

Peripheral Nerve Entrapments

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DISCLOSURE

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The Definition of Entrapment Neuropathy

- An entrapment neuropathy is defined as a pressure-induced injury to a peripheral nerve in a segment of its course due to anatomic structures or pathologic processes.

Toussaint CP, Perry EC, 3rd, Pisansky MT, Anderson DE. What's new in the diagnosis and treatment of peripheral nerve entrapment neuropathies. *Neurol Clin.* 2010;28(4):979-1004.

Entrapment Neuropathy

- Kopell and Thompson stated that peripheral nerve entrapment occurs at anatomic sites where the nerve changes direction to enter a fibrous or osseofibrous tunnel, or where the nerve passes over a fibrous or muscular band.
- Entrapment occurs at these sites because mechanically induced irritation is most likely to occur at these locations.

Kopell HP, Thompson WA. *Peripheral Entrapment Neuropathies*. Baltimore: Williams and Wilkins; 1976.

Nerve Entrapment

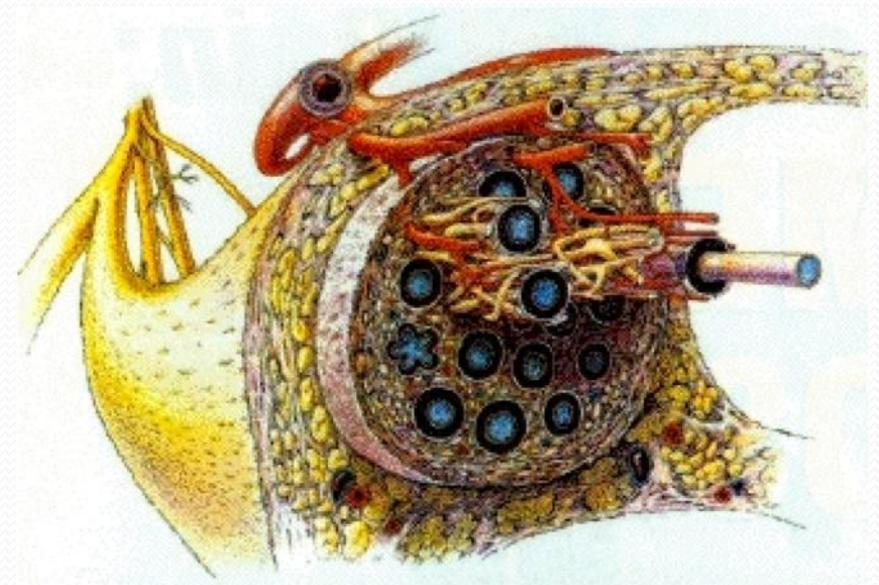
- Tunnels
- Narrow anatomical space
- Fibrous bands, scar tissue
- Masses, bony callus
- External compression
 - Casts, braces
 - Edema
- Inflammation

The Hallmarks of Nerve Entrapments

- Pain
 - Burning, aching, tingling
- Paresthesias with compression
- Tinel's sign
 - represents ectopic excitability
- “Double crush”
 - The presence of a more proximal lesion renders the distal nerve more vulnerable to compression

Pathophysiology

- Prolonged compression causes ischemia due to compression of vasa nervorum
- Mechanical deformation of myelin sheath
- Impairment of axonal transport of nutrients



The Scope of the Problem

- Peripheral nerve entrapments can occur from the top of the head to the toes.
- Knowing the cause of pain can help the physician treat the problem effectively, and will decrease unnecessary and potentially worsening surgeries and therapies.
- A knowledgeable interventional pain physician can diagnose and treat these nerves in the most effective manner.

Naming of Nerve Entrapments

- The compressed nerve (e.g., lateral femoral cutaneous neuralgia)
- The classic Greek or Latin name (e.g., meralgia paresthetica)
- The anatomic area affected (e.g., metatarsalgia)
- The anatomic tunnel (e.g., carpal tunnel syndrome, tarsal tunnel syndrome)
- The motion that causes the compression (e.g., hyperabduction syndrome)
- The names of the describing authors (e.g., Kiloh-Nevin's syndrome)

History

The diagnosis is hidden in the patient's history, and the cause is elicited by the physical exam.

J. Bart Staal

- The history given by the patient, in the patient's own words, is key to making the diagnosis of a peripheral nerve entrapment.
 - Mechanism of injury
 - The initial site of pain
 - The initial referral pattern

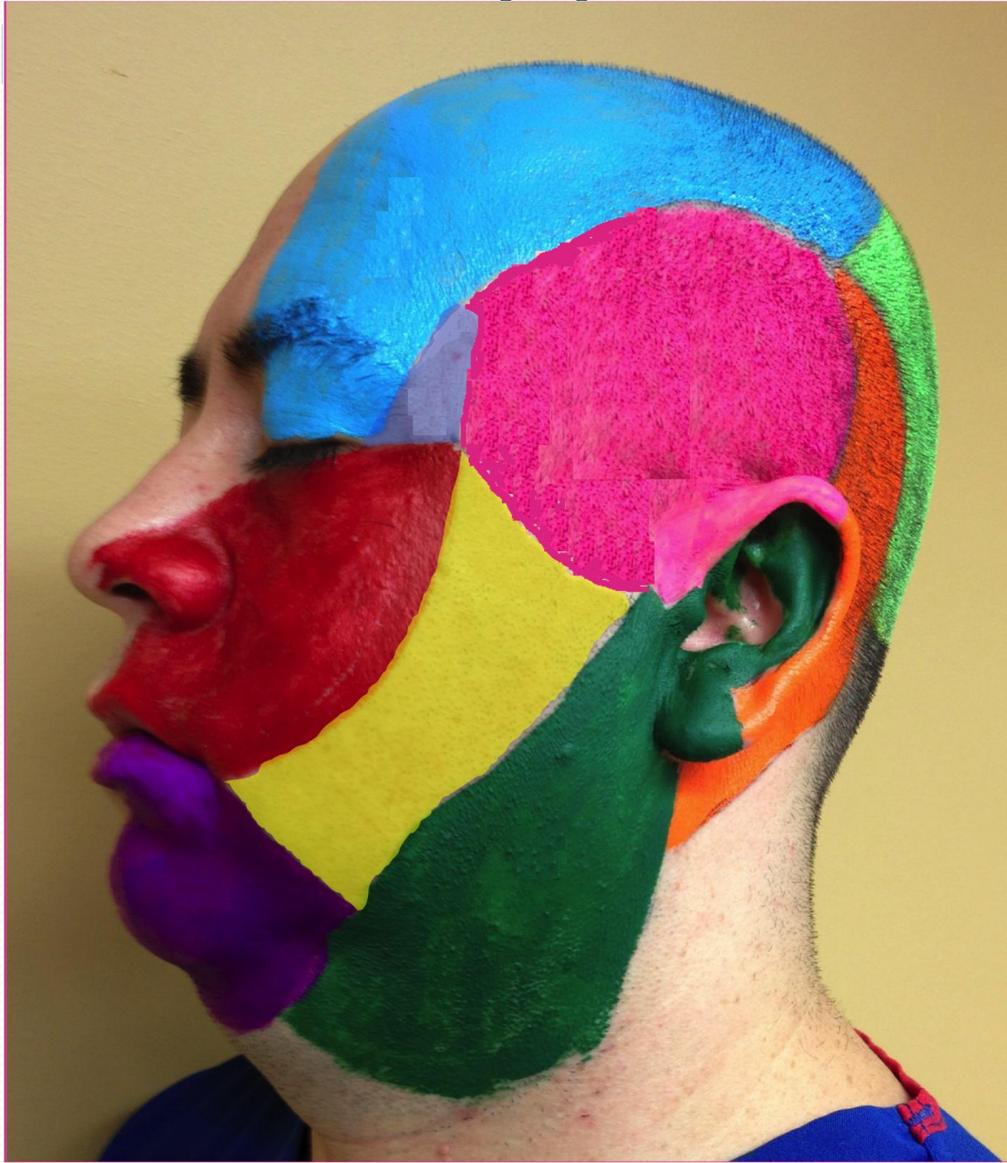
Physical Exam

- Have the patient point to where it hurts
- Inspection
- Based on your knowledge of the patterns of pain, make an educated guess as to the entrapment site
- Examine tangential to the nerve
 - like strumming a guitar string
- Examine proximally to trace back to the site of entrapment

Why are it hurt?

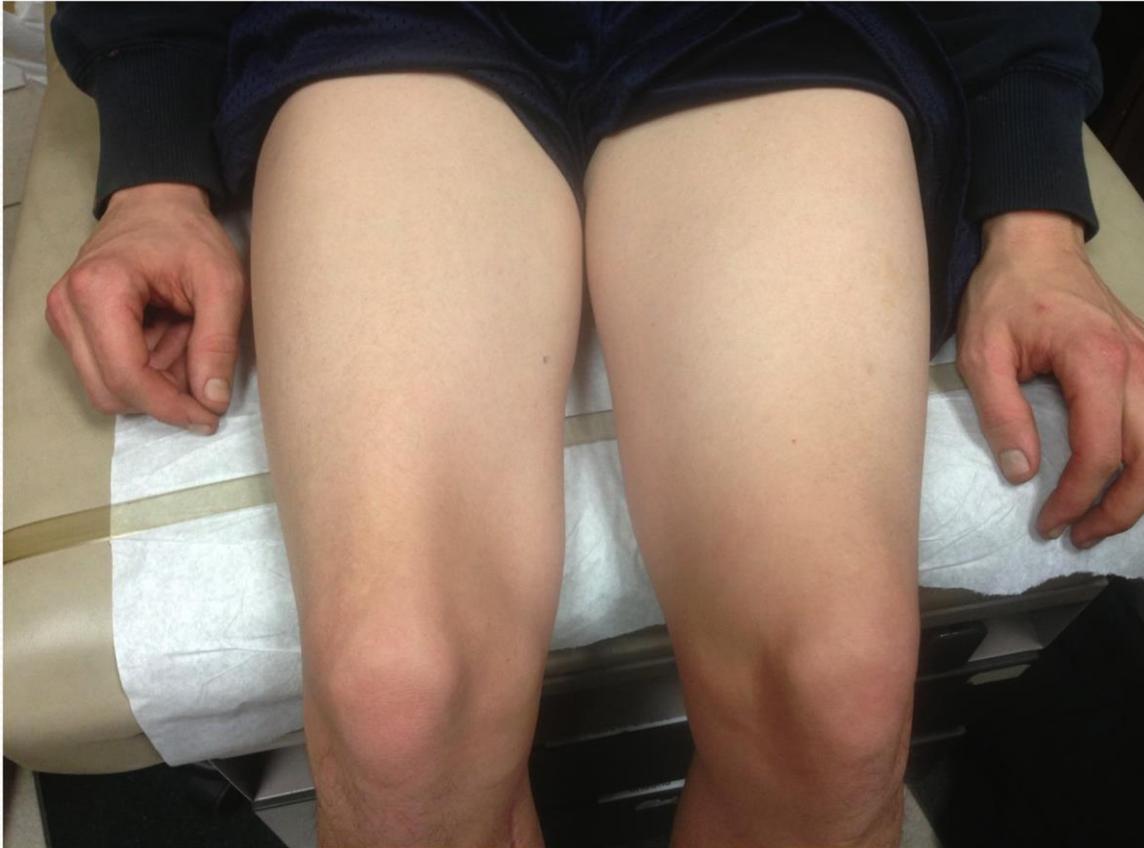


Patter



Physical Exam

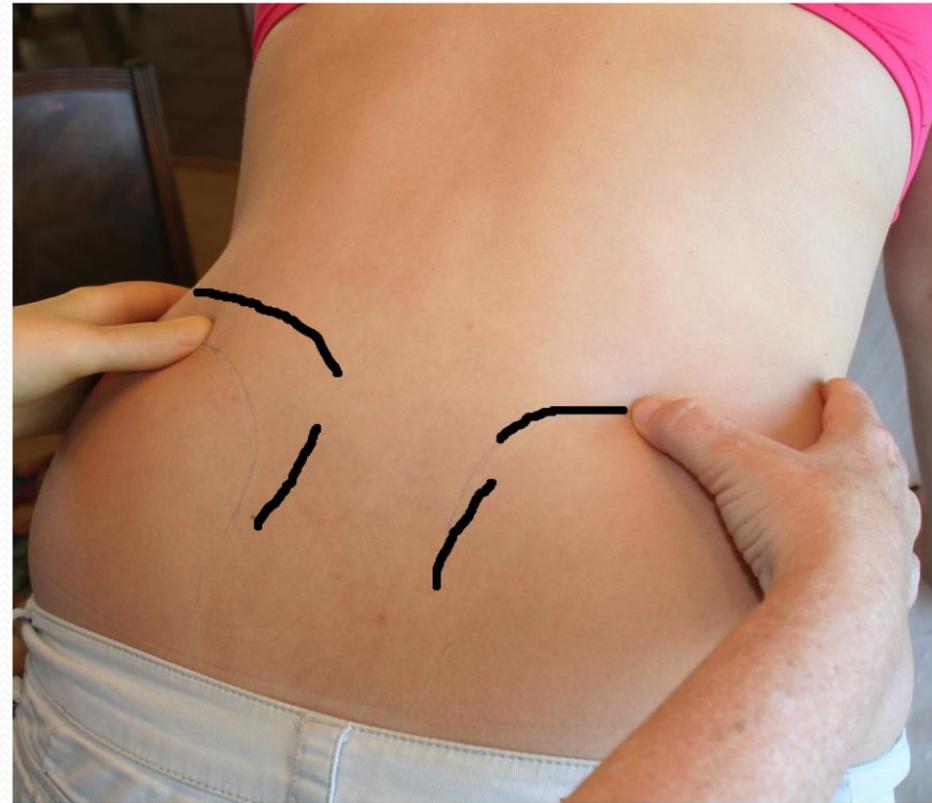
- Inspection



Physical Exam

- Palpation of known entrapment sites
 - Normal nerves are almost insensitive to pain, while entrapped nerves will be extremely sensitive

Beyer TE. Idiopathic supraorbital neuralgia. Laryngoscope. 1949;59(11):1273-5.



Diagnostic Studies

- EMG/NCV
- MRI
- Ultrasound

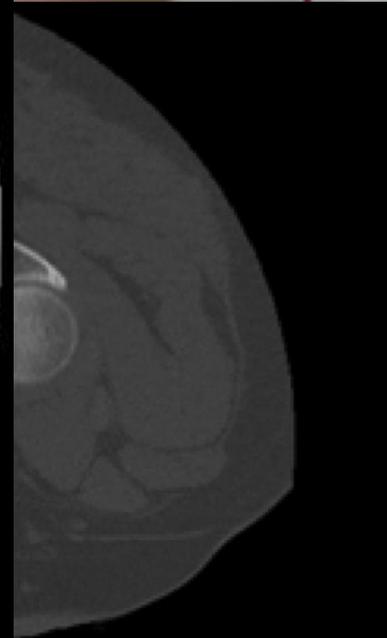


Diagnostic Injections



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CLAY SURGERY CENTER

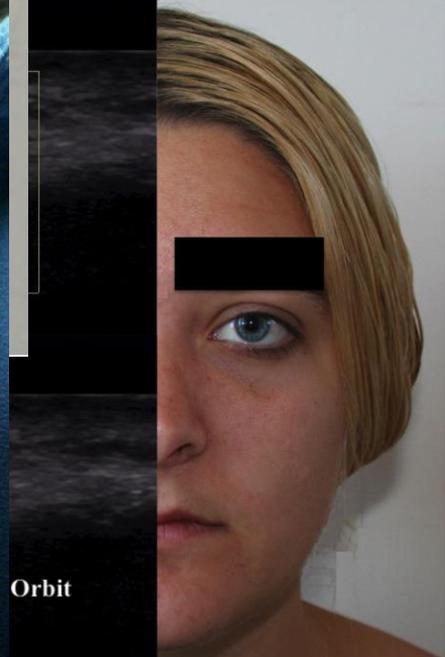
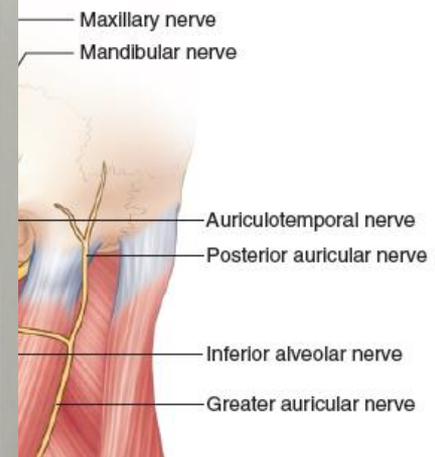
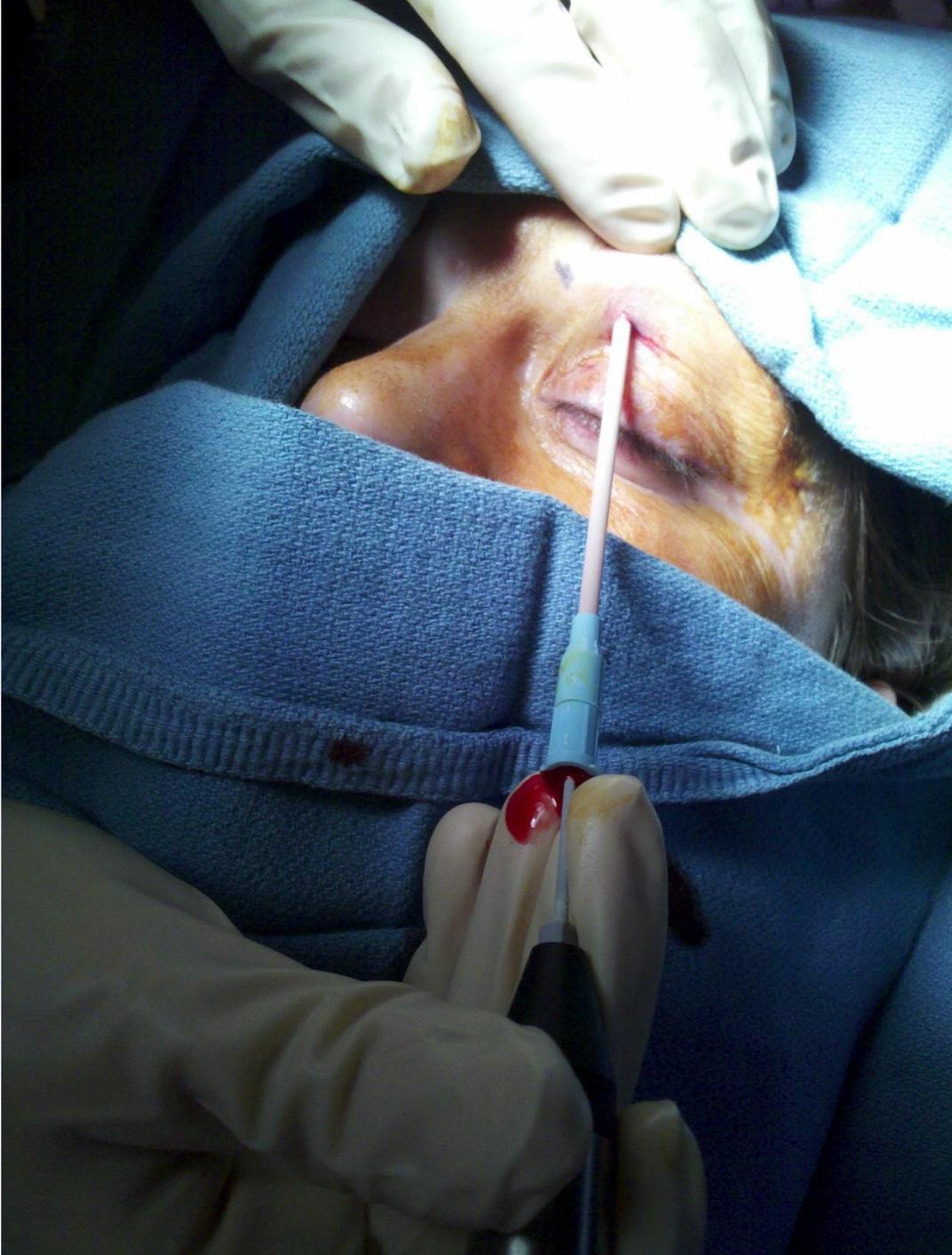


Topics

- Headache
- Facial pain
- Chest wall pain
- Upper extremity pain
- Abdominal pain
- Pelvic pain
- Low back pain
- Lower extremity pain



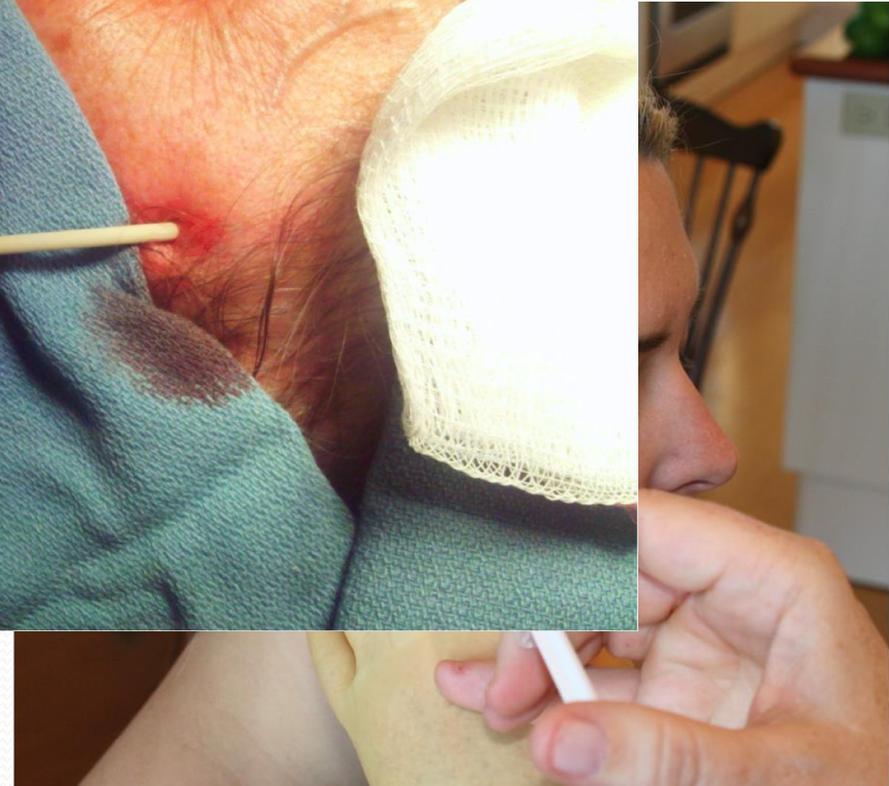
Headaches



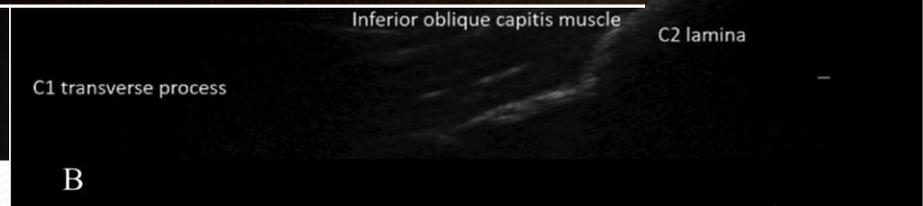
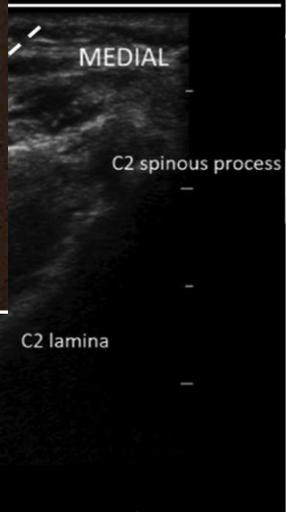
Auriculotemporal Nerve



...ulotemporal nerve



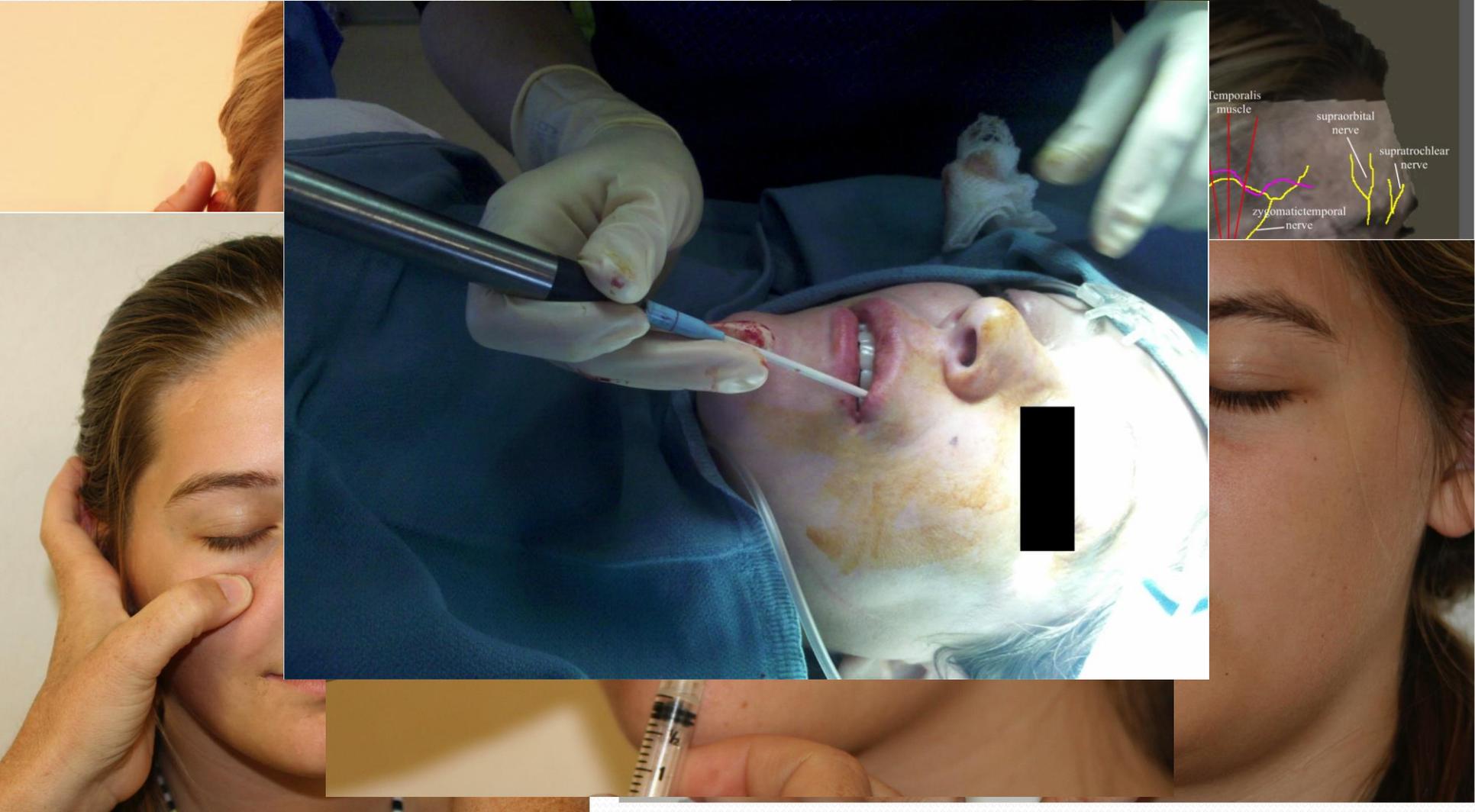
Cervical Injections



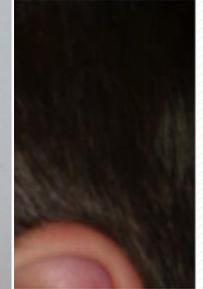
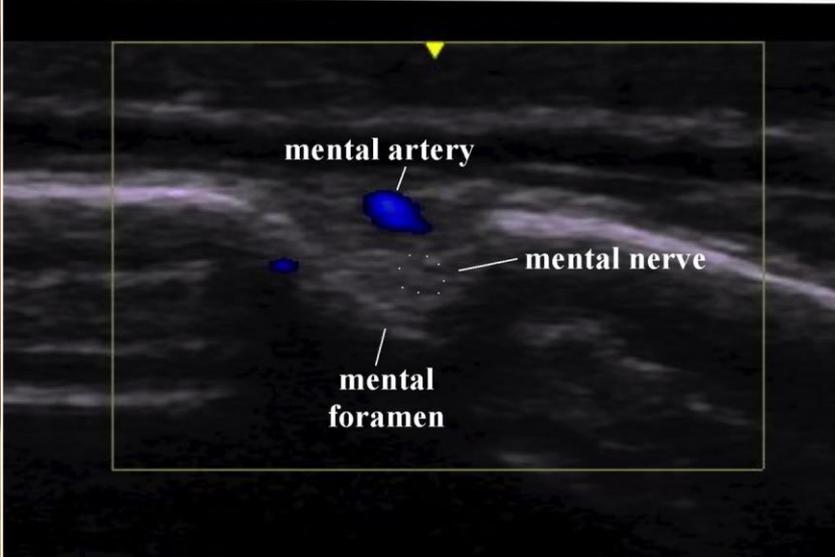
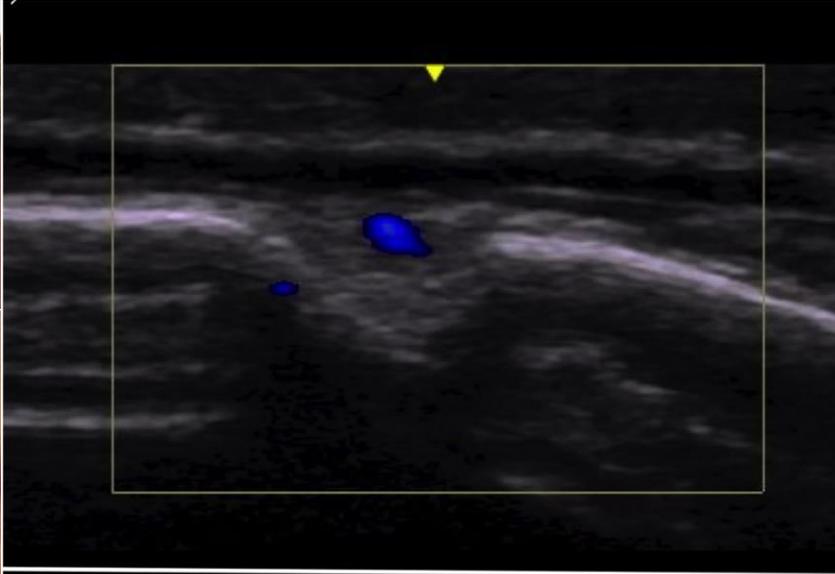


Facial Pain

Infraorbital Neuralgia



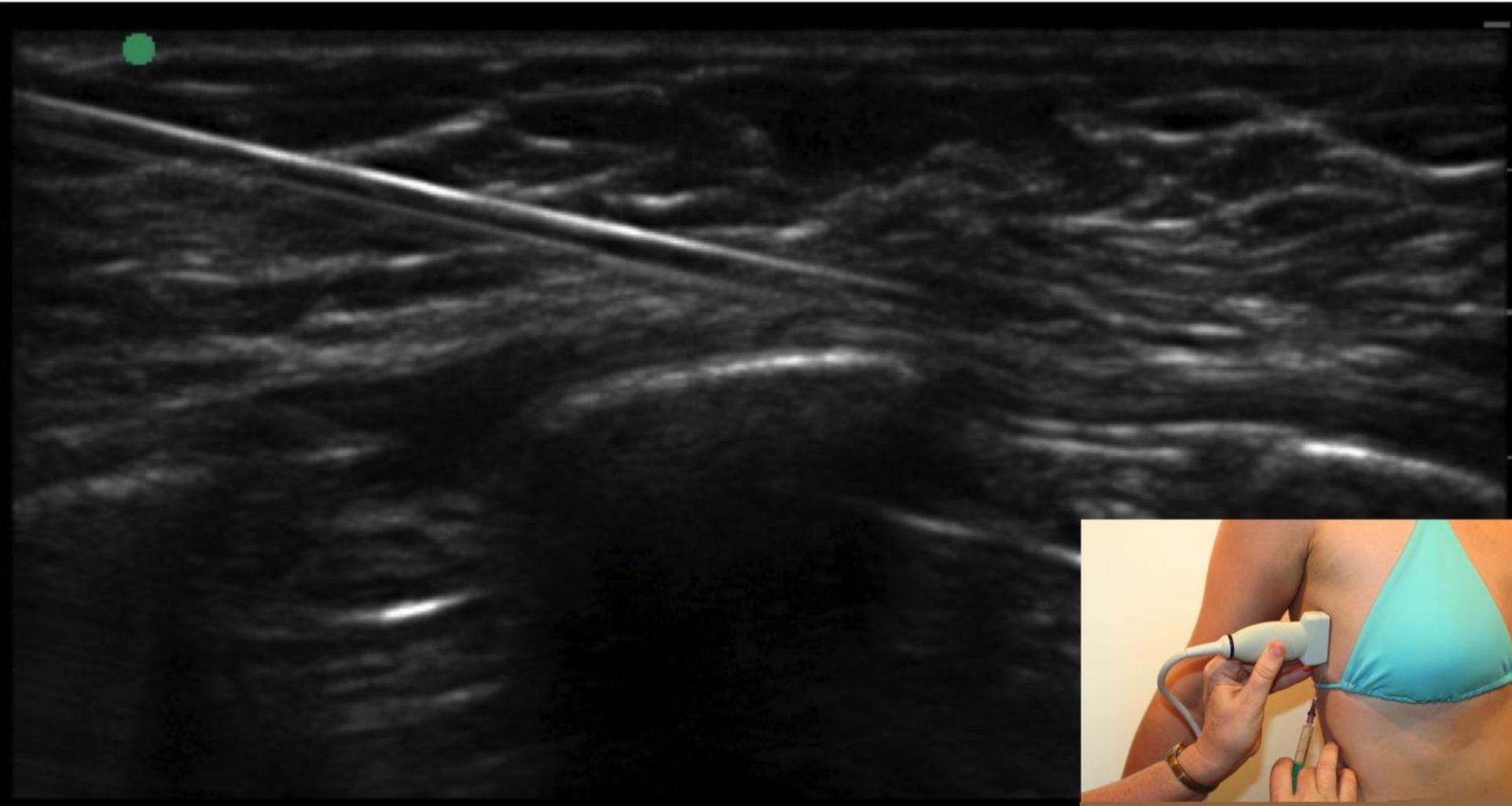
Mental Neuropathy





Chest Wall Pain

Long Thoracic Nerve palsy



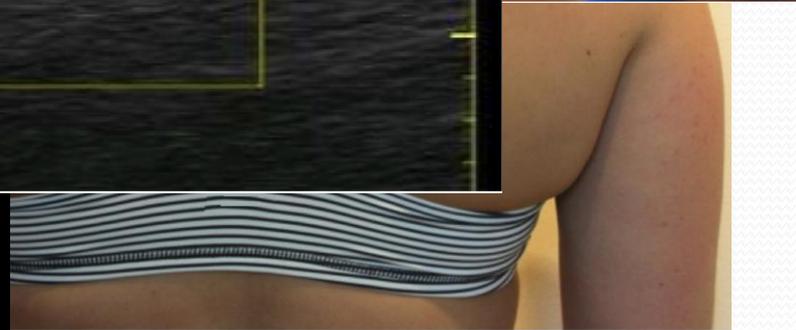
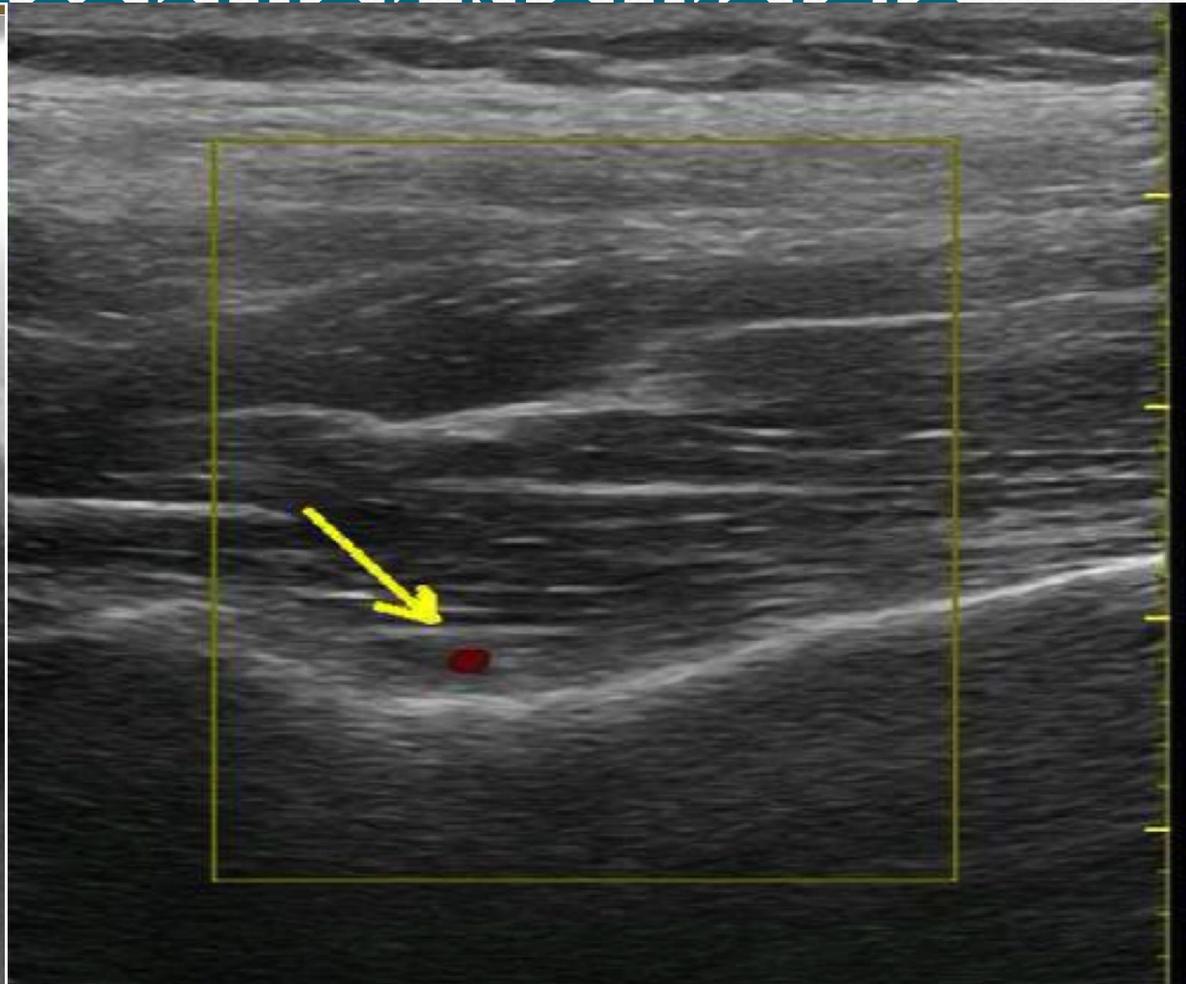
Dorsal Scapular Neuralgia



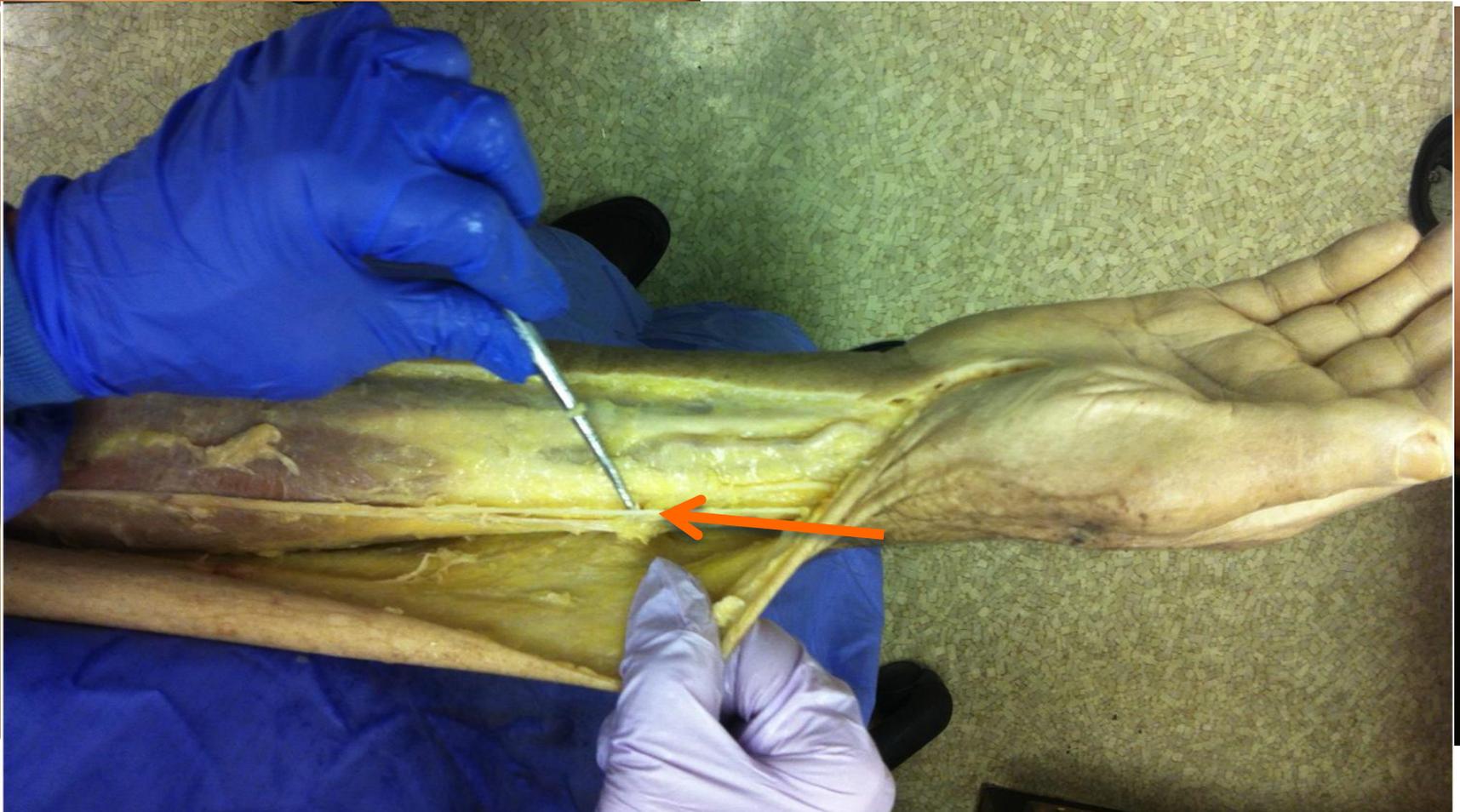


Upper Extremity Pain

Supraorbicular Neuralgia



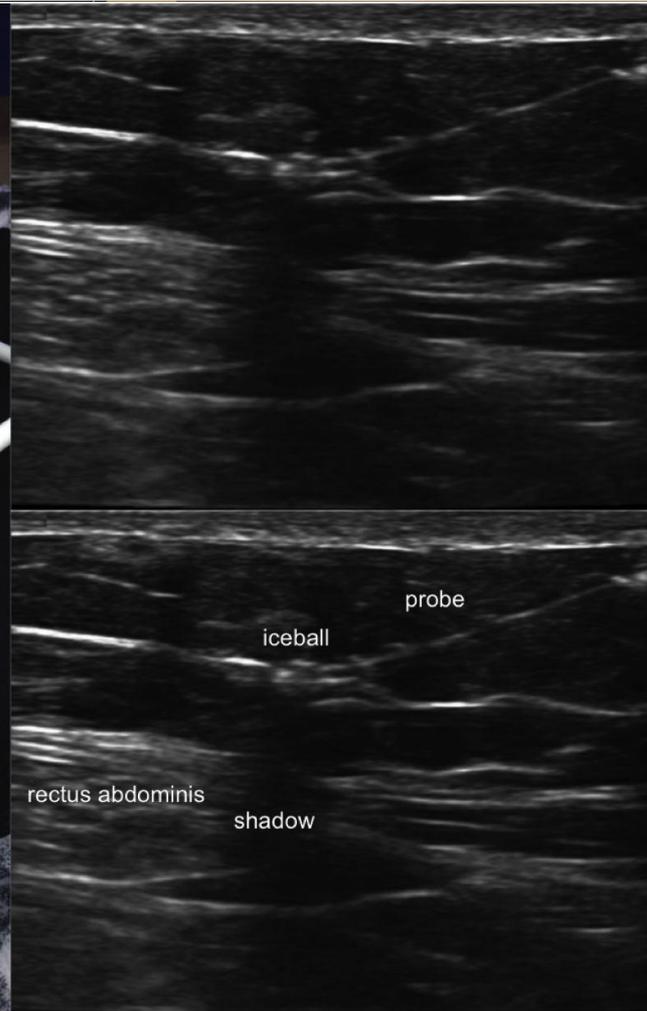
Radial Neuralgia at the Wrist





Abdominal Wall Pain

Anterior Cutaneous Nerve Entrapment (ACNE)

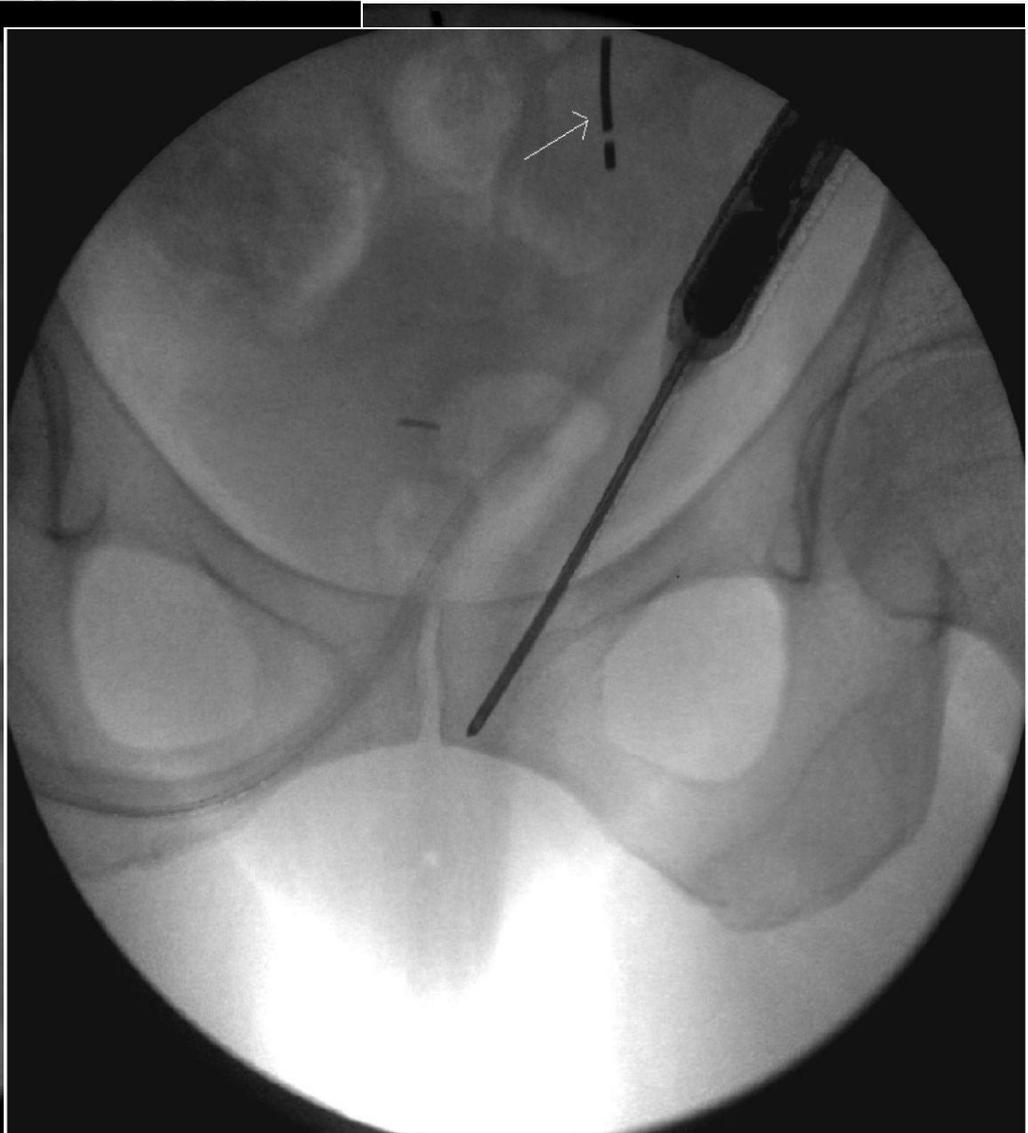
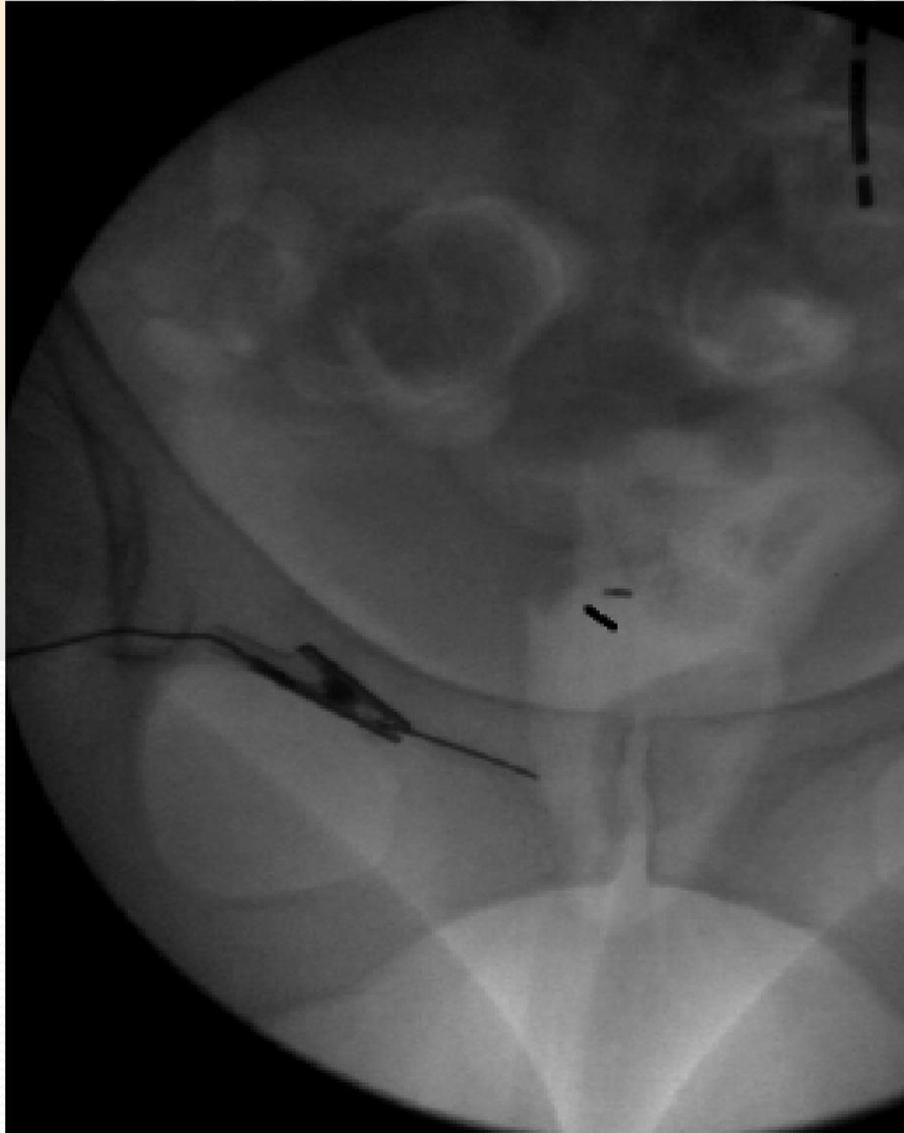


acoabdominal

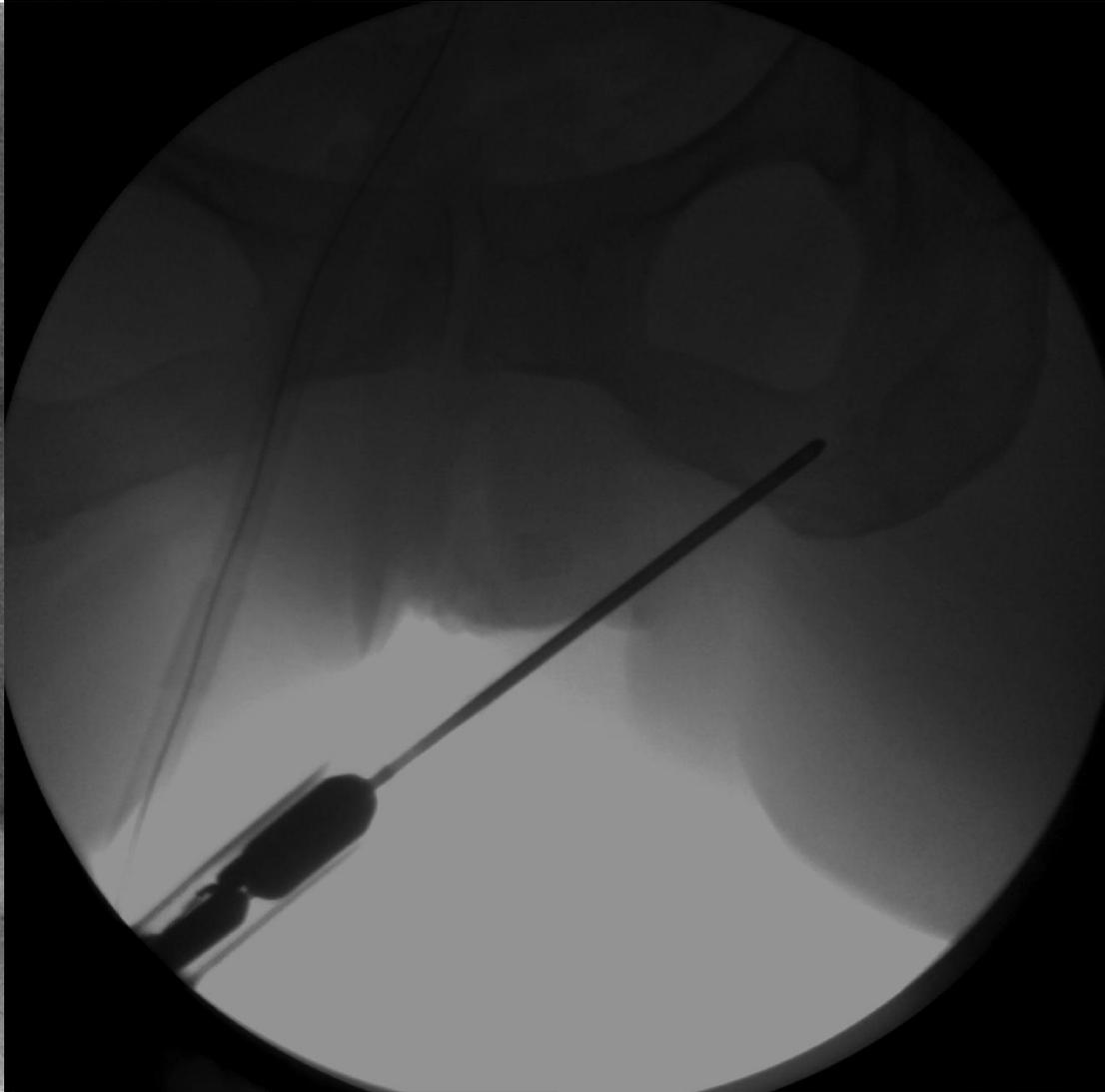


Pelvic Pain

Cervicofemoral Neuropathy



Durandol Neurology

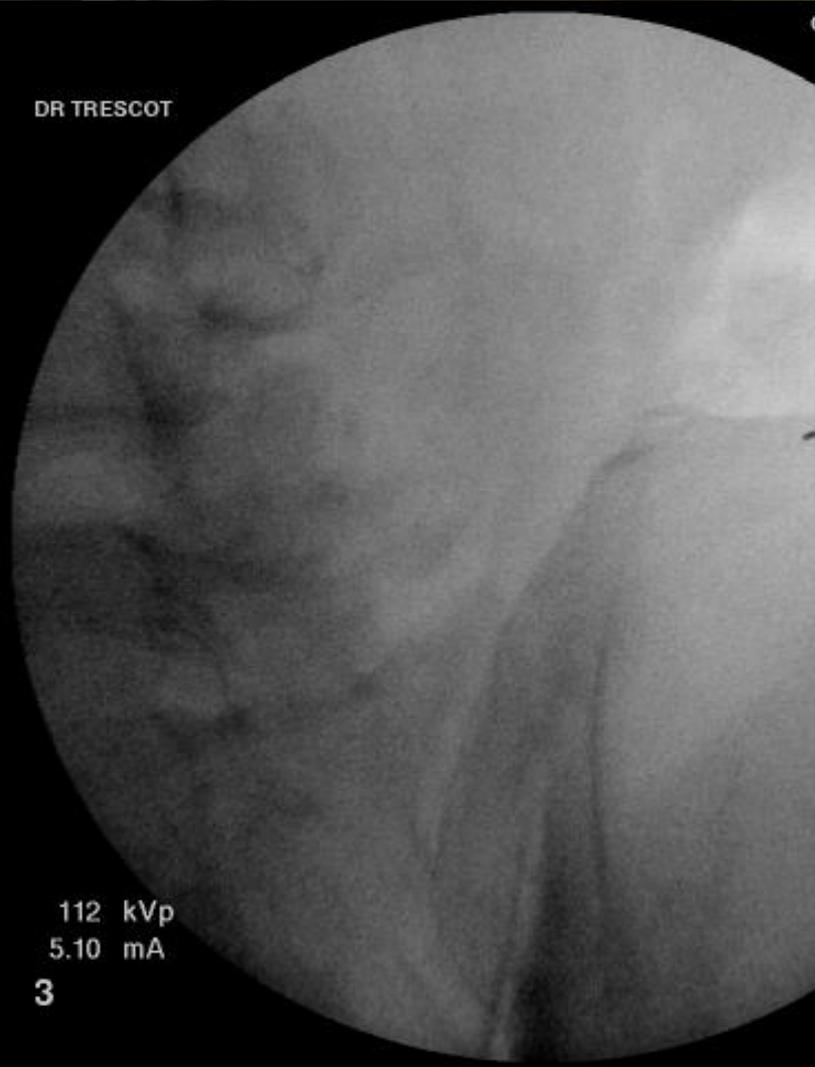




Low Back Pain



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112 kVp
5.10 mA

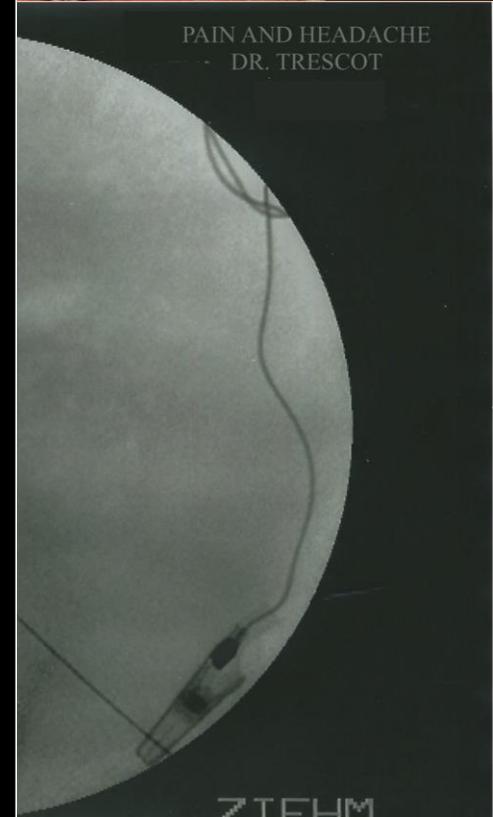
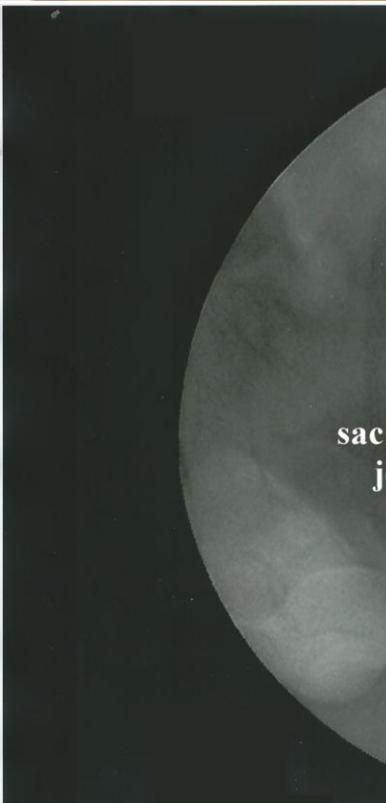
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The Pain Center

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Superior Gluteal Neuralgia



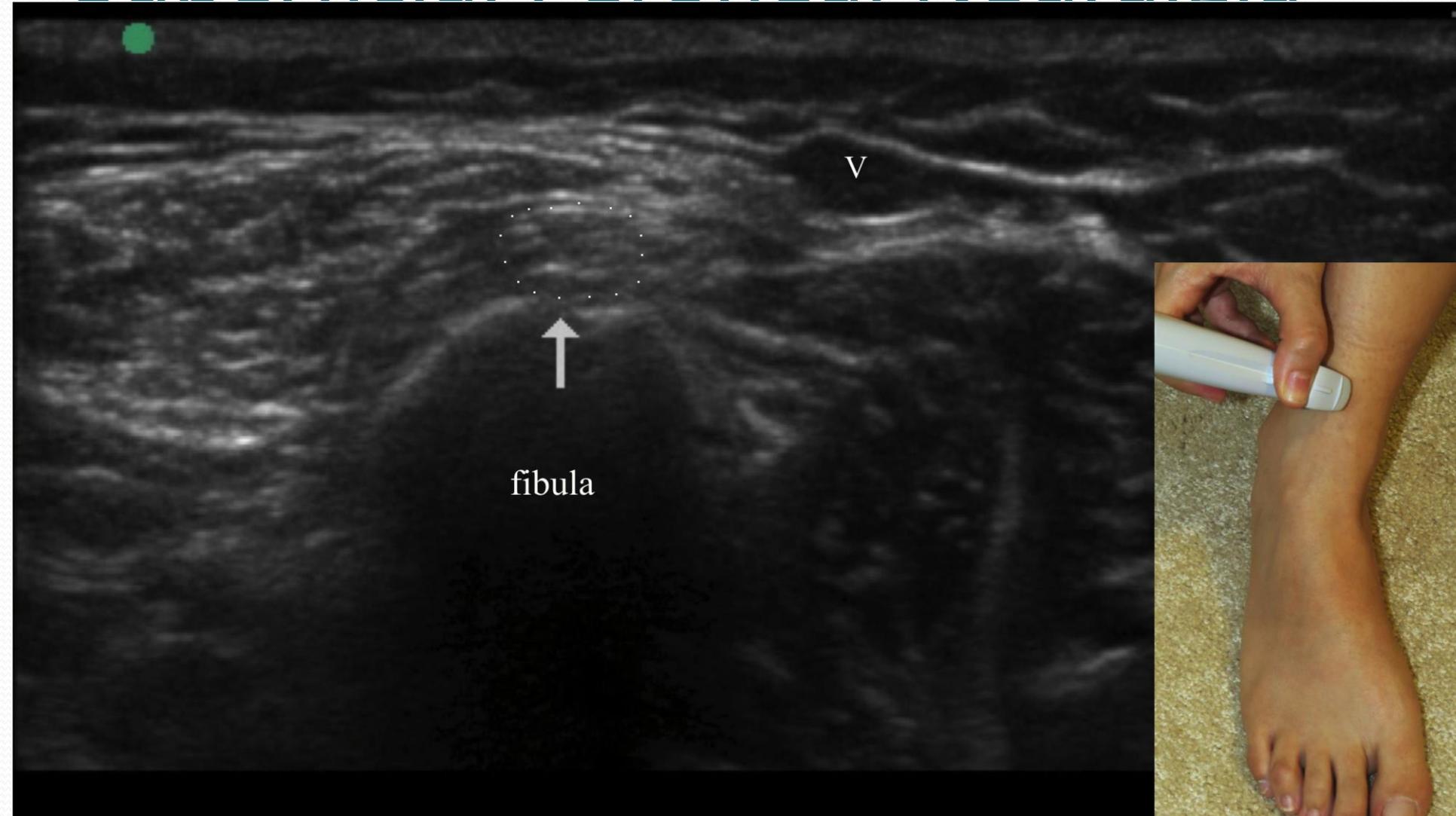


Lower Extremity Pain

Infrapatellar Saphenous



Superficial Peroneal Neuralgia



Summary

- Peripheral nerve entrapments can cause a variety of pain conditions, including headaches, facial and neck pain, chest wall pain, upper extremity and lower extremity pain, abdominal pain, as well as low back pain.
- The history and a directed physical exam, followed by diagnostic injections, are key to the successful diagnosis and treatment of these entrapments

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Peripheral Nerve Entrapments

Clinical Diagnosis
and Management

Trescot Ed.



Peripheral Nerve Entrapments

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and Management

Featured as a single volume, this is a comprehensive guide to possible nerve entrapment syndromes and their management. Each chapter covers a single nerve, or group of closely related nerves, and goes over the clinical presentation, anatomy, physical exam, differential diagnosis, contributing factors, injection techniques, neurolytic/surgical techniques, treatments of perpetuating factors, and complications. Nerve entrapments can occur throughout the body and cause headaches, chest pain, abdominal pain, pelvic pain, low back pain, and upper and lower extremity pain. As an example, one of the most common forms of nerve entrapment syndrome, Carpal Tunnel Syndrome, affects roughly 1 in 20 people in the United States, and is only one of several types of entrapment syndromes possible for the median nerve. Chapters are also extensively illustrated and include 3D anatomical images. The additional online material enhances the book with more than 50 videos – at least 2 for each nerve. This enables readers to easily navigate the book. In addition to a conventional index it includes a “Pain Problems Index” for searching by symptom. *Peripheral Nerve Entrapments: Clinical Diagnosis and Management* is a long-needed resource for pain physicians, emergency room physicians, and neurologists.

Pain Medicine

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Thank you

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