Epidural Scenario

Part A

Mr Smith is a 68-year-old man with a history of hypertension, Ischemic heart disease and high cholesterol, has had a Radical Cystectomy, Ileal Loop Diversion and arrives into Recovery at 1810. He has an epidural insitu that was bolused early in the procedure (approximately 1550) but has not been topped up since. On arrival, Observations are:

Temp = 35.1°C, BP=180/100, HR=110, RR=22 and pain is severe

On assessment, the dermatome level is approximately T12 on the right and L2 on the left but seems generally 'patchy'. The patient is distressed and accurate assessment is difficult. Mr Smith has full sensory function above L2 with leg movement and strength present.

An infusion of Ropivacaine 0.2% with Fentanyl 800mcg/200ml is ordered at a rate of 4-12 ml/hr with boluses of 5ml up to 15 ml every hour prn. IV Pain protocol is also ordered. Questions:

1. What is the difference between an epidural and a spinal?
2. What are the advantages and disadvantages of an epidural vs a spinal block?
3. Why is temperature regulation impaired during neuraxial block?
4. What are your actions to re-establish the epidural block?
5. How would you manage the patient's pain in the interim?
6. What action do you need to carry out prior to attaching the epidural infusion?

Part B

A bolus of 5 ml of the epidural solution is administered to the patient at 1825 and the infusion is commenced at 5 ml/hr.

7. What observations and monitoring are required following an epidural bolus?

By 1900 the dermatome block is T5 on the right but remains T10 of the left. Pain is on the left-hand side of the abdomen with evidence of sensory and motor blockade in the lower limbs

8. How could you assist the block to move to the left side?

By 1930, the patients' blood pressure is 90/50, heart rate =52 bpm and RR=12. The dermatome block is T2 R=L

9. Why is hypotension a side effect of a high epidural block? How would you manage the scenario of a high block and hypotension?
10. What other complications may occur with an epidural?

Answers Scenario 1 Epidural

Part A

1. An epidural is a procedure where an anaesthetist places a catheter into the epidural (extra dural) space around the patient's spinal cord to provide a route of administration of analgesics (local anaesthetic/opioids) and modulate sensory and motor inputs from the spinal cord. An epidural block can be placed at any level of the spine. Administration of drugs can be intermittent, continuous or patient controlled. A spinal involves the introduction of local anaesthetics +/- opioids into the subarachnoid space at below the level of L2 to produce a denser motor and sensory block.
2.

	Advantages	Disadvantages
Epidural	• Can be used at any level of the spine • Catheter can be inserted and used for top ups and postoperative analgesia • The arachnoid mater is not punctured, reducing the risk of spinal headache • Can titrate dose of LA to desired effect	• Loss of resistance not as clear an endpoint as presence of CSF in spinal anaesthetic • Block can miss segments • Larger doses of LA are required than in spinal anaesthetic • Larger needle than in spinal • Slower onset of anaesthesia
Spinal	• Clear endpoint when CSF is aspirated • Quick and relatively easy to do • The dose of LA is small • Provides total anaesthesia and is unlikely to miss segments or have an incomplete block	• One shot only technique • Dose of LA cannot be titrated • Can only do below L2 (where spinal cord divides into filum terminale) • The arachnoid mater is punctured which can result in CSF leak and spinal headache

3. Spinal and epidural anaesthesia can result in marked alterations in core temperature because the afferent thermal input to the hypothalamus from the 'blocked area' is abolished. The absence of cold input from the blocked area is incorrectly interpreted by the hypothalamus as an increase in skin temperature. Core temperatures that would normally result in cold responses, no longer trigger those responses. Efferent sympathetic vasoconstrictive input into the blocked area is also abolished, resulting in vasodilation. These two processes together allow redistributive hypothermia to occur.

4.
   - Note observations, pain response and dermatome assessment of R=T12 and L=l2 and patchy with sensory and motor function present
   - Commence infusion on lower end of infusion rate (e.g. 5ml/hr)
   - Ensure oxygen and ECG monitoring insitu. Five minutely observation of Pulse, Respirations, BP, Sedation Score, Pain Score, Dermatomes and leg movements are to be taken for 20 minutes
   - Re bolus after twenty minutes if block not adequate to cover pain. Repeat observations for twenty minutes as above. Consider increase of infusion rate.
   - Repeat bolus (and observations) after 20 minutes depending on dermatome level, haemodynamic status and pain

5. IV Pain protocol, IV Panadol if not given in OTS

6. **Prior to attaching epidural:**
   - Three patient identifiers
   - Ensure presence of emergency orders
   - Allergies, check order and pump parameters
   - Attach a 2mL syringe to the epidural catheter hub, and aspirate gently for blood or cerebrospinal fluid to confirm proper epidural catheter placement. If you aspirate more than 0.5 mL of blood or serous fluid, don't reinject the aspirate or administer the medication. Instead, notify the practitioner, because the catheter has most likely migrated into a vein or the intrathecal space.

7. **At commencement of an Infusion or after Rescue Bolus Dose:**
   Five minutely observation of Pulse, Respirations, BP, Sedation Score, Pain Score, Dermatomes and leg movements are to be taken for 20 minutes

8. Try positioning the patient on the side that you require the block to disperse to (i.e. left side)
9. **Hypotension related to high neuromuscular blockade**:
   - Supportive therapy. Cease/reduce infusion rate with ongoing assessment of dermatome levels
   - Ensure oxygen insitu
   - Fluid bolus +/- vasopressors as per emergency orders
   - Five minutely observations with administration of vasopressors
   - When blood pressure increases with vasopressors and fluids, sit patient up slightly and gradually to encourage block to drop. Continue to monitor haemodynamic status and dermatome levels

10. **Complications of epidural:**

Local anaesthetic toxicity
Headache
Epidural haematoma/abscess, meningitis
Pain (inadequate block)
Haemodynamic changes (hypotension)
Puritis related to neuraxial opioids
Accidental dural puncture
Accidental intravascular injection Accidental intrathecal injection (total spinal)
Accidental disconnection (see hospital policy)
Catheter migration

References

Epidural analgesic administration, Lippincott Procedures https://procedures.lww.com/lnp/view.do?pId=6704357&hits=epidural&a=false&ad=false&q=epidural

STAN: http://intranet/Manuals/Procedures/Procedures/Pain-Management-Epidural-Analgesia-and-Intrathecal-Opioids.pdf page 1-13

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