

Anesthetic Management of A Patient who Underwent Emergent Cesarean Section after Sudden Disturbance of Consciousness Caused by Disseminated Intravascular Coagulation due to Severe Urine Infection and Septic Shock

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Abstract

A 29-year-old woman with a history of lower back pain presented at 38 weeks of normal gestation with sudden headache and progressive disturbance of consciousness. Laboratory findings suggested severe infection, and detailed examination was necessary to determine the cause. However, the fetal heart rate suddenly decreased to <60 bpm. Therefore, emergent caesarian section was performed. Because of hypersomnia and fetal bradycardia, we decided to perform surgery under general anesthesia, which was induced with 5 mg/kg thiamylal and 0.8 mg/kg rocuronium in rapid sequence. Oxygen–nitrous oxide inhalation was used for maintenance of anesthesia until delivery. The infant's Apgar score was 2/5/6. Immediately after delivery, we administered 30 mg pentazocine and 5 mg diazepam. However, this triggered a sudden drop in the patient's blood pressure. Phenylephrine and dopamine were administered to increase her blood pressure. Furthermore, oozing from the surgical field was observed during abdominal closure, and bleeding from the abdominal drain and oozing from the scar increased in the intensive care unit. Her plasma fibrinogen level had decreased to <50 mg/dl from the preoperative level of 530 mg/dl. On the basis of her medical history of right pyelonephritis and sonographic findings of bilateral renal pelvis expansion, a diagnosis of disseminated intravascular coagulation caused by urine infection and severe septic shock was made. Her conditions showed marked improvement after appropriate treatment with fresh frozen plasma and a third-generation cephalosporin.

Keywords: Emergent cesarean section; Disturbance of consciousness; Disseminated intravascular coagulation; Urine infection; Sepsis

Introduction

Emergent cesarean section (eCS) accounts for 0.6% of all deliveries [1]. Generally, eCS is chosen to avoid the risk of maternal and/or fetal death. The most common indication for eCS is placental abnormalities such as abruption [2] or sudden massive hemorrhage caused by placenta previa [3].

However, there may be unexpected cases necessitating eCS. These can be associated with maternal illness such as progressive congenital cardiac disease or severe infection. Cases of eCS after sudden disturbance of consciousness not caused by intracranial diseases and sepsis are considered rare. Here we report a case involving a 29-year-old woman with a history of pyelonephritis who underwent eCS under general anesthesia at 38 weeks of normal gestation following a sudden disturbance of consciousness and a drop in the fetal heart rate. Postoperative investigations revealed a diagnosis of disseminated intravascular coagulation (DIC) due to severe urine infection and sepsis.

Case Presentation

A 29-year-old woman with a medical history of pyelonephritis and lower back pain presented at 38 weeks of normal gestation with complaints of a sudden headache, shivering, and lower back pain while

out shopping with her husband. She also exhibited progressive disturbance of consciousness and was consequently transported to the emergency department of our hospital by ambulance.

In the emergency room, she complained of headache and nausea and exhibited a state of confusion. Bowel incontinence was also observed. Her body temperature was 38°C. Laboratory examinations revealed leukopenia (white blood count, 2800/L) and increased C-reactive protein (CRP) levels (2.63 mg/dL). Brain computed tomography (CT) showed no abnormalities. We suspected severe infection of an unknown origin and proceeded to conduct more detailed examinations. However, the fetal heart rate showed a sudden decrease to <60 bpm. Therefore, eCS was scheduled and the patient was transported to the operating room within 10 min.

On arrival in the operating room, she exhibited hypersomnia, a systolic blood pressure (BP) of 80 mmHg, and a heart rate of 110 bpm. Because of hypersomnia and fetal bradycardia, we chose general anesthesia for the delivery procedure.

Anesthesia was induced with 5 mg/kg thiamylal and 0.8 mg/kg rocuronium administered in rapid sequence. Oxygen–nitrous oxide inhalation was used for the maintenance of anesthesia until delivery. Neonate was delivered within 5 min after anesthetic induction. The infant's Apgar score was 2/5/6.

Within 3 min after delivery, we administered 30 mg pentazocine and 5 mg diazepam. However, this immediately triggered a marked decrease in her BP, necessitating the intermittent administration of phenylephrine and continuous administration of dopamine. Her blood

pressure remained unstable despite this treatment. Furthermore, we observed the dilatation of blood vessels in the extremities and increased body temperature, leading to a suspicion of anaphylactic shock or septic shock. However, anaphylactic shock was ruled out according to the absence of an allergic rash or a past history.

The patient also exhibited oozing during abdominal closure and received fresh frozen plasma (FFP) to replenish coagulation factors until transport to the intensive care unit (ICU). The patient's blood pressure increased gradually. The duration of general anesthesia and surgery was 86 and 52 min, respectively, intraoperative blood loss was 680 ml, amount of fluid infusion was 2780 ml, and urine volume was 150 ml. In ICU, bleeding from the abdominal drain increased, with oozing from the scar. The plasma fibrinogen level decreased to <50 mg/dl from the preoperative level of 530 mg/dl. We consulted her previous physician and recovered a medical history of right pyelonephritis treated with antibiotics.

Moreover, we observed bilateral renal pelvis expansion on sonography (Figure 1A), and abdominal computed tomography (CT) image (horizontal slice) showed bilateral expansion of the renal pelvis (Figure 1B). Incidence of amniotic fluid embolism, which is with a risk of eCS and a cause of DIC, is excluded in ICU with several examinations.



Figure 1A: Postdelivery radiographic findings for a patient who underwent emergent c-section after sudden disturbance of consciousness caused by disseminated intravascular coagulation due to urine infection and severe septic shock- Transabdominal sonography image (coronary slice) showing expansion of the renal pelvis.

On the basis of these findings and her past history, a diagnosis of DIC caused by severe septic shock and urine infection was made. Blood, urine, and amniotic cultures tested positive for *Escherichia coli*. FFP and ceftriaxone, a third-generation cephalosporin, were administered in ICU for the treatment of DIC and sepsis. Following this treatment, her CRP levels decreased to 1.63 mg/dL and her condition improved markedly.

Discussion

We reported a case involving a 29-year-old woman who underwent eCS under general anesthesia at 38 weeks of gestation following sudden disturbance of consciousness caused by DIC due to severe urine infection and septic shock. The disturbed consciousness was accompanied by a sudden drop in the fetal heart rate. A retrospective cohort study by Acosta et al. [4] indicated that 1,598 of 1,622,474 (approximately 0.09%) pregnancies developed sepsis. Therefore, eCS due to sepsis is considered rare.



Figure 1B: Postdelivery radiographic findings for a patient who underwent emergent c-section after sudden disturbance of consciousness caused by disseminated intravascular coagulation due to urine infection and severe septic shock- Abdominal computed tomography (CT) image (horizontal slice) showing bilateral expansion of the renal pelvis.

A case of vaginal birth after cesarean (VBAC) in a patient with mental state alterations caused by meningitis [5] and a case of eCS in a patient with arteriovenous malformation (AVM) rupture [6] have been reported. To the best of our knowledge, no case of eCS performed under general anesthesia because of sudden disturbance of consciousness in association with severe infection and sepsis has been reported.

The eCS is indicated to avoid the risk of maternal and/or fetal death. The most common indications are placental abnormalities such as abruption [2] or sudden massive hemorrhage caused by placenta previa [3]. However, there are several unexpected cases requiring eCS because of medical conditions in the absence of placental abnormalities. These include pre-eclampsia, HELLP syndrome, and aggravation of existing congenital heart disease in the mother. Severe infection is also a ground for selecting eCS. The urogenital system is most commonly infected during pregnancy. Snyder et al. [7] reported urine infection and pyelonephritis as the most common etiology (37%) for maternal sepsis. They also reported that patients with septic shock exhibited significantly higher rates of DIC. The present case showed similar findings. The eCS in our case have been performed for fetal bradycardia as a result of maternal sepsis. Other authors concluded that the infection may not be severe in all cases and can be managed with antibiotics [8]. However, the present patient complained of severe headache, lower back pain, and sudden disturbance of consciousness. Moreover, brain CT showed no significant findings. Because of fetal bradycardia and hypersomnia, further detailed investigations could not be performed, and the urine infection was diagnosed only after eCS. The symptoms and signs of sepsis can be subtle and can be frequently mistaken as manifestations of other disorders such as delirium. Because of severe headache and progressive disturbance of consciousness, we initially suspected intracranial disease in our patient.

Barton et al. [9] reported that pregnancies complicated by severe sepsis and septic shock are associated with increased rates of preterm

labor, fetal infection, and preterm delivery. Therefore, appropriate selection of CS and anesthetic management is required. General anesthesia is considered safe for eCS in patients with sepsis. A previous report documented maternal death following epidural anaesthesia for CS in a patient with unsuspected sepsis [10]. The odds ratio for cesarean section in the presence of a nonreasoning fetal heart rate was reported to be higher than that in the presence of other diseases [1]. Therefore, we believe that our decision to perform eCS under general anesthesia was justified from the perspective of saving the lives of the mother and child. However, the period between anesthetic induction and the start of surgery may be more shortened. Furthermore, several reports indicated that norepinephrine is effective for maintaining blood pressure and associated with greater heart rate and cardiac output compared with phenylephrine under spinal anesthesia [11]. Our case was performed general anesthesia but not spinal anesthesia, and we encountered unexpected sudden hypotension. So, we administered phenylephrine initially. But, we should use norepinephrine for similar case in future.

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