Intrathecal Migration of Functioning Epidural Catheter following Fetoscopic Neural Tube Defect Repair: A Case Report

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Introduction

- Inadvertent intrathecal catheter placement after dural puncture is a relatively common complication of epidural placement, but the migration of a previously functioning epidural catheter into the intrathecal space is extremely rare.[1,2]
- We present a case of postoperative migration of an epidural catheter to the intrathecal space after fetoscopic neural tube defect repair.

Figure 1. Fetoscopic neural tube defect (NTD) repair

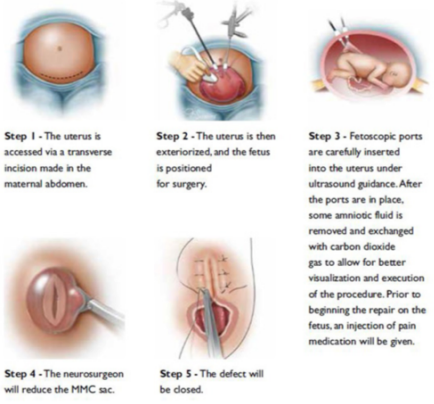
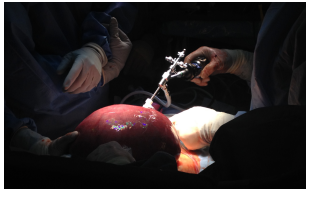


Figure 2: Fetoscopic MMC Repair



Above: Surgical steps performed during fetoscopic NTD repair. Illustration: Beth Sumner.

Left: Photo showing uterine exteriorization and port placement for fetoscopic MMC repair.

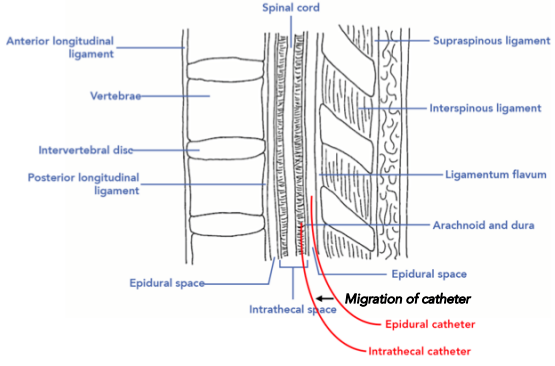
Case Description

Preoperative:
- 28 yo G2P0 at 24w2d gestation presented for evaluation for prenatal repair of fetal myeloschisis (L1-sacrum)
- Fetal defects included Chiari II malformation but preserved lower extremity movement at the time of evaluation, otherwise no defects noted

What is Fetoscopic Neural Tube Defect Repair?

- Fetal repair of myelomeningocele (MMC) can lead to lower rates of hydrocephalus, decreased need for shunts, and improved leg function
- In 2014, the first fetoscopic MMC closure in the United States was performed at Texas Children's Hospital
- Fetoscopic repair involves exteriorization of the uterus through a low abdominal incision with two 4mm incisions in the uterus

Figure 3: Epidural to intrathecal catheter migration



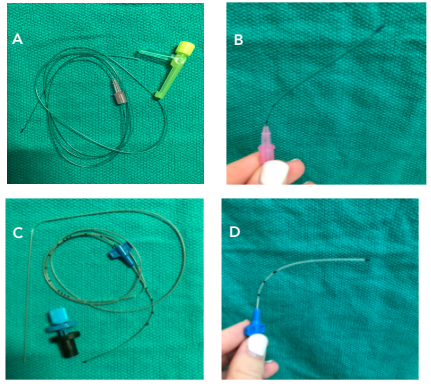
Intraoperative:
- Epidural placed easily with negative test dose
- Patient transported to the operating room, where she moved herself to the operating table
- General endotracheal anesthesia induced, surgery completed uneventfully
- Epidural bolused with a total of 15cc 0.25% bupivacaine in divided doses, with negative aspiration confirmed
- Extubated and taken to L&D with normal vital signs, minimal lower extremity motor blockade, and no pain

Postoperative:
- Infusion of 0.1% bupivacaine with 10mcg/mL fentanyl started at 10mL/hr
- 2 hours later, decreased variability and late decelerations noted on the fetal heart rate tracing. SBP in upper 80s (marginally lower than baseline). Epidural paused during evaluation.
- Terbutaline given and patient placed in full lateral position. Decelerations ceased and variability improved.
- SBP in the 70s continued, and markedly increased density of motor blockade was noted.
- Aspiration of the epidural catheter revealed free-flowing clear CSF. Epidural catheter removed.
- Bilateral TAP block was performed after block receded.
- Patient transitioned easily to oral pain regimen the following day. No headache occurred, and patient discharged once uterine quiescence confirmed.

Discussion

- Epidural catheters, particularly the stiff plastic variety, can migrate out of the epidural space even after a catheter has been functioning appropriately.[3,4]
- Anesthesiologists should have a high index of suspicion in any patient who has unexplained hypotension or acutely increased density of motor blockade.
- Early identification of intrathecal catheter migration can prevent serious adverse events for both mother and fetus undergoing fetal surgery.

Figure 4: Comparison of commonly used epidural catheters



A. Plastic catheter (B Braun Perifix® catheter)
B. Demonstration of increased stiffness of plastic catheter
C. Wire-reinforced catheter (Arrow® FlexTip Plus® catheter)
D. Demonstration of increased flexibility of wire-reinforced catheter

References

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4. Shih CK, et al. Kaohsiung J Med Sci. 2012;28(7):373-6.