Low Dose Spinal Anesthesia For Caesarean Section in a Patient with Peripartum Dilated Cardiomyopathy*

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✔ The patient with peripartum dilated cardiomyopathy (PPCM) was diagnosed at 28 wks gestation, and treated. Emergent caesarean section (C/S) was performed at 38 wks gestation under low dose spinal anesthesia combined with epidural catheter. Spinal anesthesia provides sufficient analgesia for C/S operation. Heart rate, blood pressure, central venous pressure and peripheral oxygen saturation were monitored continuously. Hemodynamic and respiratory parameters remained stable during the operation. No postoperative complications occurred. The epidural catheter was used for postoperative analgesia.

Key words: *Caesarean section, anesthetic management, low dose spinal anesthesia, peripartum dilated cardiomyopathy.*

✔ Yirmi sekiz haftalık gebe hastaya Peripartum Dilate Kardiyomiyopati tanısıyla medikal tedavi başlanmıştı. Bu hastada gebeliğinin 38. Haftasında, epidural kateter de yerleştirmek suretiyle düşük-doz spinal anestezi altında acil sezaryen operasyonu gerçekleştirildi. Spinal anestezi sezaryen ameliyatı için yeterli analjezi sağladı. Kalp hızı, kan basıncı, santral venöz basınç ve periferik oksijen satürasyonu monitörize edilerek sürekli gözlendi. Operasyon süresince hemodinamik ve solunumsal parametreler stabil seyretti. Postoperatif komplikasyon gelişmedi. Epidural kateter postoperatif analjezi amacıyla kullanıldı.

Anahtar kelimeler: *Sezaryen, anestezi uygulaması, düşük doz spinal anestezi, peripartum dilate kardiyomiyopati.*

INTRODUCTION

Peripartum dilated cardiomyopathy is an uncommon form of heart disease with the absence of a determinable cause for cardiac failure[1]. The clinical picture of peripartum dilated cardiomyopathy (PPCM) may vary from asymptomatic form with cardiomegaly only to severe congestive heart failure. The presentation is often insidious. The onset of symptoms generally occurs in the last trimester of pregnancy. Maternal mortality is high, and termination of pregnancy may be considered[2]. These patients are extremely sensitive to cardiodepressant anesthetic drugs. Epidural anesthesia may be considered as the safest anesthetic technique in patients with PPCM undergoing caesarean section[3]. To the best of our knowledge, there have been no reports on the use of low-dose spinal anesthesia in such patients. We report a case with PPCM who underwent an emergent caesarean section, managed with low-dose spinal anesthesia.

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CASE REPORT

A 30-yr-old patient with PPCM, gravida 4, para 3, presented for emergency C/S at 38 wks gestation due to uterine contractions, breech presentation and big baby. At 28 wks, she complained of chest pain radiating to the left shoulder and arm, palpitation, dyspnea and fatigue. Electrocardiography revealed moderate tachycardia. Echocardiography showed left ventricular dilatation and dysfunction with moderate mitral regurgitation. Digoxin (0.5 mg/day) and furosemide (80 mg/day) were recommended by the cardiologist. As the patient's condition improved after therapy, both the cardiologist and the obstetrician decided that the continuation of pregnancy was appropriate.

On admission to the operating room arterial blood pressure was 100/70 mmHg, and heart rate was 98 beats/min. She suffered from dyspnea and orthopnea. Intravenous cannula was placed on her left hand. Intraarterial cannula was placed into her right radial artery after local anesthetic infiltration. Under local anesthesia, a central venous catheter was located in the right atrium via the right internal jugular vein for central venous pressure (CVP) monitoring. Combined spinal-epidural anesthesia was planned. An 18-gauge Tuohy needle was introduced into the epidural space by the midline approach at the L3-L4 interspace, using the loss-of-resistance to saline technique with the patient in the left decubitus position. With an extra long 26-gauge Quinke needle (Spinocan R, 120mm; B. Braun, Melsungen, Germany), subarachnoid block was performed using the needle-through-needle technique. 1,5 mL (7.5 mg) 0.5% hyperbaric bupivacaine was injected intrathecally. Epidural catheter was introduced into the epidural space, and the patient was placed in supine position with a left lateral uterine displacement to avoid hypotension by aortocaval compression. Cephalad spread of the sensory block was assessed with pinprick test.

The patient breathed 50% O_2 through a face mask. Fluid therapy was maintained carefully under CVP guidance to avoid acute preload modifications. CVP was 8 cmH_2O in the supine position with left uterine displacement, preoperatively. Since the sensory anesthesia level of T4-S5 was reached in the first 10 minutes after subarachnoid injection, no additional anesthetic was needed through the epidural catheter. A 4330 g, 53 cm male infant was born with Apgar scores of 8 and 9 at 1 and 5 minutes, respectively. The estimated blood loss was 500 mL. The patient received 900 mL Lactated Ringer's and 600 mL dextrose 5% solutions. During the operation, hemodynamic parameters were stable. CVP ranged between 8 and 10 cmH_2O before fetus extraction, however, by the onset of oxytocin infusion 2% (8 $ml.kg.h^{-1}$) it has increased up to 15 cmH_2O. Heart rate and blood pressure remained stable at the level of 80-120 dk^{-1}, 85-100/60-70 mmHg, respectively, no inotropic agent was needed during the operation.

Postoperative analgesia was provided with morphine via epidural catheter. The epidural catheter was removed on the third postoperative day. She was discharged from the hospital on the fifth postoperative day in good condition.

DISCUSSION

PPCM is a rare and often fatal disorder. It is defined as the onset of acute heart failure in pregnancy or puerperium period without a history of infection, metabolic, ischemic or valvular causes of myocardial dysfunction. The incidence is approximately 1/10000 deliveries. Risk factors of the disease include advanced maternal age, multiparity, multiple fetuses, history of preeclampsia and obesity. Patients often have fatigue, weakness, shortness of breath, dyspnea on exertion, orthopnea, cough, palpitations or pedal edema[4].

Diuretics and digoxin are used as first line treatment for this disorder. Additionally, angiotensin-converting enzyme inhibitors are used in cardiomyopathy for afterload reduction, however, pregnancy is a contraindication for use of ACE inhibitor treatment[1]. Instead, the

combination of hydralasine and nitroglycerine or amlodipine may be used safely in pregnancy. In our case, the use of digoxin and diuretics improved patient condition and no vasodilators was needed.

General anesthesia may cause profound myocardial depression or cardiac arrest in patients with PPCM[5]. Principles of anesthesia management are based on afterload reduction, optimal preload maintenance, and avoidance of myocardial depression. General anesthesia with fentanyl and/or midazolam may be used safely for cardiovascular stability, but respiratory depression after delivery may develop in both mother and baby[6].

Hypercoagulable state of pregnancy, and stasis in the dilated heart may cause thromboembolic complications in PPCM[4]. Therefore, anticoagulation with heparin would be necessary. In this case heparin wasn't used, so regional anesthesia could be applied.

A slow titrated epidural anesthetic technique may be considered as the best method in reducing cardiovascular instability[3]. However, epidural anesthesia has its own disadvantages. Local anesthetic doses needed to achieve a mid-thoracic block are close to the recommended maximum doses, and even then epidural bupivacaine provides poor anesthesia and frequently needs supplementary analgesia[7]. The main advantage of spinal vs epidural anesthesia is the speed of onset and qualification of analgesia. In combined spinal-epidural anesthesia, the level of block is more predictable, and it also provides a route for postoperative pain management. When hyperbaric bupivacaine is used; the incidence of hypotension, which is the most common complication of subarachnoid block for C/S, is lower than usual dose regimens[8]. In addition, in pregnant women increased sensitivity of nerve fibers to local anesthetics, reduced amount of cerebrospinal fluid, and the effect of uterus on cephalad spread of intrathecally injected local anesthetics provide sufficient block with low dose subarachnoid local anesthetics[9]. In our case, 7,5 mg of hyperbaric bupivacaine provided sufficient analgesia for operation.

In conclusion, low dose spinal anesthesia may be preferred in the patients with PPCM for C/S with complete monitorization and adequate hydration. Additional epidural catheterisation provides both supplementation of local anesthetics in case of inadequate anesthesia and postoperative pain management.

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