

## Mide rezeksiyonu yapılan 26 haftalık gebe hastada torakal epidural anestezi ve analjezi uygulaması

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### SUMMARY

#### Thoracic epidural anesthesia and analgesia for gastric resection at 26 week pregnant woman

Anesthesia and surgery are required in up to 1.5% to 2% of all pregnancies. Alterations in maternal anatomy and physiology create potential risks for both mother and fetus. The anesthetic considerations for any surgery during pregnancy must take both patients into account. Gastric adenocarcinoma presenting during pregnancy is a rare condition and has a poor prognosis. This report describes anaesthetic management of a woman who was diagnosed with gastric adenocarcinoma at 26 weeks' gestation. Distal subtotal gastrectomy was planned in an attempt to maximize the mother's life expectancy while maintaining the pregnancy until the fetus reached viable gestation. A combination of general anesthesia and thoracic epidural anesthesia was used. The goal was to reduce physiological stress and minimize anesthesia risk for both mother and fetus and also diminish the neuroendocrine response during the surgery. The patient was discharged from the hospital 10 days after the surgery and was then readmitted at 30 weeks' gestation for an elective cesarean section.

**Key words:** Pregnancy, gastric adenocarcinoma, surgery, thoracic epidural anesthesia, anaesthetic management, fetal stress

### ÖZET

Tüm gebeliklerin % 1.5-2'sinde anestezi ve cerrahi gereksinimi olmaktadır. Maternal anatomi ve fizyolojide meydana gelen değişiklikler, hem anne hem de fetüs için risk oluşturabilmektedir. Gebelik döneminde cerrahi bir girişim gereksiniminde, anestezi yaklaşım her iki hastayı birden kapsamalıdır. Gastrik adenokarsinom gebelik döneminde nadir görülen ve kötü prognozla seyreden bir tablodur. Bu vaka takdiminde gastrik adenokarsinom tanısı alan 26 haftalık gebe hastada anestezi yaklaşım sunulmaktadır. Hastamızda fetüsün yaşayabilirliğinin sağlanacağı döneme kadar gebeliğin devamını sağlamak ve bu süre içinde annenin yaşam kalitesini en yüksek düzeyde tutmak amacıyla distal subtotal gastrektomi planlandı. Hem anne hem fetus için anestezi riskini en aza indirmek, fizyolojik stresi azaltmak ve aynı zamanda cerrahi sırasında ortaya çıkan nöroendokrin cevabı azaltmak amaçlanarak, genel anestezi ile birlikte torakal epidural anestezi uygulandı. Hasta 30. gebelik haftasında elektif sezaryen operasyonu için tekrar çağrılarak, postoperatif 10. günde taburcu edildi.

**Anahtar kelimeler:** Gebelik, gastrik adenokarsinom, cerrahi, torakal epidural anestezi, anestezi yaklaşım, fetal stres

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## Introduction

Anesthesia and surgery are needed in 1.5% to 2% of all pregnancies, the most common indications being trauma and acute abdominal conditions (Kuczkowski KM 2004, Rosen MA 1999). Appendicitis, cholecystitis, ovarian cyst, ovarian torsion and breast tumor are frequent non-obstetric indications for surgery during pregnancy, whereas life threatening cardiac or neurosurgical conditions are less common (Rosen MA 1999). Gastric cancer presenting during pregnancy is rare and has a poor prognosis (Yucesoy G et al. 2005, Kamal Y et al. 2004, Kurabayashi T et al 2004, Jaspers VK et al. 1999, Ueo H et al. 1991).

Maternal anatomy and physiology are altered in pregnancy, and these changes mean special anesthesia risk for mother and fetus. When surgery is required, anesthetic management for both patients must be carefully considered. The technique must be safe, with minimal fetal exposure to teratogenic agents and avoid risk of preterm delivery (Rosen MA 1999). The overall aim is to maintain the best possible physiological conditions for both patients (Kuczkowski KM 2004).

## Case Report

A 30-year-old pregnant woman (weight 53 kg, height 155 cm) was admitted to our Department of Gastroenterology with the complaints of digestive disturbance, abdominal pain and nausea and vomiting. The patient's pregnancy history was gravida 5, parity 1. A recent ultrasonographic examination had revealed fetal gestational age of 26 weeks. Laboratory testing revealed hemoglobin 8.7 mg/dL, hematocrit 27.4%. Iron preparates were prescribed orally as this decrease was thought to be a result of iron deficiency and pregnancy related dilutional anemia. Except for the decreased hemoglobin level, all biochemical and physiological parameters of pregnancy were within normal limits. Abdominal computed tomography and ultrasonography both showed a mass in the gastric antrum and evidence of lymphadenopathy. Gastroscopy and examination of biopsies of the mass revealed a large gastric ulcer in the antrum and undifferentiated gastric cancer. Based on this, the patient was diagnosed with diffuse gastric adenocarcinoma.

Immediate tumor resection and distal subtotal gastrectomy were planned by general surgeons

and obstetricians. To reduce anesthesia and surgical risks and to minimize physiological stress for both mother and fetus, the technique chosen was combination of general and epidural anesthesia. Physical examination findings were tachypnea and abdominal tenderness. In addition, she had a Mallampati class I airway. Preoperative testing of the mother revealed hemoglobin 10.6 mg/dL and hematocrit 32.1%. All biochemical parameters, prothrombin time (PT), partial thromboplastin time (PTT) were in the normal range. The patient was administered preoperative orally antacid prophylaxis (ranitidine, 150 mg). In the operating room invasive blood pressure, electrocardiographic findings, end-tidal carbon dioxide and oxygen saturation were monitored. These parameters were monitored continuously throughout the procedure. Blood-gas analysis was evaluated every hour. The initial blood pressure was 100/60 mmHg while the heart rate was 75 bpm and oxygen saturation was 98%. After securing intravenous access, the patient was preloaded with 10 ml/kg of lactated Ringer's solution over 30 minutes. Then, an 18 gauge epidural catheter was inserted T7-T8 intervertebral space and advanced cephalad for 6 cm in the epidural space. A test dose of 3 ml of 2% lidocaine was injected to rule out subarachnoid placement of the catheter. After a test dose, 7 ml 0.5% bupivacaine hydrochloride was given with careful hemodynamic monitoring. The level of block was tested by pin prick every 5 minutes. T4-T12 dermatomal desensitization was achieved in 20 minutes, and general anesthesia was induced. The patient was pre-oxygenated with 100% oxygen for 3 minutes, and anesthesia was induced with intravenous injections of 1.5 mg/kg propofol and 0.1 mg/kg vecuronium bromide. Endotracheal intubation was achieved with rapid sequence induction using cricoid pressure. During surgery, anesthesia was maintained with a 50%/50% oxygen and air mixture and infusions of propofol (3.5 mg/kg/h, with a total dose of 475 mg over 3.5 h). An infusion of 0.2% bupivacaine was initiated beginning at the second hour (7 mL/h).

Following initial dose of muscle relaxant, no further dosing was required. No fetal or uterine monitoring was attempted, this was not possible in our case due to the particular surgical technique that was required.

In order to avoid supine hypotensive syndrome, a left lateral uterine displacement was performed. In addition, maternal hypotension (mean arterial

blood pressure < 60 mmHg) was controlled by administration bolus dose of ephedrine and colloid solution. 5 mg ephedrine was given twice during surgery. Maternal blood pressure (systolic/diastolic) remained between on values of 85-120/45-70 mmHg while heart rate ranged from 70 to 80 beats per minute. In addition to the monitoring detailed above, end-tidal carbon dioxide assessments and blood gas analysis were done throughout the operation. A laparotomy was performed and distal subtotal gastrectomy was carried out. Total blood loss was only 250 mL and total operating time was approximately 3.5 h. At the end of the procedure, the patient was extubated and transferred to the intensive care unit (ICU). Postoperative analgesia was achieved with a 5-ml/h infusion of 0.1% bupivacaine via the epidural catheter. Postoperative pain was measured by using a Visual Analog Scale (VAS; 0= no pain, 10= worst possible pain) at as soon as extubated and different postoperative hours (2, 4, 6, 12, 24 and 48. hours). All VAS values were lower than 3 point.

Patient was discharged from the ICU on the postoperative second day. The epidural catheter was retrieved because of anticoagulant medication and patient controlled analgesia with meperidine was administered for pain relief. At the first hour in the ICU, postoperative assesment of the fetus and uterus with Doppler ultrasound and cardiocotography revealed no abnormalities.

The mother was discharged 10 days after surgery. Mother's condition required chemotherapy to be started at the earliest time to prevent further deterioration. Because of this, she was readmitted to hospital at 30 weeks' gestation for an elective cesarean section. Under general anesthesia, a 1400 g female infant with 1-and 5-minute Apgar scores of 7 and 9, respectively, was delivered. The baby was transferred to neonatal intensive care unit immediately after birth. Chemotherapy was planned and the patient was discharged. One month later, baby and mother were at good health and chemotherapy was going on.

## **Discussion**

Surgical procedures during pregnancy pose potential risks for both mother and fetus (Melnick M.D et al 2004). Organogenesis occurs during the first trimester, so it is usually recommended that all but true emergency surgeries must be postponed until later in the pregnancy to avoid

potential teratogenic effects or fetal death in utero (Kuczkowski KM 2004, Mattingly JE et al. 2003).

Anesthetic plans for surgery during pregnancy must be taken into account for the safety of both mother and fetus. Intraoperative hypoxemia or asphyxia due to reduced intrauterine blood flow, maternal hypotension and hypoxia; and depression of the fetal cardiovascular or central nervous system due to passage of anesthetic agents across the placenta are all potential risk factors for the fetus (Rosen MA 1999, Ueo H et al. 1991).

The gestational age of the fetus, the seriousness of the mother's illness and the importance of the surgery to the mother's health are all prominent factors in the decision whether to continue a pregnancy until the fetus is viable (Kuczkowski KM 2004). If the decision is to attempt to maintain the pregnancy until this stage, then suitable anesthetic technique must be used. As indicated above the basic goal in these situations is to provide sufficient and safe anesthesia for the mother while avoiding intrauterine fetal asphyxia, exposure to teratogenic agents and preterm labor (Miller RD 2000).

Regional anesthesia techniques provide excellent pain relief, block the neuroendocrine response, minimize fetal exposure to drugs and cause less severe respiratory depression in the mother and the fetus than general anesthesia (Miller RD et al. 2000). Although these techniques provide muscle relaxation for obstetric anesthesia and low abdominal surgery, they are usually insufficient for upper abdominal surgery (Caforio L et al. 2000). Fetal exposure to anesthetic agent with general anesthesia can cause respiratory depression (Mattingly JE et al. 2003). General anesthesia also increases plasma concentration of stress hormones and can cause adverse fetal effects. In addition to general anesthesia provides sufficient muscle relaxation and depth of anesthesia for complex upper abdominal surgery. Because of the reasons mentioned above, thoracic epidural anesthesia technique combined with general anesthesia to reduce the risk of surgery and anesthesia was preferred. But, epidural technique invariably blocks the sympathetic nerves, causing peripheral vasodilatation, decreased venous return and maternal blood pressure. Because of this reason, a significant decrease in maternal systolic blood pressure can adversely affect uteroplacental blood flow. For this reason, it is important to preserve maternal

cardiac preload by hydrating and avoiding a caval compression phenomenon. It is suggested that if maternal mean arterial pressure is maintained within normal range, epidural anesthesia is associated with a significant increase in placental intervillous blood flow (Mattingly JE et al.2003).

Thoracic epidural anesthesia provides effective pain relief and reduces stress-related hormone release and the neuroendocrine response (Chaney MA. 2006, Waurick R. 2005, Caforio L et al. 2000). Specifically, this regional technique is associated with significantly lower concentrations of stress hormones in maternal plasma, which theoretically may reduce vasospasm in the uteroplacental vascular bed and improves placental perfusion (Mattingly JE et al. 2003, Caforio L et al. 2000). Because of the effects that we mentioned before, in order to provide adequate anesthesia, we used only propofol infusion. During the operation period, there were no need to use muscle relaxant agent except induction period. Throughout the operation, we monitored the patient's vital signs and there were no significant changes in blood pressure, pulse rate and pupil size. So that we didn't use additional anesthetic agent.

Although it is well known that general anesthesia has adverse effects on a fetus, the combination of general anesthesia and thoracic epidural anesthesia technique, offers good surgical conditions, is safe for both mother and baby, and involves minimal fetal exposure to drugs.

Controlled mechanic ventilation with general anesthesia helped us to keep the maternal partial pressure of carbon dioxide in normal limits to prevent the fetal hypercarbia and respiratory acidosis.

In our pregnant patient with gastric cancer, we used a combination of general and thoracic

epidural anesthesia to facilitate safe surgery and course of pregnancy. We suggest that the combination technique reduces the potential risks and stresses for both mother and fetus, and we recommend it as a good option for pregnant surgical patients.

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