

CASE REPORT

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Epidural catheter migration during cesarean



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Abstract

Background: Early detection and vigilance of high spinal anesthesia post epidural catheter migration in cesarean section leads to safe conduct of anesthesia. Our case describes the migration of a previously functioning epidural catheter in the subarachnoid space.

This migration can be explained by patient posture changes and movements.

Case presentation: A 32 year – old G2P0 medically free female parturient (height 160cm, weight 65 kg), admitted to the labor ward with a 4 cm cervical dilatation, an epidural catheter was inserted in the L3-4 space, and an aspiration test was negative for CSF/blood through epidural catheter.

Epidural catheter was fixed on her back using sterile dressings. Epidural mixture of 0.1% bupivacaine and fentanyl 2 mcg/ml started. Due to fetal distress, cesarean section was urgently planned. She was given a bolus dose through the epidural catheter, 10 minutes after skin incision, the patient suddenly started to complain of difficulty of breathing and drowsiness. Moreover, her oxygen saturation suddenly started to drop so rapid sequence induction with cricoid pressure applied and was performed till she was intubated. Her pupils were reactive and dilated. She had stable vital signs. She was reversed with neostigmine and atropine after the use of nerve stimulator. Aspiration from the epidural catheter was performed. A clear 10mls fluid was aspirated. The fluid was sent to the lab for analysis and found to be CSF. Upon extubation, the patient was conscious and obeying commands. She completely recovered the motor power of her upper and lower limbs while she was admitted to ICU for observation and she was discharged the next day without any residual anesthesia.

Conclusion: Aspiration test and epinephrine test dose is always recommend to be performed prior to local epidural anesthetic for cesarean section even if the function of the epidural catheter was previously established. Careful observation of neurologic signs is also important.

Keywords: Epidural, Catheter migration, High spinal

Background

Early detection and vigilance of high spinal anesthesia post epidural catheter migration in cesarean section leads to safe conduct of anesthesia. Once safely inserted epidural catheter, it may migrate despite skin surface attachment (Bishton et al. 1992). Complications of epidural catheter movement could occur few hours later after insertion. Unintentional subarachnoid large local anaesthetic (Philip and Brown 1976) dose injection leads to high or total spinal anesthesia (Hogan 1999).

Case presentation

A 32 year – old G2P0 medically free female parturient (height 160cm, weight 65 kg), admitted to the labor ward with 4 cm cervical dilatation. Epidural analgesia and the possible complications were discussed and she was consented.

Under complete aseptic technique, L3-4 spinal space was identified, in the sitting position draping and cleaning was done, 5ml of 2% lidocaine (xylocaine) was injected as infiltration with an insulin needle. Upon the second trial, the epidural space was found at 5.5 cm, the catheter was inserted in the space, and an aspiration test

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was negative for CSF/blood through the epidural catheter.

Epidural catheter was fixed on her back using sterile dressings. An epidural mixture of 0.1% bupivacaine and fentanyl 2 mcg/ml on 20 ml normal saline syringe was prepared. The patient was given 4 ml of the mixture as a bolus then in less than 5 min. another 6 ml was given as top-ups. Her blood pressure measurement was checked every 5 min, with readings around 105 / 60.

After 30 min the patient was rechecked again, she was able to raise and move her legs without motor block at level T10, with stable vital signs. Continuous infusion pump at rate 15 ml / hr. of 0.1 % bupivacaine and 2 mcg/ml fentanyl was initiated.

At the time of surgery (due to fetal distress), the patient felt nauseated; anti-emetics were given. At incision time, the patient felt pain so another 5ml of epidural mixture (0.1 % bupivacaine and 2 mcg/ml fentanyl) was given through the epidural catheter. Neither perioral tingling nor blurred vision was reported.

Her initial vital signs at time of surgery were B.P: 104-146/60-85; HR: 74-120, O₂ saturation 99%. A 3kg baby was delivered, active management with Oxytocin 20 IU was administered.

10 minutes later, the patient suddenly started to complain of difficulty in breathing and drowsiness. Moreover, her oxygen saturation suddenly started to drop so rapid sequence induction with cricoid pressure applied and was performed till she was intubated. Her pupils were reactive and dilated. She had stable vital signs. She was reversed with neostigmine and atropine after the use of nerve stimulator.

An aspiration from the epidural catheter was performed. A clear 10mls fluid was aspirated. The fluid was sent to the lab for analysis and found to be CSF. The sent sample has helped us to diagnose epidural-catheter migration.

Upon extubation, the patient was conscious and obeying commands, she was able to protrude her tongue but could not move her lower limbs but she was able to breathe normally.

After 2 hours, she completely recovered the motor power of her upper and lower limbs while she was admitted to ICU for observation and she was discharged next day without any residual anesthesia.

Discussion

If an epidural catheter enters the subdural space (Corsby et al. 1990), consequently dangerous side effects will occur. The epidural catheter might migrate the epidural space to an inter- vertebral foramen (CARR and HEHRE 1962) causing a unilateral block. Also, it may attach the spine soft tissues leading to loss of analgesia. Movement of the catheter at the skin surface does reflect its tip

migration, because it might become migrated outside the epidural space.

This migration of the epidural catheter at the skin surface has been reported in >40% of parturients (Ravindram et al. 1979).

Epidural catheter migration can cause cannulation of the intravascular, subdural, or subarachnoid spaces (Abouleish and Goldstein 1986). If subdural needle placement occurs, it will lead to epidural catheter placed into subarachnoid space. Trans-arachnoid migration of a catheter from the subdural to the subarachnoid space may complicate the aim of continuous analgesia. A solution to this problem is epinephrine epidural test dose. In pregnancy this test is controversial because of decreased autonomic nerve system response to epinephrine, so the interpretation is difficult due to heart rate increase during uterine contractions along with decreased uterine blood supply (Phillips and Macdonald 1987).

As far as we know, the spinal dura is a potential structure varying in thickness from 2.5 (Bishton et al. 1992) mm at the cervical levels to 0.5 mm in the lumbar region. The progressive movements of women during labor may contribute to epidural catheter displacement and migration. The incidence of subarachnoid placement of catheters has been reported as 0.57% in general surgical patients 9 and of 0.2% in obstetric cases (KALAS and HEHRE 1972).

In some reported cases in literature, no true evidence of epidural catheter penetrating dura mater has occurred (Hogan 1999), unless subarachnoid injections as top up through the epidural catheter. We can predict that subdural rather than epidural initial injection through the perforating needle took place in the arachnoid space. Subdural catheters is also well recognized complication (CARR and HEHRE 1962), as in our case, high spinal occurred as cerebrospinal fluid was easily aspirated through the catheter.

Our case describes the migration of a previously functioning epidural catheter into the sub-arachnoid space. We think that this migration can be explained by patient posture changes and movements.

Conclusion

We conclude, in order to prevent epidural catheter complications for cesarean section, it's better to use epinephrine as test dose as well as aspiration test of CSF, along with close observation for any accompanying neurological signs.

Abbreviations

ml: Milliliter; Mcg: Microgram; Cm: Centimeter; Kg: Kilogram; GPO: Gravida Para; CSF: Cerebrospinal fluid; Hr: Hour; BP: Blood pressure; HR: Heart rate; %: Percentage

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Author's contributions

A. AJ is the doctor in charge of the patient and has written the case report, read and approved the final manuscript.

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Availability of data and materials

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Declarations**Ethics approval and consent to participate**

Not required.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

Competing interests

The author declares that he has no competing interests.

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