

SPINAL AND EPIDURAL ANESTHESIA



Objectives of the Lecture

Spinal and Epidural Anesthesia

1. Definition
2. Advantages
3. Indications and Contra-indications
4. Local Anaesthetics for Spinal Anaesthesia.

Objectives of the Lecture

continue

Spinal and Epidural Anesthesia

- 5. Factors affecting the spread of local anesthetic agents**
- 6. How to perform the spinal anesthesia?**
- 7. Complications of Spinal Anesthesia.**

Objectives of the Lecture continue

Spinal and Epidural Anesthesia

- 8. Definition of Epidural anesthesia
- 9. Indication contraindication and complications
- 10. Technique
- 11. Differences between spinal and Epidural Anesthesia

Definition

Spinal anesthesia :

is the injection of small amounts of local anesthetics into the (CSF) at the level below (L2) , where the spinal cord ends , anesthesia of the lower body part below the umbilicus is achieved

Advantages of spinal anesthesia (SPA)

1. Cost. The costs associated with SPA are minimal.
2. Patient satisfaction. the majority of patients are very happy with this technique.
3. Respiratory disease. SPA produces few adverse effects on the respiratory system as long as high blocks are avoided.
4. Patient airway. As control of the airway is not compromised, there is a reduced risk of airway obstruction or the aspiration of

Advantages of SPA Continue

5. Diabetic patients. There is little risk of unrecognised hypoglycaemia in an awake patient.
6. Muscle relaxation. SPA provides excellent muscle relaxation for lower abdominal and lower limb surgery.
7. Bleeding. Blood loss during operation is less than when

Advantages of SPA Continue

- 8. Splanchnic blood flow.** Because of its effect on increasing blood flow to the gut.
- 9. Visceral tone.** The bowel is contracted by SPA and sphincters relaxed although peristalsis continues. Normal gut function rapidly returns following surgery.
- 10. Coagulation.** Post-operative deep vein thromboses and pulmonary emboli are less common following spinal anaesthesia.

Indications

1. Operations below the umbilicus : hernia repairs , gynaecological and urological operations
2. Any operation on the perineum or genitalia

Indications of SPA

continue

3. All operations on the leg except for limb amputation which is possible but an unpleasant experience for an awake patient so here be patient is supplied with light general anesthetic.

Indications of SPA

continue

4. Special indications

- Elders
- Chronic systemic disease ,
hepatic ,renal and endocrine
disease (DM)
- Most patients with mild
cardiac diseases except for
stenotic valvular disease and
uncontrolled hypertension.

Contra-indications

1. Patient refusal
2. Uncooperative patients : like young children and psychiatric patients
3. Clotting disorders : as bleeding from ruptured peridural vein is common , patients with low platelet count or those on anticoagulant drugs (heparin + warfarin) are at high risk of hematoma formation.

Contra-indications continue

4. Hypovolemia : since SPA has marked hypotensive effect ,hypovolemic patients must be adequately rehydrated and resuscitated
5. Septicemia : leading to CSF infection and meningitis
6. Anatomical deformities (relative contraindication) as it will probably only serve to make the dural puncture more difficult.

Contra-indications continue

7. Neurological disease. Any worsening of the disease postoperatively may be blamed on the spinal anaesthetic.

8. Inadequate resuscitative drugs and equipment. No regional anaesthetic technique should be attempted if drugs and equipment for resuscitation are not immediately to hand.

Local anesthetics for SPA

- ▶ Local anesthetic agents are either hyper-, hypo- or isobaric.
- ▶ Hyperbaric agents tend to spread below the level of injection and they are easier to predict that's why they are preferred over iso- and hypobaric agents.

Local anesthetics for SPA continue

- Bupivacaine (Marcaine) : 0.5% hyperbaric bupivacaine is the best
- 0.5% isobaric bupivacaine is also popular
- Lasts longer than most spinal anesthetics from 2-3 hours

Local anesthetics for SPA

continue (Lidocaine)

- Lidocaine (Xylocaine) : 5% hyperbaric lidocaine is the best lasting 45-90 mins.
- 2% lidocaine can be used but as a much shorter duration of action.
- 0.2 ml of adrenaline 1:1000 + lidocaine will prolong the duration of action
- Lidocaine from (multi dose vials) should not be used intrathecally as they contain potentially harmful preservatives.

Factors affecting the spread of local anesthetic solutions in CSF

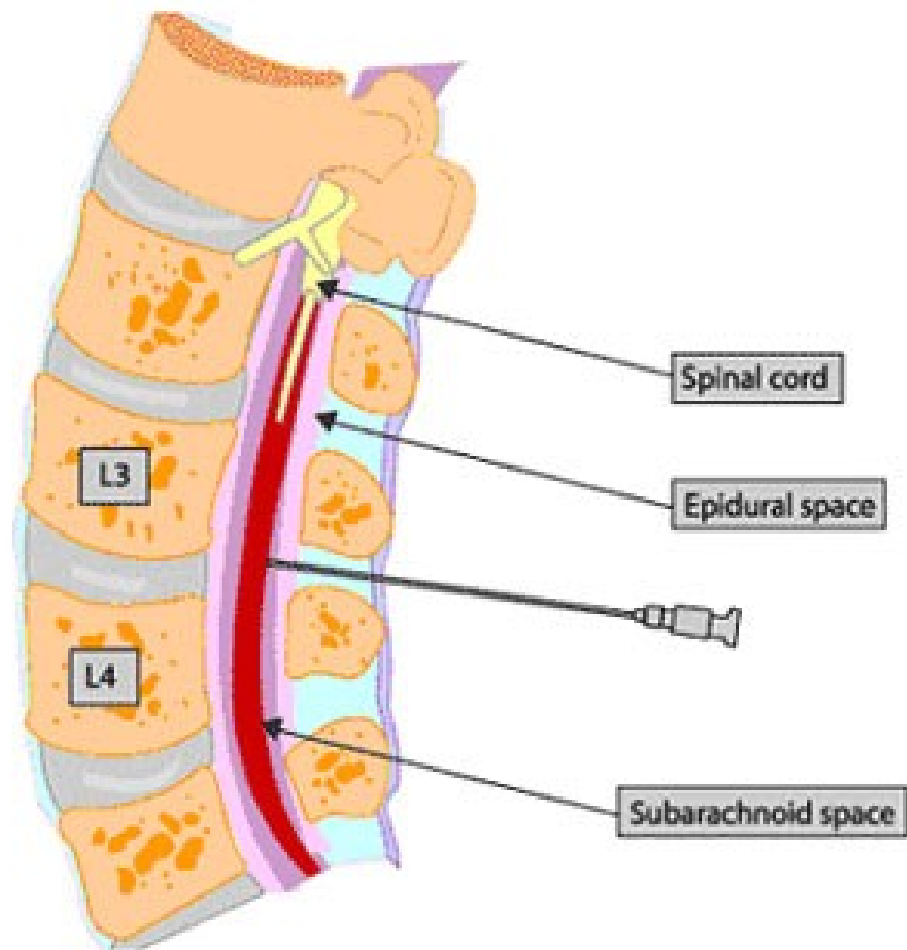
1. The baricity of the local anesthetic solution.
2. The position of the patient .
3. The level of injection.
4. The speed of injection (like all anesthetics).
5. Obesity : as increase in intra-abdominal pressure decreases the subarachnoid space so doses must be reduced.
6. Pregnancy : increase in intra-abdominal pressure leading to increase in peridural veins filling leading to less subarachnoid space and less doses.

How to perform the spinal injection?

- Clean the patient's back with antiseptic.
- Locate a suitable interspinous space.
- Raise an intradermal wheal of LA agent at proposed puncture site.

How to perform the spinal injection? continue

- ▶ Insert the needle: the structures that will be passed skin , subcutaneous tissue, supraspinous ligament , interaspinous ligament , lagementum flavum , dura mater.
- ▶ When CSF appears then slowly inject the local anesthetic.



Complications of spinal Anaesthesia

- Hypotension : due to vasodilatation and a functional decrease in the effective circulating volume.
- ✓ By giving fluids and oxygen mask.
- ✓ Raising the legs: simple and effective.
- ✓ increase the speed of IV infusion: until the blood pressure is restored.
- ✓ If the pulse low give atropine IV.
- ✓ Vasoconstrictor (ephedrine).

Complications of spinal Anesthesia continue

- Headache : within 12-24 h and may last for 1 week.
 - it is postural and it is often occipital associated with a stiff neck , nausea, vomiting , Dizziness and photophobia.
 - Ask to lying flat in bed and give simple analgesics.

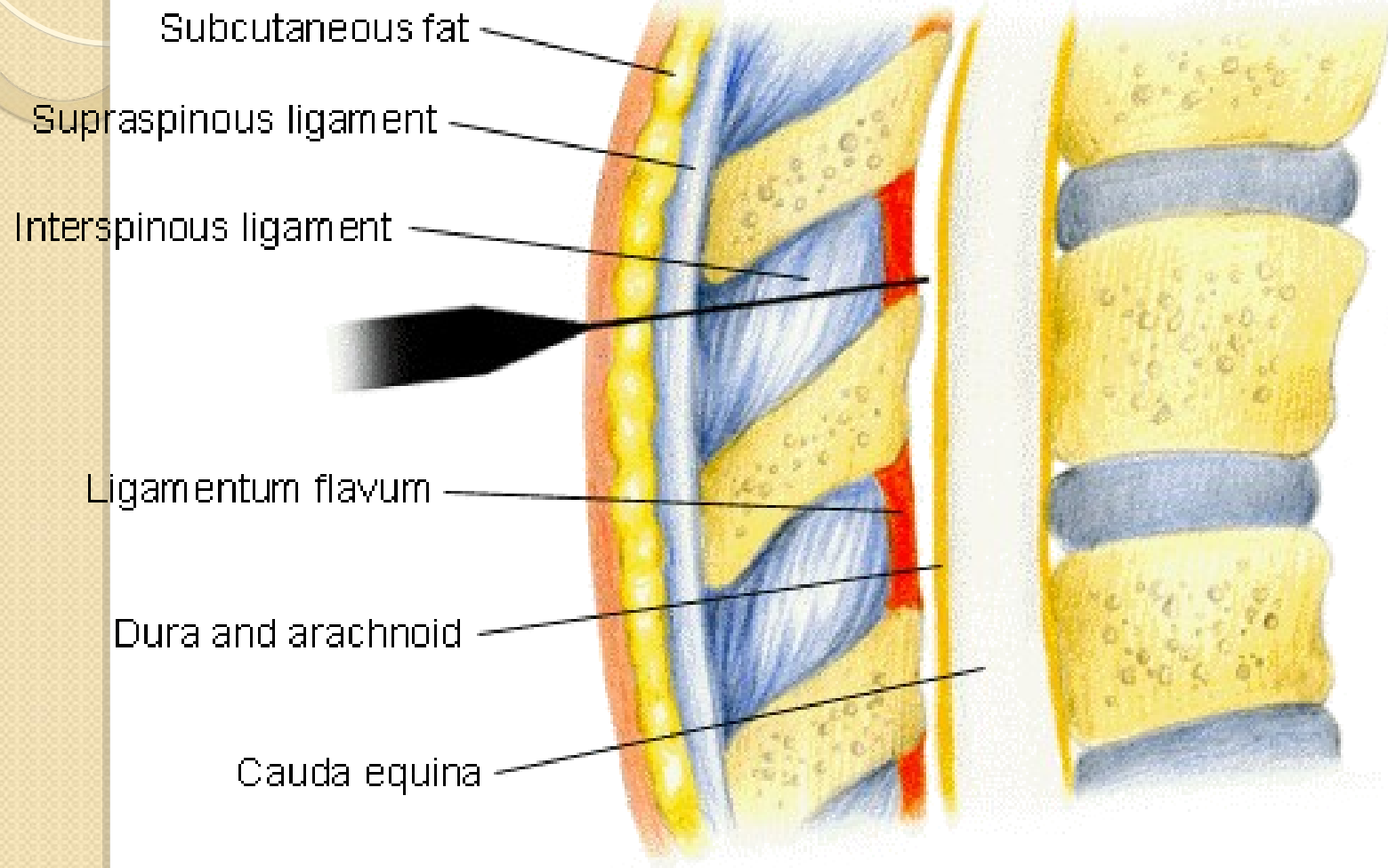
Complications of spinal Anesthesia

continue

- Urinary retention : the sacral autonomic fibers are among the last to recover.
- Permanent neurological complications (rare): meningitis, arachnoiditis , peridura abscess

Epidural Anesthesia

- Local anaesthetic solutions are deposited in the peridural space between the dura mater and the periosteum lining the vertebral canal. The peridural space contains adipose tissue, lymphatics and blood vessels. The injected local anaesthetic solution produces analgesia by blocking conduction at the intradural spinal nerve roots.



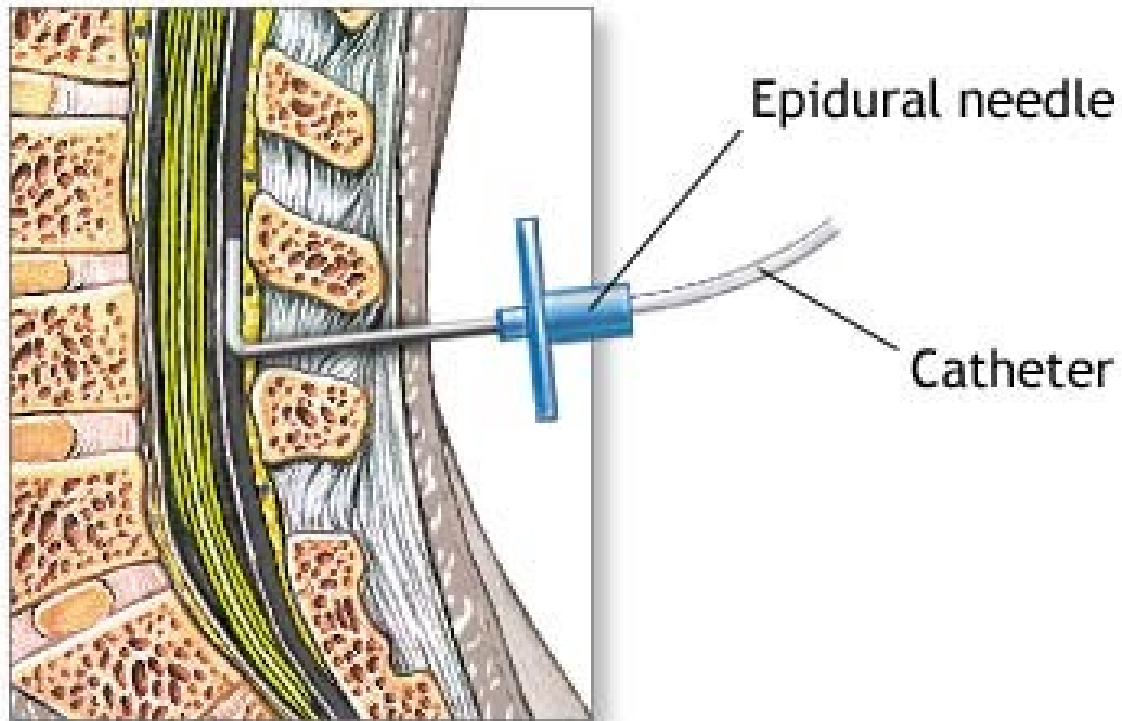
Epidural Anesthesia

continue

- **Technique:**

Loss of resistance technique to identify the epidural space.

- 0.5% Bupivacaine (mainly) or lidocaine (2.0%) is usually used to produce epidural anaesthesia.



Epidural Anesthesia

continue

Indication and Contraindication:

- the same of spinal anaesthesia.
- Additional indication is the post operative Pain management using the epidural catheter technique.
- **Complications:** the same of spinal anaesthesia, **except** the post dural puncture headache.

Differences between Spinal and Epidural Anesthesia

Extradural Anaesthesia	Spinal anaesthesia
Level: at any level of the vertebral column.	Level: below L1/L2, where the spinal cord ends
Injection: epidural space (between Ligamentum flavum and dura mater) i.e without puncture of the dura mater	Injection: subarachnoid space i.e puncture of the dura mater
Identification of the Peridural space: Using the Loss of Resistance technique.	Identification of the subarachnoid space: When CSF appears
Doses: 15- 20 ml bupivacaine 0.5% mainly	Dosis: 2.5- 3.5 ml bupivacaine 0.5% heavy
Onset of action: slow (15-20 min)	Onset of action: rapid (2-5 min)
Density of block: less dense	Density of block: more dense
Hypotension: slow	Hypotension: rapid

THE END

