guyon's Canal (just superficial to carpal tunnel on ulnar aspect of wrist)

Technique

Transverse Exam (Short Axis)

- Probe marker towards radial aspect of wrist
- Proximal exam: place probe over scaphoid and pisiform (just distal to radius and ulna)

- Distal exam: place probe over hamate and trapezium and angle probe proximally
- Ask subject to wiggle fingers to test for laxity of median nerve in carpal tunnel
- Median nerve should move freely without being pushed into flexor retinaculum

Longitudinal Exam (Long Axis)

- In long axis nerves and tendons look similar
- Flexing 2nd and 3rd digit slowly can help distinguish tendon from nerve
- Tendons will slide under the nerve
- Median nerve will be relatively still
- Median nerve has hyperechoic epineurium on deep and superficial surfaces
- In long axis: floor of tunnel is made of the radius, lunate, and capitate (from proximal to distal)

Pathology

- A median nerve > 4 mm indicates swelling
- In longitudinal view: bulging of median nerve prior to entering the carpal tunnel is abnormal
- In transverse view: observe for swelling in proximal carpal tunnel

More Carpal Tunnel Ultrasound

- If you want to check out a video on carpal tunnel here's a link: [Carpal Tunnel Tutorial](#)