
Basic sonoanatomy of ultrasound guided interventions of cervical and spines

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Pain Fellowship





Technique

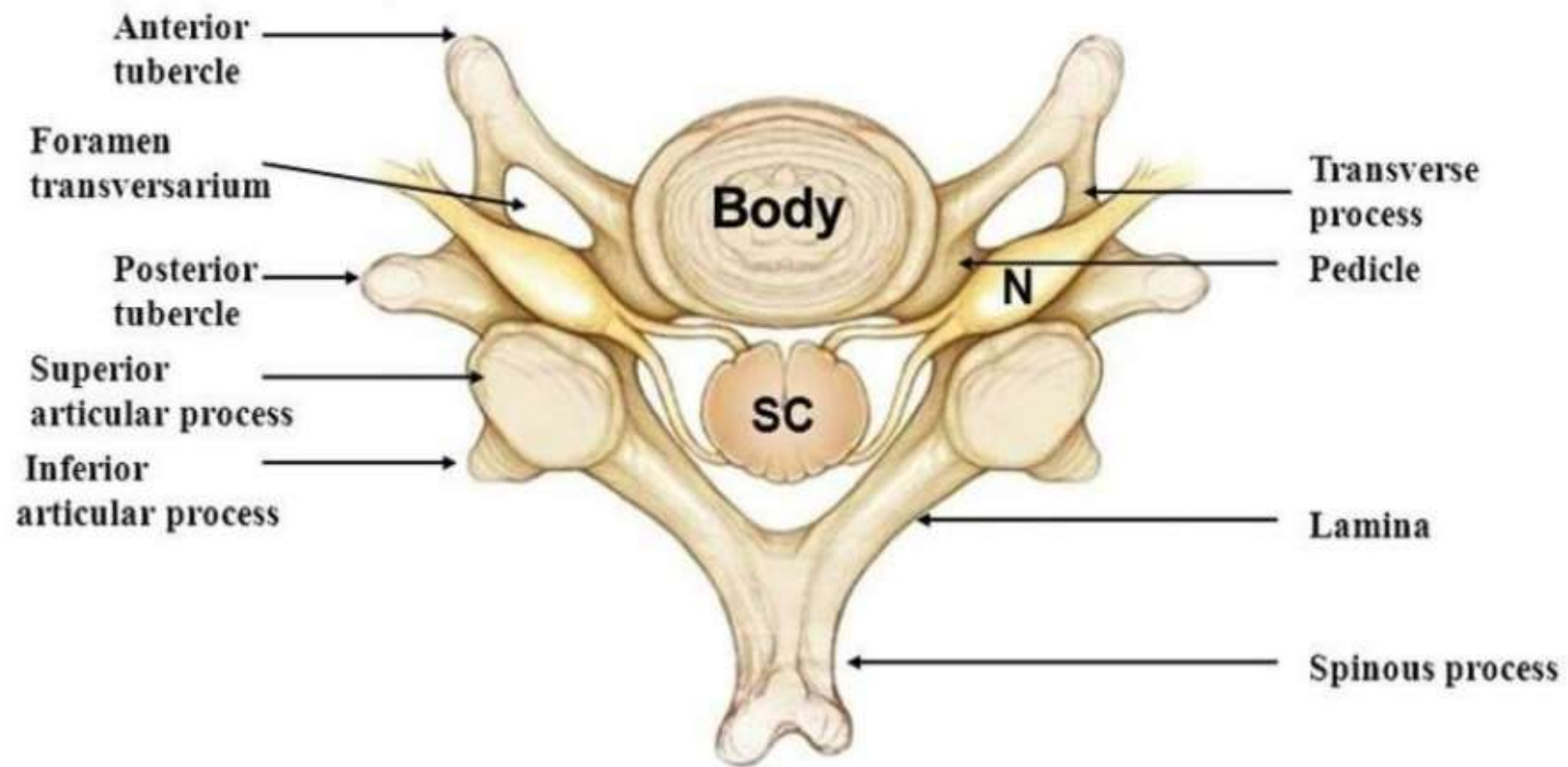


Probe

Patient Position

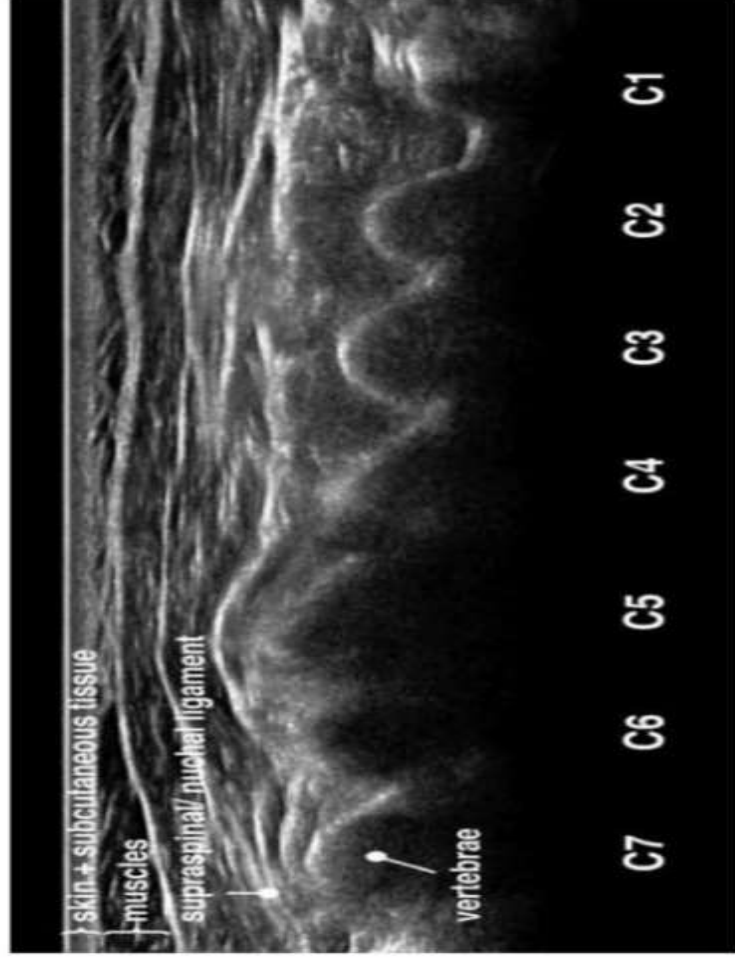
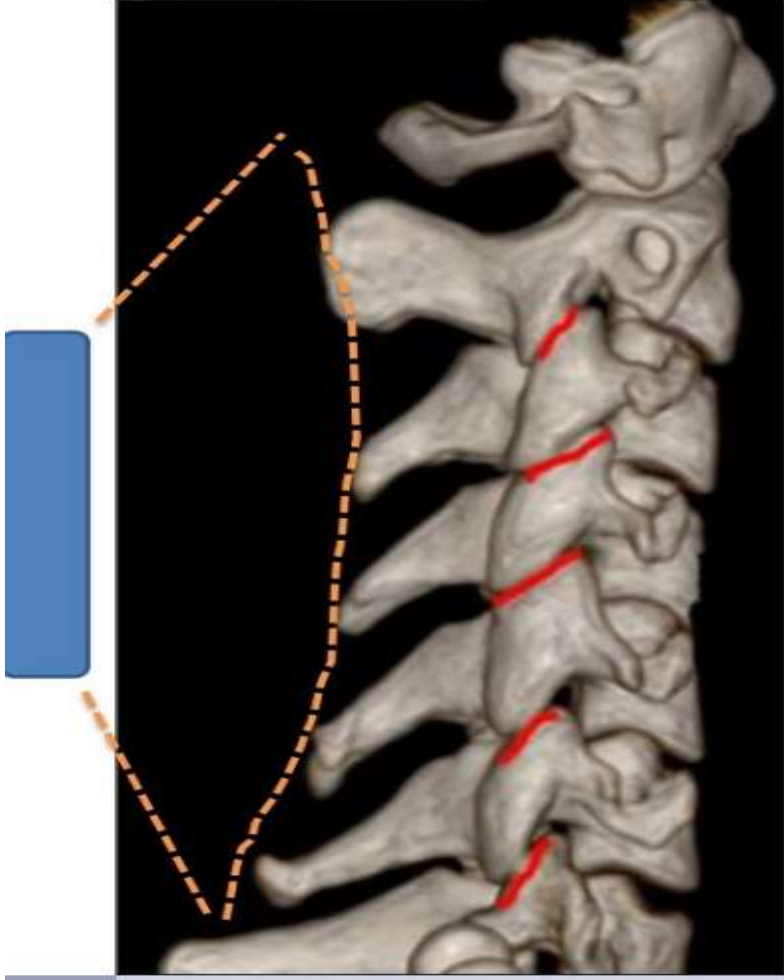


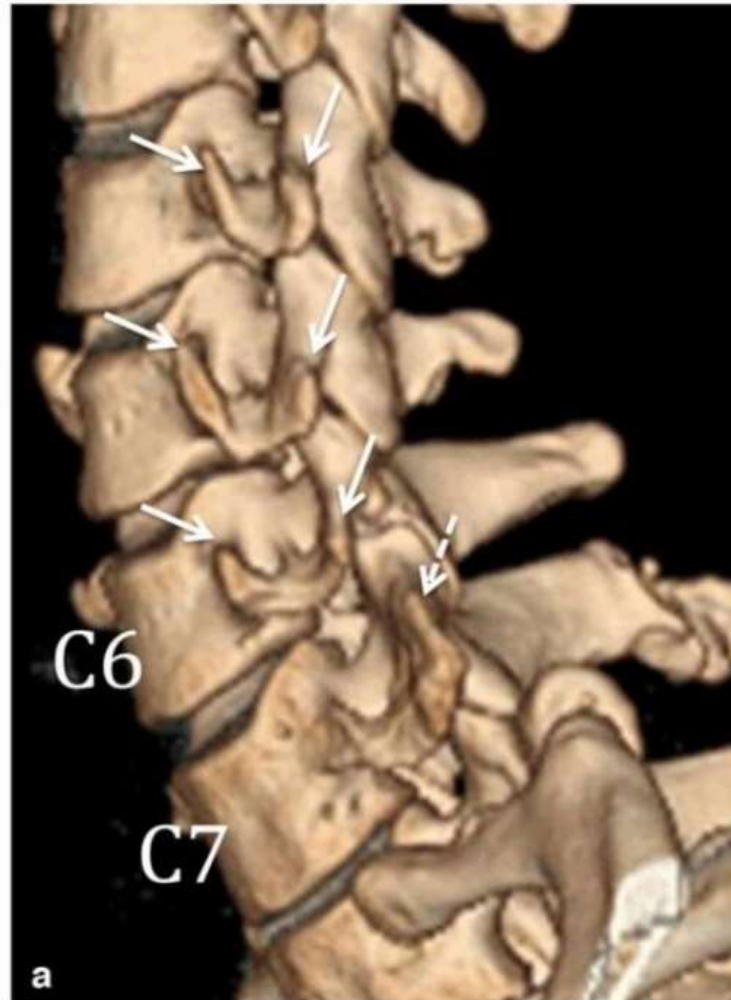
Cervical Spine

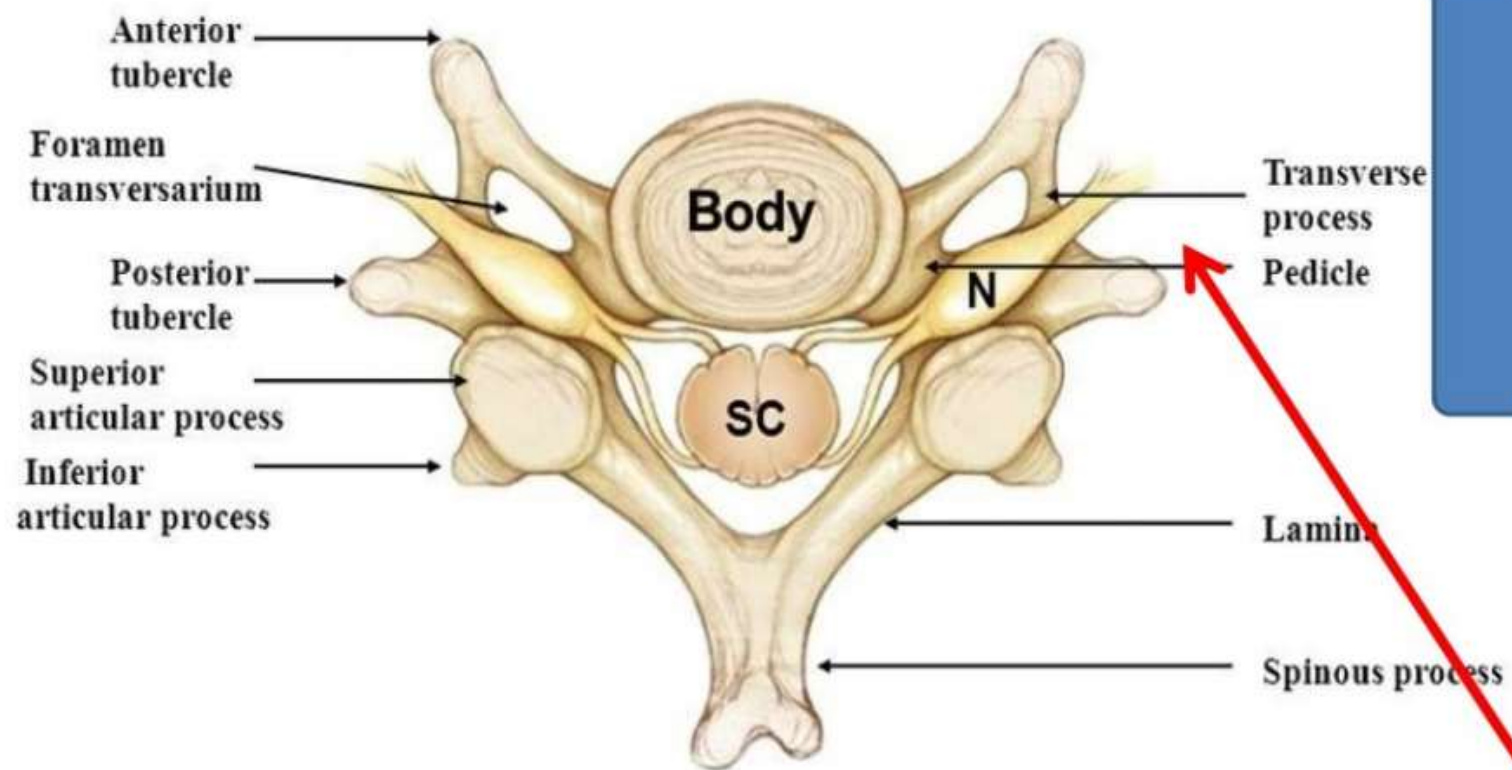


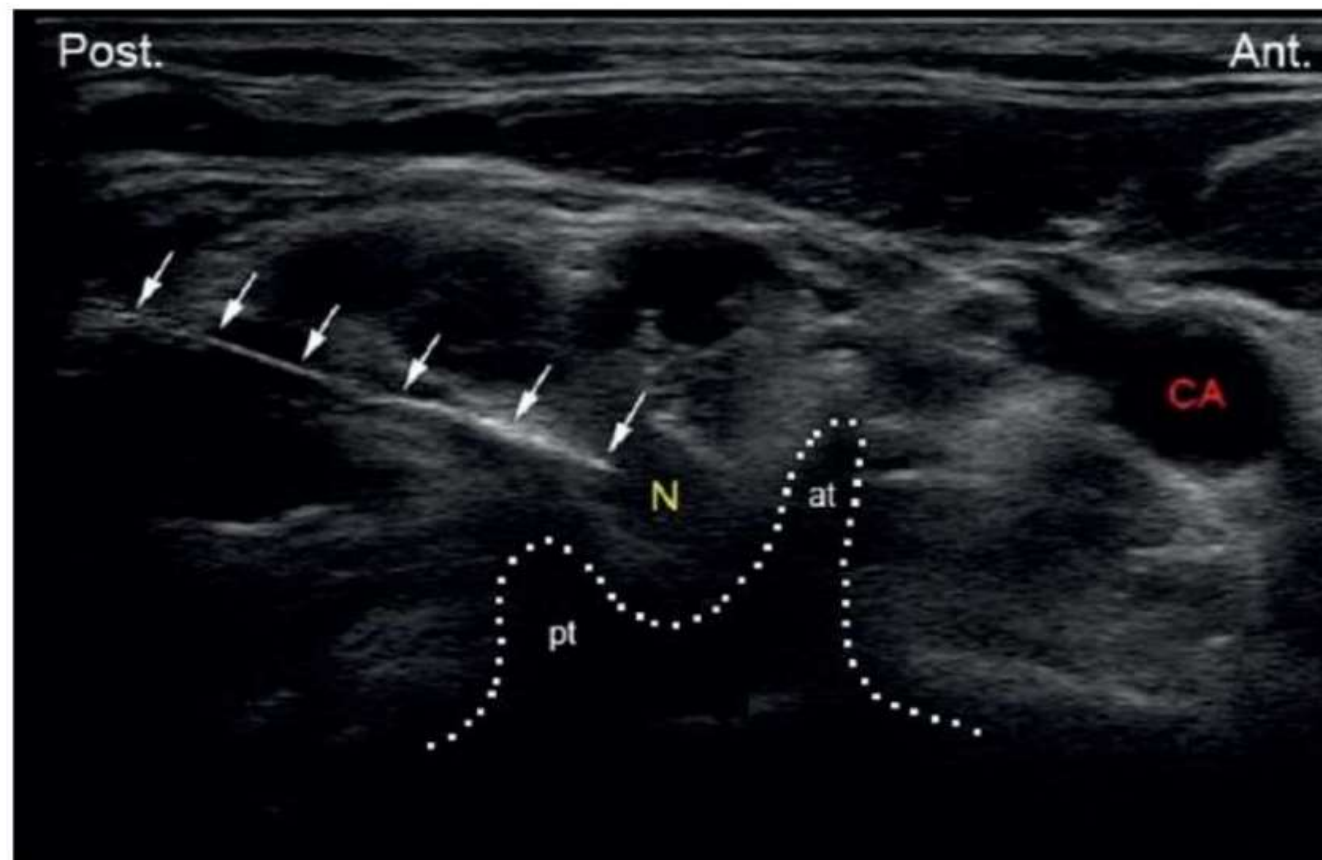


C6

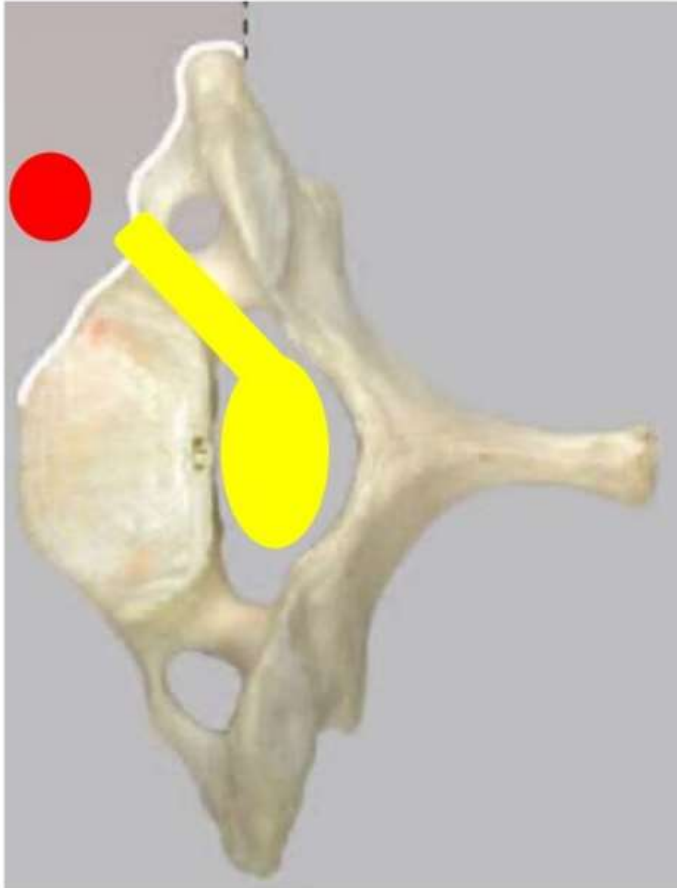


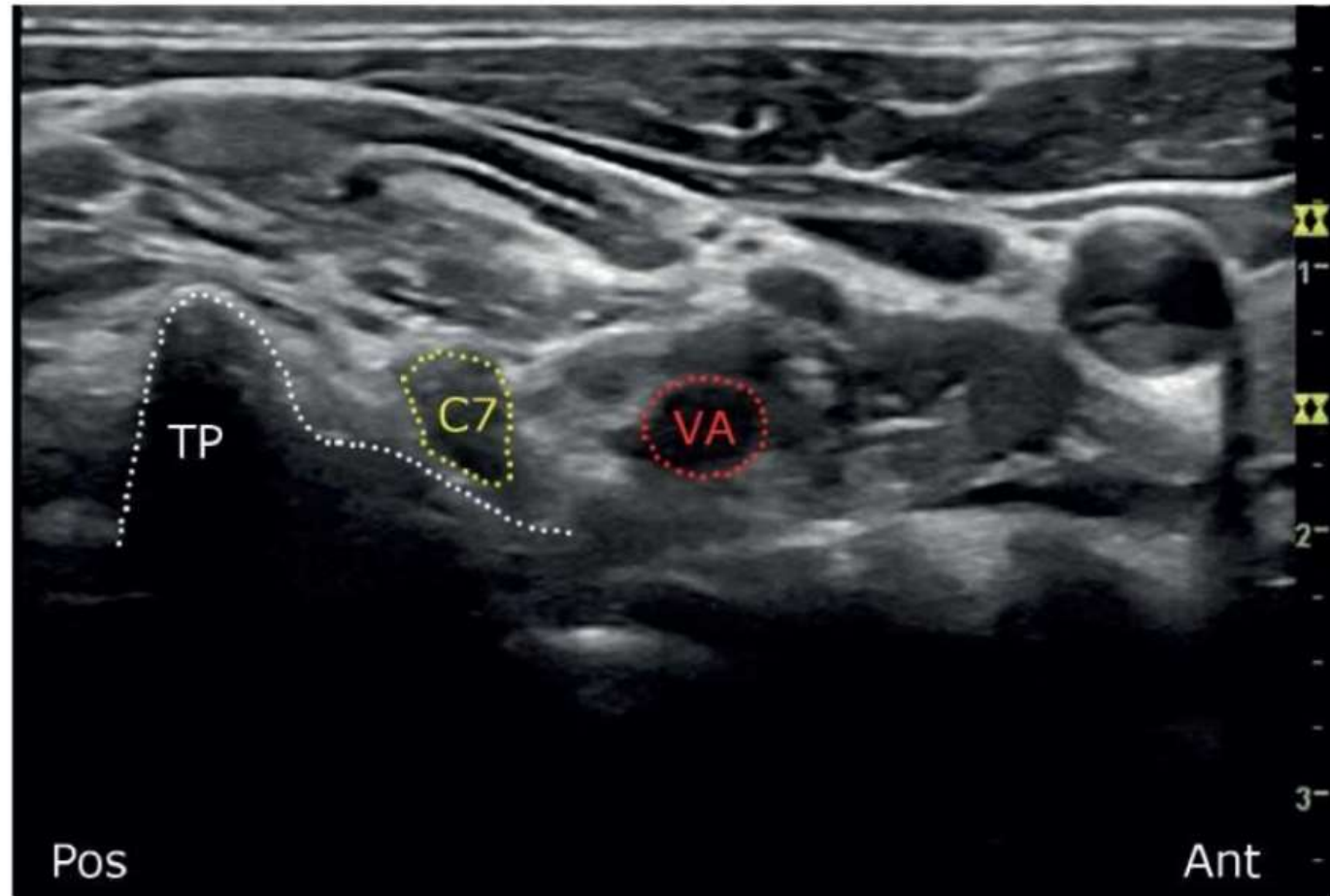




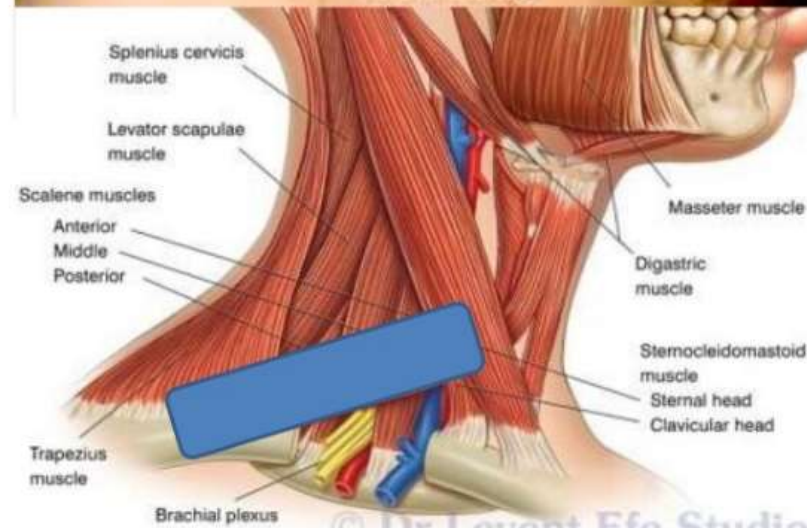
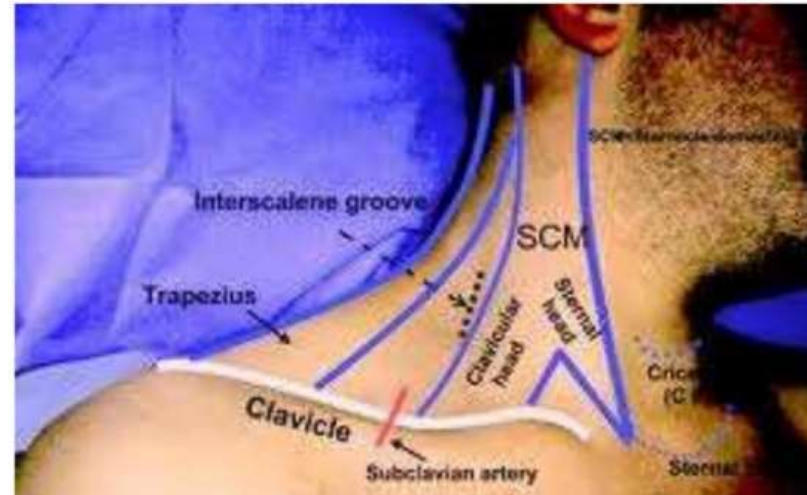


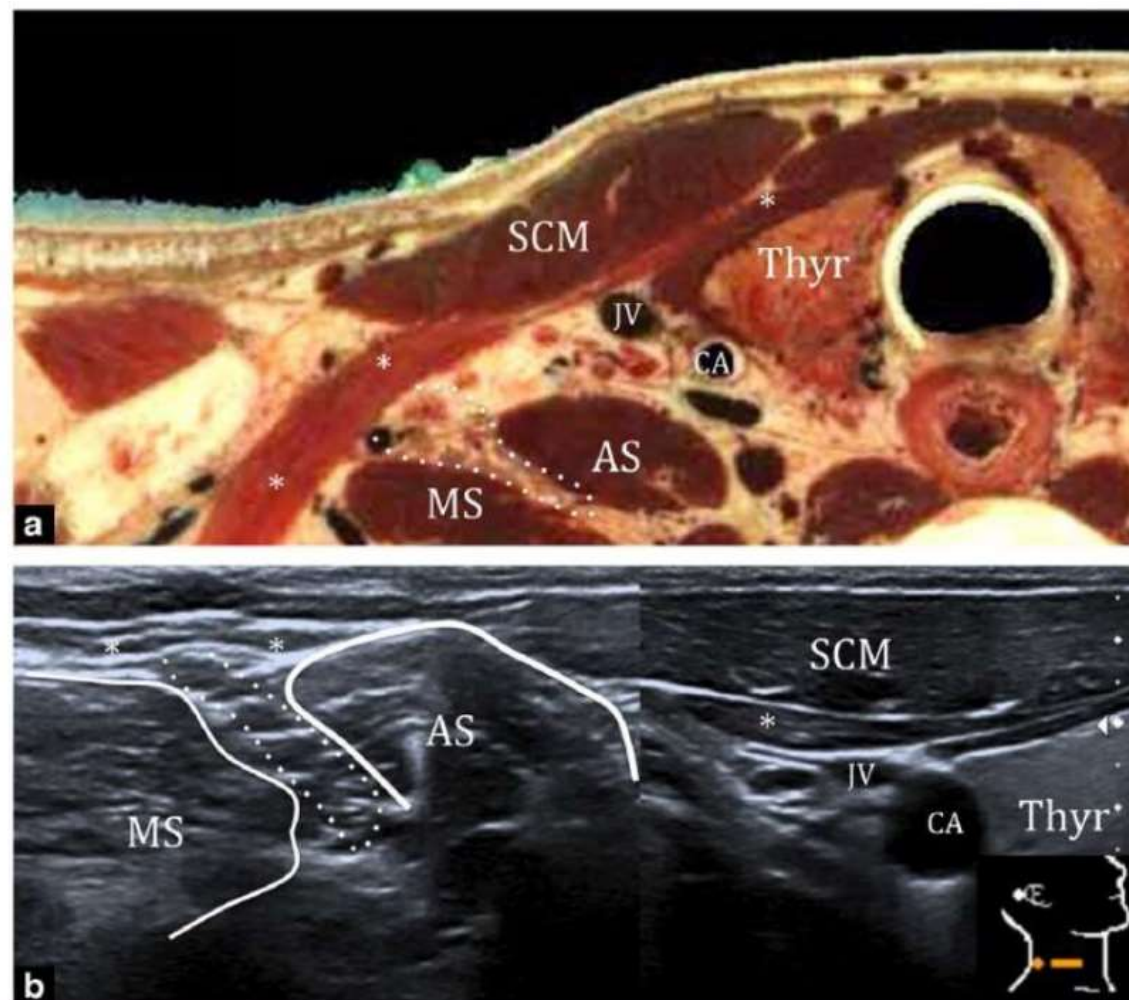
C6

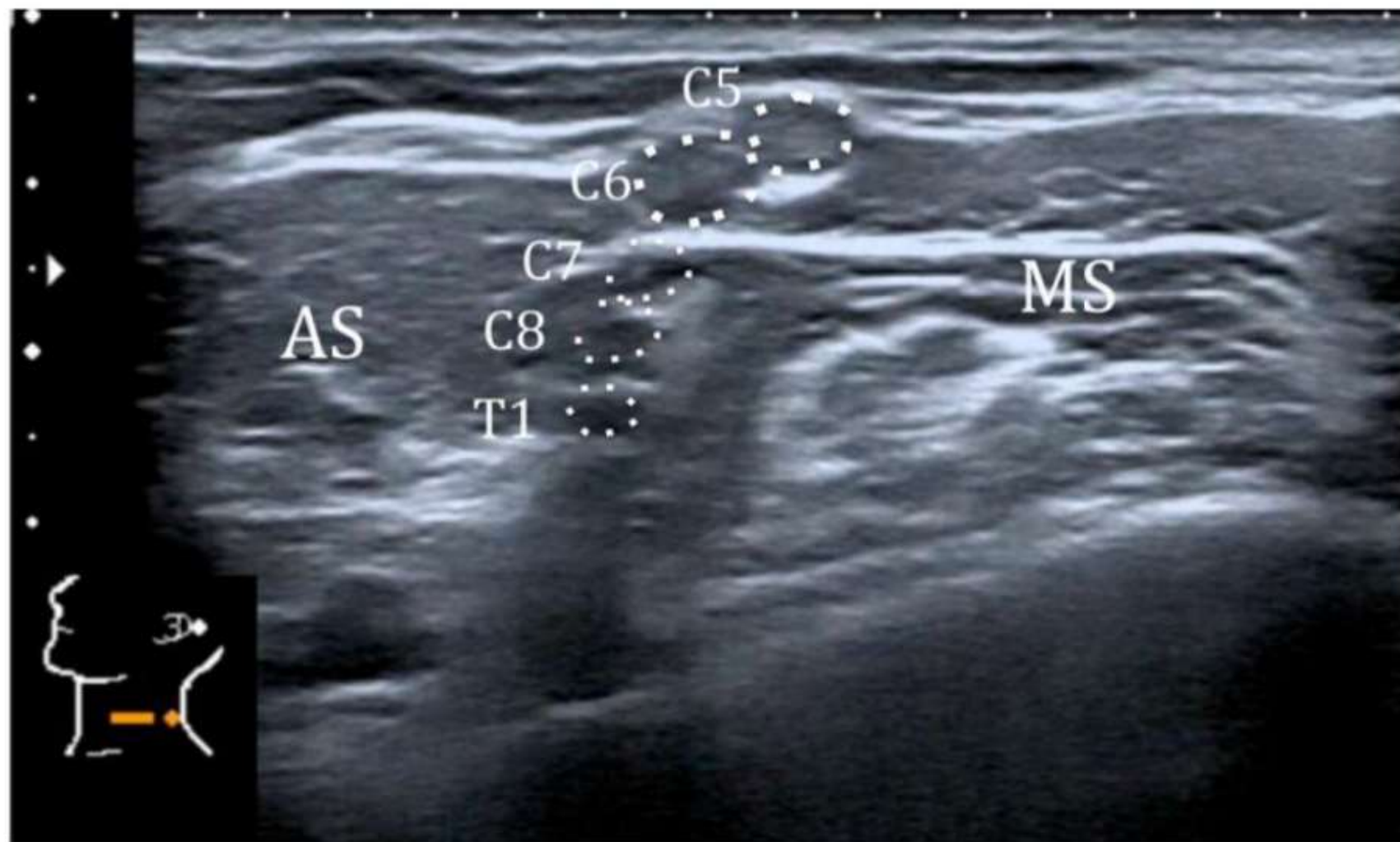




C7

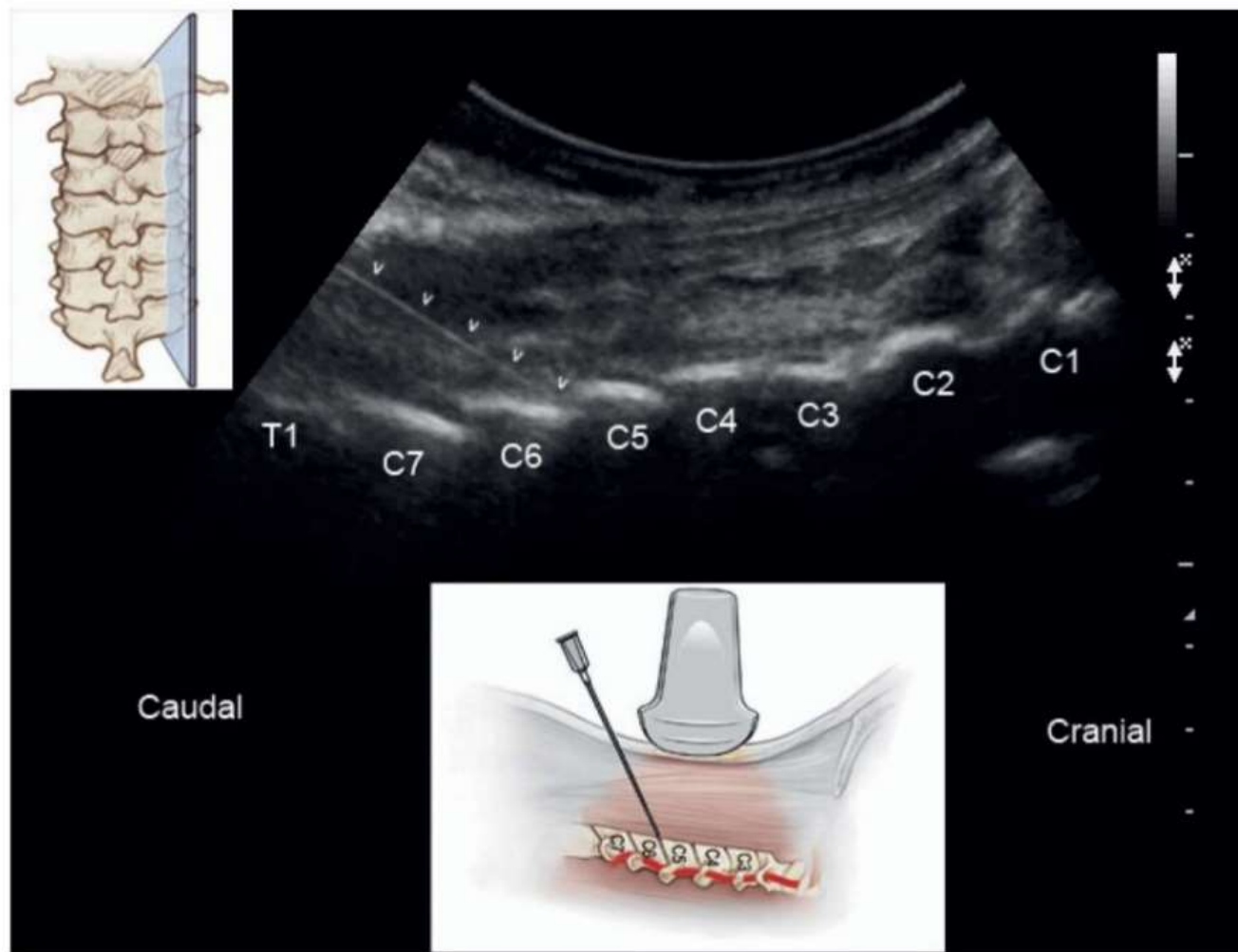


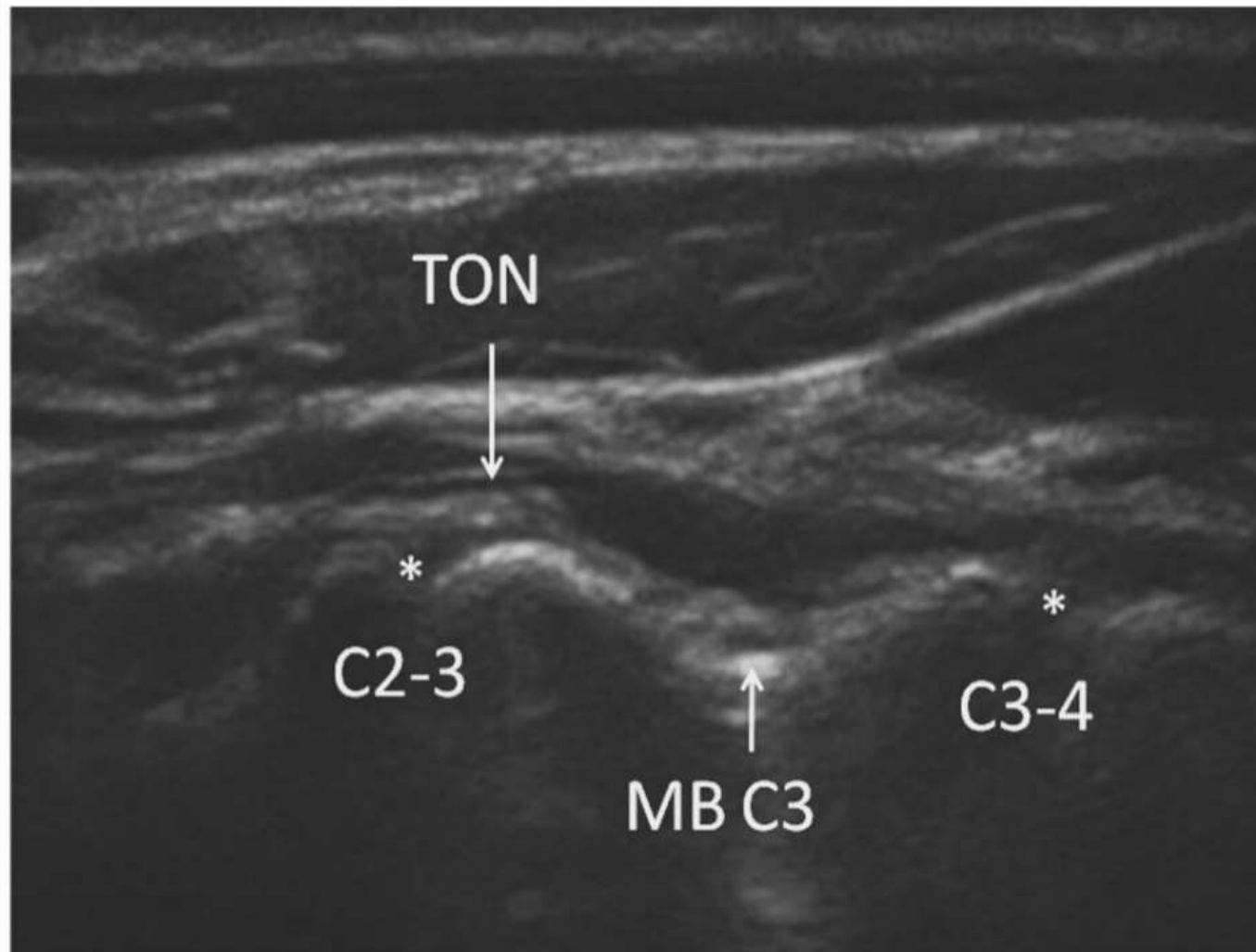


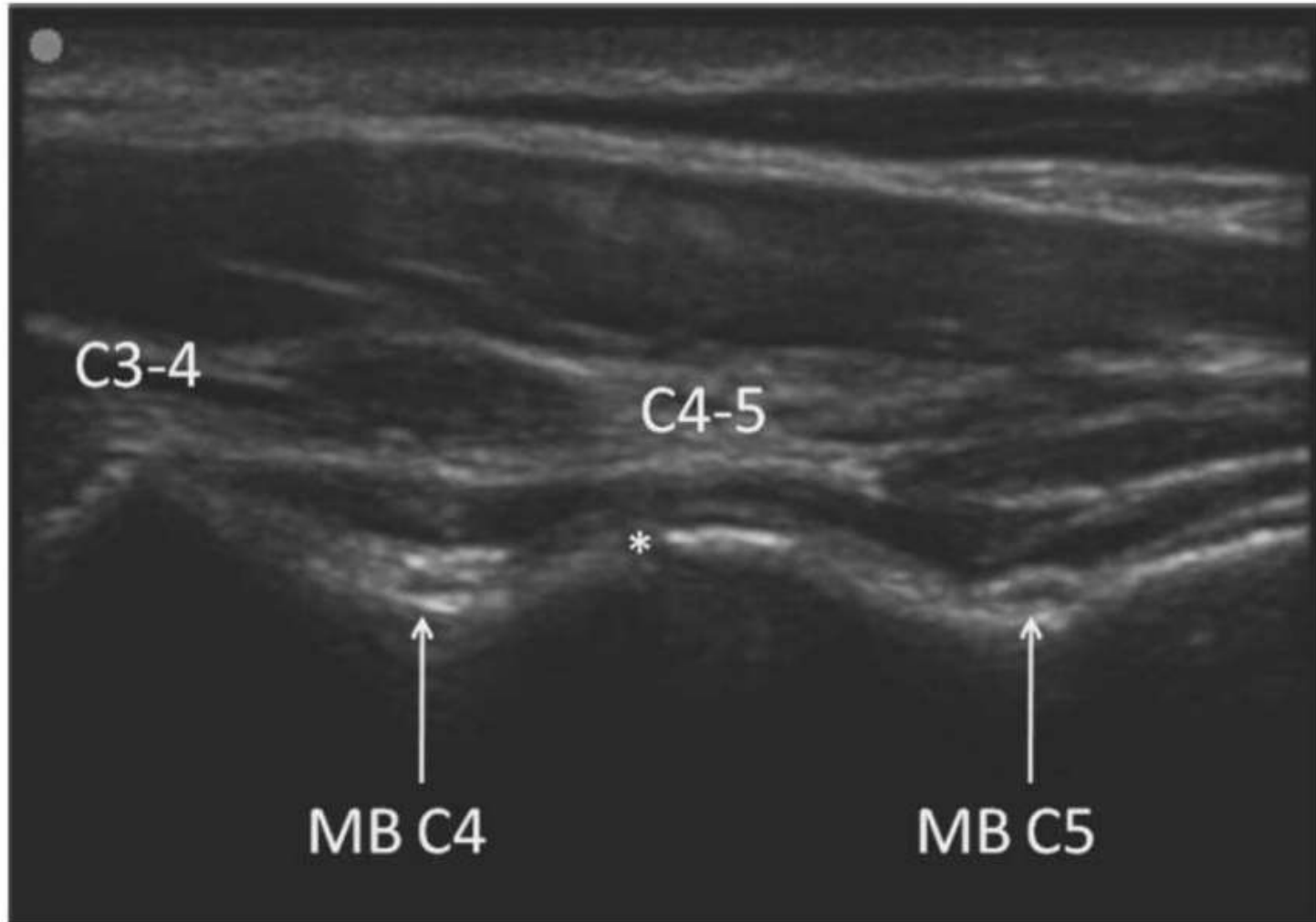




Fact Joint and Medical Branch



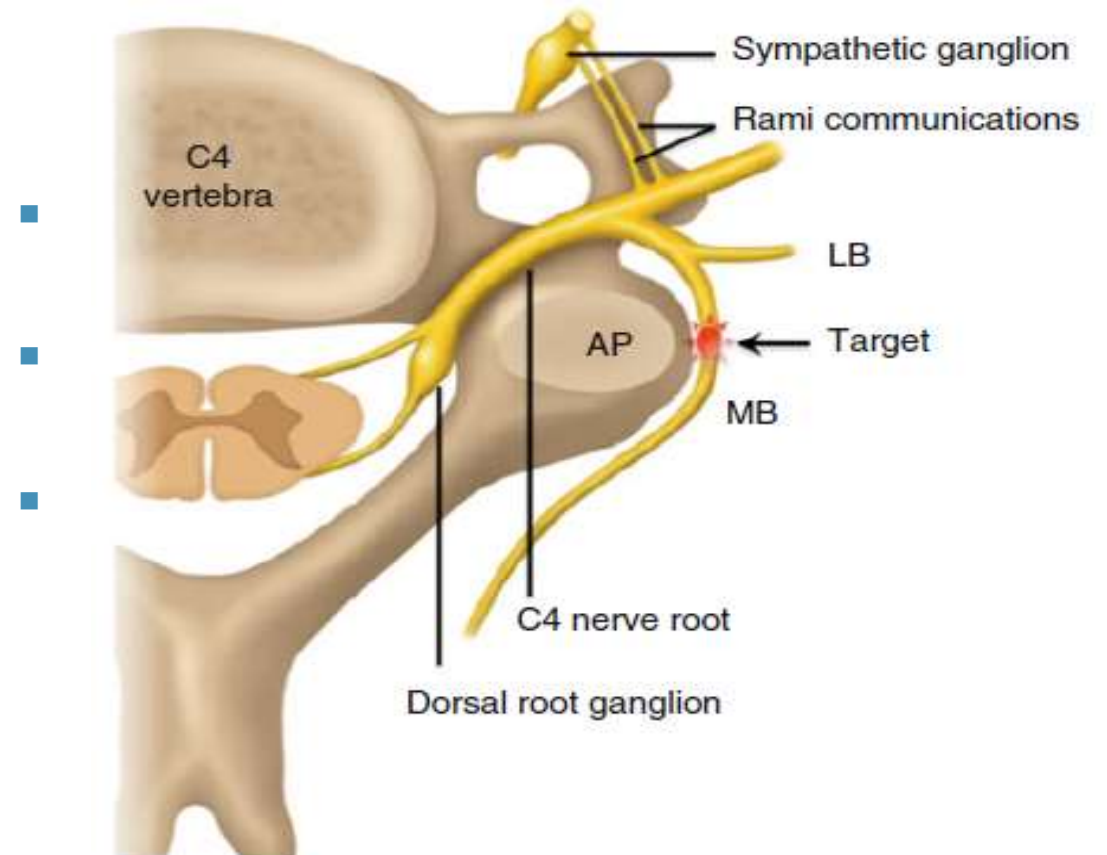




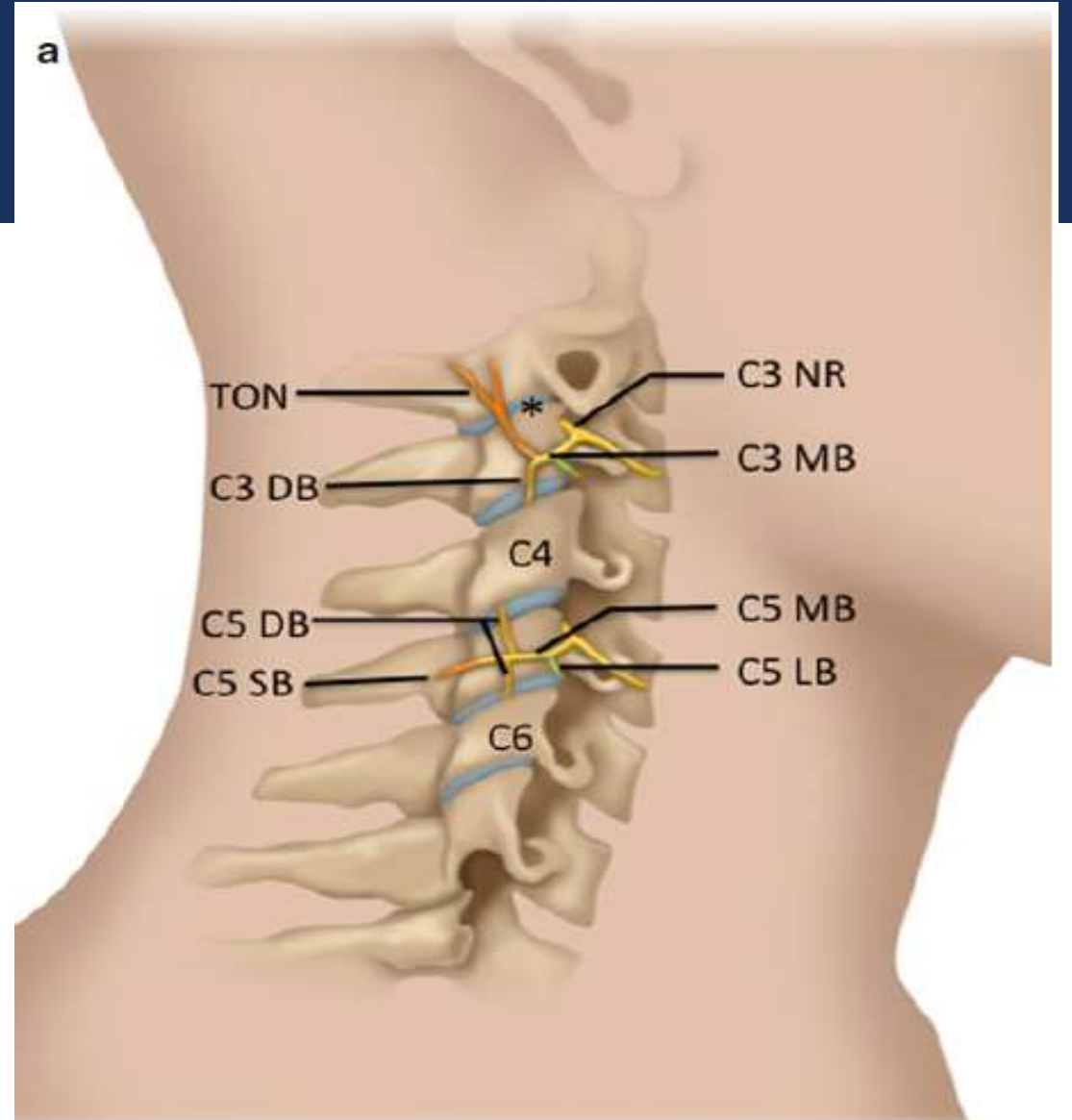
ANATOMY

The facet joints C3–4 to C6–7 are innervated by the medial branches of the spinal nerves' dorsal rami each joint being supplied by the nerve above and below the corresponding segment

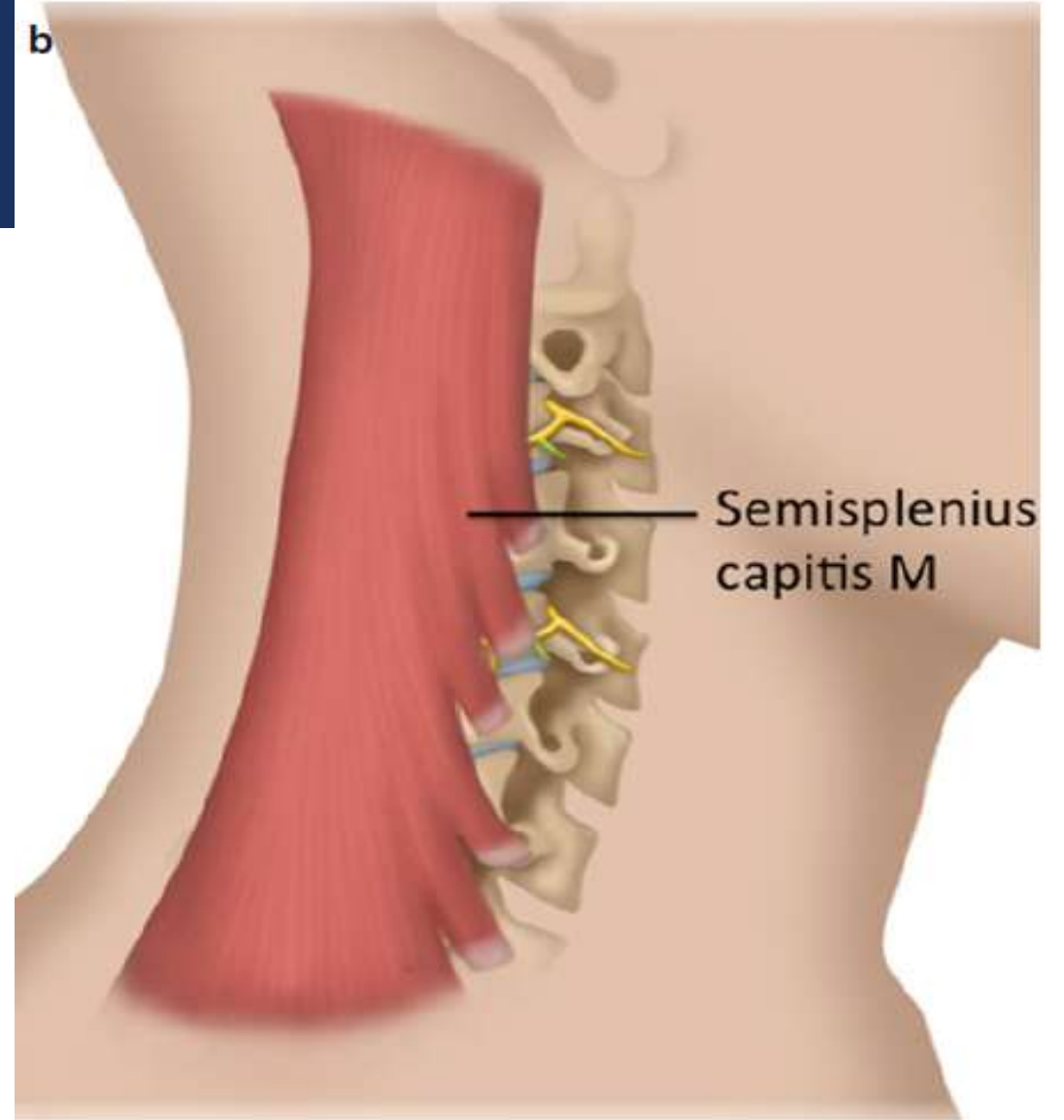
The nerves run across the center of the articular pillar, and injection of local anesthetic at this location is used to selectively block nociceptive input from a single joint for diagnostic purpose



- The superficial branch of C3 nerve root is well developed → the third occipital nerve, TON
- supplies C2–3 facet joint as it crosses the mid portion of the C2–3 joint cleft



The medial branches' cervical dorsal rami are bound to the periosteum by an investing fascia and held against the articular pillar by tendons of semispinalis capitis

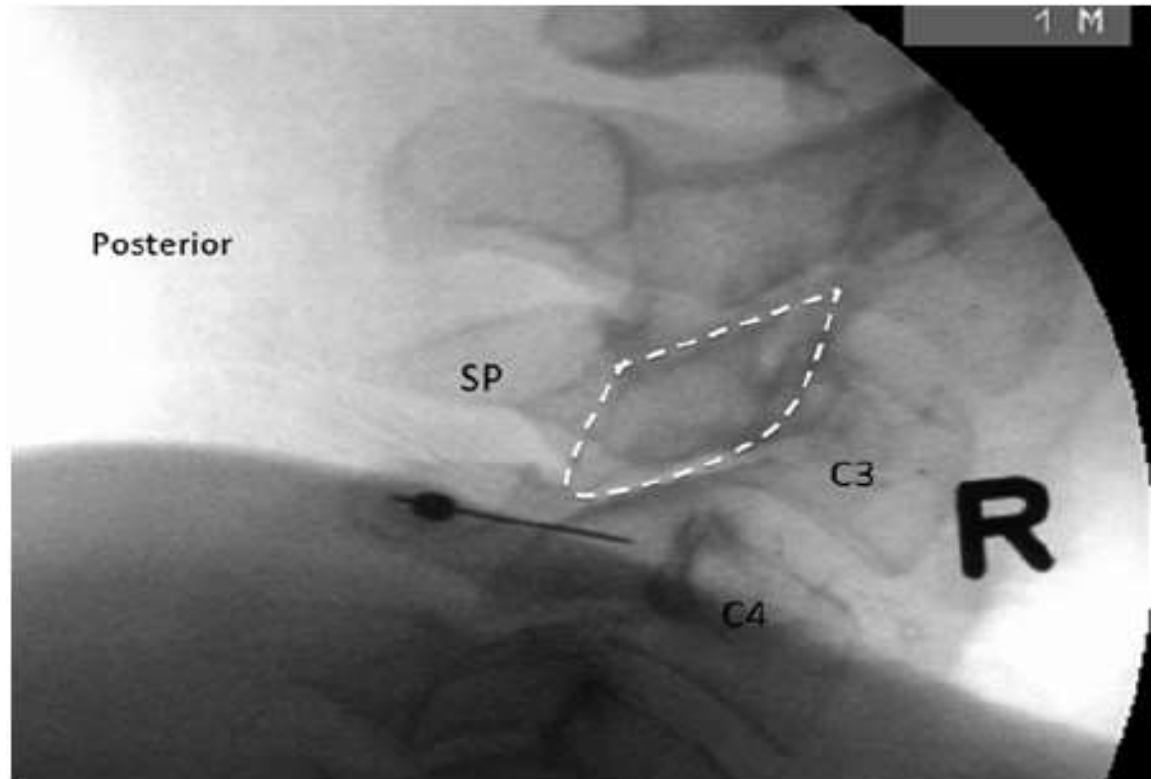



TECHNIQUE

- The classic technique of performing both diagnostic facet nerve blocks and RF neurotomy involves fluoroscopic needle guidance

- Ultrasound imaging offers the advantage of being able to visualize the actual target nerves, → not possible with fluoroscopy

- Not only the bony target can be identified , but also the medial branch itself, due to its superficial course



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- The classic technique of radiofrequency neurotomy using fluoroscopy is to perform a matrix of about six thermal lesions in order to increase the chance of successful coagulation of the nerve , since the exact course of the nerve due to its variable course is not known
 - Using ultrasound → expected to decrease the number of thermal lesions needed

PRACTICAL ASPECTS OF ULTRASOUND-GUIDED TECHNIQUE

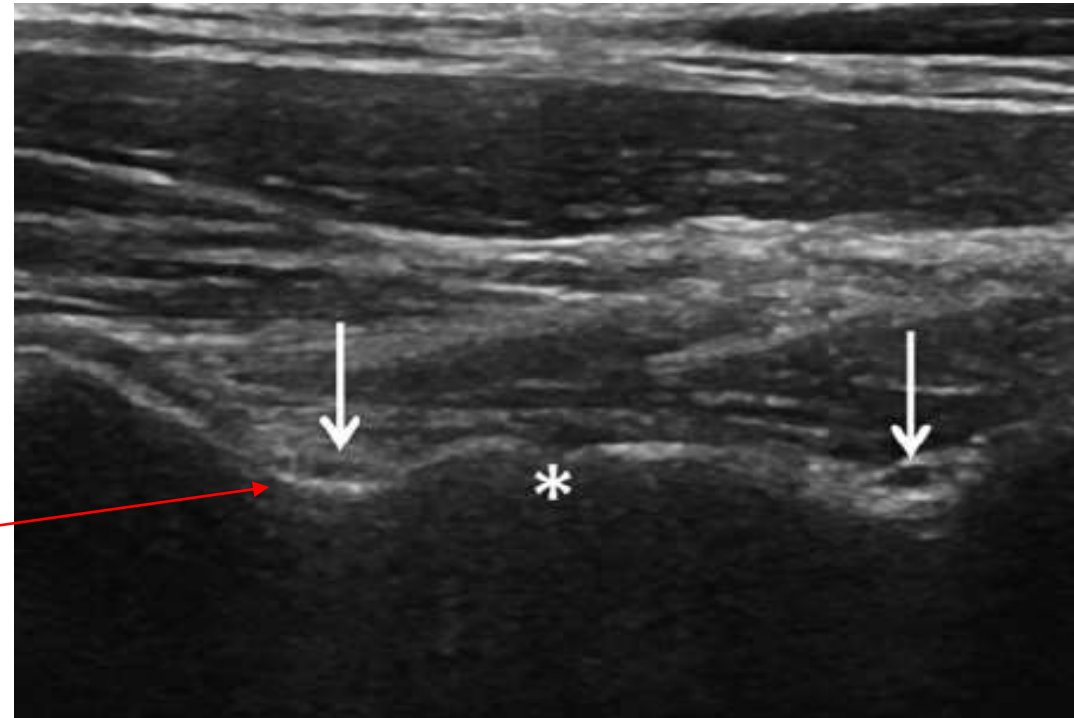
The patient → a lateral position ■

The lateral region of the neck first is scanned in a transverse plane in the area of the mastoid process ■

Slowly moving the transducer in a caudal direction, the vertebral artery is identified and followed until it enters the transverse foramen of C2 ■

Posterior the transverse foramen C2, the facet joint C2–3 is located ■

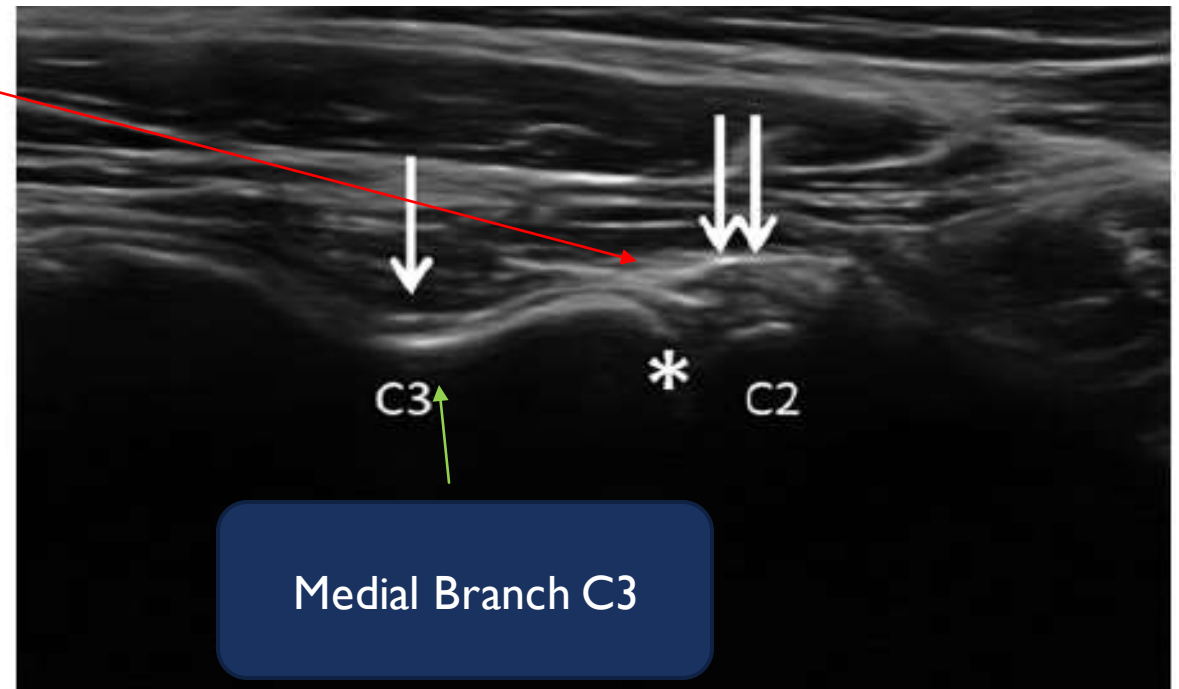
- The transducer is turned 90° until it lies in a longitudinal plane to the neck.
- typical image of the cervical facet joint region appears:
 - .1 each “hill” being a facet joint
 - .2 each “groove” in between the joints corresponding to the articular pillar
 - .3 the medial branch can be identified as a hypoechoic structure, very much resembling a blood vessel



The third occipital nerve (joint supplying nerve of the facet joint C2–3) is located on the joint cleft of the facet joint C2–3

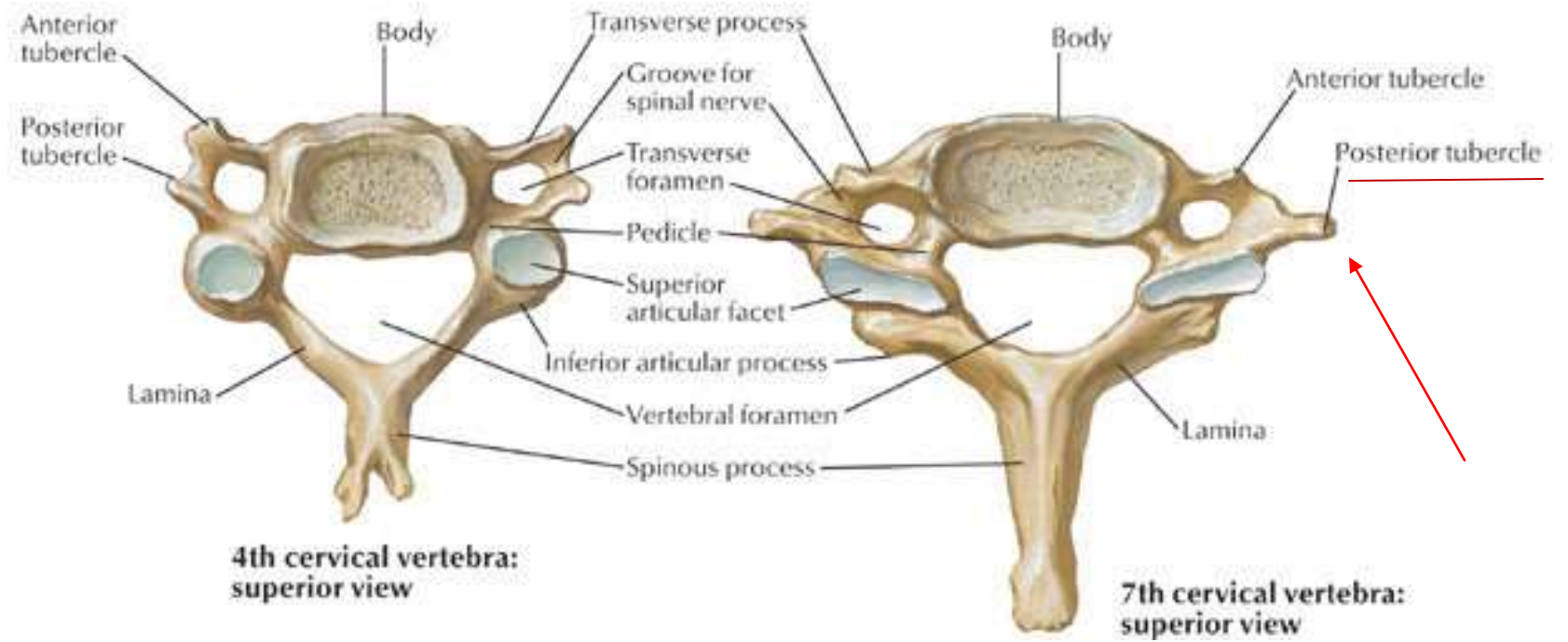
Counting the segments can be difficult in some patients

the most cranial joint cleft identified in the typical longitudinal plane is always C2–3, since the more cranial joints C1–2 and C0–1 are located much more anterior.

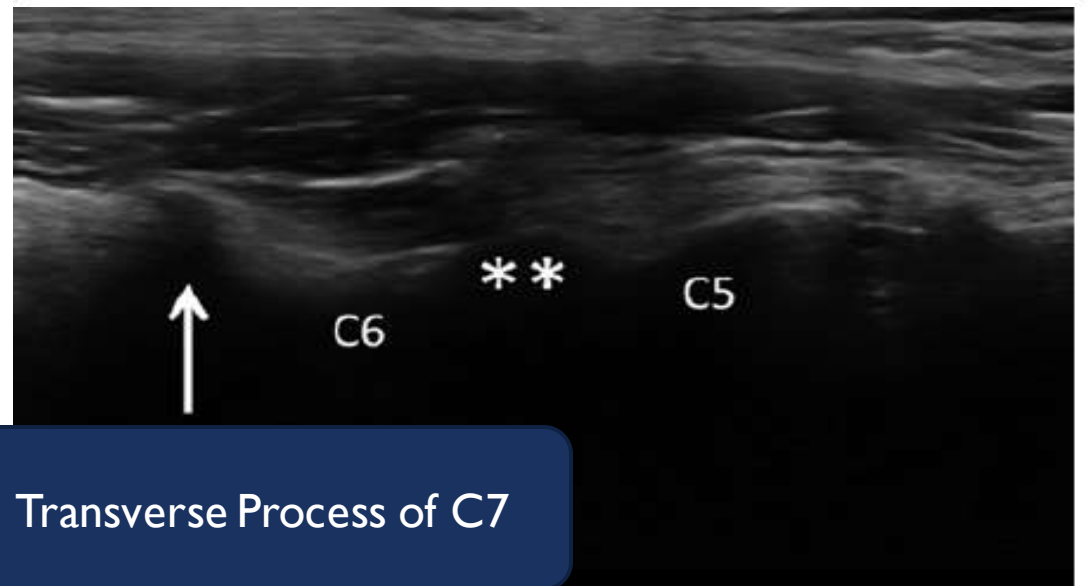
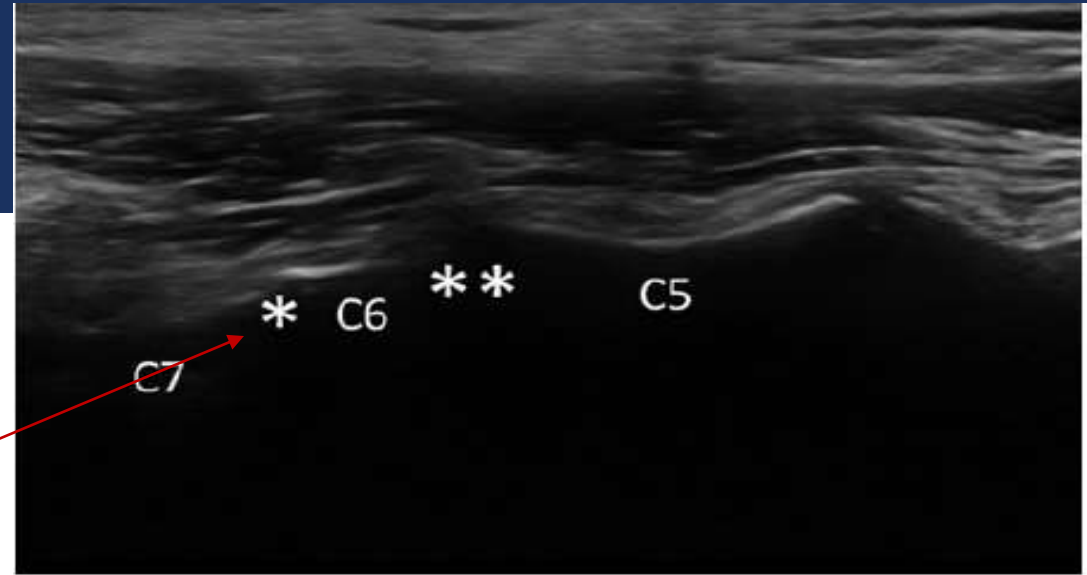


A further help is the region of C7.

The transverse process of C7 has a unique anatomy → no anterior tubercle, very prominent posterior tubercle



This posterior tubercle is easily identified; hence the joint cleft located just cranial to this landmark will be C6–7



Transverse Process of C7

INJECTION TECHNIQUE

in-plane (according to the publication of Finlayson and coworkers) .1

out-of- plane → If is chosen, it is recommended to always place the needle from anterior to posterior .2

since inexperienced practitioners will tend to place the needle too posteriorly (not dangerous), as opposed to a too anterior placement (i.e., toward the vertebral artery) if a posterior-to-anterior direction is chosen ■

PRACTICAL POINTS

- The target for TON is the joint cleft of C2–3
- The targets for C3–6 medial branches are the grooves (articular pillars) where the medial branches are usually found between the articular pillar and investing layers of the semispinalis capitis.
- The volume of 0.3 mL of local anesthetic.
- For the C7 medial branch, the target is the apex of the superior articular process of C7, which is the caudal aspect of the C6–7 facet joint

