Anesthesia for Nondelivery Obstetric Procedure

Col.Siriluk Chumnanvej,M.D.

Shnider and Levinson's, Anesthesia for Obtetrics, Chapter 15, 5 ed., 2013. p.220-237.

Outline for Nondelivery Obstetric Procedure

1. Cerclage
2. External Cephalic Version
3. Postpartum Tubal Sterilization

Shnider and Levinson's, Anesthesia for Obtetrics, Chapter 15, 5 ed., 2013. p.220-237.

1. Cerclage

- Transvaginal cerclages ; performed with
  - spinal, epidural -- T_{10}-L_1 and S_2-S_4 sensory blockade
  - general anesthesia

- Transabdominal ; performed with GA

Shnider and Levinson's, Anesthesia for Obtetrics, Chapter 15, 5 ed., 2013. p.220-237.

2. External Cephalic Version

- success rate of ECV is 60% with regional anesthesia (T_6)
- Absolute & Relative Contraindication to ECV

Absolute Contraindications	Multiple gestation Severe fetal or uterine anomalies Ruptured fetal membranes Intrauterine growth restriction Nonreassuring fetal status Isoimmunization Placenta previa Placental abruption
Relative Contraindications	Early labor Oligohydramnios Small for gestational age fetus Presence of uterine scar Maternal obesity

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General Recommendations for ECV

- Fetal presentation should be reassessed before preparing the patient for ECV.
- Verify nil per os (NPO) status of the patient.
- Discuss with the obstetrician the delivery plan for each scenario, if the ECV is successful or not.
- Consider placing an epidural catheter if the plan is to deliver the fetus after the ECV, regardless of success of the procedure, to provide either labor analgesia for induction of labor, or anesthesia for a cesarean delivery.
- Perform ECV in the labor and delivery room, pre-operative holding area or postoperative unit, after confirming that there is an operating room available for emergent cesarean delivery.
- Plan for routine noninvasive monitoring of the mother, especially when neuraxial blockade is performed.
- Maintain left uterine displacement throughout the procedure.
- Fetal heart rate monitoring before and after each ECV attempt is recommended.

3. Postpartum Tubal Sterilization

Anesthetic Considerations

1. For postpartum → no oral intake of solid foods within 6 - 8 hours
2. Aspiration prophylaxis
3. Anesthetic technique (neuraxial vs. general) → timing of the procedure & based on anesthetic risk factors, obstetric risk factors and patient preferences
4. Neuraxial techniques; Spinal Anesthesia

General Anesthesia

- Aspiration prophylaxis
- 0.5 MAC

Ronald D. Miller, Basics of Anesthesia, Chapter 33:Obtetrics, 7 ed., 2018. p.581-583.

Outline for Anesthesia

- Avoidance of Teratogenic Drugs
- Avoidance of Intrauterine Fetal Hypoxia & Acidosis
- Prevention of Preterm Labor
- Management of Anesthesia
- Laparoscopic Surgery

Ronald D. Miller, Basics of Anesthesia, Chapter 33:Obtetrics, 7 ed., 2018. p.581-583.
Paul G Barash. Clinical anesthesia. Chapter 41:Obtetrics anesthesia, 8 ed., 2017. p.2911-2914.

Anesthesia for Nondelivery Obstetric Procedure

- Incidence 1% - 2%, with trauma, appendicitis, cholecystitis, excision of ovarian cysts & breast biopsy
- Nonurgent operations → delayed until after the first trimester to minimize teratogenic effects
- Second trimester → optimal time for intervention
  ∵ as lowest risk of preterm labor
- Treatment of incompetent cervix (cervical cerclage)

Ronald D. Miller, Basics of Anesthesia, Chapter 33:Obtetrics, 7 ed., 2018. p.581-583.

Anesthesia for Nondelivery Obstetric Procedure

1) Determine anesthetic plan that optimizes the maternal & fetal condition

2) Consult an obstetrician & perinatologist in order to optimize plans for unexpected events

3) Determine a plan for fetal monitoring if appropriate

4) Discuss a plan in the event of a cesarean delivery or maternal arrest

Ronald D. Miller, Basics of Anesthesia, Chapter 33:Obtetrics, 7 ed., 2018. p.581-583.

ACOG

"Surgery should be done at an institution with neonatal & pediatric services;

an obstetric provider with cesarean delivery privileges should be readily available;

a qualified individual should be readily available to interpret the FHR."

- Induction and emergence from anesthesia is more rapid than in the nonpregnant state because of increased minute ventilation, decreased FRC,
- decreased MAC of volatile agents, which may be seen as early as 8 -10 weeks of gestation
- Supine hypotensive syndrome can occur as early as the second trimester.
- Gastric emptying is essentially normal in the first two trimesters, but is prolonged in the third. Gastroesophageal sphincter tone is decreased after 20 weeks

Ronald D. Miller, Basics of Anesthesia, Chapter 33:Obtetrics, 7 ed., 2018. p.581-583.

Avoidance of Teratogenic Drugs

- critical period of organogenesis → GA 2-8 weeks

- No currently used anesthetic drugs have been shown to have any teratogenic effects in humans when using standard concentrations at any gestational age, with the exception of cocaine

Avoidance of Intrauterine Fetal Hypoxia & Acidosis

- Avoidance of decreased UBF & oxygenation
  - Avoiding maternal hypotension with LUD after GA 20th week
  - Preventing arterial hypoxemia
  - Excessive changes in $PaCO_2$ → hypercapnia & hypocapnia result in reduced UBF & fetal acidosis

Ronald D. Miller, Basics of Anesthesia, Chapter 33:Obtetrics, 7 ed., 2018. p.581-583.

FHR monitoring via Doppler

- Available at GA 16 - 18 weeks
- Variability as a marker of well-being is established at GA 25 - 27 weeks

Prevention of Preterm Labor

- Risk factors: - Intra-abdominal procedures
- FHR & maternal uterine activity → monitored after surgery
- treated with tocolytics (nifedipine or indomethacin)
- maternal corticosteroid administration is recommended for concern of preterm delivery prior to GA 32 weeks to decrease neonatal morbidity

- Postoperative analgesics can alter the perception of contractions, stressing the need for external monitoring.

Management of Anesthesia

- Delay the operation until the second trimester
- Elective surgery should be delayed until returned to nonpregnant physiologic state (approximately 2 - 6 weeks postpartum)
- Discussed & Plan for → fetal monitoring, potential maternal arrest & implications of urgent cesarean delivery
- Aspiration prophylaxis & LUD
- maintained Normocarbia (30 mm Hg end-tidal CO_2)

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- General anesthesia → effects of altered physiology during pregnancy are not limited.
- Increased effect of local anesthetics during pregnancy → reduced by 25% - 30% during any stage of pregnancy
- Medicinal doses of benzodiazepines are safe when needed to treat perioperative anxiety.
- Some believe that N_2O use is contraindicated in the first two trimesters

- adequate uterine perfusion with fluids & appropriate use of vasopressors (phenylephrine)
- Inhaled concentrations of oxygen at least 50%
- Postoperatively;
  - deep venous thrombosis prophylaxis
  - FHR & uterine activity monitored (often at least 24 hours
  - plan for postoperative analgesia

- Intrauterine fetal asphyxia is avoided by maintaining
  - maternal PaO_2
  - $PaCO_2$
  - uterine blood flow

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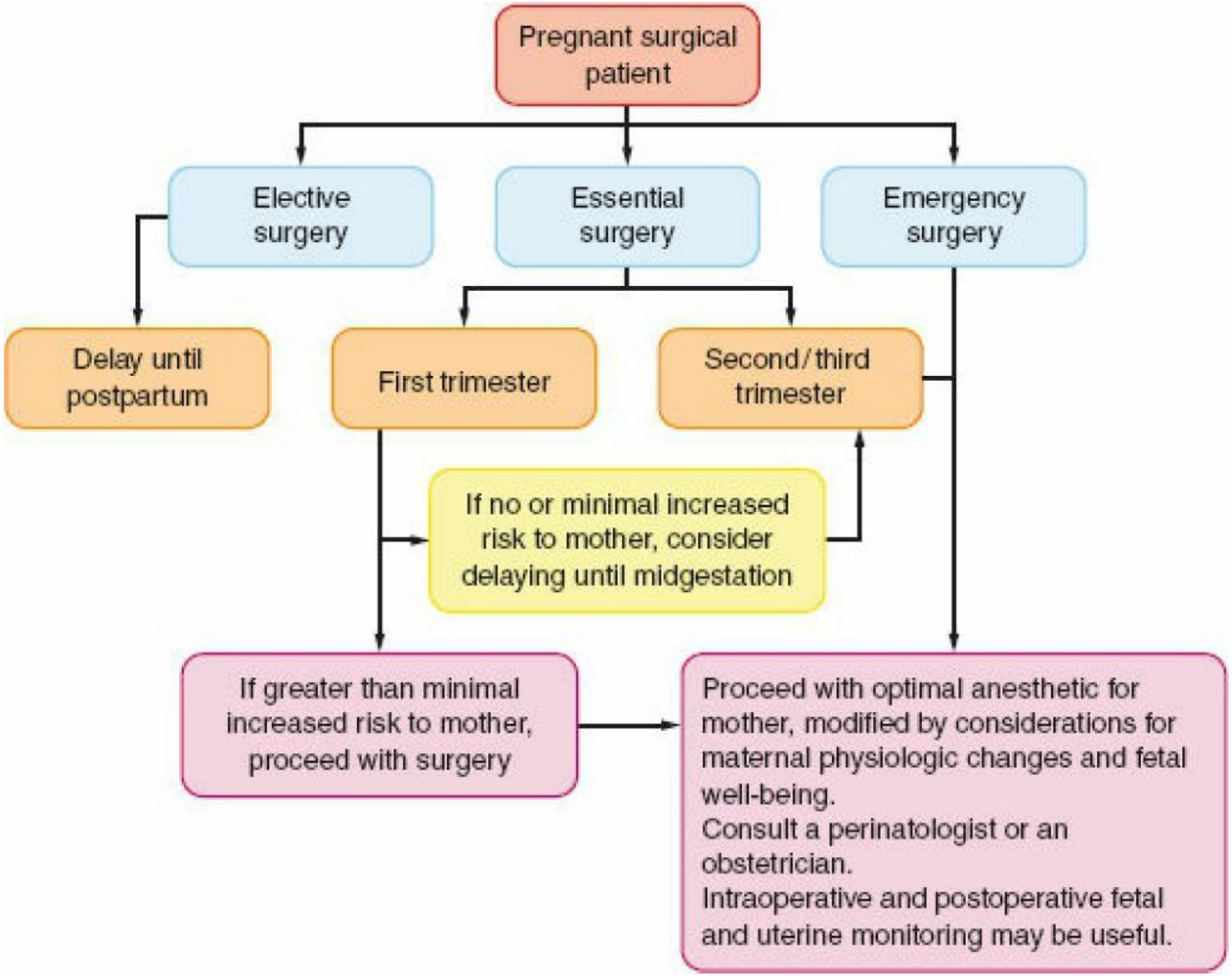
Recommendations for management



Avoidance of Teratogenic Drugs | Avoidance of Intrauterine Fetal Hypoxia & Acidosis | Prevention of Preterm Labor | Management of Anesthesia | Laparoscopic Surgery

Laparoscopic Surgery

- safe during any trimester
- lower preterm delivery rate was noted compared to open approaches
- end-tidal CO_2 should be monitored throughout surgery & low neumoperitoneum pressures (10 - 15 mm Hg)

References

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