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Management of accidental dural puncture in labour

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1.0 Introduction

Accidental dural puncture occurs in approximately 0.5 – 1.0% of epidurals. Post dural puncture headache can also occur after intentional dural puncture during a spinal anaesthetic but this tends to be less common and less severe.
It can lead to significant maternal morbidity and can compromise the ability of a mother to care for her baby. It may or may not be recognised at the time of epidural insertion and whilst it can cause problems in labour with high block, it is possible that the catheter has not entered the cerebral spinal fluid (CSF) even though the needle has caused a puncture and this may mean that despite a normally functioning epidural, the woman could subsequently develop a headache. Management depends on when the condition is recognised and the severity of the symptoms.

2.0 Objective

To ensure that any accidental dural puncture is managed appropriately by both the anaesthetist and midwife and in line with the Obstetric Anaesthetists Association guidance.

3.0 Scope

This guideline applies to all medical and midwifery staff working on the maternity unit.

4.0 Main body of the document

4.1 Recognition

- Free flow of Cerebrospinal Fluid (CSF) down the Tuohy needle
- Back flow of CSF after the catheter has been inserted. This can occur even if there hasn't been an obvious puncture with the needle so always aspirate before injecting.
- It may be hard to distinguish between back flow of saline used for loss of resistance and CSF, although CSF will continue to flow down the catheter and will feel warm.
- If the test dose or first dose give a response that would indicate intrathecal spread

4.2 Management

4.2.1 Immediate care

Immediately withdraw the Tuohy needle. There are two options for the management of a recognised dural puncture.

Either

- Thread the catheter 2-3 cm into the CSF and manage as a spinal catheter. **Clearly label that this is not an epidural catheter**
- Give 1 ml 0.25% bupivacaine and 25mcg Fentanyl down the catheter or alternatively give 2.5mls of the low dose infusion mixture from the bag
- **Only the Anaesthetist may perform top ups**
- **Do not** connect the infusion

- Inform the attending midwife, Labour Ward shift leader and obstetrician as to what has occurred and give the top ups yourself using the same mixture as when you inserted the catheter.
- If only recognised on test dose/first dose, manage any complications that arise e.g. high block or hypotension and do not give a subsequent dose until the patient is stable and the effects are wearing off. Then manage as above.
- Make sure the catheter is removed before the woman returns to the postnatal ward.
- Ensure a clear management plan is recorded on the partogram and where applicable in the woman's records

NB - If a woman with a spinal catheter in situ requires a Caesarean section, then it can be topped up using incremental doses of 0.5% bupivacaine (0.5mls at a time). Diamorphine 300mcg can also be given to assist with post-operative analgesia.

Or

- If catheter cannot be easily threaded establish an epidural at an adjacent space
- Careful anaesthetist only top ups with 10-15mls of low dose solution (0.1%bupivacaine and 2mcg/ml Fentanyl). Do not start an infusion and beware as drugs can transfer to CSF if there is a large hole in the dura.
- Use extreme caution if topping up for a Caesarean section – remember an unquantifiable amount of the dose may go intrathecally.

NB – midwives cannot give top ups under any circumstances following a dural puncture

4.3 Follow on care

- Once the woman is comfortable, explain what has happened and discuss the risk of Post Dural Puncture Headache (PDPH).
- Inform the Anaesthetic Consultant at the first appropriate opportunity (i.e. next morning) and make sure the woman's details are handed over to the person taking over from you.
- Shortening the second stage can be considered, the obstetric registrar should be informed. After delivery, encourage oral intake (consider intravenous fluids if oral intake is restricted) to ensure adequate hydration and prescribe analgesia to be given if headache develops.
- Fill in a "Dural tap form" which should be located in the MDT handover room
- The woman will be followed up as routine and again at 24-48 hours and the appropriate sections of the "Dural tap form" completed. Prior to discharge, even if asymptomatic, the woman will be instructed to phone the ward if she subsequently develops a headache or if she has any concerns.

4.4 Management of PDPH

Characteristics of a PDPH:

- Usually starts 1-2 days post procedure but may occur weeks after
- A postural headache which can be relieved by lying down
- Usually frontal and bilateral
- Can have associated neck stiffness, visual disturbance, photophobia, tinnitus and nausea
- May be improved by compression of the upper abdomen whilst in the upright position

Review the woman and take a history to establish whether this is or is likely to be a PDPH. Try to exclude any other (potentially more serious) causes for the headache.

Discuss the case with a consultant obstetric anaesthetist (or the on-call consultant if a weekend). If there is doubt about the diagnosis, consider MRI/CT and discussion with a neurologist.

Treat conservatively for 24 hours:

- Encourage fluid intake unless fluids are restricted
- Prescribe and administer analgesia

4.5 Epidural Blood Patch Protocol

Consider an epidural blood patch if symptoms persist after 24 hours of conservative treatment. A blood patch is more likely to succeed if it is performed at least 48 hours post dural tap however if symptoms are very severe or the woman is anxious to go home then it could be performed between 24-48 hours. In this case the woman should be advised that there is a reduction in the success rate.

- Ensure the patient is apyrexial and has no signs of sepsis. A full blood count is useful but there is often a slight increase in white cell count post-delivery so interpreting significance can be difficult
- Check when the last dose of dalteparin was given.
- Explain the procedure including risks of failure (25-30% with first patch), further dural puncture, backache, neck pain and the same neurological complications that can occur with an epidural
- As this is an anaesthetic therapeutic intervention it is recommended that written consent is obtained as well as documenting the discussion in the notes.
- The woman will need to be moved to Labour ward for the procedure so liaise with the Labour ward shift leader as to when they can accommodate her
- Two anaesthetists are required for the procedure with ideally a consultant to perform the epidural
- Perform the epidural in the left lateral position under full asepsis
- The second anaesthetist will then take blood under strict aseptic conditions (use the same 0.5% chlorhexidine spray as used on the back and allow to dry before taking). Take 20mls of blood for the blood patch
- **Slowly** inject the 20mls into the epidural space aiming for a minimum of 15mls but stopping if the woman experiences back pain or severe neck pain. If any blood remains it can be sent to Microbiology for culture.
- Following the procedure, the woman must lie flat for 1-2 hours after which she can gently mobilise. If the headache is improved the woman may then be discharged home (if appropriate) but should be told to return if the headache recurs
- Fill in the “Dural tap form” and document the procedure in the woman’s records
- If the headache is not improved or rapidly recurs, a second patch should be considered after discussion with a Consultant Obstetric Anaesthetist. If there is any doubt about the diagnosis or if a third patch is being considered, there should be consultation with a neurologist to ensure that the diagnosis is correct

4.6 Patient Information and Follow Up

No Procedure performed – If the patient does not have an epidural blood patch performed initially, she will need to be informed that she should contact the hospital again if her symptoms are not improving.
She should also be aware that she can change her mind and request a blood patch after initially declining it.

If she has not yet been discharged, it should be documented on the D1 that she has a headache typical of PDPH and should be referred back to the hospital if symptoms continue/worsen.

After Epidural Blood Patch – If the patient goes home that day a contact telephone number should be taken so that she can be followed up the next day.
The fact that an epidural blood patch has been performed should be documented on her D1. She should be told to contact the hospital again if the headache recurs.

5.0 Roles and responsibilities

5.1 Midwives

To assist the anaesthetist with the management of an accidental dural tap in labour or the care of a woman with a Post Dural Puncture Headache (PDPH).
To observe the woman in the postnatal period for signs of a PDPH and request review by the anaesthetic team should they occur.

5.2 Anaesthetists

To manage an accidental dural puncture in line with the guideline.

5.3 Obstetricians

To be involved if dural tap is affecting maternal or fetal well-being. To ensure safe delivery of the baby.

6.0 Associated documents and references

Jessop Wing, Royal Hallamshire Hospital obstetric anaesthesia guidelines.

Leeds region guidelines

Obstetric Anaesthetists Association Guidelines for obstetric anaesthetic services (2019). [online] www.oaa-anaes.ac.uk/ClinicalGuidelines

National Insititue for Health and Care Excellence (NICE) Intrapartum care for healthy women and babies Clinical guideline. CG190. Published: 3 December 2014
Intrapartum care for healthy women and babies (nice.org.uk)

Royal College of Anaesthetists, Royal College of Nursing, Association of Anaesthetists of Great Britain and Northern Ireland, British Pain Society, European Society of Regional Anaesthesia. Best Practice in the Management of Epidural Analgesia in the Hospital Setting. (2020)
Epidural-AUG-2020-FINAL.pdf (fpm.ac.uk)

The Association of Anaesthetists of Great Britain & Ireland 2007

Turnbull DK, Shepherd DB. Post dural puncture headache: pathogenesis, prevention and treatment. British Journal of Anaesthesia 2003 **91** 718-29

MBRRACE-UK: Saving Lives, Improving Mother's Care 2020: Lessons learned to inform maternity care from the UK and Ireland Confidential Enquires in Maternal Death and Morbidity 2016-2018. MBRRACE-UK_Maternal_Report_Dec_2020_v10_ONLINE_VERSION_1404.pdf (ox.ac.uk)

7.0 Training and resources

Training will be delivered as outlined in the Maternity Training Needs Analysis. This is updated on an annual basis.

8.0 Monitoring and audit

Any adverse incidents relating to the guideline for the management of accidental dural tap puncture in labour will be monitored via the incident reporting system. Any problems will be actioned via the case review and root cause analysis action plans. The action plans are monitored by the risk midwife to ensure that improvements in care are made. The trends and any root cause analysis are discussed at the monthly risk meetings to ensure that appropriate action has been taken to maintain safety.

The guideline for management of accidental dural tap puncture in labour will be audited in line with the annual audit programme, as agreed by the CBU. The audit action plan will be reviewed at the monthly risk management meetings on a quarterly basis and monitored by the risk midwife to ensure that improvements in care are made.

9.0 Equality and Diversity

The Trust is committed to an environment that promotes equality and embraces diversity in its performance as an employer and service provider. It will adhere to legal and performance requirements and will mainstream equality, diversity and inclusion principles through its policies, procedures and processes. This guideline should be implemented with due regard to this commitment.

To ensure that the implementation of this guideline does not have an adverse impact in response to the requirements of the Equality Act 2010 this policy has been screened for relevance during the policy development process and a full equality impact assessment is conducted where necessary prior to consultation. The Trust will take remedial action when necessary to address any unexpected or unwarranted disparities and monitor practice to ensure that this policy is fairly implemented.

This guideline can be made available in alternative formats on request including large print, Braille, moon, audio, and different languages. To arrange this please refer to the Trust translation and interpretation policy in the first instance.

The Trust will endeavor to make reasonable adjustments to accommodate any employee/patient with particular equality, diversity and inclusion requirements in implementing this guideline. This may include accessibility of meeting/appointment venues, providing translation, arranging an interpreter to attend appointments/meetings, extending policy timeframes to enable translation to be undertaken, or assistance with formulating any written statements.

9.1 Recording and Monitoring of Equality & Diversity

The Trust understands the business case for equality, diversity and inclusion and will make sure that this is translated into practice. Accordingly, all guidelines will be monitored to ensure their effectiveness.

Monitoring information will be collated, analysed and published on an annual basis as part of Equality Delivery System. The monitoring will cover the nine protected characteristics and will meet statutory employment duties under the Equality Act 2010. Where adverse impact is identified through the monitoring process the Trust will investigate and take corrective action to mitigate and prevent any negative impact.

Appendix 1

Glossary of terms
CSF – Cerebrospinal fluid
CT – Computerised Tomography
MRI – Magnetic Resonance Imaging
PDPH – Post dural puncture headache

Appendix 2 (must always be the last appendix)

Maintain a record of the document history, reviews and key changes made (including versions and dates)

Version	Date	Comments	Author
1	06/07/2010		
2	03/06/2013		

Review Process Prior to Ratification:

Name of Group/Department/Committee	Date
Reviewed by Maternity Guideline Group	02/09/2021
Reviewed at Women's Business and Governance meeting	15/10/2021
Approved by CBU 3 Overarching Governance Meeting	22/12/2021

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Trust Approved Documents (policies, clinical guidelines and procedures)

Approval Form

Please complete the following information and attach to your document when submitting a policy, clinical guideline or procedure for approval.

Document type (policy, clinical guideline or procedure)	Guideline
Document title	Management of accidental dural tap puncture in labour
Document author (Job title and team)	Dr Ellwood
New or reviewed document	Reviewed
List staff groups/departments consulted with during document development	Senior midwives, consultant obstetricians, consultant anaesthetists
Approval recommended by (meeting and dates):	Reviewed by Maternity Guideline Group — 02/09/2021 Reviewed at Women's Business and Governance meeting — 15/10/2021 Approved by CBU 3 Overarching Governance Meeting — 22/12/2021
Date of next review (maximum 3 years)	22/12/2024
Key words for search criteria on intranet (max 10 words)	Dural puncture
Key messages for staff (consider changes from previous versions and any impact on patient safety)	
I confirm that this is the FINAL version of this document	**Name: Charlotte Cole** **Designation: 26/01/2022**

FOR COMPLETION BY THE CLINICAL GOVERNANCE TEAM

Approved by (group/committee): CBU3 Governance

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