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Case Report

Anesthetic Management of a Patient with Beta Thalassemia during Cesarean Section with Combined Spinal-Epidural Block

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Abstract: β-thalassemia minor is a hereditary hemoglobinopathy characterized by a reduction in β-globin synthesis, usually presenting as mild, microcytic anemia. Although generally asymptomatic, pregnant women with this condition may pose anesthetic challenges due to altered hematologic and physiological states. In this case, a patient with β-thalassemia minor underwent a cesarean section under combined spinal-epidural anesthesia without complications. The anesthetic technique provided effective sensory blockade and stable hemodynamics, demonstrating that regional anesthesia can be safely administered when accompanied by appropriate preoperative evaluation, vigilant intraoperative monitoring, and effective blood conservation strategies. This case underscores the importance of individualized anesthetic planning for patients with hemoglobinopathies undergoing obstetric surgery.

Keywords: β-Thalassemia Minor, Cesarean Section, Combined Spinal-Epidural Anesthesia, Obstetric Anesthesia.

INTRODUCTION

β-thalassemia minor is a hereditary hemoglobinopathy characterized by decreased synthesis of the β-globin chain, often resulting in mild anemia [1]. Although rare in Korea, its incidence has increased in recent years due to a rise in international marriages with individuals from Southeast Asia [2]. Recognizing its clinical features and appropriate management strategies is crucial for ensuring safe obstetric and anesthetic care.

A cesarean section in a patient with β-thalassemia minor was successfully performed using combined spinal-epidural anesthesia without complications. This case demonstrates that, with careful anesthetic management, patients with hemoglobinopathies can safely undergo obstetric surgery, highlighting the importance of individualized and well-planned anesthetic strategies.

CASE PRESENTATION

A 27-year-old Korean woman, 163 cm tall and weighing 76 kg, was scheduled for an elective cesarean section at term. She had been diagnosed with β-thalassemia minor two years earlier at another hospital and had undergone a cholecystectomy for gallbladder stones one year prior. Preoperative evaluation revealed no abnormalities of the airway or spine. Laboratory investigations demonstrated microcytic, hypochromic anemia with a hemoglobin concentration of 7.6 g/dL, hematocrit of 23.3%, and platelet count of 249 × 10^3/μL. Electrocardiography showed sinus tachycardia at 101 beats per minute, and transthoracic echocardiography revealed no significant abnormalities.

Combined spinal-epidural anesthesia was administered using an 18-gauge Tuohy needle at the L3–4 intervertebral space. Standard intraoperative monitoring included electrocardiography, noninvasive blood pressure, pulse oximetry, and temperature monitoring. Intraoperative blood salvage was employed

to minimize red blood cell loss, using reduced suction power and an increased washing volume (from 750 mL to 1000 mL). The estimated blood loss during surgery was approximately 1200 mL, and about 800 mL of red blood cells were successfully salvaged and reinfused.

The total operation time was 50 minutes, and the duration of anesthesia was 80 minutes. The cesarean section was completed uneventfully without any complications.

DISCUSSION

β-thalassemia minor is a genetic disorder resulting from reduced β-globin chain synthesis, leading to microcytic, hypochromic anemia of mild to moderate severity. Unlike β-thalassemia major, patients with the minor form are typically asymptomatic and rarely require blood transfusion. However, the physiological stress of pregnancy and delivery can exacerbate anemia, creating challenges for oxygen delivery and hemodynamic stability during anesthesia [1]. Therefore, a thorough perioperative evaluation and careful selection of anesthetic technique are essential to optimize both maternal and fetal outcomes.

In obstetric anesthesia, regional techniques are generally preferred for cesarean delivery [3, 4], as they avoid airway manipulation and reduce the risks associated with general anesthesia, such as hypoxia and hemodynamic instability. Combined spinal-epidural (CSE) anesthesia provides the advantages of rapid onset from the spinal component and the ability to titrate the epidural dose for extended procedures or postoperative pain control. In this case, CSE anesthesia ensured effective sensory blockade and stable intraoperative hemodynamics, allowing a smooth and complication-free surgical course.

Intraoperative blood salvage is an important consideration in patients with thalassemia due to their predisposition to chronic anemia [5, 6]. Although β-thalassemia minor generally does not necessitate routine transfusion, minimizing blood loss is still crucial. The use of intraoperative cell salvage with adjusted suction and washing settings helped preserve red cell integrity and maintain hemoglobin levels without the need for allogeneic transfusion.

This case demonstrates that patients with β-thalassemia minor can safely undergo cesarean section under regional anesthesia when appropriate precautions are taken. Comprehensive preoperative assessment, meticulous intraoperative monitoring, and proactive blood management strategies are vital. The successful outcome supports combined spinal-epidural anesthesia as a safe and effective approach for such patients and emphasizes the need for individualized anesthetic planning based on both hematologic and obstetric considerations.

CONCLUSION

This case highlights that, with careful preoperative assessment, vigilant intraoperative monitoring, and effective blood conservation measures, cesarean section in patients with β-thalassemia minor can be safely performed under combined spinal-epidural anesthesia. A personalized anesthetic approach that considers the patient's hematologic status and the physiological demands of pregnancy is essential for ensuring favorable maternal and neonatal outcomes.

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