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Trust Guideline for the Management of Inadvertent Dural Puncture and Post Dural Puncture Headache in Obstetrics

A clinical guideline recommended for use

In:	Delivery Suite
By:	All Anaesthetic Staff
For:	Women in labour who have had an inadvertent dural puncture when having an epidural sited
Division responsible for document:	Women and Children's Division
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This guideline has been approved by the Trust's Clinical Guidelines Assessment Panel as an aid to the diagnosis and management of relevant patients and clinical circumstances. Not every patient or situation fits neatly into a standard guideline scenario and the guideline must be interpreted and applied in practice in the light of prevailing clinical circumstances, the diagnostic and treatment options available and the professional judgement, knowledge and expertise of relevant clinicians. It is advised that the rationale for any departure from relevant guidance should be documented in the patient's case notes.

The Trust's guidelines are made publicly available as part of the collective endeavour to continuously improve the quality of healthcare through sharing medical experience and knowledge. The Trust accepts no responsibility for any misunderstanding or misapplication of this document.

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Version and Document Control:

Version Number	Date of Update	Change Description	Author
5	01/07/2021	Reviewed, minor changes only.	Dr Jeremy Corfe

This is a Controlled Document

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Rationale for the Guideline:

The incidence of dural tap in women having an epidural for labour analgesia is approximately 1%. Of these women, up to 75% will go on to develop a post dural puncture headache[1]. This is associated with an increased maternal morbidity, prolonged hospital stay and can impair the mother's ability to care for her child.

Objective of the Guideline:

The purpose of this guideline is to ensure good practice in the management of inadvertent dural puncture and its sequelae. This includes:

1. Recognising that inadvertent dural puncture has occurred.
2. Subsequent safe management of epidural or spinal analgesia and anaesthesia.
3. Patient information and follow up.
4. Treatment of dural puncture headache.

Recommendations:

Recognising inadvertent dural puncture

Dural puncture may be recognised at the time of insertion by an obvious free flow of warm liquid through the epidural needle. However dural puncture is often not recognised until after the catheter has been inserted. An intrathecal catheter may be recognised by aspiration of clear fluid. This should be tested for glucose and protein by using a urine reagent stick. A small syringe should be used as this is more sensitive. Inadvertent dural puncture may also be suspected by the absence of a falling meniscus or failure of the siphon test.

These tests are not infallible and an intrathecal catheter may not be recognised until an initial bolus of local anaesthetic is given. In this instance onset of analgesia will be rapid. There may also be dense motor block of the legs, symptomatic hypotension, breathlessness, arm weakness and unconsciousness.

*Dense rapid onset motor block **does not** occur with normal labour epidurals and should prompt immediate anaesthetic review to exclude an intrathecal catheter.*

Management of inadvertent dural puncture

If dural puncture is recognised prior to insertion of the epidural catheter there are two options for managing labour analgesia: the catheter can be inserted intrathecally or the needle can be removed and the epidural resited at a different space.

Intrathecal catheter

This is the preferred method as it will allow rapid onset of analgesia, avoid the risk of further dural puncture and the possibility of a high block in the presence of a dural tear. Several studies have shown that the incidence and severity of post dural puncture headache may be reduced if an intrathecal catheter is used[2-6].

Consideration should be given to workload and anaesthetic availability when siting an intrathecal catheter. It may be more appropriate to re-site the epidural particularly if the patient is only in early labour. This is particularly relevant at night or at weekends when the on call anaesthetist is single handed and may not be able to leave theatre to perform frequent top ups.

The catheter should be carefully threaded through the dura leaving no more than 3cm in the subarachnoid space. If unable to pass the catheter then the Tuohy needle should be withdrawn slightly and continued flow of CSF confirmed before re-attempting insertion. If still unable to thread the catheter or if pain or paraesthesia occurs then the procedure should be abandoned and the epidural re-sited at another lumbar interspace.

Analgesia should be initiated by using 2-3mL from an ampoule of 0.1% Bupivacaine with 2micrograms/mL Fentanyl. This should be given via the epidural filter using a small syringe (2 or 5mL) to ensure accurate dosing. Remember that the epidural filter will add dead space of approximately 1ml. If analgesia is inadequate after 10 minutes a further 1-2mL of the pre-prepared mix can be given.

Alternatively 2mL of 0.25% Bupivacaine, 25 micrograms of Fentanyl and 2.5mL of 0.9% Sodium Chloride can be drawn up in a 5ml syringe under sterile conditions. This will give 5mL of 0.1% Bupivacaine with 5 micrograms/mL Fentanyl. Aliquots of 1-2mL of this mixture can be given every 10 minutes until adequate analgesia is achieved.

Each bolus should be followed by a flush of 2ml of sterile saline. The filter dead space must not be left primed with local anaesthetic as this may lead to confusion and larger doses may be given inadvertently.

Subsequent top ups can be given when further analgesia is requested by the patient. Again these should either be 1-2mL from a pre-prepared ampoule or of the alternate mixture described above. If analgesia is inadequate further 1-2mL doses can be given every 10 minutes until analgesia is obtained.

CTG monitoring should be performed and maternal blood pressure and heart rate should be recorded every 5 minutes for 20 minutes after each top up.

Multiple dosing from the same bag or ampoule is not supported. A fresh bag or ampoule should be used each time. This also applies to the alternative mix which should be made up fresh each time. Tachyphylaxis may occur and larger doses than expected may be required more often to obtain adequate analgesia especially in the later stages of labour[7]. **All top ups must be given by the duty anaesthetist.**

Anaesthesia for caesarean section or other procedures can be given by cautious administration of 0.5 to 1mL boluses of 0.5% hyperbaric bupivacaine. **Again tachyphylaxis can occur and more than expected may be required.** Diamorphine 300mcg OR Fentanyl 15 micrograms with preservative free intrathecal Morphine 100 micrograms can also be given once the block is established. The catheter must be removed at the end of surgery. If you are unhappy with this technique or if the intrathecal catheter has not been behaving as expected in labour, then remove the catheter and perform a single shot spinal as you would normally.

The catheter must be clearly marked as a spinal catheter. The midwife caring for the patient and the Delivery Suite Coordinator must both be informed. It should also be noted on the patient information white board. The duty Anaesthetist must be informed at handover. The patient should be told that a dural puncture has occurred and should be reassured. A patient information leaflet (Appendix A) should be given to the patient. It should be documented in full in the notes and on the computer database to ensure follow up.

It is the responsibility of the Anaesthetist who inserted the catheter to ensure that all relevant people are aware that it is an intrathecal catheter.

Epidural re-site

The epidural should be resited at another lumbar interspace by an experienced anaesthetist. If another dural puncture occurs then use an intrathecal catheter as described above. Do not have further attempts at siting an epidural. If unable to thread the catheter into the subarachnoid space then alternative methods of analgesia will need to be used, such as a Remifentanil Patient Controlled Analgesia (PCA). This should be discussed with the on call Consultant.

Once the epidural has been resited then a test dose followed by the first dose should be administered by the Anaesthetist. The amount of local anaesthetic required to establish a block may be significantly less in the presence of a hole in the dura. The first 4 top ups should be supervised by the anaesthetist in case of high block. Once the Anaesthetist is satisfied that it is safe to do so subsequent boluses may be given by the attending midwife. It must be explained to the midwife that there is a risk of high block and she should be aware of indicators such as dense motor block and hypotension.

Infusions and Patient Controlled Epidural Analgesia (PCEA) must not be used. Boluses must only be administered by the midwife looking after the patient or the anaesthetist. Ideally the bolus cord and button should be removed from the pump in between top ups.

Again it is important to communicate that a dural tap has occurred to the midwife looking after the patient, the Coordinator, to any subsequent anaesthetists at hand over and to the patient. It should also be documented on the patient information white board that a dural tap has occurred. A patient information leaflet (Appendix A) should be given to the patient.

In either instance if there is no headache during labour then an elective assisted delivery is not necessary and pushing should be encouraged. If a headache is present or the second stage is prolonged then assisted delivery should be considered.

Dural punctures are a relatively common complication of epidurals. It is important for our records and for patient follow up that any inadvertent dural punctures (suspected or confirmed) and blood patches are well documented on the computer audit system. Please record whether the catheter was left in situ or if saline was given intrathecally.

Management of a post dural puncture headache

A post dural puncture headache will usually occur within the first 3 days. It is commonly distributed over the frontal and occipital areas radiating to the neck and shoulders. It is exacerbated by an upright posture and relieved by lying flat. Other symptoms may include nausea, tinnitus, hearing loss, diplopia and vertigo[1]. If there is not a postural element to the headache and there is focal neurology then alternate diagnoses should be considered and a neurologist should be consulted.

The patient should be encouraged to drink plenty and keep well hydrated; intravenous fluids should be prescribed if this is not possible. There is little good evidence to support the use of caffeine in the treatment of post dural puncture headache[11]. Simple analgesia should be prescribed – Paracetamol, Diclofenac or Ibuprofen. If opiate analgesia is required then regular laxatives should also be prescribed. Codeine must not be given to breast feeding mothers. Oramorph, Dihydrocodeine or Tramadol are acceptable alternatives in breast feeding mothers but they should be given at the lowest effective dose and for as short a duration as possible[12]. All babies should be monitored for signs of adverse opiate effects regardless of maternal dose.

A delayed epidural blood patch should be offered after 24 hours. If the patient is requesting to be discharged and still has a headache then they must be given instructions on who to contact and what to do if the headache worsens. These are contained within the patient information leaflet (Appendix 1).

Performing an epidural blood patch

Epidural blood patch after 24 hours is successful in up to 75 – 85% of patients, a further 18% will experience partial relief[6,9]. It should not be performed until 24 hours postpartum and anaesthesia has worn off. The patient should have the procedure explained to them and informed consent obtained which should be documented clearly on a standard consent form. This should include failure, repeat dural puncture, backache commonly lasting for several days but sometimes longer, nerve damage, and infection (abscess). Arachnoiditis is a theoretical risk as blood in the

epidural space has been linked with it but the exact risk is unknown and it is very rare.

If there are any signs of systemic infection, coagulopathy or patient refusal, then a blood patch should not be performed. Hospital guidance relating to Low Molecular Weight heparin administration must be followed. The decision to perform an epidural blood patch should be made by the duty Obstetric Consultant Anaesthetist. It should be performed in obstetric theatre by a senior Anaesthetist with the aid of another doctor and an Operating Department Practitioner (ODP).

The patient should be positioned in the lateral position and IV access secured. Both anaesthetists should follow strict aseptic precautions and be gowned and masked. The epidural space should be located at the level of or below the original site at which the dural puncture occurred[1]. Once the space is located then up to 20mL of the patient's blood[10], taken aseptically by the second operator, should be injected through the Tuohy needle. This should be done slowly over about 1 minute. If pain occurs then stop injecting. It is no longer considered necessary to send blood cultures at the same time as performing a blood patch. The patient should lie supine for 3 hours after which they can gently mobilise.

They should be advised to avoid lifting and any other activities that may cause a Valsalva like effect over the next few days. Laxatives should be prescribed. If the headache regresses then they may be discharged. They should be given advice on whom to contact if the headache returns or if they develop any other worrying symptoms or neurology. They should contact the duty anaesthetist on Delivery Suite who will be able to advise on further management or arrange for them to attend to be reviewed. If the headache does not resolve or recurs then simple analgesia should be given and a second blood patch may be considered. If the headache persists then alternative diagnoses must be considered and a Neurology referral should be made.

All patients who receive an epidural blood patch or who have had a severe headache should be followed up by phone on a daily basis until symptoms have resolved or are deemed acceptable by the patient. A follow up phone call after 2-3 weeks will be made from the high risk Obstetric Anaesthesia clinics; please email Bethany Jackson with the patient details to arrange this and cc Dr Jeremy Corfe or Dr Monica Morosan. Ensure that the patient has received a copy of the patient information leaflet with details of who to contact and how if there are any problems. Make sure a current telephone number is recorded on the obstetric anaesthesia audit system to allow subsequent phone follow up.

Clinical audit standards

All patients who receive any intervention described in this document will be entered into the pre-existing anaesthetic database. Standards that can be audited include adequacy of analgesia and anaesthesia with intrathecal catheters, rates of post dural puncture headache and the need for blood patching, blood patch success rates, patient and staff satisfaction. Audit should be performed 12 months after guidelines are implemented.

Summary of development and consultation process undertaken before registration and dissemination

This guideline has been developed on behalf of the anaesthetic division who have agreed the final content. During its development it has been circulated for comment to: all consultant anaesthetists employed by the Norfolk and Norwich University Hospitals NHS Foundation Trust. It has been discussed at departmental clinical governance and divisional meetings. Any comments received have been addressed and, where appropriate, incorporated within the document.

This version has been endorsed by the Clinical Guidelines Assessment Panel.

Distribution list/ dissemination method

Anaesthetists, obstetricians, midwives, anaesthetic guideline folder on delivery floor, intranet.

References

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Appendix 1

Patient information leaflet:

Headache after Epidural or Spinal Anaesthetic Trustdocs Id: 10813