

C-24 Anesthesia Considerations and Management for a Pregnant Patient Undergoing Emergent Non-Obstetric Surgery

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Objective

After completion of this session, the participant will be able to:

- Manage the high risk parturient for non-obstetric surgery.

Case Stem Question

A 31-year-old female, G2P1, is admitted for fevers and abdominal pain. She has a history of chronic abdominal pain secondary considered secondary to inflammatory bowel disease. Past medical history includes migraines and eczema. Past surgical history includes colonoscopy and C-section, tolerated without anesthetic complications. She is allergic to sulfa. She is admitted and placed on TPN, treated with oral and IV steroids, and broad-spectrum antibiotics. She has minimal improvement in symptoms, with continuing abdominal distension and fevers.

After multiple weeks of medical treatment, her condition became medically refractory with concerning colonic distention and only mild improvement in symptoms, requiring an exploratory laparotomy and total abdominal colectomy with end ileostomy and colonic mucous fistula creation.

PMH: migraines, eczema

PSH: colonoscopy, c-section

Social history: Married, non-smoker, occasional alcohol, denies drug use

Physical exam:

HR 119 BP 110/56 RR 16 O2 95% on RA

General: Awake, conversant, with generalized weakness and pallor

Chest: Tachycardic, RRR

Abdomen: Distended with diffuse tenderness

Labs notable for WBC 13.8, Hgb 7.8 after 4 units RBC received the day prior, CRP 97.5, Na 134.

Daily fetal heart rate monitoring: consistent activity.

Intraoperatively, the patient was found to have a very dilated and friable colon with two microperforations and spillage of liquid stool into the abdominal cavity. The procedure was performed successfully with minimal blood loss of approximately 100 mL.

What are the anesthetic considerations for a high-risk pregnant patient undergoing non-obstetric surgery?

Guiding Questions for Discussion

1. What evaluations should be done preoperatively for a pregnant patient undergoing non-obstetric surgery?
2. Are there contraindications due to pregnancy for pharmacologic agents used in anesthesia care?
3. What are the considerations for positioning for pregnant patients?

4. What are the indications for fetal heart monitoring intraoperatively?
5. How can you prevent changes in hemodynamics during surgery that could negatively affect fetal viability?
6. How can you maximize maternal and fetal safety?
7. Does gestational age change anesthetic management?
8. How should post-operative pain be treated in a pregnant patient undergoing non-obstetric surgery?

Surgery for medically refractory or complicated ulcerative colitis may be necessary during pregnancy. Previous research has shown a higher rate of preterm delivery and fetal mortality after surgery. However, there may be greater risk to the mother and fetus of continuing to attempt to manage the condition medically and the potential development of sepsis than proceeding with surgery. Therefore, anesthetic and surgical plans must be implemented to prioritize maternal safety while also minimizing risks for the fetus. Preoperatively, considerations to optimizing hydration and oxygenation should be undertaken with fluid administration and blood transfusions. In our case, the patient was requiring blood transfusions in the weeks leading up to surgery to maintain a hemoglobin of above 7 as recommended by the high-risk obstetric team and our patient was transfused with 4 units of packed red blood cells the day prior to the procedure. Due to the increased hypercoagulable state of pregnancy, venous thromboembolism prophylaxis with low molecular weight heparin is recommended. Since abdominal surgeries are usually done with the patient lying supine, pregnant patients should be positioned with a left lateral tilt to avoid compression of the vena cava. During the surgery, uterine manipulation should be minimized as much as possible. Fetal monitoring and tocometry, when possible, should be continued during surgery to determine effects of anesthesia on fetal heart rate and variability. If it is not possible during surgery due to surgical constraints, as in the case presented here, fetal monitoring should be done preoperatively and postoperatively.

Maternal physiologic changes due to pregnancy can affect the anesthesia plan and management. The anatomic changes during pregnancy can affect the soft tissue of the neck which can create more challenges to airway management. Physiologically, minute ventilation and oxygen requirements increase during pregnancy while functional residual capacity decreases, leading to the potential for rapid development of maternal hypoxia and hypercapnia. Mild maternal hyperventilation is expected during pregnancy as well which can lead to maternal respiratory alkalosis which should be maintained during surgery to prevent fetal acidosis. Additionally, the plasma volume and cardiac output increase while the peripheral vascular resistance decreases. Physiologic anemia occurs due to dilution. Lying in a supine position can lead to aortic and vena caval compression by about 20 weeks which can cause severe hypotension. Avoiding hypotension under anesthesia is even more important during pregnancy, to ensure proper blood flow and oxygenation to the uterus and fetus. Vasoactive medications, often used to support blood pressure during surgery, can lead to reduced uterine blood flow in pregnant patients, but ephedrine and phenylephrine have been shown to be safe for use during pregnancy. Continuing generous fluid support and blood transfusions are also important to maintain proper hemodynamics.

In terms of pharmacologic teratogenic concerns, previous research has not conclusively

shown an increased risk of the administration of anesthetic agents leading to congenital anomalies. No particular agent has been shown to be safer or more harmful than another. Benzodiazepines, often used for pre-procedure anxiolysis, have previously been shown to cause fetal anomalies but these results have been disproven. Additionally, paralytic agents have been shown to not significantly cross the placenta. Anesthetic agents do lead to expected decreases in blood pressure which should be managed appropriately to avoid decreased perfusion to the uterus and fetus, and using the lowest concentrations of the agent should be considered to prevent severe hypotension. Opioids can be administered intraoperatively and postoperatively, as severe pain leading to stress and increased respiratory rate and blood pressure can be dangerous to fetal health.

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