

Total Spinal Anesthesia Late in the Course of Obstetric Bupivacaine Epidural Block

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A case that appears to represent late entry of an epidural catheter into the subdural space of a parturient in labor is reported.

REPORT OF A CASE

A healthy 27-year-old woman, gravida 2, para 0, abortion 1, with a 39-week uncomplicated pregnancy was admitted to hospital in early labor, following spontaneous rupture of amniotic membranes.

When the cervix was 8 cm dilated, 100 per cent effaced, and the fetal head at -1 station, anesthesia consultation was requested. The patient was 165 cm tall and weighed 80 kg. The blood pressure was 120/90 torr in the supine position, and spinal landmarks were adequate. She was placed in the left lateral decubitus position, the skin at L₂-L₃ interspace was anesthetized, and a 17-gauge Weiss needle inserted. The epidural space was identified using hanging-drop retraction and confirmed by loss of resistance to air injection with a syringe. Fluid could not be aspirated. A #18 polyvinylchloride catheter (Becton-Dickinson, Rutherford, New Jersey), having no side holes, with a stylet passing to 2 cm from the tip, was inserted 2 cm beyond the bevel in a caudal direction. Again, fluid could not be aspirated, and no paresthesias were elicited. A test dose of 2 ml of 0.5 per cent bupivacaine was injected and the patient placed in a semi-sitting position. Five minutes later no untoward effect or anesthesia had occurred, and 12 ml of 0.5 per cent bupivacaine were then injected. The sensory level of analgesia rose to T6 over the next 20 minutes without loss of voluntary movements of the legs. Arterial pressure remained at 110-120/70-74 torr except for one episode of hypotension (80/40 torr), corrected by positioning the patient on her left side with a slight head-down tilt. She remained alert and comfortable.

Two hours and 40 minutes after initial injection of local anesthetic, the patient began to complain of discomfort with contractions. The anesthetic

level had receded to below T10. Blood pressure was 106/60 torr. An additional dose of 7 ml (35 mg) of 0.5 per cent bupivacaine was injected without prior aspiration. Several minutes later the patient complained of dizziness, with the blood pressure 100/60 torr. She was turned to the left lateral decubitus position. Fifteen minutes following the injection, arm weakness and dysarthria occurred. Oxygen was administered by mask, followed by tracheal intubation because of inadequate respiration. The patient was immediately taken to the delivery room with the cervix fully dilated. Twenty minutes after intubation a 2,548-g female infant was delivered by low forceps. Apgar scores were 8 at 1 minute and 9 at 5 minutes.

In the delivery room the patient's blood pressure remained 130-140/90 torr. She had regained adequate respiration and muscle strength in her upper extremities within an hour and 15 minutes after the second injection of bupivacaine. The trachea was extubated with the sensory block at T2. The patient recalled losing consciousness between intubation and arrival in the delivery room.

Prior to removal of the catheter, 4 ml of clear, colorless fluid were aspirated and the first 2 ml discarded. There was free flow of fluid with pH 7.25 and glucose concentration 58 mg/dl. The concentration of bupivacaine in the aspirate was determined by gas chromatography to be 205 µg/ml. The catheter was extracted intact without defect. Five and a half hours after the second injection, the patient had a sensory level of anesthesia to pinprick at L2.

Approximately 36 hours postpartum, an orthostatic, fronto-occipital headache developed. The headache abated after two days of treatment with fluids, supine position, and a tight abdominal binder. The patient had a single fever spike, but there was no meningeal, urinary or pulmonary abnormality. She was discharged from the hospital six days after delivery of the infant.

DISCUSSION

The clinical course of this patient suggests that she initially received epidural anesthesia. There was no evidence of cerebrospinal fluid on repeated aspiration of both needle and catheter. Moreover, despite the large dose of local anesthetic injected, the level of anesthesia to pinprick did not exceed T6. On the other hand, 2½ hours later, a second dose of bupivacaine resulted in a high level of anesthesia with respiratory failure and loss of

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consciousness. This suggests that the catheter had entered the subarachnoid space, an impression confirmed by easy aspiration of fluid that contained glucose and had a physiologic pH. The concentration of bupivacaine found in the aspirate also supports this conclusion. Wilkinson and Lund¹ found that after epidural block with bupivacaine, the maximum concentration of local anesthetic in the cerebrospinal fluid was 31 $\mu\text{g/ml}$. The concentration we obtained (205 $\mu\text{g/ml}$) is equivalent to 35 mg of bupivacaine distributed in a 170-ml volume. Finally, the development of a typical post-lumbar-puncture headache indicates that the subarachnoid space was entered.

Numerous cases of inadvertent spinal anesthesia have occurred with bupivacaine²⁻⁴ and other agents.⁵ Our case is unique in that spinal anesthesia occurred late in a previously satisfactory epidural anesthesia.

In conclusion, we report an incident of late appearance of total spinal anesthesia following uneventful epidural block. It must be assumed that the catheter penetrated the dura and en-

tered the subarachnoid space, although we are at a loss to explain the mechanism. Total spinal anesthesia might have been avoided had the epidural catheter been aspirated prior to the reinforcement dose of anesthetic. This event stresses the necessity for continuous monitoring during epidural anesthesia.

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A Cervical Mass Associated with Positive Pressure on the Airway

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The spontaneous appearance of a mass in the neck shortly after induction of anesthesia in a 9-year-old boy was cause for concern. Several possibilities were considered for differential diagnosis, and finally anesthesia was discontinued and further evaluation was done to make a definitive diagnosis.

REPORT OF A CASE

A 9-year-old white boy was admitted to the hospital for operative correction of an undescended right testicle. The past medical history was un-

remarkable except for a behavior problem, for which he was currently receiving psychiatric care. He had two younger siblings, both of whom were healthy. Physical examination revealed that the patient was thin and of average stature and build. The head was small and measured in the third percentile. The neck was slender, and no mass was palpable. The thyroid was normal in size, and the trachea was in the midline. The lungs were clear, and heart murmurs were not detected. The remainder of the examination was within normal limits, except for five *café-au-lait* spots over the right scapula and an empty right scrotal sac. Blood pressures in both arms and legs were normal. Results of laboratory tests were within normal limits. A roentgenogram of the chest showed a prominent aortic knob and possible rib notching. An electrocardiogram was consistent with borderline left ventricular hypertrophy. A cardiology consultation led to the recommendation that the patient be followed in cardiology clinic at six-month intervals and that a slight coarctation of the aorta could not be ruled out. Operation was not contraindicated at this time.

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