Special Considerations in OB Anesthesia: Malpositions & Multiples

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Presentation of Fetus

• Lie

• Presenting fetal part

• Attitude
Attitude

- **Attitude** of the fetal head
  - either *flexion* or *extension*

- **Vertex presentation with flexion**
  - Associated with the greatest Chance of safe vaginal delivery
Breech Presentation

- Prevalence decreases with increasing gestational age
  - End of 2\textsuperscript{nd} trimester: 25%
  - 30 weeks: 17%
  - Term: 3.5%
Breech Presentation

• Defined by the presenting body part and whether the hips and knees are flexed or extended
Fetal Risks

• Neonatal mortality with breech presentation is about 5x greater than that of term cephalic presentations

• Umbilical cord compression and prolapse
  – Footling breech: 10%
  – Complete breech: 5%
  – Frank breech: 0.5%
    • the same as with a vertex presentation
Fetal Risks

- Nuchal arm
  - posterior aspect of the shoulder
- Difficulty with aftercoming head
- Fetal mechanical injury
  - Skull fracture
  - Brachial plexus injury
- Fetal anoxic brain injury and death
Maternal Risks

- Increased morbidity r/t use of C/S
- Increased risk with vaginal delivery
  - Intrauterine manipulation
    - Increases risk of infection
  - Uterine relaxation
    - Increases risk of uterine atony & hemorrhage
Systemic Review
ECV: a safe procedure?

• Reviewed 6 RCT from 1997-2010
  • 2 studies: Analgesic doses used
  • 4 studies: Anesthetic doses used

• Results:
  • Significant improvement on ECV success rate in four studies that used anesthetic doses
  • Two studies that utilized analgesic doses reported no significant difference

Sultan P & Carvalho, B. IJOA 2011
Meta Analysis
Anesthetic dose of neuraxial blockade increases success rate of EFV

- Central neuraxial anesthesia with anesthetic—compared-analgesic-doses
  - associated with an increase in ECV success rate for breech

  - Anesthetic dose defined:
    - Producing a motor block

Lavoie A and Guay J. Can J Anes, 2010
Obstetric Management for Breech Deliveries

- **Cesarean Section**
  - As risks for C/S decrease, the use of C/S for breech deliveries increases
    - 80% - 100% C/S rate
  - 4-10 fold increase of fetal trauma with vaginal breech delivery compared to abdominal delivery
    - However, maternal morbidity is several times higher with C/S
Anesthetic Considerations

• Vaginal Breech delivery

  Epidural
  • Preferred for breech presentation
    – May slow delivery, does not effect fetus
  • Excellent pain relief
  • Decreases desire to bear down
    – before for full dilation
  • Analgesia for C/S if needed
  • Pelvic floor relaxation
    – leads to controlled delivery
Anesthetic Considerations

• **Vaginal Breech delivery**

• **Uterine relaxation** may be required immediately to assist with delivery of aftercoming head
  - Nitroglycerine
    - 50 – 100 ug
    - 0.8 mg SL aerosol spray

• **General Anesthesia**
  - High dose volatile anesthetic
Normal Vertex Delivery

1. Head floating, before engagement
2. Engagement; flexion, descent
3. Further descent, internal rotation
4. Complete rotation, beginning extension
5. Complete extension
6. Restitution, (external rotation)
7. Del. of ant. shoulder
8. Delivery of posterior shoulder

- Head floating
- Engagement flexion
- Internal rotation
- Complete rotation, begin extension

- Complete extension
- External rotation
- Delivery of anterior shoulder
- Delivery of posterior shoulder
FIG. 3. Attitudes of the vertex.
Malpresentation of vertex

• Most common factor associated with malpresentation:
  – Cephalopelvic disproportion
    • Occurs when the baby’s head or body is too large to fit through the mother’s pelvis
    • Due to large fetal size or contracted maternal pelvis
    • May inhibit flexion and rotation of fetal head
Occiput posterior presentation

- 5% of births
- Larger cephalic diameter presents into pelvis
  - Greater frequency of cephalopelvic disproportion
- Fetal occiput fails to spontaneously rotate anteriorly
- Persistent occiput posterior presentation
  - Results in more prolonged and painful labor
Shoulder Dystocia

• Occurs if after the delivery of the fetal head the shoulders arrest

• Shoulders are against the boney pelvis and thus the rest of the fetal body can not be delivered
Treatment

• Vaginal delivery
  – Complete episiotomy
  – McRoberts procedure
    • Mother abducts legs > chest
  – Suprapubic pressure
  – Manual rotation of anterior shoulder
  – Extraction of posterior arm
  – Replacement of the head and C/S
Shoulder Dystocia

• Maternal Complications
  – Uterine atony
    • hemorrhage
  – Uterine rupture
  – Vaginal lacerations
    • Fourth degree tear
  – Genital tract trauma and infection
Placenta Classification

Chorion
- placenta

Amnion
- amniotic sac
Placenta Classification

- Type of placentation determines likelihood of vascular communications
  - Vascular communications occur
    - Nearly all monochorionic placentas
    - Rare dichorionic placentas
  - May result in
    - Twin-twin transfusion syndrome
    - Intrauterine fetal death
Maternal Physiologic Changes

- **Increased uterine size**
  - decreased total lung capacity
  - Decreased FRC
  - Displaces stomach cephalad
    - decreases competence of lower esophageal sphincter

- **Weight gain > rate after 30 weeks**

- **Maternal blood volume** (additional 500ml) & CO increases
Fetal Risks

- Twin delivery increases perinatal mortality
  - 6-8x’s

- Morbidity and Mortality r/t prematurity
  - 40-50% PTL, 30-40% deliver<37 weeks
  - Rare to carry to term
    - Uterus doesn’t remain latent until term bc of insufficient uterine blood flow

- Abnormal presentations
  - Increases the risk for umbilical cord prolapse
Twin-to-Twin Transfusion

- Abnormal connection of chorionic blood vessels in the placenta between two monochorionic twins
  - one twin becomes the donor and the other twin becomes the recipient
- Donor twin is smaller and is at risk for intrauterine growth restriction and anemia
- Recipient twin is plethoric (excess amount of blood) and is at risk for volume overload and cardiac failure
Twin-to-Twin Transfusion

• **Treatment**
  – Serial amnioreduction to control polyhydramnios
  – Selective feticide to allow the other fetus to survive
  – Selective fetoscopic laser photocoagulation of the vascular anastomoses bt. the two twins
    • Laser inserted either percutaneously or through a maternal laparotomy
Anesthesia
TTTS Fetal Surgery

• Considerations
  – Analgesia, amnesia and immobility
    • Mom & Baby
  – Preserve gas exchange and cardiovascular stability of both
  – Control uterine tone
Fetal Risks

• **Second twin**
  – Increased morbidity and mortality than first
    • FHR monitoring improves outcome
  – After delivery of twin A the following reduce intervillous blood flow and oxygenation to the 2nd twin:
    • Partial separation of placenta
    • Reduced uterine size
    • Clamping of the 1st umbilical cord
Twin Fetal Risks

• **Malpresentation**
  – d/t growth retardation and polyhydramnios

• **Placental problems**
  – Cord prolapse/entanglement d/t:
    – Malpresentation
    – Malposition
    – Premature rupture of membranes
Maternal Risks

• **Physiologic risks**
  – Increased CO
    • an additional 15%
  – Increased Supine Hypotensive Syndrome
    • a 32-week uterus of a twin gestation is as big as a term uterus containing a single-fetus and gets progressively larger

• **Anemia**
  • occurs 2-4x more often
Maternal Risks

- **Physiologic risks**
  - Hypoxia
    - Decrease in FRC
    - Increase in closing volume and oxygen consumption
  - Pulmonary edema
    - Use of tocolytics
  - Difficult intubation
  - Pulmonary aspiration
Obstetrical Risks

- PIH and preeclampsia
  - 5x more common

- Antepartum hemorrhage
  - Abruptio placenta & placenta previa

- Postpartum hemorrhage
  - Uterine atony d/t over distended uterus
  - 2-3 x times increased risk
Obstetrical Risks

- **Malpresentation**
  - Greater frequency of C/S and postoperative infection

- **Polyhydramnios**
  - Excess of amniotic fluid
  - Occurs in about 12% of multiple gestations
  - Heralds congenital abnormalities including GI and CNS
Obstetric Management

• **Indications for C/S**
  – Malpresentation of twin A
  – Discordancy (twin B > twin A)
  – Intrauterine death of one fetus
  – Twin-twin transfusion
  – Congenital deformities
  – Decreased uteroplacental reserve
  – Fetal cardiac decelerations
  – Prematurity
  – Three or more fetuses
Intrapartum Management

• Delivery should occur in the OR
  – emergency abdominal delivery can be performed
  – Provide supplemental O2
  – Have LA to extend epidural for C/S