We have reported a case of intraoperative diagnosis of whole lung torsion and the hemodynamic sequelae of detorsion. Reports of the intraoperative diagnosis of torsion are rare, whereas the incidence of torsion during intrathoracic procedures may be as high as 0.2%. We conclude that in the diagnosis of torsion is easily missed. We attribute this to the subtlety of the presenting symptoms and advocate a high index of suspicion. When indicated, bronchoscopic examination of the airways may be diagnostic. Awareness of maneuvers that predispose patients to the development of torsion may help to predict high-risk cases.

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Anesthesiology
1997; 87:166–8

Severe Maternal Hypotension and Fetal Bradycardia after a Combined Spinal Epidural Anesthetic

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INTRATHECAL sufentanil alone or combined with bupivacaine is commonly administered *via* a combined spinal epidural (CSE) technique to provide analgesia for patients in labor. Although side effects of these agents have been reported, there is debate about whether spinal sufentanil used alone or with bupivacaine is associated with clinically significant hypotension.[1–6] We describe a case of severe maternal hypotension with associated fetal bradycardia after the intrathecal administration of 7.5 μg sufentanil and 2.5 mg bupivacaine.

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Received from the Department of Anesthesia, Section of Obstetric Anesthesia, Bowman Gray School of Medicine of Wake Forest University, Winston-Salem, North Carolina. Submitted for publication November 29, 1996. Accepted for publication January 17, 1997.

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Key words: Bupivacaine, Combined spinal epidural, Hypotension, Sufentail.

Case Report

A 32-yr-old, 60-kg, gravida 3, para 2 parturient requested epidural analgesia during active stage 1 labor. Her past medical history was unremarkable, and she had no complications with two epidural anesthetics with previous births. Informed consent was obtained for a CSE anesthetic. Maternal blood pressure was 135/80 mmHg (recorded in the right upper arm with an appropriately sized oscillometric blood

pressure cuff), the maternal heart rate was 98 beats/min, and the fetal heart rate was 120–140 beats/min with good variability before intrathecal injection. After a 500-ml bolus dose of intravenous lactated Ringer's solution was given, and with the patient in the sitting position, a CSE technique using a 17-gauge Touhy-Schliff epidural needle (with the loss-of-resistance-to-air technique) and a $4^{11}/_{16}$th-inch 27-gauge Whitacre spinal needle (Becton-Dickinson, Rutherford, NJ) was performed at the L2–L3 interspace without incident. After aspiration of clear spinal fluid, a 1.15-ml solution of 7.5 μg sufentanil (Janssen Pharmaceutica, Markham, Ontario) and 2.5 mg bupivacaine (Sensorcaine; Astra Pharmaceutical, Mississauga, Ontario) was administered intrathecally. After the epidural catheter was inserted and secured, the patient was positioned on her side to ensure left uterine displacement. Four minutes after spinal injection, the patient's blood pressure decreased to 74/38 mmHg and was associated with nausea and light headedness. Ephedrine (15 mg) was administered intravenously. Eight minutes after spinal injection, the patient's blood pressure was 69/33 mmHg, and an additional bolus dose of 20 mg ephedrine was administered. Twelve minutes after spinal injection, the patient's blood pressure was 68/33 mmHg, and bradycardia (60–80 beats/min) developed in the fetus. An additional bolus dose of 25 mg ephedrine was administered; at that same time, the patient received supplemental oxygen and an additional 500-ml bolus dose of lactated Ringer's solution, and she was repositioned to the right lateral decubitus position. Phenylephrine was prepared; however, by 16 min after spinal injection, the maternal blood pressure increased to 92/44 mmHg, and the fetal heart rate increased to >100 beats/min. There was no evidence of uterine hypertonicity during the episode of fetal bradycardia. Immediately after this episode, the patient could perform straight-leg raises, and a bilateral C7 sensory level to pinprick and alcohol was noted. No further episodes of maternal hypotension or fetal bradycardia occurred. The patient requested additional analgesia 170 min after CSE was administered. Local anesthetics were given through the epidural catheter, which provided excellent analgesia throughout the course of labor and delivery. Vaginal delivery occurred 8 h after the CSE was administered. The fetal acid–base status was not assessed at the time of delivery; however, the neonate's APGAR scores were 8 and 9 at 1 and 5 min, respectively.

Discussion

Individual case reports of significant respiratory depression or arrest in laboring women receiving spinal sufentanil as part of a CSE technique have lead to a consensus that adequacy of respiration must be assessed for 20–30 min after spinal injection.[7,8] In contrast, there is controversy over whether this technique decreases blood pressure.[1–6] This case suggests that severe hypotension can accompany this technique and underscores the importance of monitoring blood pressure and the adequacy of respiration when CSE analgesia is used.

Spinal injection of sufentanil has been reported to decrease or have no effect on blood pressure in laboring women.[1–6] Some researchers have argued that any decrease in blood pressure that may occur is due to pain relief and is without physiologic significance.[1,4–6] Others suggest a mild sympatholytic action, perhaps due to a direct inhibitory action of opioids on spinal preganglionic sympathetic neurons.[2,3,9] The reported incidence of a decrease in blood pressure >20% from spinal sufentanil alone ranges from 0–32% and requires ephedrine treatment in 0–12% of patients.[1,2] Few details of the effect of this decrease in blood pressure on fetal heart rate have been provided in these series.

The addition of bupivacaine to sufentanil or fentanyl prolongs the duration of analgesia compared with opioid alone with CSE analgesia,[3–6] and these combinations are commonly used. The reported incidence of a decrease in blood pressure >20% from these combinations ranges from 0–13% and requires ephedrine treatment in 0–3.75% of patients.[3–6] The density of a motor blockade from 2.5 mg bupivacaine is so minimal that women receiving such combinations are allowed to ambulate in some centers.[6] Although a high sensory level was noted at the time of hypotension in the case we describe, this was unlikely to represent extensive spinal anesthesia from bupivacaine because it was not accompanied by motor blockade. Similarly, transient extensive hypalgesia has been noted in 72–100% of women receiving spinal sufentanil alone.[1,2,6]

Although many anesthesiologists consider dextrose-free solutions of sufentanil and bupivacaine to be isobaric compared with cerebrospinal fluid, such preparations are actually hypobaric relative to cerebrospinal fluid.[10] The CSE anesthetic performed in this case was dextrose-free and administered with the patient in the sitting position, which may have augmented the extent and severity of the hypalgesia and hypotension. Positioning patients in the lateral decubitus position when intrathecal hypobaric solutions are administered could potentially reduce the incidence and severity of side effects.

We report a case of severe maternal hypotension accompanied by fetal bradycardia in a laboring woman receiving sufentanil plus bupivacaine for CSE analgesia. Anesthesiologists using this technique should be aware of the potential for this side effect and should monitor blood pressure and be prepared to treat hypotension should it occur.

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Anesthesiology
1997; 87:168-9

Combined Spinal and Epidural Anesthesia in a Parturient with Idiopathic Hypertrophic Subaortic Stenosis

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IDIOPATHIC hypertrophic subaortic stenosis (IHSS), also known as hypertrophic obstructive cardiomyopathy, is characterized by dynamic obstruction of the left ventricular outflow tract secondary to asymmetric hypertrophy of the ventricular septum. Pregnancy is usually well tolerated, but acute peripartum pulmonary edema and a fatal ventricular arrhythmia have been reported.[1,2] Epidural anesthesia for vaginal delivery and general anesthesia for cesarean section have been described previously.[3,4] We report the use of combined spinal and epidural anesthesia using intrathecal fentanyl followed by epidural infusion of a diluted bupivacaine-fentanyl infusion for pain relief during labor and delivery in a parturient with IHSS.

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Received from the Department of Anaesthesia and Intensive Care, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong. Submitted for publication November 4, 1996. Accepted for publication February 22, 1997.

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Key words: Anesthesia: obstetric. Anesthetic technique: epidural, spinal. Heart: idiopathic subaortic stenosis.

Case Report

A 19-yr-old primigravida who had been diagnosed as having IHSS 5 yr previously was referred for anesthetic preassessment at 31 weeks gestation. Before pregnancy, her symptoms were controlled with propranolol, although exercise tolerance was limited to walking for 15 min on level ground. During the pregnancy she had been well and had stopped the propranolol by her own choice in the first trimester. Echocardiography showed asymmetric interventricular septal thickening, systolic anterior motion of the mitral valve, and mild mitral regurgitation with a left ventricular outflow tract gradient of 15 mmHg at rest. The obstetric plan was for vaginal delivery.

The patient was admitted in early labor at 37 weeks gestation. Examination showed that she weighed 54 kg, was 157 cm tall, and had an arterial pressure of 130/80 mmHg, heart rate of 90 beats/min, and a grade 2/6 holosystolic murmur at the lower left sternal border. Her airway was assessed as Mallampati class 1. There was no jugular venous distention, and the chest was clear to auscultation. Obstetric examination showed cephalic presentation, cervical dilatation of 1 cm, and regular painful contractions. Monitoring with continuous cardiotocography, electrocardiography, and pulse oximetry was established. A radial artery catheter was inserted for continuous arterial pressure measurement, and a central venous pressure catheter was placed *via* the right cubital fossa, with the position checked with a