

EPIDURAL ANALGESIA FOR LABOUR

Aims

To provide adequate analgesia for labour without significant side effects. The pain in primiparous labour is said to be one of the most severe pains experienced, with over 50% of women reporting severe or very severe pain during labour.

The time from the anaesthetist being informed about an epidural until they are able to attend should not normally exceed 30 min and must be within an hour in exceptional circumstances (Document "exceptional circumstances" that lead to delays in the patients notes and explain this to the woman).

Preparation

Take a history, specifically excluding contra-indications. Make sure that continuous electronic foetal heart monitoring (EFM) during epidural insertion and during labour analgesia is available and attached. Consider STAN monitoring if external monitoring is difficult.

Absolute contra-indications¹

- a) Patient refusal
- b) Septicaemia
- c) Infection at site of insertion
- d) Coagulopathy / Thrombocytopenia (platelet count $< 75 \times 10^9$). Beware of a falling count over the past few days – always check the platelet count if this has occurred. If they platelet count is between 75 and 100×10^9 perform clotting studies before proceeding with the epidural.
- e) Raised intra-cranial pressure.
- f) Haemorrhage and cardiovascular instability / hypovolaemia. There may be limited circumstances where an epidural may be appropriate in these circumstances, discuss with the consultant anaesthetist prior to inserting the epidural.
- g) Known allergy to amide (lignocaine-type) local anaesthetic solutions or opioids
- h) Ideally there should be sufficient staff for 1:1 monitoring and care of the mother during the duration of the block. Please inform the consultant obstetric anaesthetists at a suitable time when this does not occur.²

Existing neurological deficits are not an absolute contra-indication to the placement

¹ Russell R, Scrutton M and Porter J (1997) Indications and Contra-indications in *Pain Relief in Labour* ed by Reynolds F, pgs 137 – 150 BMJ Publishing Group, London

² Obstetric Anaesthetists Association Recommended minimum standards for obstetric anaesthesia services *Int J Obstet Anesth* 1995;4:125 – 128

of an epidural, but their presence and the extent of any pre-existing deficit must be recorded in the notes prior to the insertion of the epidural. Other relative contraindications include previous spinal surgery or gross spinal deformity – explain to the woman that the block may be patchy due to the possibility of poor spread of the solution.

Women who have had intramuscular pethidine should not receive an epidural containing opiate for **four** hours post the injection.

Technique

1. Explain the procedure and associated risks and obtain a verbal consent from the patient. You can use the epidural information card provided.
Risks that should be explained include absolute failure rate (1:1000) and partial failure/patchy block (1:10), dural puncture rate, (ideally less than 1 in 250) and the remote risk of neurological damage (1:100 000 or less), which may be permanent. There is also a slight higher risk for instrumental delivery and prolonged second stage of labour with epidural analgesia.
Record this in the notes. There is some debate as to the validity of consent obtained in labour; ideally all women should have had the risks of the procedure explained to them beforehand. A desire by the anaesthetist to take written consent is merely an urge for self-protection, and serves no useful purpose for the mother. The midwife must document in the notes that the mother agrees to regional analgesia and it may be wise for the anaesthetist to sign these notes.³
2. Make sure that there is adequate i.v. access (a 16G cannula) and start to preload the woman with about 500mls of Hartmann's solution.
3. Position the patient (sitting or lateral) and assess the anatomy of the lumbar spine.
4. Full aseptic technique is essential – gown, gloves and mask as well as preparation of the site with chlorhexidine spray. Additionally, sterile drapes should be used.
5. Once the patient is suitably positioned, infiltrate the skin with lignocaine 1%.
6. Insert the Tuohy needle into the ligamentum flavum - this is identified by a slight 'grittiness'.
7. Withdraw the stylette from the Tuohy needle and advance it slowly, utilising a continuous loss of resistance technique using normal saline. Always maintain tight control of the needle, even if the patient is moving. Generally the epidural space is located between 4 and 6 cms from the skin in an average-sized woman.

³ Bush DJ A comparison of informed consent for obstetric anaesthesia in the USA and the UK. *Int J Obstet Anesth* 1995;4:1 – 6

8. When the epidural space is reached, detach the syringe. If a copious amount of fluid is leaking from the needle, replace the stylet and ask the midwife to get a blood glucose monitoring set. This is to exclude the possibility of a dural tap. If the fluid is positive for glucose, treat the insertion as a possible dural tap and abandon further attempts at siting the epidural in that space.
9. If there is no obvious dural tap, thread the catheter through the Tuohy needle, aiming to leave about 4 - 5 cms in the epidural space. **Never** withdraw the catheter back through the Tuohy needle as this can lead to the catheter shearing and part of it being left within the epidural space.
10. If there is difficulty in threading the catheter, either inject more saline through the Tuohy needle and then try to thread the catheter, alternatively, get the patient to slightly straighten her legs or her back slightly, depending on the initial position chosen to site the epidural (sitting or lying). **Never rotate the Tuohy needle** once the epidural space has been located - this is associated with a higher incidence of dural puncture.
11. Firmly secure the epidural catheter in place, using Mefix or equivalent.
12. If one is using the epidural regimen that consists of the low dose mixture there is no need to give a formal test dose.⁴ Give the first dose slowly in divided boluses i.e. 7 and then 8 mls of the low dose mixture. If there are no signs of inadvertent intrathecal placement of the catheter, proceed with the chosen regimen.
13. Accepted regimens in this labour ward are:
 - 10 mls - 20 mls 0.1% plain bupivacaine with fentanyl 2µg/ ml hourly p.r.n. as a bolus. This is the preferred dosage regimen in this unit and topping up the block should be done in accordance to the height of the block.
 - 10 mls 0.25% bupivacaine hourly, 5 mls to be given on either side. The midwives will give this prescription. This is only to be used when the low-dose technique is not possible or it fails to provide adequate analgesia.
 - Any other solution that is approved as part of a research trial. You will be informed of these, well in advance of their introduction into the labour ward.
14. If you have difficulty in inserting an epidural after multiple attempts have been made, **Call for more experienced assistance**. Do not persist in trying to site an epidural for more than 20 minutes.
15. Routine monitoring will be performed by the midwives - fetal heart rate during and after the procedure, maternal heart rate and blood pressure and level of the block, every five minutes for fifteen minutes following the insertion and then half hourly. Similar observations should be performed after every top-up. The midwives will give a standard prescription for top-ups as detailed before.

⁴ Birnbach DJ, Chestnut DH The epidural test dose in obstetric patients: has it outlived its usefulness? *Anaesth Analg* 1999;88: 971-2

If no top-ups are required after this, observations shall be done half-hourly with hourly assessment of the level of the sensory block.

If a woman is not pain free after 30 min of epidural insertion and first top up, the anaesthetist should be contacted immediately.

Women with routine epidural and no complications should be reviewed by an anaesthetist at least every four hours. This review should also include fluid management in labour.

16. Fetal Monitoring during insertion of epidural block

Continuous electronic fetal heart monitoring (EFM) during epidural insertion and during labour analgesia should be available and attached. As it can be difficult to get continual CTG whilst the block is sited, STAN monitoring with a fetal scalp electrode should be considered prior to siting of an epidural if external monitoring is difficult.

If at any stage there are concerns re the fetal well being the procedure should be abandoned until a proper assessment is made of the fetal status.

Discussions with the women and her companion during this period should be documented in the notes.

17. An anaesthetist **must** give top-ups in the following situations:

- a) When the midwife is concerned about the level of the block
- b) When the anaesthetist is concerned about the block
- c) Where an inadequate or unusual prescription has been ordered
- d) There is a hypotensive episode (systolic blood pressure < 100mmHg) after the previous top-up
- e) When analgesia is persistently inadequate
- f) For forceps deliveries.
- g) To extend the block for caesarean sections
- h) After a suspected dural tap

18. An anaesthetist should be informed about instrumental deliveries that are not performed in theatre where the epidural is topped up in the delivery room.

All women who have had an epidural must be followed up post delivery.

EPIDURAL TOP-UP PROCEDURE

The midwives will predominantly give the top-ups.

1. Assess fetal well being → Continuous monitoring.
2. Assess the following prior to each top up
 - Level of block – if at T10 or below consider top-up see chart of levels if unsure

- BP and pulse
 - IV line that is patent
3. Encourage mother to sit upright.
 4. Wash hands and apply alcohol rub.
 5. Draw up solution as prescribed by anaesthetist.
 6. Administer epidural solution dose slowly.
 7. Record BP, pulse, respiratory rate and fetal heart rate at 5 minute intervals for a minimum of 15 minutes, longer if vital signs unstable. Thereafter half - hourly unless woman's condition necessitates more frequent observations
 8. The woman must not be left unattended for at least 15 minutes following epidural top up.

'MOBILE' OR LOW-DOSE EPIDURALS

Aims

To provide good pain relief in labour without loss of motor function or proprioceptive ability.

Theoretical Advantages

1. Increased maternal satisfaction
2. Retention of the urge to bear down and the ability to push during the second stage
3. Retention of bladder sensation / avoidance of urinary retention
4. Obstetric outcome may be improved
5. Long-term post-partum blockade may be reduced

Technique

1. Site epidural as before.
2. Do not give a test dose and do not give 0.5% solutions of bupivacaine, as this nullifies advantages of this technique. Instead give 15 mls of a solution of 0.1% plain bupivacaine with fentanyl 2 µg/ml **slowly**, preferably in divided doses.
3. The midwives will then give subsequent top up doses, i.e. 10 – 20 mls of the mixture maximum hourly on request.
4. Patients are only allowed to mobilise in the bed or to get into a chair only - full motor power cannot be guaranteed and they should be warned of this. They are not to be encouraged to walk around the delivery suite.
5. Monitoring should be performed by the midwives as follows: fetal heart rate, maternal heart rate and blood pressure as well as the level of the block every five

minutes for the first thirty minutes after the insertion of the epidural and then half-hourly after this. The midwife must inform the anaesthetist if the block is higher than T4.

6. Emphasise to the patient that the block may not be sufficient for the second stage of labour and that she may need an additional top-up from the midwife or anaesthetist for this.

MOBILITY GUIDELINES

(Note: women must be ensured of an adequate and motivated midwife and / or partner before this is attempted)

The ability to ambulate during labour with regional anaesthesia has been shown to improve maternal satisfaction. Remaining up right for both top-ups and in the second stage has been shown to be associated with an improvement in CTG tracings and a trend towards fewer assisted deliveries.

The ability to ambulate should be assessed 20 –30 minutes after the initial injection by the ability to raise each leg straight off the bed for at least five seconds. If this is possible the woman should be asked if she feels capable of weight bearing. An affirmative answer is associated with intact motor power in 98% of cases.

Before weight bearing, other requirements to be satisfied include:

- No postural hypotension or symptoms
- Co-operative, understanding parturient
- Engaged foetal presenting part
- A partner and or midwife must be available at all times to accompany the woman whilst mobilising to a chair. At no stage should the woman be encouraged to walk around the delivery suite.

COMPLICATIONS OF EPIDURAL ANALGESIA⁵

Immediate Complications

Dural tap

- If unsure about the diagnosis, test the fluid for glucose as described earlier. If it is positive, or if the tap is obvious, remove the Tuohy needle.
- Re-site the epidural at a different interspace.
- All top-ups to be given by the anaesthetist on call. No top-ups are to be given by midwives in this situation.
- Make sure that the woman is regularly followed up post-natally and that the consultant obstetric anaesthetist is informed at a suitable time.
- There is no evidence that women should have instrumental deliveries just because they have had a dural tap.
- Please refer to protocol for management of Post Dural Puncture Headache

Bloody tap

- If there is an obvious amount of blood leaking back down the catheter, it is safer to re-site the epidural at a different interspace.
- If once the epidural catheter is flushed with saline 0.9% and no further aspiration of blood is possible or no evidence of blood tracking back down the catheter is observed, judiciously give the first dose of the local anaesthetic solution slowly.

Hypotension

- Ephedrine should always be kept available on the epidural trolley; Phenylephrine is available in the obstetric theatre fridge (already diluted in 100 mls Normal Saline 0.9%).
- Ephedrine or phenylephrine should be given if the systolic blood pressure falls to less than 80 mmHg or if there is maternal dizziness, fainting or sudden nausea.
- Small bolus doses of either drug should be given intravenously until a satisfactory result is achieved.
- Make sure that the woman is in the left lateral position, (thus avoiding aorto-caval compression) and administer appropriate fluids and supplemental oxygen via facemask.

Total spinal

Avoidance

- The epidural catheter should always be aspirated gently before giving any injection of local anaesthetic solution.

⁵ Yentis S.M et al. in *Analgesia, Anaesthesia and Pregnancy: A practical guide* 2001;62
W.B.Saunders, London

- Low dose mixture should be used whenever possible for top-up doses (10-15mls). Total spinal with these doses is extremely unlikely.
- Following a suspected dural tap the anaesthetist must give all top-ups.

Signs of a total spinal

- Apnoea
- Profound Hypotension
- Unconsciousness

Management

- Increasing respiratory distress will precede apnoea. Turn the patient into the left lateral position and administer 100% oxygen. Assist ventilation if need with a bag and mask
- Proceed to endotracheal intubation, if required. There is no need to give induction agents if the patient has already lost consciousness.
- Profound hypotension should be treated with rapid fluid infusions and phenylephrine. Bradycardia should be treated with atropine.
- Unconsciousness with dilated pupils should resolve spontaneously if the cardiovascular and respiratory systems are supported.
- Delivery by LSCS is usually indicated and the obstetricians should be involved at an early stage. Following resuscitation, senior anaesthetists and obstetricians should make the further management decisions.

Inadvertent Overdose of Local Anaesthetic

Avoidance

- The epidural catheter should always be aspirated gently before giving any injection of local anaesthetic solution to exclude intravascular position.
- Only the premixed syringes with 20 mls of Bupivacaine 0.1%/Fentanyl should be used on labour ward, no bags with local anaesthetic infusion.

Signs of a Local anaesthetic overdose

- Metallic taste
- Dizziness/LOS
- Seizures
- Bradycardia, arrhythmia, cardiac arrest

Management

- BLS/ALS approach with uterus displacement/left sided position
- **Protocol for accidental Overdose of Local Anaesthetics**
In cardiac arrest secondary to local anaesthetic toxicity intravenous administration of a lipid solution as Intralipid 20% is recommended.
Please use the following regimen:
 - Give 1ml/kg over 1 min
 - If no response, repeat twice more at 3-5 min intervals
 - As soon as stability is restored (or after the third dose) convert to an infusion with 0.25ml/kg/min continuing until haemodynamically stable

References

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3. Picard J, Meek T. Lipid emulsion to treat overdose of local anaesthetic: the gift of the glob. *Anaesthesia 2006 (Editorial)*; Vol 61, No 2:107-109
4. Weinberg GL, Palmer JW, Vade-Boncouer TR, Zuechner MB, Edelman G, Hoppel CL. Bupivacaine inhibits acylcarnitine exchange in cardiac mitochondria. *Anesthesiology* 2000; 92:5234-8