Developing local guidance for management of accidental dural puncture

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Introduction

Accidental dural puncture (ADP) and inadvertent placement of intrathecal catheter has an incidence of 1-2%. The project aim was to assess current local guideline concordance to recently developed national guidelines by the expert working panel of the Obstetric Anaesthetists' Association (OAA) published in 2024 (1), to assess trainee experience and confidence in managing intrathecal catheter, and development of a robust easy-to-use tool to assist in ADP management.

Methods

Departmental obstetric anaesthetic handbook guidance on management of ADP was compared to the recommended management outlined by OAA and DAS by Griffiths et al. Anaesthetic trainees of all grades undertaking in-hours and out of hours cover of labour ward were asked six questions in an anonymous survey.

Trainee Survey Questions

1. *Have you ever placed an intrathecal catheter following a recognised accidental dural puncture?*
2. *Have you ever managed an intrathecal catheter, placed by yourself of another anaesthetist?*
3. *How confident do you feel in managing an intrathecal catheter?*
4. *How confident are you in knowing the correct dosage to initiate intrathecal analgesia in labour room?*
5. *How confident are you that you know the correct dosage for ongoing intrathecal top ups?*
6. *How confident are you in topping up an intrathecal catheter for operative delivery?*

Results

Our protocol varied from national guidance in suggested length of intrathecal catheter inserted into intrathecal space; dosage for initiation and management of intrathecal analgesia. No advice regarding utilisation of intrathecal catheter for theatre was provided.

10 anaesthetic trainees responded to the survey:

- 20% had placed an intrathecal catheter
- 30% had managed an intrathecal catheter
- 80% were "not confident"(40%) or "neutral"(40%) in managing an intrathecal catheter
- 90% were "not confident" they knew correct dose to initiate analgesia in labour room
- 80% were "not confident" of correct maintenance dosages
- 70% were "not confident" on topping up an intrathecal catheter for theatre
- 40% were "unsure" where to locate local guidance

An easy-to-use flow chart was developed and attached to labour ward epidural trolley. A prospective use-and feedback cycle was employed. Feedback was collated and flowchart adapted to its current iteration. Departmental handbook was updated to reflect changes. New resources were presented at departmental governance meeting.

Discussion

Updated departmental handbook and flow chart brought us in line with OAA and DAS guidance. Accepting that ADP is thankfully an infrequent occurrence, two feedback loops on the active use of flowchart allowed for alterations and clarifications before formal implementation. Positive feedback led to distribution to two other Maternity Units in our health board.

References

(1) Griffiths, Russel, Broom et al. Intrathecal catheter placement after inadvertent dural puncture in the obstetric populati on: management for labour and operative delivery. Guidelines from the Obstetric Anaesthetists' Association. Anaesthesia 2024, 79, 1348-1368.

MANAGEMENT OF ACCIDENTAL DURAL PUNCTURE ON LABOUR WARD

Recognised accidental dural puncture during epidural placement

Catheter thought to be intrathecal following test dose of 3ml 0.25% levobupivacaine

Signs of accidental dural puncture:

Flow of CSF through Tuohy or aspiration of CSF.

Rapid onset analgesia and motor block +/- haemodynamic instability.

Option 1	Option 2
Remove Tuohy needle and re-site epidural at a different space.	**Insert intrathecal catheter** Advance catheter until 2-4cm lie within subarachnoid space ie advance 2 - 4cm beyond depth of Tuohy at skin
Beware on passing epidural catheter at second site that tip may enter subarachnoid space.	Clearly label the catheter SPINAL and remove BD pump from labour room.
Give epidural top ups with caution as local anaesthetic may reach CSF.	Inform patient, on-call anaesthetic consultant, the patient's midwife and charge midwife of placement of intrathecal catheter.

Monitoring:

Maternal BP check every 5min for 15min following bolus, then 1 hourly.

Anaesthetist to remain for 10mins post bolus.

Sensory and motor block check 1hourly.

Continuous foetal heart rate monitoring.

Do not mobilise patient.

Regular positional changes.

Non-invasive BP, ECG and oxygen sats to be monitored.

All top ups should be administered by anaesthetist.

FIRST BOLUS DOSE: Start analgesia with a bolus of 3ml of 0.125% levobupivacaine. 1ml will remain in the dead space of the filter/catheter. You can add up to 15 micrograms of fentanyl.

FURTHER BOLUS DOSES: Use 2ml of epidural "bag mix" for each top up.

If analgesia inadequate remove the catheter and consider re-siting the epidural or using alternative form of labour analgesia.

Intrathecal catheter should be removed after delivery and BEFORE discharge to post-natal ward.

Topping-up intrathecal catheter for operative delivery:

Perform in theatre with full monitoring and phenylephrine running, beware hypotension.

Incremental top ups, of max 2.5mg bupivacaine. Leave 3 minute minimum between intrathecal top-ups, assessing in between. Intrathecal 300microgram diamorphine may be given. During intrathecal anaesthesia block height should be assessed every 5minutes until no further extension is observed.

Remember: flowchart accounts for the dead space of the intrathecal catheter and filter (usually 1ml) when giving top ups in labour or for operative delivery. Flushing with saline after each top up is **NOT** recommended.