CASE REPORT

UNUSUAL SPINAL ANESTHESIA EXPERIENCE DURING NON-OBSTETRIC SURGERY: A CASE REPORT

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Abstract

Back pain is common during pregnancy. Anesthesia care providers should be familiar with the management principles of non-obstetric surgery. Anesthetic technique and agent selection should be guided by the nature of the surgery and the operative site. Percutaneous endoscopic lumbar discectomy (PELD) is a minimally invasive treatment for back pain, and there is no clear consensus as to whether general or regional anesthesia is better for this surgery. The author reports a rare case of spinal anesthesia for PELD in a pregnant woman during the second trimester of pregnancy.

Introduction

The physiology of the parturient is more complicated than that of a non-pregnant woman of childbearing age. The changes in the mother's cardiovascular, pulmonary, hematologic, and renal physiology, and the effects thereon on the fetus, are diverse. Special considerations are needed to devise an anesthetic plan that is safe for both the mother and fetus.[1] The anesthetic technique and agent should be selected according to the nature of the surgery and the operative site.

It has been estimated that up to 2% of pregnant women require non-obstetric surgery, which can be performed at any time during the pregnancy.[2] Common surgeries performed urgently or emergently include appendectomy, ovarian detorsion, bowel obstruction, trauma, and cholecystectomy.[1,3] General anesthesia is preferred for intra-abdominal surgery, and elective surgery should be performed only during the second trimester.[1,3] The main concern during the first trimester is the development of fetal organs. Surgeries performed during the third trimester are associated with an increased risk of preterm labor.[3] Thus, anesthesia care providers should be familiar with the management principles of non-obstetric surgery during pregnancy.

Back pain is common during pregnancy, with a reported rate of 56%.[4] However, symptomatic lumbar disc displacement is very rare, occurring only in about 1 in 10,000 pregnancies.[4] Non-surgical or surgical management is needed in cases with symptomatic lumbar disc herniation.[4] There have been reports of percutaneous endoscopic lumbar discectomy (PELD) performed under both epidural anesthesia and general anesthesia.[5,6] However, other anesthetic methods should be

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considered if epidural anesthesia is not indicated.

Herein, the author reports a rare case of spinal anesthesia for PELD in a pregnant woman during the second trimester.

Case Report

A 31-year-old primigravida nulliparous patient (height, 155.3 cm; weight, 67 kg) visited our hospital with a 2-day history of severe low back pain that radiated to her right leg. She was hospitalized at 18 weeks of gestation due to intractable pain. Physical examination revealed normal muscle strength in both lower extremities, and dysesthesia along the right L5 nerve root dermatome. The deep tendon reflex was normal.

Magnetic resonance imaging demonstrated right disc herniation at the L5–S1 level, with considerable narrowing of the spinal canal (Fig. 1). The patient was also examined by an obstetrician. An ultrasonographic examination revealed that the fetus was healthy. Despite conservative treatment (caudal block and epidural patient-controlled analgesia [PCA]), the patient's symptoms became progressively incapacitating and she experienced depression. After consultation with a spine surgeon, an obstetrician, an anesthesiologist, and the patient, spinal anesthesia was determined to be optimal for the PELD, which was performed at 20 weeks of gestation.

Standard monitoring procedures, such as electrocardiography, noninvasive blood pressure measurement, and oxygen saturation were used.

The patient received 3 l/min oxygen through a face mask and 200 ml of crystalloid for pre-hydration before the induction of anesthesia. Pulse rate was 92 beats/min and blood pressure was 124/76 mmHg. The patient was shifted into the left lateral decubitus position in the operating room. A lumbar puncture was performed with 8 mg of 0.5% heavy bupivacaine. After spinal anesthesia, the patient's blood pressure was maintained at 104/61 mmHg. The anesthesiologist observed the patient for 15 min to confirm that the vital signs were stable. Blood pressure was maintained at 106/57 mmHg, and heart rate was 82 beats/min. No vasopressor was administered.

The patient was placed in the prone position over a gel pad and sponge cushion. Vital signs were maintained in the prone position. As the patient did not complain of dyspnea or compression, the surgery commenced.

The total anesthetic time was 80 min and the total surgical time was 45 min. A total of 500 ml of crystalloid was administered intravenously during surgery. The patient's general postoperative condition was normal and her leg pain was completely relieved. Referral to an obstetrician was done to confirm that the mother and fetus were in good condition on postoperative day (POD) 2. She was discharged on POD 4.

Discussion

The goal of non-obstetric surgery is to ensure the well-being of the mother and fetus, and maintain the pregnancy. Surgery is stressful for both the mother and healthcare providers. Depending on the type of surgery and the patient's condition, there are numerous general and regional anesthesia options for non-obstetric surgery. However, anesthesia and surgery can increase the likelihood of hypoxia, impair fetal development, or cause loss of pregnancy. The surgeon and anesthesiologist should consider the patient's condition when choosing the anesthesia method, to shorten the operating and anesthesia time.[7] Reactivation of an epidural catheter is less cost-effective than spinal anesthesia for postpartum tubal ligation surgery.[8] Our patient experienced no pain relief from non-surgical manipulation, such as epidural PCA, and spinal anesthesia was planned to shorten the surgery and anesthesia time.

Healthcare providers can use non-surgical conservative treatment to treat disc herniation if there is an issue with insurance. Few analgesics and anesthetics can be used during pregnancy.[4] PELD is a minimally invasive technique, and the anesthesia used (i.e., local, general, or epidural) plays an important role in its success.[9] There are many special considerations for non-obstetric surgery in pregnant patients. There is no clear consensus as to whether general or local anesthesia is better. Mazze et al.[10] reported that no particular type of anesthesia is associated with a higher likelihood of adverse outcomes.

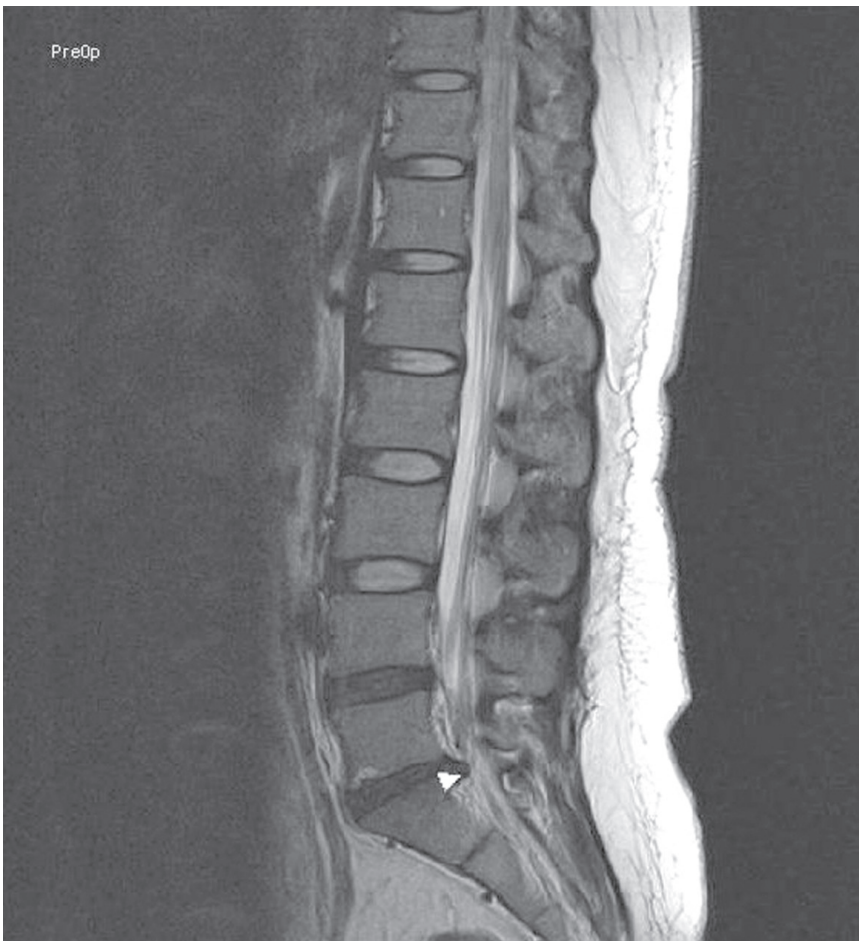

Fig. 1
Preoperative magnetic resonance image showing herniated lumbar disc at the L5/S1 level.

General anesthesia ensures patient comfort but may pose a greater risk of neurological complications, potentially rendering them uncooperative.[9] Anesthesia-related mortality in the parturient is related to respiratory events and airway manipulation. The airway of a pregnant woman is eight times more difficult than that of a non-pregnant woman. The oropharyngeal diameter narrows due to edema as the pregnancy progresses.[11] Aspiration prophylaxis should be considered, as pregnant patients are generally considered to have full stomachs.[12]

An alternative anesthetic method, regional anesthesia, is preferred in a pregnant patient if the indication and site of surgery are appropriate. Peripheral nerve block and neuraxial anesthesia are options for surgery on the extremities. If a regional anesthetic is used, clinicians should first consider thrombocytopenia due to hemodilution, and any other abnormalities in the coagulation profile. The surgeon performing endoscopic lumbar discectomy should check for any motor weakness or severe pain caused by nerve damage, and may prefer to use epidural anesthesia.[9] Epidural anesthesia is associated with an increased risk of neurological complications in cases of severe spinal stenosis.[13] Narrowing of the epidural space may occur, which can increase the likelihood of an accidental dural puncture. Also, it may not be possible to perform epidural blood patch to treat a post-dural puncture headache (PDPH). Epidural anesthesia takes longer time than spinal anesthesia.[14,15] Prolonged operating and anesthesia times are associated with a higher likelihood of adverse outcomes; moreover, a strong correlation has been observed between premature birth and the duration of surgery and anesthesia.[7] Other important factors include the type of surgery, whether there is an underlying maternal condition requiring surgery, and disease severity. Devroe et al.[16] reported no independent association between the type of anesthesia and outcome but recommended that regional anesthesia be considered whenever possible

to avoid the problems associated with low birth weight and the neurotoxicity of anesthetics.

Common complications of neuraxial anesthesia are hypotension and decreased uteroplacental blood flow. Hypotension induced by spinal anesthesia can be sustained with intravenous fluids and vasopressors, to in turn maintain uteroplacental perfusion pressure. The duration of anesthesia is shorter for spinal than epidural anesthesia.[14] PDPH is a common complication after lumbar puncture, and the prevalence of PDPH is higher in pregnant women.[17] However, our patient had no PDPH.

Clinicians should be aware of, and prepared for, the common side effects of non-obstetric surgery, and efforts should be made to shorten the duration of surgery and anesthesia. Spinal anesthesia should be carefully performed with hemodynamic monitoring when regional anesthesia is needed for non-obstetric surgery.

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