Imperial College Healthcare NHS Trust

CLINICAL GUIDELINE TITLE	ACCIDENTAL DURAL PUNCTURE v4.0

Maternity Guideline

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SUMMARY & INTRODUCTION

1) Introduction

Dural taps occur with a frequency of about 1 in 150 epidurals. After a Dural tap with a 16G Tuohy needle the incidence of headache is 80-90%. Post-Dural puncture headaches (PDPH) can occur after spinals with an incidence of approximately 1:800 for 25g pencil point needles.

2) Signs and symptoms

Headaches are common after labour and most headaches are not Dural puncture related. However, any woman suffering headache post-labour with anaesthetic intervention should have it excluded. A PDPH is characterised by a headache that is relieved by lying flat or with IVC compression and worsened by sitting or standing. The pain may not be felt in the head but in the neck or across the shoulders. It may be accompanied by occipital pain, neck-ache and tinnitus. However, all sorts of neurological symptoms have been ascribed to Dural tap and cured by blood patching, therefore an atypical presentation may well occur

3) Management at time of puncture

Treatment of a Dural puncture begins as soon as PDPH is suspected:

1. Inform patient and midwife that a Dural puncture has occurred.
2. After Dural puncture DO NOT pull out the Tuohy needle -Try not to drain more than a few mls of CSF (cerebral spinal fluid)
3. Thread epidural catheter into the sub-arachnoid space (if safe). Approximately 2cm should be threaded into the sub-arachnoid space
4. Label as spinal catheter.
5. Top-ups must only be done by the anaesthetist – the patient must not have Patient Controlled Epidural Analgesia (PCEA)
6. Top-up doses are up to 2-3 ml of the standard low-dose mixture in incremental doses. Remember the dead space in the catheter and filter is 1 ml.
7. After delivery remove catheter as usual
8. If the Tuohy needle is withdrawn at the time of puncture, re site the epidural a space higher or lower

    - Treat as a normal epidural, but the anaesthetist must give each top-up – the patient must not have PCEA
    - REMEMBER EACH DOSE IS A TEST DOSE

9. Dural puncture is not an indication for immediate operative delivery
10. The Consultant Obstetric Anaesthetist must be informed ASAP (in working hours)
11. Enter the women's details into the anaesthetic diary (St Mary's) & start a PDPH follow up sheet at QCCH

If there is any doubt whether the fluid seen flowing back through the epidural needle is CSF or saline, the table below illustrates ways that CSF can be identified. The temperature can be assessed on the back of the anaesthetist's hand (with gloves removed), and other tests can be performed using a urine dipstick.

	N/Saline	CSF
Temperature	Cold	Warm
pH	5-7.5	7.5-8.5
Sugar	Nil	+ or trace
Protein	Nil	+/++

4) Intrathecal catheter and Caesarean section

If an intrathecal catheter has been used for labour and Caesarean section becomes necessary, discuss management with on-call Consultant anaesthetist.

Remember isobaric bupivacaine injected through a multi-orifice catheter may well produce a very different block to the hyperbaric solution injected via the pencil point needle that you are used to (See CEMD 97- 99)

Suggested management options:

1. Top-up via intrathecal catheter
2. Single shot spinal after removal of catheter
3. CSE

12. If the intrathecal catheter has been working well then option 1 may be preferable
13. Intrathecal top-ups should be done in theatre with full monitoring and ODP present
14. The possibility of a high block is very real.
15. Consider the dead space in the filter and the epidural catheter (1ml)
16. Top-up with 0.5% isobaric bupivacaine. The 1st dose should be 2mls (this gives a dose of 5mg intrathecal, the other 5mg remaining in the epidural filter and catheter).
17. Assess block after top-up and further increments of 0.5ml 0.5% hypobaric bupivacaine (2.5mg) should be given until an appropriate height of block achieved.
18. Do NOT flush the catheter

Diamorphine (250 micrograms) should be given for post-operative pain relief. This should be done by first aspirating 2mls from the epidural catheter (to ensure all the bupivacaine is removed) and then injecting the diamorphine followed by 2mls 0.9% sodium chloride. If the catheter cannot be aspirated freely do NOT flush as this can result in a very high and rapid block.

If in any doubt do NOT use the intrathecal catheter but use method 2 or 3.

After delivery

1. Remove epidural catheter. Do NOT infuse saline through the catheter.
2. Review woman twice daily and document findings on Cerner regional follow up and on PDPH follow up proforma. At SMH also document on Cerner and on SAFER handover form.
3. There is some evidence that leaving an intrathecal catheter in situ for 24 hours before removal may reduce PDPH rates. The epidural catheter MUST be removed before the patient is discharged to the post-natal ward
4. If no headache is present, allow the patient to mobilise. Lying flat in bed will not prevent the incidence of post-Dural puncture headache

Patient Information

The Obstetric Anesthetists Association *'Headache after an epidural or spinal injection -What you need to know* '' should be printed off and given to the patient.

5) Dural puncture headache

All women who experience dural puncture with an epidural needle or post-dural puncture headache (PDPH) after a spinal block should be reviewed daily by a member of the anaesthetic team.

Some dural puncture headaches do resolve spontaneously, but may take days and are debilitating.

Conservative Treatment

Bed rest: Most women gain some relief when supine. Prolonged bed rest is not recommended as it may increase the risk of thromboembolism

Oral fluids: Normal hydration should be maintained and no evidence of excessive fluid administration

Intravenous fluids: Need only be used to prevent dehydration when adequate fluid cannot be talen orally

Pharmacological Management

Caffeine: Limited evidence to support use and if used treatment should not exceed 24hours. Oral therapy preferred and should not exceed 300mg with max of 900mg/24hours. Consider lower dose of 200mg in breastfeeding women or those with low birth weight or premature infants. Monitor intake of caffeinated drinks.

6) Epidural blood patch guidelines

When conservative therapy is ineffective and the woman experiences difficulty performing activities of daily life and caring for her baby, an EBP should be considered. Complete and permanent relief of symptoms following a single EBP is only likely to occur in 1/3 of cases with headache after puncture with an epidural needle. Complete or partial relief may be seen in 50-80%.

In cases of partial or no relief, a second EBP may be performed after consideration of other causes of headache. Women should be informed that performing an EBP within 48hours of dural puncture is associated with reduced efficiency and greater requirement for a 2nd EBP. With severe PDPH, an EBP within 48 hours of dural puncture may be considered for symptom control.

If diagnosis of PDPH is strongly suspected there is no evidence that imaging is needed before performing an EBP. If the headache changes in nature, or when 2 EBPs have been unsuccessful, urgent consideration should be given to further investigation and imaging.

19. The patient must be apyrexial (and not on antibiotics) – otherwise do not perform a blood patch. Platelets and clotting must be normal.

20. Before performing an EBP, written information should be offered to women to aid the consent process. Written consent is recommended.

21. The Blood Patch should be performed at a time convenient to the mother taking into account the workload of the delivery suite. Ideally, immediately after a feed as the mother will be relatively immobile for four hours following the procedure. The mother should empty her bladder beforehand.

22. Two anaesthetists to perform the blood patch. One should be a consultant.

23. Strict asepsis should be observed for both the epidural and the venepuncture, i.e. both operators should scrubbed, masked and gowned.

24. The ODP (Operating Department Assistant) should also be masked as per usual epidural precautions.

25. Perform an epidural as close to the original puncture site as possible, ideally one interspace below. MRI scans have shown that a blood patch spreads twice as far cranially as it does caudally and over 3 to 5 segments. Clot resolution occurs in 7 hours.

    - When the epidural space has been found, the second operator takes 20 + mls of the patient's blood aseptically. Inject 20 mls of blood slowly. Pain due to arachnoid irritation may occur. Injection should stop before 20mls is injected if not tolerated by the patient.

26. The woman should lie flat with a single pillow for 2 hours following blood patch. Regular observations of maternal pulse, blood pressure and temperature are recommended.

Follow-up

- Women who have undergone an EBP should be reviewed by an anaesthetist within 4 hours of the procedure.

- Women who are discharged home should be contacted the following day.

- Women who remain in hospital should be reviewed daily until discharge or until symptoms resolve.

- The woman should be discharged with the relevant telephone numbers (see below), simple analgesia (paracetamol /ibuprofen). They should be given verbal and written advice on when to contact the hospital should their headache return or any other symptoms develop.

- A letter must be sent to GP and the Community MW made aware on the discharge letter.

27. Laxatives should be prescribed to prevent straining which can cause an initially successful patch to fail.

N. B. whilst blood patches are highly effective initially, the headache may recur and a second and even a third blood patch may be required. Cerebral imaging should be considered before a 3rd patch to exclude other causes for the headache.

Subdural haematoma and cerebral venous sinus thrombosis are well recognised complications of dural puncture and pregnancy, respectively. Both should always be included in the differential diagnosis of persistent headache after dural tap or post dural puncture headache.

- The woman should be informed that if she has any problems she should contact the labour ward and return to the labour ward to be reviewed.

  SMH: 0203 312 1060 or the 'on call' obstetric anaesthetist (bleep 1211)

  QCCH: 0208 383 33025 or the 'on call' obstetric anaesthetist (bleep 9404)

- A letter should be sent to the patients GP (cc to the patient)

PDPH – conservative management

- Follow up twice daily whilst an in patient
- Follow up daily by telephone call until symptoms have resolved following discharge.
- The woman should be informed that if she has any problems she should contact the labour ward and return to the labour ward to be reviewed.

  SMH: 0203 312 1060 or the 'on call' obstetric anaesthetist (bleep 1211)

  QCCH: 0208 383 33025 or the 'on call' obstetric anaesthetist (bleep 9404)

- A letter should be sent to the patients GP (cc to the patient)

At QCCH : Once the patient has been discharged and all follow up concluded please return the completed PDPH follow up sheet to the PDPH folder in the anaesthetic office

At SMH: File follow up sheet in the PDPH section of handover folder in labour ward office

7) References and Further Reading

https://www.oaa-anaes.ac.uk/Clinical_Guidelines

Knight, M., Kenyon, S., Brocklehurst, P., Neilson, J., Shakespeare, J. and Kurinczuk, J.J.E., 2014*. Saving Lives, Improving Mothers' Care Lessons learned to inform future maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2009-2012.*

Ayad S., Demian, Y., Narouze, S.N., Tetzlaff, J.E.(2003*) Subarachnoid catheter placement after wet tap for analgesia in labor: influence on the risk of headache in obstetric patients****. Reg Anesth Pain Med. 28: 512-5***

Duffy, P.J., and Crosby, E.T. ( ) The epidural blood patch. Resolving the controversies .
Canadian Journal of Anesthesia / Journal Canadian d'anesthésie Volume 46, Number 9, 878-886

8) Auditable standards

- % of women having an obstetric epidural who have a Dural puncture.

Target for best practice: <1% of epidurals should have a Dural puncture

- % of women who have PDPH after spinal or regional anaesthesia:

Target for best practice: <1% of spinal anaesthesia should be followed by severe PDPH.

- % of women having anaesthetic intervention being followed up

Target for best practice: 100% of patients having an anaesthetic intervention should be followed up.

9) IMPLEMENTATION

Training required for staff	No – but staff need to be aware of guideline
If yes, who will provide training	N/A
When will training be provided?	N/A
Date for implementation of guideline:	May 2019

10) MONITORING / AUDIT

When will this guideline be audited?	In accordance with maternity annual audit plan
Who will be responsible for auditing this guideline?	Obstetric Anaesthetists
Are there any other specific recommendations for audit?	See auditable standards listed above

11) REVIEW

Frequency of review • *Drug related guidance must be reviewed every 2 years* • *Therapy related guidance must be reviewed every 3 years* • *Clinical treatment guidance must be reviewed every 3 years*	**Please indicate frequency of review:** *3 yearly* **Person and post responsible for the review:** Ruth Bedson ruth.bedson@imperial.nhs.uk

12) REFERENCES

13) GUIDELINE DETAIL

Start Date:	**May 2019**
Approval Dates	**Name of Divisional group:** Maternity Guidelines Group **Date of ratification:** 20th May 2019
	Name of Directorate group: Maternity Q&S & DOM Committee **Date of ratification:** 19th June 2019
Has all relevant legislation, national guidance, recommendations, alerts and Trust action plans been considered, and included as appropriate in the development of this guideline?	**Please list ALL guidance considered:** See references above
Have all relevant stakeholders been included in the development of this guideline?	**Please list all (name and role):** Obstetric Consultants Obstetric Registrars Midwives

	Neonatologists Obstetric Anaesthetists Pharmacists
Who will you be notifying of the existence of this guidance?	**Please give names/depts:** Midwives Obstetric Consultants Obstetric Registrars SHOs Neonatologists Lindo Wing & Stanley Clayton Private Maternity Departments A & E at SMH & QCCH Physiotherapists
Related documents	Epidural anaesthesia
Author/further information	**Name:** Ruth Bedson **Title:** Consultant Obstetric Anaesthetist **Division:** Surgery, Cancer & Cardiovascular **Site:** QCCH **Telephone/Bleep:** 020 331 33991 **Trust email address:** ruth.bedson@imperial.nhs.uk **Contributors:** Jo Bray (Consultant Obstetric Anaesthetist, SMH) Felicity Plaat (Consultant Obstetric Anaesthetist, QCCH) Karen Joash (Consultant Obstetrician and Gynaecologist)
Document review history	**Next review due:** May 2022 Version1 Imperial June 2012 Version 2 August 2014 – date review Version 3 May 2017 Version 4 May 2019
THIS GUIDELINE REPLACES:	Accidental Dural Puncture v3.0 ID_036442

14) INTRANET HOUSEKEEPING

Key words	Dural puncture Dural tap Headache Epidural Epidural blood patch
Which Division/Directorate category does this belong to?	Women's, Children's & Clinical Support
Which specialty should this belong to when appearing on the Intranet??	Maternity

15) EQUALITY IMPACT OF GUIDELINE

Is this guideline anticipated to have any significant equality-related impact on patients, carers or staff? No