

Thoracic Surgery and Analgesia

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Overview

- Surgical aspects
- Analgesic options
 - Epidural
 - Paravertebral
 - Adjuvant
- Ultrasound guidance



Surgical Approach

- Thoracotomy
- VATS



Treating Pain after Thoracic Surgery



Neuraxial Techniques

Epidural Catheters and Paravertebral Blocks

Traditional Anatomic Approach

OR....

Ultrasound Guided



Thoracic Epidural

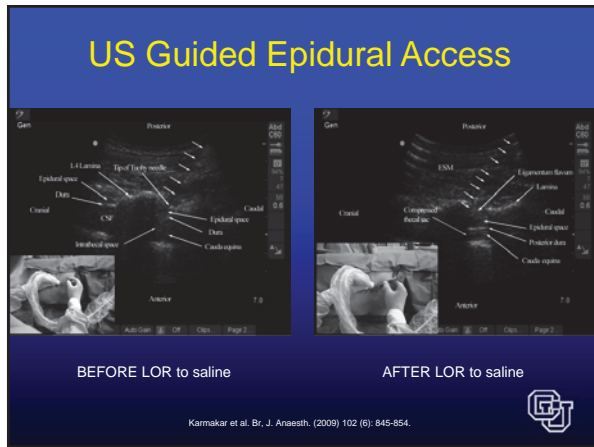
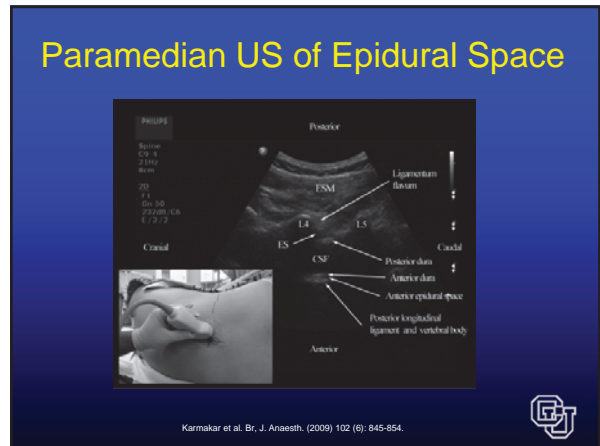
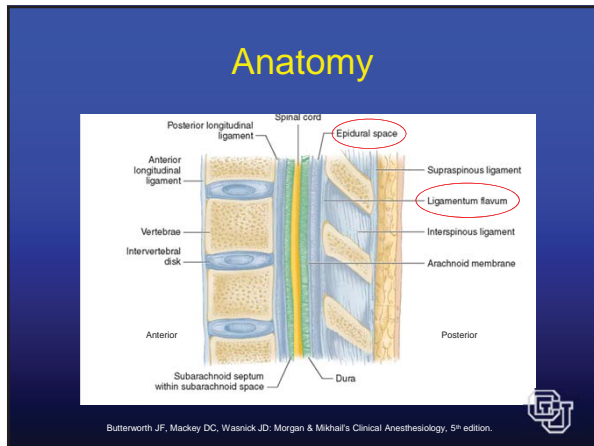
Benefits

- Decrease acute incisional pain
- Reduce parenteral opioid requirements
- Decrease splinting, improve cough
- No effect on shoulder pain
 - Adjuvant therapy necessary

Contraindications

- Patient refusal
- Bleeding diathesis
- Infection at site of injection
- Other relative contraindications





Paravertebral Block

Safety Considerations

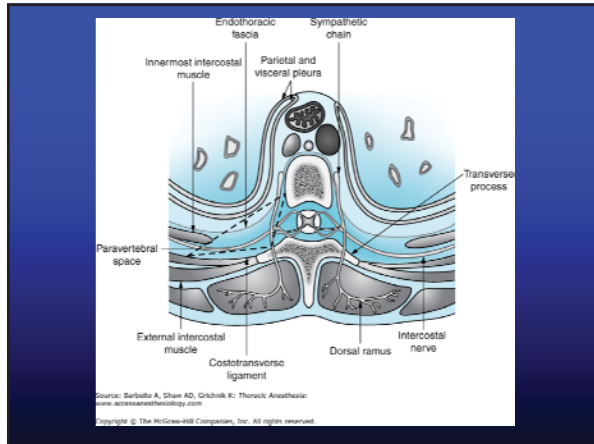
- Pneumothorax is very rare
- Use of small Tuohy needle
- Every dose is a “test dose”

Contraindications

- Anti-coagulation: relative contraindication
 - PT>14
 - PTT>40s
 - Platelet count < 50,000/μl
- Local infection
- Empyema


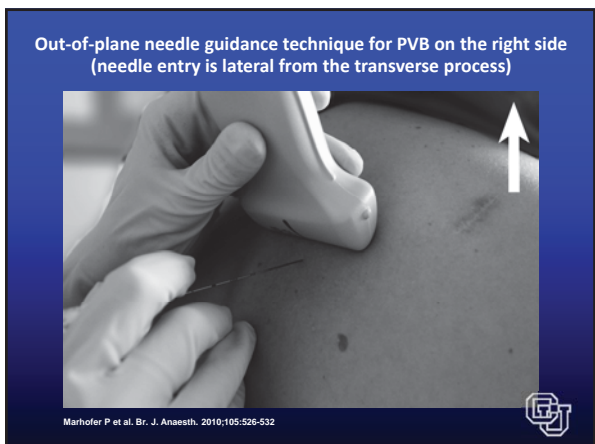
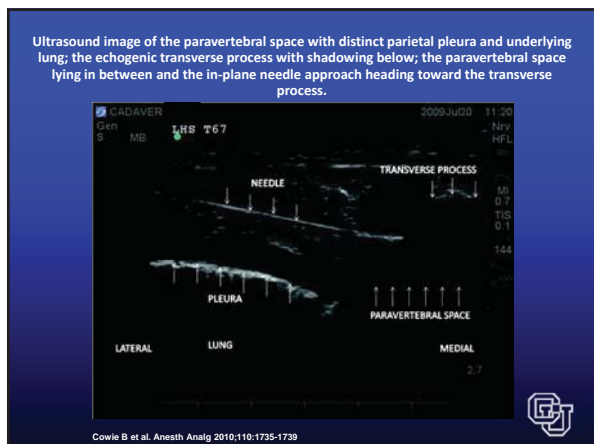
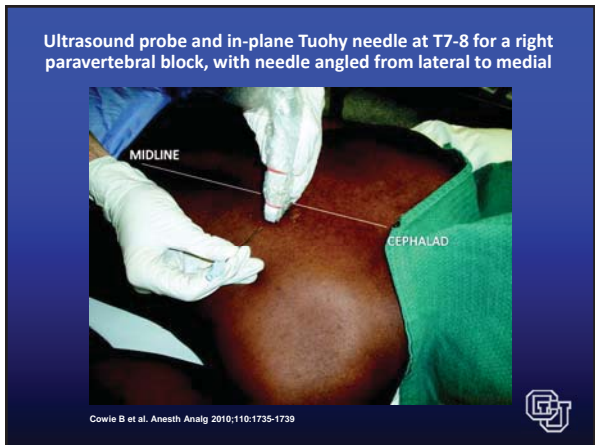
Paravertebral space – Anatomy

- Spread: Cranial + Caudal
- Caudal: lumbar plexus via the endothoracic fascia
- Spinal nerve → intercostal nerve – dorsal ramus
- Sympathetic chain



Paravertebral block

- Indications: Thoracotomy, breast surgery, cholecystectomy, rib trauma, renal surgery
- Landmarks: Spinal process at the desired thoracic dermatomal levels
- Needle insertion: 2.5 cm lateral to midline
- Transverse process: 2 – 5 cm in adult
- Target goal: needle insertion 1 cm past the transverse process (4 – 6 cm)
- Local anesthetic: 3 - 5 mL per level

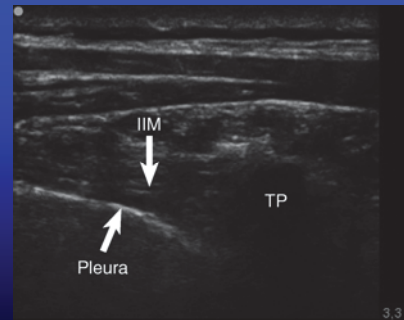



US guided paravertebral block out of plane

- Identification of desired spinous process
- Lateral movement of the probe until transverse process is visible
- Oblique movement until the typical double layer of internal intercostal membrane, transverse process and the pleura is seen in one image
- Needle is positioned 1 cm caudal from the probe
- Tip of the needle is positioned between the IIM and the pleura



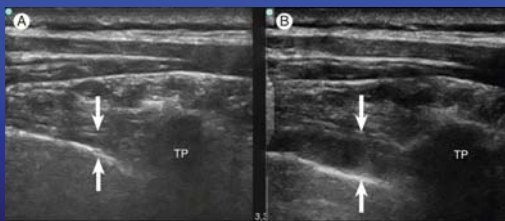
Ultrasound image of the PVS between the IIM (internal intercostal membrane), the transverse process (TP), and the pleura



Marhofer P et al. Br. J. Anaesth. 2010;105:526-532



Ultrasound illustration of the PVS (between the arrows) before (a) and after administration (b) of 12 ml of local anaesthetic.



Marhofer P et al. Br. J. Anaesth. 2010;105:526-532

Conclusion

- TEA for open thoracotomy
- PVB for VATS lobectomy or as a rescue
- Consider adjuvant therapy for VATS/VATS lobes

