



Our Experience of Epidural Anesthesia for Cesarean Section in Pregnant Woman with Corrected Tetralogy of Fallot: A Case Report

Düzeltilmiş Fallot Tetralojisi Olan Gebede Sezaryen İçin Epidural Anestezi Deneyimimiz: Olgu Sunumu

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ABSTRACT

Tetralogy of Fallot (TOF) is the most commonly encountered cyanotic congenital cardiac disease in pregnancy. While most pregnancy cases after surgical repair of TOF have focused on cardiovascular and obstetric concerns, few authors have focused on anesthetic management strategies. Determining the type of anesthesia in these patients is very difficult, and current recommendations are based solely on reported pathophysiological concepts and clinical experiences. In this case report, we aimed to share our epidural anesthesia experience for cesarean surgery in a 37-week pregnant woman with corrected TOF surgery. In conclusion, we suppose that application of epidural anesthesia with divided and increasing doses of slow-acting bupivacaine in pregnant women with repaired TOF is a safe alternative to achieve good anesthesia with effective cardiovascular stability.

Keywords: Corrected tetralogy of Fallot, Epidural anesthesia, Caesarean Section

ÖZ

Fallot tetralojisi (TOF) gebelikte en sık karşılaşılan siyanotik konjenital kalp hastalığıdır. TOF'un cerrahi onarımından sonraki gebelik olgularının çoğu kardiyovasküler ve obstetrik kaygılara odaklanmışken, nispeten az sayıda yazar anestezi yönetim stratejilerine odaklanmıştır. Bu hastalarda anestezi seçimi çok zordur ve güncel öneriler sadece bildirilen klinik deneyimlere ve patofizyolojik kavramlara dayanmaktadır. Bu olgu sunumunda düzeltilmiş TOF cerrahisi geçiren 37 haftalık gebede, sezaryen cerrahisi için uygulanan epidural anestezi deneyimimizi paylaşmayı amaçladık. Sonuç olarak, TOF onarımı olan gebelerde bölünmüş ve artan dozlarda yavaş etkili bupivacain ile epidural anestezi uygulamasının, etkili kardiyovasküler stabilite ile iyi anestezi elde etmek için güvenli bir alternatif olduğunu düşünüyoruz.

Anahtar Sözcükler: Düzeltilmiş fallot tetralojisi, Epidural anestezi, Sezaryen



INTRODUCTION

Tetralogy of Fallot (TOF) is characterized by the presence of a ventricular septal defect, aortic overriding, pulmonary artery outflow obstruction and right ventricular hypertrophy. It is a classical and the most ordinarily encountered (10%) cyanotic congenital cardiac lesion in pregnancy (1). Therefore, for successful anesthetic management in such a patient, it is important to know the physiological changes that occur during pregnancy, as well as having detailed knowledge of the underlying pathophysiology and the current degree of cardiovascular impairment (2). In this case report, we aimed to share our experience with epidural anesthesia for cesarean surgery in a 37-week pregnant woman who had corrected TOF surgery.

CASE REPORT

Written informed consent was obtained from the patient. A 32-year-old, 72 kg pregnant woman who was in her 37th gestational week was referred to the anesthesia service to be evaluated before elective cesarean delivery. It was learned that the patient underwent complete correction surgery for TOF at the age of 4 and an appendectomy at the age of 12, and she did not use any medication other than iron and vitamin supplements that were initiated during pregnancy. The physical examination findings of the patient were normal. On airway examination, the thyromental distance was found to be greater than 6.5 cm, the incisor distance was greater than 3 cm, and Mallampati class II with full range of neck movements. Right bundle branch block was seen on the electrocardiogram. The preoperative biochemistry values, hemogram, coagulation panels and blood gas measurements were within normal limits. The echocardiography (ECO) revealed normal left ventricular wall movements, a 13 mmHg average gradient on the pulmonary valve, right heart cavities were severely dilated, there was mild to moderate tricuspid insufficiency, and a systolic pulmonary artery pressure of 32 mmHg was evident.

Standard anesthesia monitoring [ECG, noninvasive blood pressure and pulse oximetry (SpO₂)] was performed in the operating room. Invasive blood pressure (IBP) monitoring was provided by left radial artery cannulation. For infective endocarditis prophylaxis, Ampicillin 2 g iv was administered to the patient 30 minutes before surgery. Her blood pressure was 120/75 mmHg, heart rate was 118/min, and SpO₂ was 94%. Oxygen was supplied with a face mask. After the epidural catheter (18 G) was inserted on the L3-4 level in the sitting position, the patient was positioned slightly in the left lateral decubitus position. As a test dose, 2 ml 2% lidocaine without adrenaline was applied through the catheter. After the test dose, when motor and sympathetic blockage was not seen, 5 mL of 0.5% bupivacaine and 50 µg fentanyl were applied via the catheter. A total of 14 mL 0.5% bupivacaine was administered at increasing doses within 30

minutes in 5-minute intervals until sensorial loss reached the T5-6 level. No change in the patient's hemodynamics had occurred during this time. A vasopressor agent was not used. After the birth, Methylergonovine maleate 0.2 mg im was slowly administered. During the operation, a total of 2000 mL crystalloid infusion was provided. The estimated blood loss was 450 mL. Her heart rate ranged from 80 to 120/min with a mean blood pressure between 86 and 107 mmHg and saturation of 92-95%. For postoperative analgesia, 3 mg morphine was administered through the epidural catheter. There were no postoperative complications and additional analgesic requirement. The patient was visited for epidural catheter removal 12 hours before discharge, and the catheter was removed. She was discharged with recommendations at the postoperative 38th hour.

DISCUSSION

An increase in the incidence of hemodynamic changes, such as hormonal factors, as well as increased blood volume and cardiac output, is observed during pregnancy (3, 4). Advancements in the treatment of congenital heart diseases not only improve the lifespan and quality of life of patients but also result in an increase in pregnancy rates in these patients (4). As reported in the literature, patients tolerate pregnancy well with a treatment that takes into consideration the teratogenic effects of the pharmacological agents used after the surgical treatment of TOF, which is the most commonly observed cyanotic congenital heart disease (5, 6).

Patients with repaired TOF may exhibit residual cardiac diseases such as dysrhythmias, pulmonary vascular anomalies, right or left ventricular failure or residual right ventricular outflow tract obstruction. The anatomy, physiology and cardiac history of each patient with repaired TOF are variable. Therefore, there is no single formula for pregnancy and delivery management for all repaired TOF patients (7). The anesthetist should consider reviewing the patient's cardiovascular testing, including ECO findings, before admission for delivery to develop an intrapartum care plan. Patients should be carefully examined and monitored to minimize the risk of neuraxial block and maximize benefits (8). For this reason, we performed an ECO evaluation of our patient, as well as a strict hemodynamic follow-up, and we performed IBP monitorization for early recognition of blood pressure changes.

Several reports in the literature have stated that vaginal delivery is preferable for most patients with surgically repaired TOF (7, 9). Although there are many recommendations, there is no standard technique for anesthesia in pregnant women with cardiac diseases. General anesthesia offers the benefit of better oxygenation. However, there is a risk of adverse hemodynamic responses associated with laryngoscopy and the possibility of airway complications such as aspiration and difficult intubation in pregnancy (7). According to the obtained data, single-dose spinal anesthe-

sia is not recommended for pregnant women with TOF. It is stated that epidural anesthesia or spino-epidural anesthesia is more beneficial even in pregnant women with the most severe cardiac diseases (9). We preferred epidural anesthesia and analgesia to minimize hemodynamic fluctuations and catecholamines by providing intraoperative hemodynamic stability and postoperative analgesia.

It is important to choose the agents and doses used carefully for a safe neuraxial blockade in pregnant women with heart disease. Therefore, using increasing doses of a slow-acting local anesthetic while controlling hemodynamic parameters helps the anesthesia settle gradually, thereby providing better preservation of cardiovascular stability (10). Therefore, bupivacaine was administered to our patient in 5-minute intervals.

If there is no problem in the health of the mother, mothers who have a normal vaginal delivery are discharged in 24-48 hours, and mothers who give birth by cesarean section in 24-96 hours. Early discharge is the discharge of the puerperant in 24 hours or less after vaginal delivery and in 48 hours or less after cesarean delivery (11). The World Health Organization recommends that mothers should receive care in a health institution for at least 24 hours in the postpartum period (12). Since postpartum early discharge has many advantages for mother and baby, it is observed that discharge times after cesarean section are frequently 24-48 hours in our institution. In our study, it was observed that the mother who gave birth to a healthy baby was discharged at the 38th hour, since there was no problem in the follow-up.

In conclusion, we suppose that application of epidural anesthesia with divided and increasing doses of slow-acting bupivacaine in pregnant women with repaired TOF is a safe alternative to achieve good anesthesia with effective cardiovascular stability. Additionally, we believe that providing postoperative analgesia via an epidural catheter may prevent adverse effects such as tachycardia, hypertension and agitation. However, we consider that our data should be supported by the reports of more recent studies.

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Author Contributions

Concept: **Gamze Küçükosman, Bahar Say**, Design: **Gamze Küçükosman, Bahar Say**, Data Collection or Processing: **Bahar Say**, Literature Search: **Gamze Küçükosman, Bahar Say**, Writing: **Gamze Küçükosman, Bahar Say**.

Conflicts of Interest

The authors do not have any conflict of interest.

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Ethical Approval and Informed Consent

Since it was a case report, ethics committee approval was not required. Patient consent was obtained.

Peer Review Process

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