Ultrasound Guided Injection of Carpal Tunnel

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Overviews

• Anatomy of the wrist
• Ultrasound anatomy
• Injection techniques
• Injection of Salivary Glands
• Botox
Bones of the Hand
Figure 2. Carpal tunnel anatomy.
Ultrasound Image of Carpal Tunnel
Transverse View

Arrowheads: flexor retinaculum
d: flexor digitorum profundus tendons
fcr: flexor carpi radialis tendon
fpl: flexor pollicis longus tendon
S: flexor digitorum superficialis tendon
Void Arrow: Ulnar nerve
White Arrow: Median Nerve
Why Ultrasound?

• Few RCTs for median nerve injections
• Short term outcomes
  – Yes at 6 weeks
• Long term outcomes
  – No
• Minimize Complications
• Accuracy
Two Approaches

• In-plane (IP)
  – Needle lined up and parallel to transducer
  – Able to see length of the needle as it approaches

• Out-of-plane (OOP)
  – Needle perpendicular to transducer
  – Transverse view
Injection techniques

• Transverse approach in plane
  – Radial to ulnar
  – Ulnar to radial
    • Mark ulnar artery
    • Radial to ulnar artery

• Longitudinal in plane

• Out of plane
  – Ulnar aspect
Transverse Injection
Transverse Approach IP
Transverse vs Longitudinal

Median Nerve - Injection

Longitudinal In-Plane

Transverse In-Plane
Precautions

• Vascular
  – Color Flow

• Anatomy
  – 5mm

• Probe Direction
Ultrasound for Salivary gland injections

- Botox
- Treatment of sialorrhea (CP, stroke, Parkinson’s)
- 9 Systemic Reviews and 2 RCTs in Parkinson’s
- Lagella et al 2006 was U/S vs non (U/S improved wk 1 vs wk 4 of non)
- 10-100u total, 1-3 sites/gland
- Parotid: 5-50u
- Submandibular : 10-30u
- Duration 1.5-7 months
Botox for Sialorrhea

• Benefits
  – Decreased drooling/amount
  – Decreased salivary flow rate
  – Less respiratory distress
  – Improved QOL
Adverse Effects

Dry Mouth/Xerostemia
Transitory difficulty swallowing
Facial weakness
Salivary Gland

- Parotid duct
- Parotid gland
- Masseter muscle
- Submandibular gland
- Sublingual gland
- Submandibular duct
- Mandible
- Tongue
Conclusion

• Anatomy
• Anatomy
• Anatomy
• Orientation