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

1. Longus Colli Muscle
2. Middle Cervical Ganglion
3. Stellate Ganglion
4. Scaenus Anterior Muscle
5. Scaenus Medias Muscle
6. Transverse Process of First Thoracic Vertebr
7. Tubercle of First Rib
8. Brachial Plexus
9. Dome of Pleura
Coeliac plexus
Ultrasound use
Lumbar sympathectomy
Joint injections

- Cervical facet joint injections for degenerative disease and non-radicular pain
- Thoracic facet joints for tender paravertebral pain
- Lumbar facet joint injections for 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
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 neuralgias, 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.