

Interventional techniques for regional anaesthesia and chronic pain

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Key points

- Interventional anaesthetic techniques have a firm place in the treatment of pain
- Useful tool for diagnosis and treatment
- Techniques include intravenous infusions, peripheral, central nerve and autonomic nerve blocks

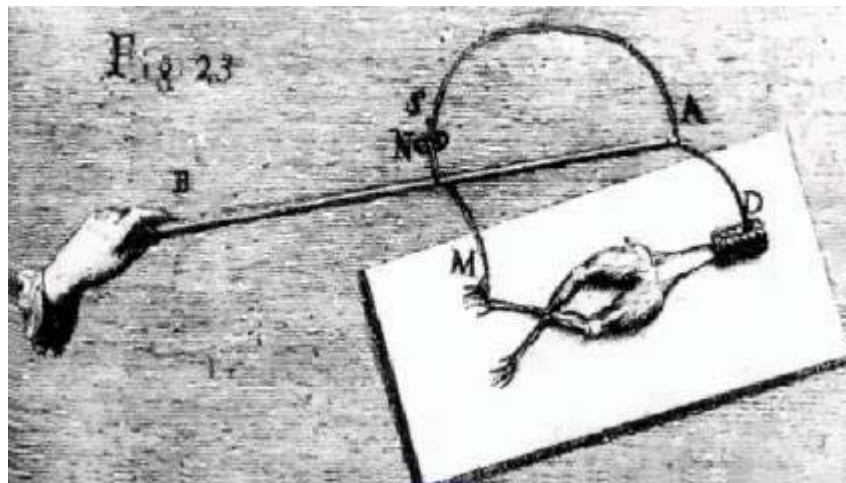
General Principles

- History
- Contraindications
- Pre-assessment
- Informed consent
- Environment
- Recovery
- Liaison with teams

Sedation

- Consider nurse led sedation
- Short acting drugs:
 - Propofol
 - Midazolam
 - Alfentanil
 - remifentanil

The first demonstration of electrical nerve stimulation was performed as early as 1780 by Luigi Galvani on a frog.





Nerve stimulation



- Required for specific nerves
- Isolation of motor function(0.05-0.2ms)
- Sensory supply longer pulse(0.3-1.0ms)
- Insulated needle improves accuracy by confining current to the tip
- Fixed needle technique

Imaging



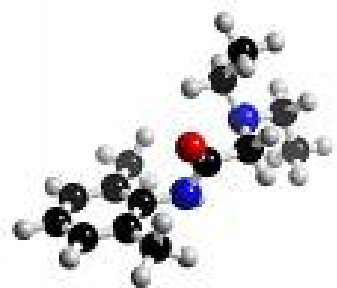
Ultrasound

- Direct visualisation
- Reduced volume
- No radiation
- Anatomy
- Skill



Solutions

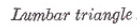
- Short-acting (local anaesthetic)
 - Diagnostic
 - Lidocaine, bupivacaine, levo-bupivacaine
- Mid-range (depot-steroids)
 - Diluted
 - Methylprednisolone or triamcinolone
- Permanent (neurolytic)
 - Alcohol (at least 50%)
 - Phenol (6%)
 - Cold (Cryotherapy) and heat (radiofrequency)

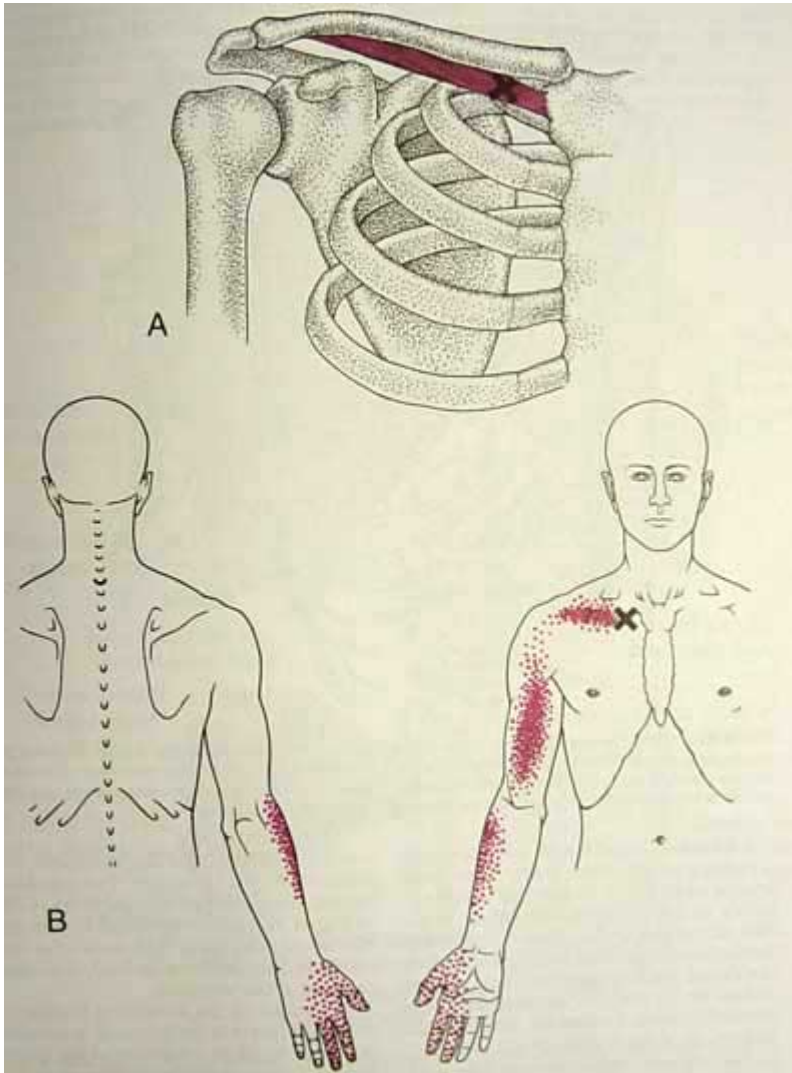


Intravenous techniques

- Lidocaine
 - Ketamine
 - Opioids
 - Phentolamine
 - Phenytoin
-
- Intravenous regional sympathetic blockade

This anatomical illustration shows the posterior view of the human torso, focusing on the muscles of the back and neck. The central feature is the vertebral column, with vertebrae labeled from the cervical region (C1-C7) down to the lumbar region (L1-L5). The scapulae are visible on either side of the upper back, with the spine of the scapula and acromion labeled. The trapezius muscle is shown as a large, fan-shaped muscle originating from the cervical and thoracic vertebrae and inserting into the scapula. The latissimus dorsi muscle is shown as a broad muscle originating from the lumbar vertebrae and extending laterally. The rhomboid muscles (rhomboides major and minor) are shown as smaller muscles between the scapula and the spine. The erector spinae muscles (erector spinae major, minor, and intermedius) are shown as a group of muscles along the spine. The lumbar triangle is indicated at the bottom left. Red dots are placed along the spine and on the muscles, likely indicating specific points of interest or anatomical landmarks.





- Myofascial TP
discrete focal
hyperirritable spots in
a taut band of skeletal
muscle
- Specific referred pain
pattern
- No systemic
manifestation

Figure 1: Medical Art Services, Inc

PROCEDURE

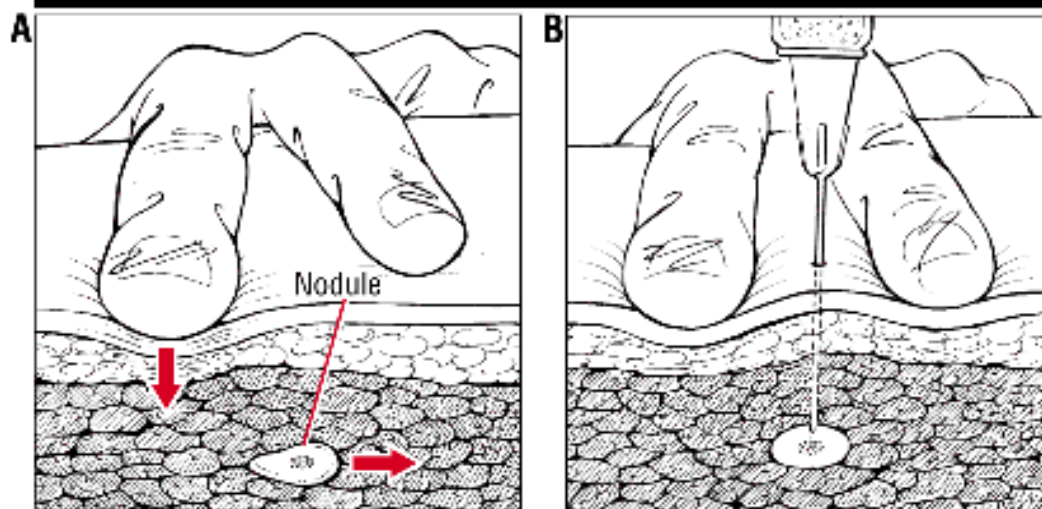
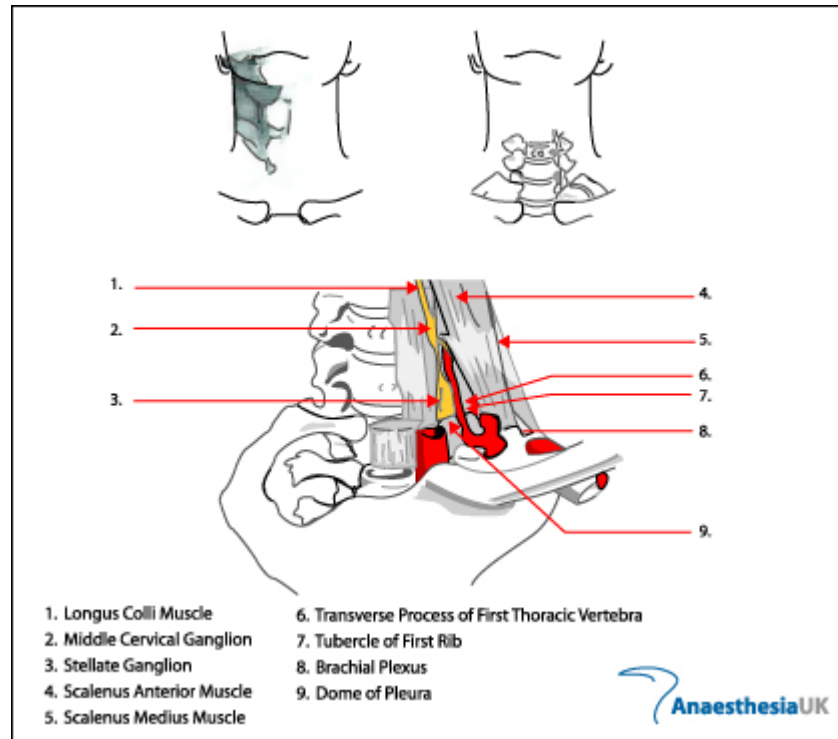


FIGURE 1. Physicians injecting patients use alternating pressure (solid arrows) to roll the trigger point nodule between the index and middle fingers (A) to localize the point for needle insertion (B).

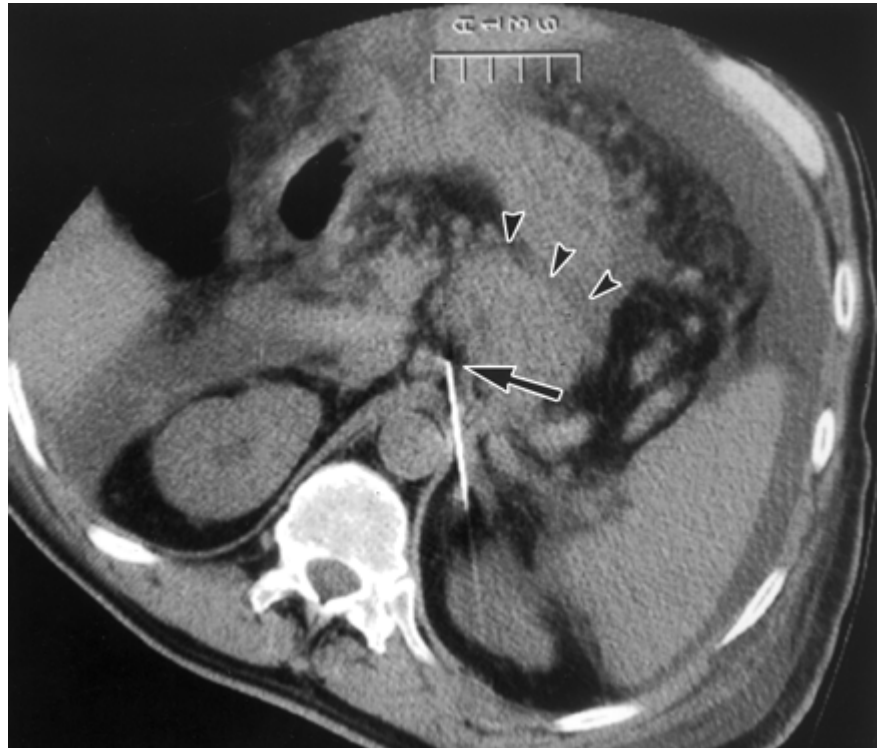
Sympathetic blockade

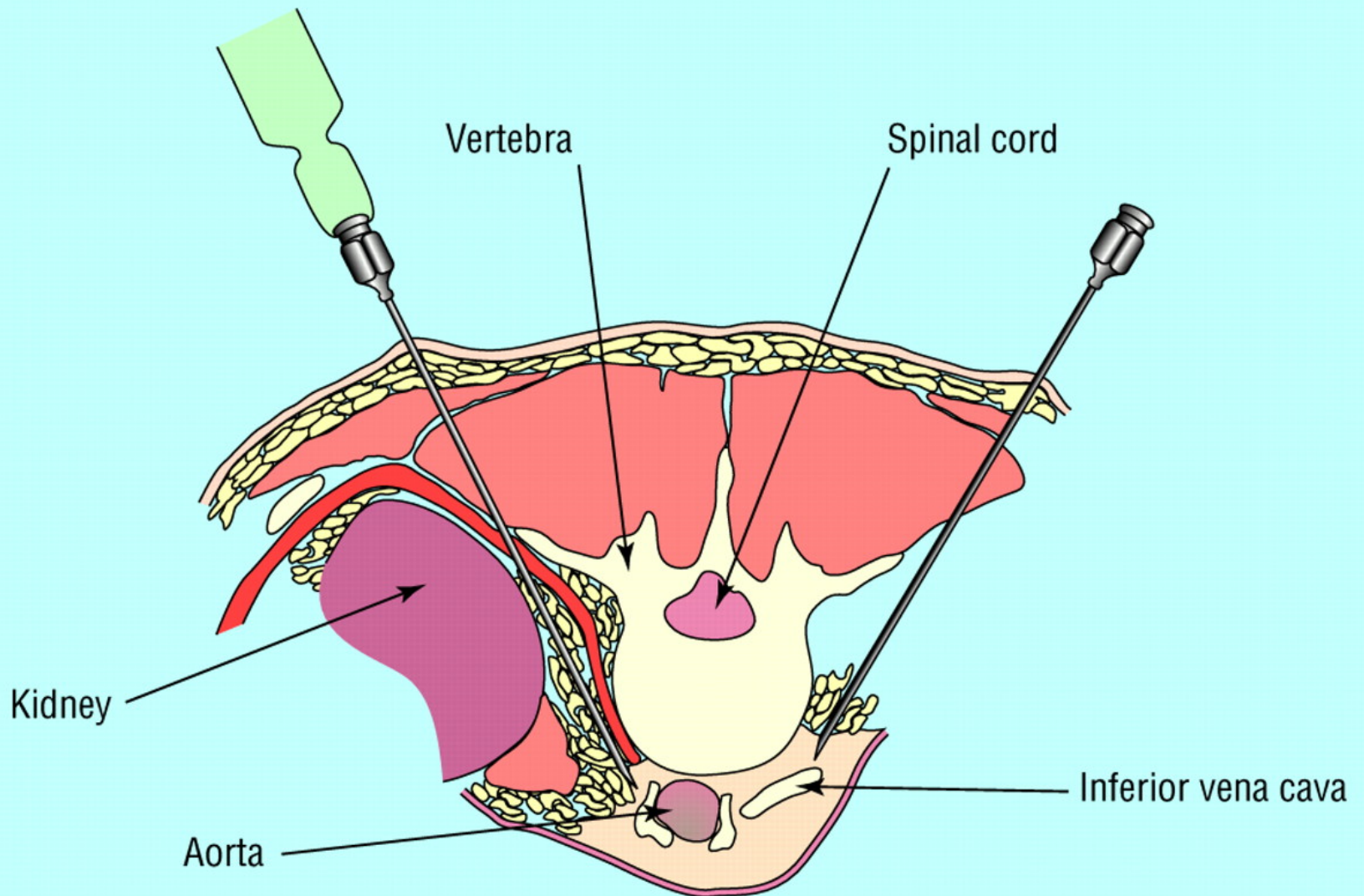
- Cervical thoracic and lumbar sympathetic chain
- Weak evidence base
- Indications : CRPS, ischaemic conditions, visceral pain including malignancies.
hyperhydrosis

Stellate ganglion block

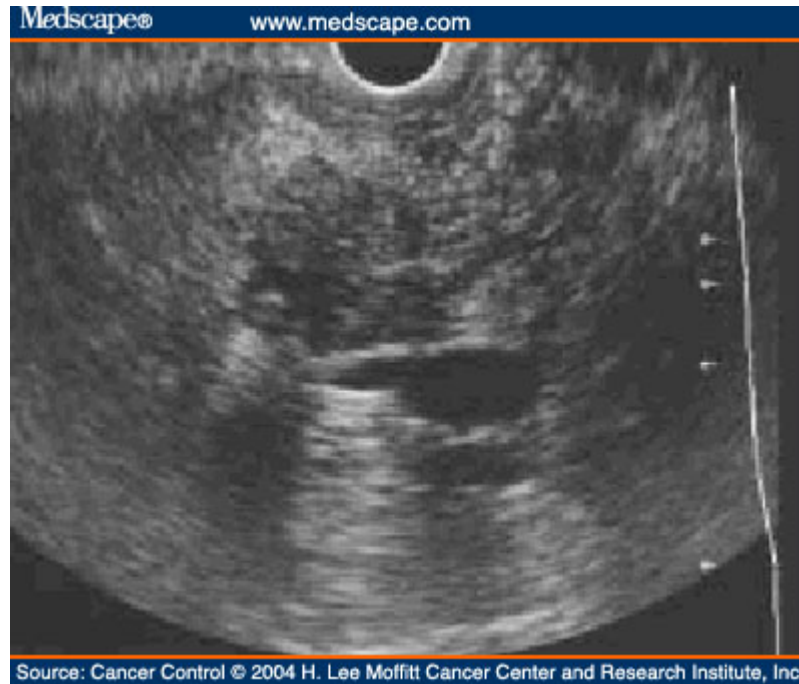


Coeliac plexus





Ultrasound use



Lumbar sympathectomy



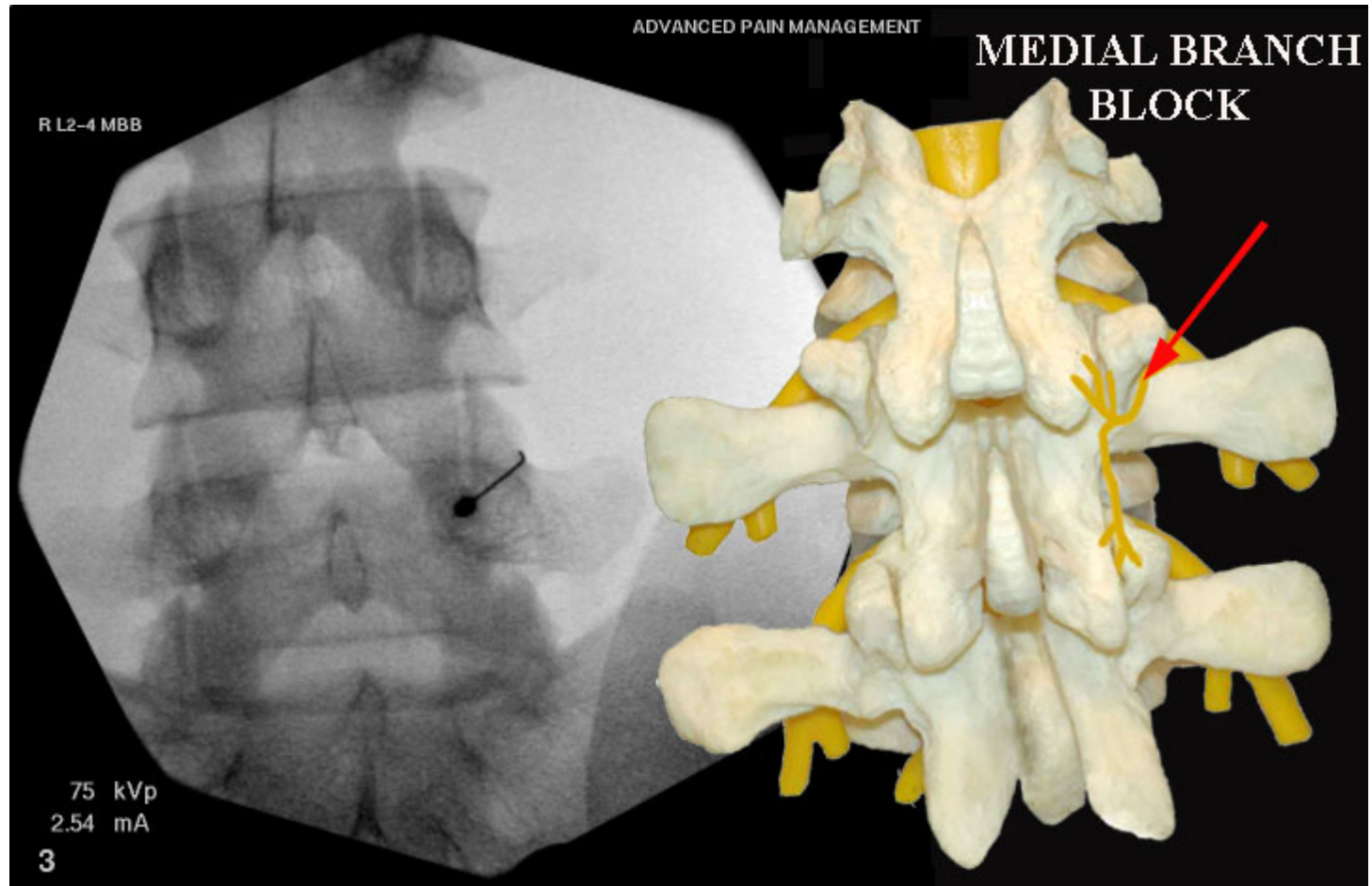
Joint injections

- Cervical facet joint injections
degenerative disease and non-radicular pain
- Thoracic facet joints
tender paravertebral pain
- Lumbar facet joint injections
chronic mechanical back pain
- Sacroiliac joint injections

LFJI



Radiofrequency lesioning



Selective nerve root blocks

- Diagnostic tool in back pain
- Curative after post-discectomy pain or disc herniation
- With nerve stimulation and Imaging
- Cervical, thoracic, lumbar and sacral nerve roots

Lateral View



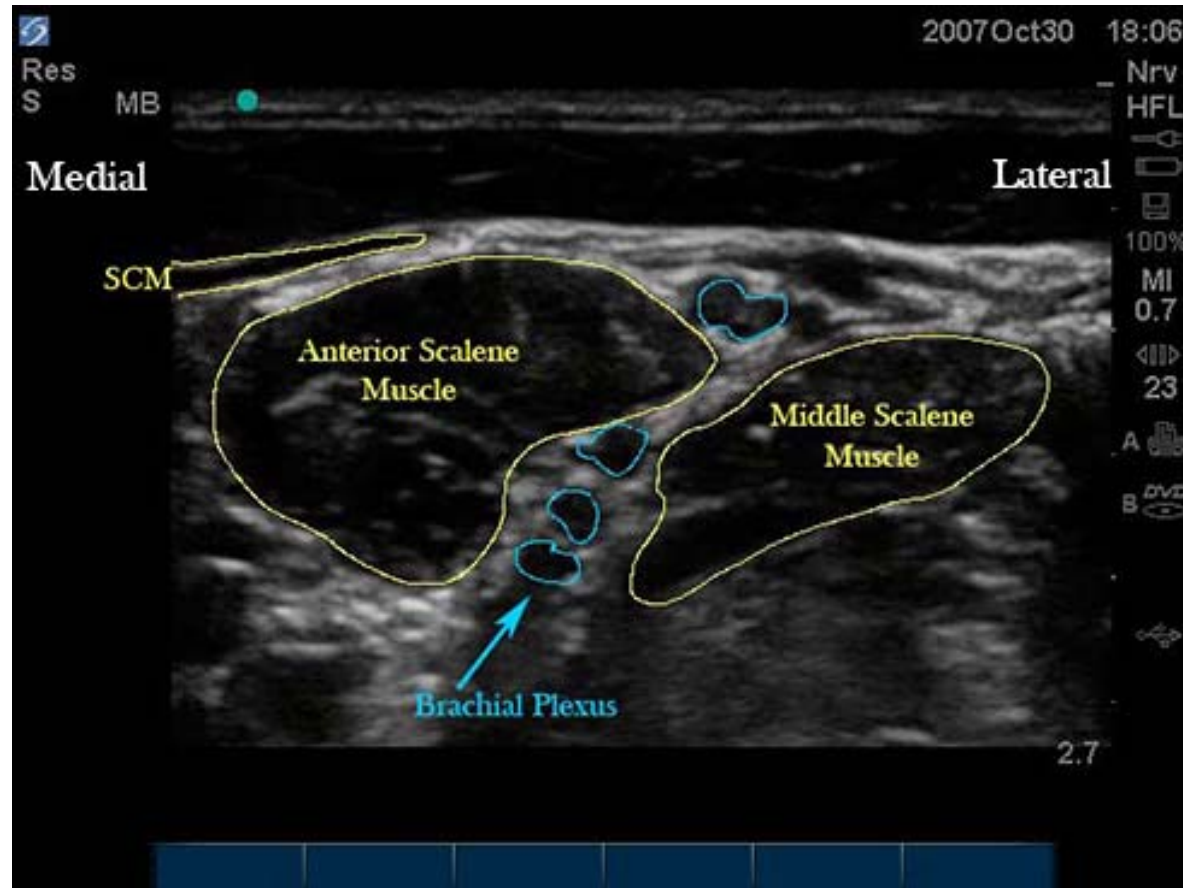
AP view



Plexus blocks

- Often for postoperative pain with or without indwelling catheter
- Brachial plexus block: interscalene, supraclavicular or axillary approach
- Lumbar plexus block

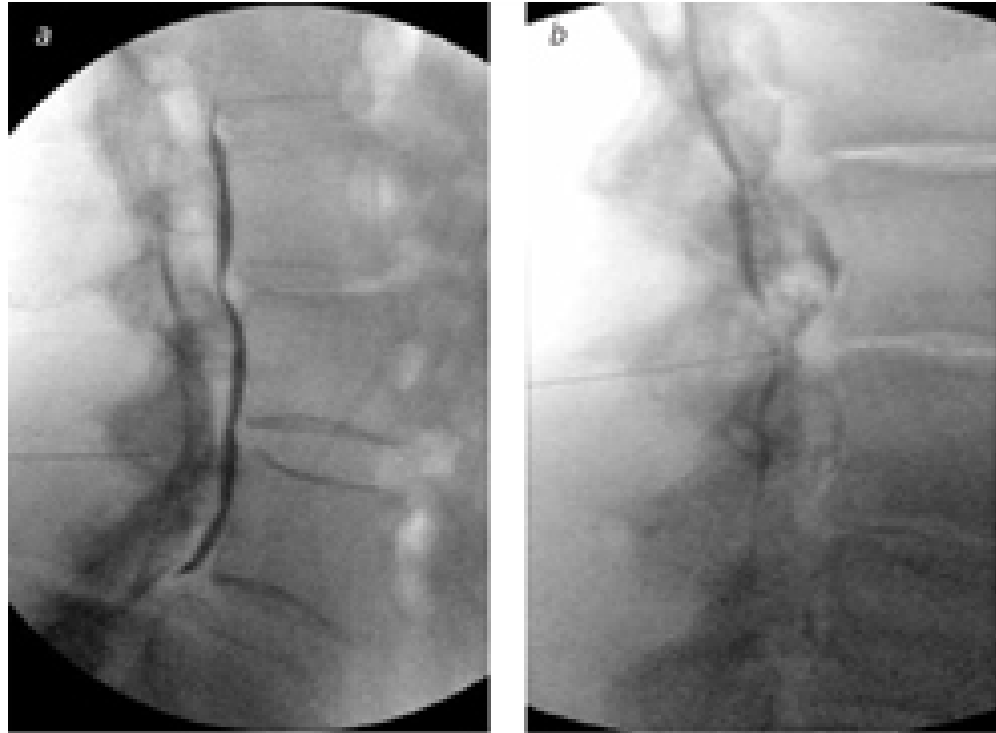
Interscalene block under ultrasound guidance



Central approach

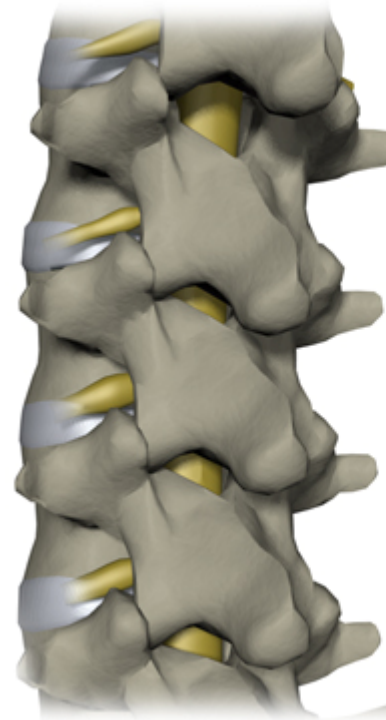
- Epidural blockade
epidural analgesia and anaesthesia
non-surgical management of lumbar
radicular pain and cervical radiculopathy
malignant pain
- Epiduroscopy
- Vertebroplasty
- Interspinous Process Distractor (X-Stop)

Epidural blockade

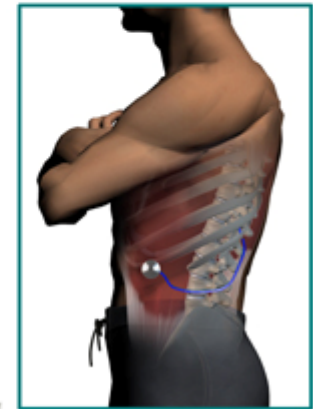


Intrathecal drug delivery

- Reduced opioid use
- Chronic non cancer pain
- Cancer pain
- Spasticity



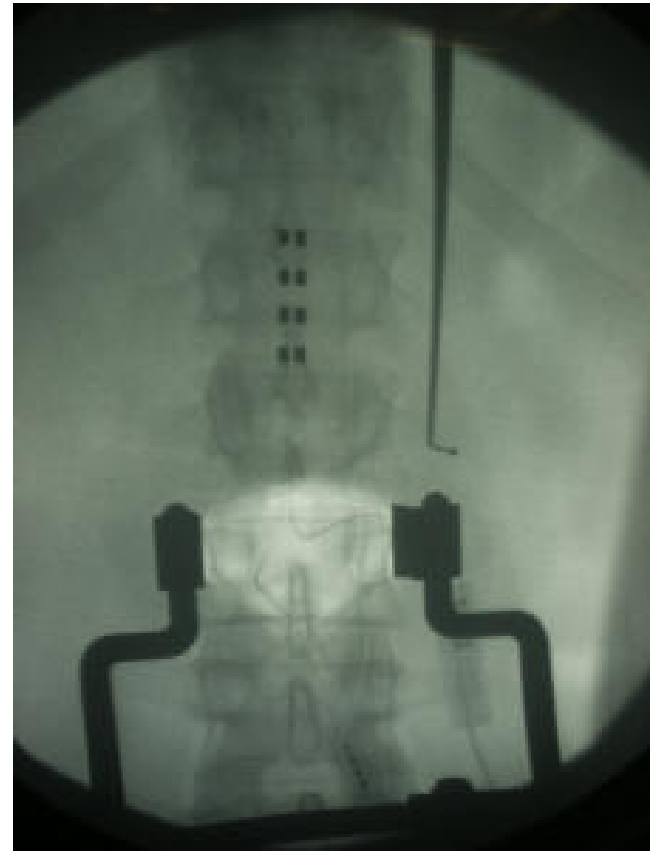
Intraspinal
Drug
Delivery



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Spinal Cord Stimulation

- Direct inhibition of transmission of pain
- Promoting descending brain and spinal inhibition



Indication for SCS (British Pain Society)

- Good Indications : Neuropathic pain, CRPS, Neuropathic pain secondary to peripheral nerve damage, refractory angina
- Intermediate indications: Amputation pain, axial pain following spinal surgery, intercostal neuralgia, spinal cord damage, peripheral neuropathies
- Poor indications: central pain of non-spinal origin, plexus avulsions

Summary

- Anaesthetic techniques for pain management build an important foundation for the clinician
- Sound knowledge of the anatomy and the procedure is essential.
- Patients need to be informed on the effects and limitation of the technique including serious side effects.