

Spinal anaesthesia

Spinal anaesthesia was first performed for surgery by Bier in 1899.

Indications

Surgical procedures to the lower body

Analgesia for upper abdominal surgery (in combination with general anaesthesia)

Mechanism of action

Results in a rapid onset of block, usually within 3 minutes. Maximal effects may take up to 30 minutes. Acts mainly at spinal nerve roots, although some effect is possible at the cord itself. Smaller sympathetic fibres are more easily blocked than larger sensory and motor fibres. Hence, the 'sympathetic' level is higher than the sensory level.

Contraindications

Relative

- Aortic stenosis/mitral stenosis. Fixed cardiac output state may result in profound hypotension secondary to the sympathetic block produced by spinal anaesthesia.
- Neurological disease (medico-legal implications)
- Systemic sepsis

Absolute

- Localised sepsis
- Patient refusal
- Anticoagulated patient

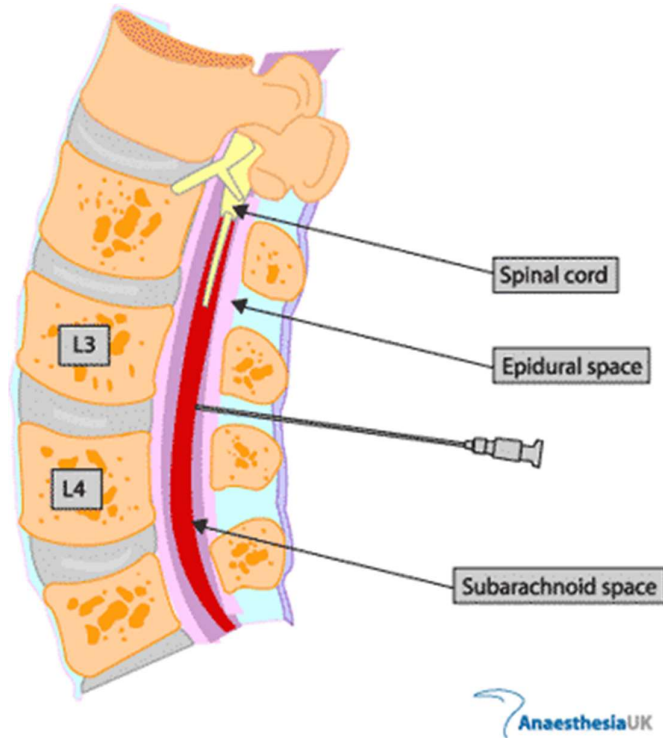
Anatomy

The spinal cord terminates at L1/2 in adults and L3 in infants. The line joining the iliac crests is at L3/4 and is called Tuffier's line. The subarachnoid space ends at S2 in adults and lies lower in children. The subarachnoid space extends laterally along the nerve roots to the dorsal root ganglia.

Technique

Preoperative assessment of the patient, as for a general anaesthetic. Facilities for resuscitation and progression to general anaesthesia must be available. Establish full monitoring. Obtain IV access before commencing the block.

Figure 6: Anatomy of the spinal cord, epidural space and the subarachnoid space.



The patient should be sitting or lying on their side. Back flexion opens the intervertebral spaces. The back is cleaned using standard antiseptic solution. The anaesthetist should adopt an aseptic technique. Aim to identify the L3/4, L4/5 or L5/S1 interspace (use Tuffier's line). The chosen interspace is infiltrated with local anaesthetic. The spinal needle is inserted in the midline, aiming slightly cranially. Resistance increases as the ligamentum flavum is entered and when the dura is encountered, with a sudden "give" as the dura is pierced. Correct placement of the needle is confirmed by cerebrospinal fluid at the hub.

The paramedian approach requires less back flexion (may be limited in certain patients). Infiltrate with local anaesthetic 1.5 cm lateral to the cranial border of the spinous process at the interspace. Aim the needle medially and cranially until the resistance of the ligamentum flavum is felt. If the lamina is engaged, walk the needle off its cranial edge.

Reference

i] Damage to the conus medullaris following spinal anaesthesia.

Reynolds F.

[Anaesthesia 2001; 56\[3\]: 238-47](#)