



Introduction To Regional Anesthesia

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Palestine

Outlines

- ❑ **Categories of block.**
- ❑ **Golden rules.**
- ❑ **Advantages of regional anesthesia.**
- ❑ **Disadvantages Of Regional Anesthe**
- ❑ **Contraindications To Regional Anest**
- ❑ **Complications of regional anesthesia**



Blocks are in three categories

C:Technically demanding blocks	B:More demanding blocks	A: Simple blocks
❖ Subarachnoid (spinal) block	➤ Intravenous regional anesthesia (IVRA).	❑ Infiltration anesthesia
❖ Interscalene brachial plexus block	➤ Axillary brachial plexus block	❑ Digital block
❖ Infraclavicular brachial plexus block	➤ Intercostal block	❑ Wrist block
	➤ Inferior dental block	❑ Inguinal hernia field block
	➤ Caudal block	❑ Penile block
	➤ Pudendal block	❑ Peri-anal block
	➤ The 3 in 1, inguinal paravascular block	❑ Knee arthroscopy (intra articular) block
	➤ Sciatic (lateral popliteal approach) block	❑ Ankle block
		❑ Carpal tunnel anesthesia

Golden rules which should never be broken

- ❑ **Before performing regional anesthesia you have to:**
 1. insert an **intravenous line** before commencing a block.
 2. **monitor** (pulse oximetry, EGG, BP as indicated).
 3. practice proper **aseptic** technique.
 4. have **resuscitation** equipment at hand.
 5. obtain the patients informed **consent**.
 6. have an adequate knowledge of the correct technique and know how to **handle complications**.

- ❑ **Shortcuts and casual practice are the highway to hell for the unsuspecting inexperienced anesthetist.**

Advantages Of Regional Anesthesia

- 1- Avoids general anesthesia complications:** airway trauma. Bronchospasm
aspiration. Prolonged sedation...
- 2- Probably safer than general anesthesia:** (eg. Remote locations).
- 3- Some patients prefer to remain awake and interact with the surgeon:**
It can be helpful for the surgeon to receive feed back from the patient during the operation.
- 4- Less postoperative nausea and vomiting (less opioid).**
- 5- Less sedation post op (decreased confusion in elderly).**
- 6- Analgesia continues into postoperative period:** new catheter infusion techniques
- 7- Faster return to street fitness and earlier discharge (cost savings).**
- 8- Subarachnoid block results in** decreased dvt, less blood loss & surgical stress.
- 9- Obstetrics:** is much safer and more pleasant for all concerned.
- 10- Regional anesthesia in remote locations is cheap and relatively safe.**

Disadvantages Of Regional Anesthesia

1-Time delay: 15 – 30 minutes before the patient is ready for surgery.

- ❑ Short recovery stay. Good organization & skilled anesthetist time delay will be minimal.

2- Patient factors:

- ❑ Discomfort associated with block placement and positioning paralysis and numbness.
- ❑ Patients may be anxious and dislike being aware (midazolam and fentanyl).

3- Surgeon factors:

- ❑ Some surgeons are irritated and distracted by an awake patient, especially when the patient persists in engaging in constant conversation with the surgeon.

4- Anesthetist factors:

- ❑ A skilled, knowledgeable anesthetist + the proper equipment = good regional anesthesia

5- Nerve damage: there is a minimal risk of permanent nerve damage.

6- Failure rate: failure rate of up to 10%.

- ❑ The conversion to GA the patient is exposed to the combined risks of both.

7- Subarachnoid block complications: dural puncture Headache, urinary retention...

8- Surgery outlasts the block: unless a catheter we have to convert to GA

Contraindications To Regional Anesthesia

- ❑ These can be divided into **absolute** and **relative** contraindications.
- ❑ Much depends upon:
 - A. The competence of the anesthetist.
 - B. The urgency of the operation.
 - C. The health status of the patient.

A- Absolute contraindications:

1. Patient refusal.
2. Inexperienced, incompetent anesthetist.
3. Major coagulation disorders and patients taking anticoagulants.
(This especially applies to spinal blocks).
4. Infection at site of needle insertion.

Contraindications To Regional Anesthesia

B- Relative contraindications:

- 1- Psychologically unsuited to a regional technique.
- 2- Surgeons who are uncomfortable with an awake patient.
- 3- Shocked, severely hypovolaemic patients.
- 4- Anticipated technical difficulty.
- 5- Neurological disease (e.g. Multiple sclerosis).
- 6- Uncertain duration of surgery (i.e. The surgery may outlast the block).
- 7- Placing the block in an anesthetized patient.

(the awake patient will Complain bitterly if the injection is intraneuronal)

Complications of regional anesthesia

- ❑ Serious complications of regional anesthesia are relatively rare.
- ❑ Complications are usually of a minor nature but at times can be life threatening.

1- local anesthetic toxicity:

When the concentration of local anesthetic in the blood rises to toxic levels.

It may be due to accidental iv injection or absorption of an excessive dose.

❑ Signs and symptoms:

- The **cardiovascular**(CVS) and **central nervous** systems(CNS) are primarily involved.
- Symptoms and signs of **CNS toxicity occur before the CVS manifestations.**
- Early symptoms of CNS toxicity include **tinnitus**, lightheadedness, facial numbness, a metallic taste and blurred vision ,confusion and disorientation.
- With higher serum levels nystagmus, tremors and isolated muscle twitching occur.
- This can lead on to convulsions, **coma and respiratory arrest.**

Complications of regional anesthesia

- ❑ If epinephrine has been included in the local anesthetic (LA) solution, the initial presentation of an overdose may be a tachycardia and hypertension.
- ❑ If epinephrine has not been added, the early signs are bradycardia and hypotension.
- ❑ **Bupivacaine** is particularly dangerous as it causes VF can be difficult to defibrillate.
- ❑ Intravascular injection can cause convulsions and cardiac arrest due to the rapid rise in blood concentrations.
- ❑ Whereas the slower systemic absorption of local anesthetic affects mainly the CNS.
- ❑ These emergencies must be handled quickly and effectively.
- ❑ **Convulsions** are managed with intravenous midazolam 10 - 15mg.
- ❑ If the patient loses consciousness, the airway must be secured and maintained.
- ❑ **Hemodynamic instability** should be managed with iv fluids & inotrops.

Complications of regional anesthesia

❑ Precautions to avoid drug toxicity:

1. Inject local anesthetics **slowly**, aspirating every 3 - 5 ml.
2. Stabilize the needle during injection by placing a short length of fine bore plastic tubing between the needle and syringe (the isolated needle technique).
3. Always perform a **check aspiration** before injecting LA (but remember, check aspirations are not fool proof).
4. Observe the patient, **pulse and ECG** for signs of intravascular injection. Added epinephrine causes a sudden tachycardia.
5. Always secure **intravenous access** before commencing block.
6. Always have **emergency resuscitation equipment** on hand and know how to use it

Complications of regional anesthesia

2- Nerve damage:

- ❑ Nerves can be damaged by direct needle trauma or by injecting (LA) into the nerve.
- ❑ Eliciting paraesthesia is an accepted method of locating nerves.
- ❑ A nerve stimulator should be used where possible.
- ❑ A short bevel needle may contuse a nerve whereas a sharp needle will lacerate it.
- ❑ If a paraesthesia is elicited, it is good practise to withdraw the needle a millimetre or two before injecting.
- ❑ Injection of large amounts of la into a nerve is extremely painful.
- ❑ The fascicular bundles are stripped and neuronal degeneration can occur.
- ❑ The incidence of nerve damage should be less than 1 in a 1000 for experienced anaesthetists.
- ❑ The most prolonged dysaesthesias and paresis resolve within a few months.
- ❑ Unfortunately, approximately 1 in 10,000 are permanent.

Complications of regional anesthesia

❑ Recommendations may reduce the risk of nerve damage:

1- Use short bevel needles:

- This is a controversial subject as some argue the sharper, long bevel needles cause less trauma.

2- Use nerve stimulators and insulated short bevel needles:

- Wherever possible (i.e. Don't deliberately elicit paraesthesiaes).

3- Avoid rapid, forceful injections:

- Never inject if there is resistance or the patient complains of severe pain.
- If this happens withdraw slightly and continue injecting.

4- Avoid regional blocks when the patient is under anesthesia.

Complications of regional anesthesia

3- vasoconstrictor problems:

- ❑ As a general rule epinephrine should not be used in concentrations greater than **1:200,000**
- ❑ **never use vasoconstrictors on** areas served by end arteries (i.E. Fingers, toes, penis, ears and nose) , can lead to ischaemic necrosis of the end organ.
- ❑ If la/vasoconstrictor solution is injected **intravascularly** a transient tachycardia will happen.
- ❑ Higher doses cause palpitations, angina, and hypertension.
- ❑ It is therefore prudent to reduce the dose of epinephrine in patients with a **history of cardiovascular disease**.
- ❑ Epinephrine in significant quantities in **pregnancy** my reduces placental perfusion.
- ❑ **Epinephrine lowers the PH** of the local anesthetic solution and This increases pain on injection

Complications of regional anesthesia

4- infection:

- ❑ Always practice strict aseptic technique.
- ❑ This means sterile gloves, drapes and an appropriate prep solution.
- ❑ A needle should never be introduced through infected skin.
- ❑ In subarachnoid block meningitis is rare ,but disastrous complication.

5- Hematoma:

- ❑ Hematomas are uncommon and usually of little consequence.
- ❑ A subarachnoid block must not be performed on a patient with a serious coagulopathy or on patients taking anticoagulant medication.
- ❑ These patients are at risk of cord compression due to an expanding hematoma.

Complications of regional anesthesia

6- wrong drug:

- ❑ This is self explanatory.
- ❑ Always, always check the drug you are about to administer.

7- Pneumothorax:

- ❑ This is a risk with infraclavicular and subcostal blocks.

8- Psychological reactions:

- ❑ Patients are often anxious and benefit from sedation.
- ❑ Vasovagal episodes are common (the dentist's chair).

9- Headache:

- ❑ Post spinal headaches can occur after dural puncture due to leakage of CSF
- ❑ Using fine bore spinal needles and good spinal technique reduces the incidence.
- ❑ The treatment is bed rest, hydration and analgesia

thank
you