Proplapsed Cord (Umbilical Cord Prolapse – UCP)

Umbilical cord prolapse is a rare obstetrical and fetal emergency characterized by the descent of the umbilical cord either alongside or beyond the fetal presenting part.

ANESTHETIC CONSIDERATIONS:

- Urgent caesarean section (delivery within 30 minutes of diagnosis)
- Anesthetic considerations of pregnancy
    - 2 patients
    - physiologic changes of pregnancy (including upper airway edema/engorgement, decreased FRC, increased minute ventilation, increased cardiac output, increased plasma volume and Vd)
    - possible difficult airway
    - risk of aspiration secondary to increased intraabdominal pressures
    - aortocaval compression and LLD position
    - rapid desaturation
- Neonatal resuscitation team on hand
- Temporizing measures: steep trendelenberg, funic decompression, bladder instillation

ANESTHETIC GOALS:

- Maintenance of acceptable maternal hemodynamics and uteroplacental perfusion
- Facilitation of urgent caesarean section (GA vs neuraxial)
- Availability of neonatal resuscitation team

PriorityResuscitationHistoryExamLabsPfts(etc)Regional

Priority:

1. Emergent

Preoperative:

2. History
    a. Obstetrical history: G?P?, previous pregnancies and deliveries, current pregnancy and any complications
    b. Past medical history
    c. Allergies
    d. Medications
    e. Past anesthetic/surgical history
    f. Rh status
    g. Membranes intact vs ruptured
3. Physical
    a. Airway exam
    b. Assessment of hemodynamic stability (mom and baby)
    c. IV access
    d. Focused cardiorespiratory exam
    e. Appropriate regional exam (body habitus, back exam)
4. Investigations
    a. Labs (CBCd, INR, PTT, type and screen + crossmatch)
    b. Fetal heart rate tracing

Optimization

1. establish large bore IV access
2. ensure valid cross match and type and screen
3. LLD position +/- steep trendelenberg +/- funic decompression
4. Regional/neuraxial vs GA

Room Preparation/Setup

- standard emergency drugs
- standard machine check (including suction, gas line supply, emergency O2 supply, inhalational agents, CO2 absorbant, circuit leak test)
- emergency induction medications for RSI: pentothal, succinylcholine
- analgesic medications: fentanyl, morphine
- oxytocin
- neonatal resuscitation: NRP team, warmer, blankets, airway equipment and ETTs, UVC catheters

Induction:

- preferentially proceed with neuraxial technique if time permitting and position permits (could do spinal in LLD position)
- if unable to pursue neuraxial secondary to coagulopathy or positioning, proceed with GA (RSI, possible difficult airway, rapid desaturation, miminal anesthetic agents until fetal delivery, counseling re: awareness)

Maintenance:

- Inhalational anesthetic maintenance <1.0 MAC due to increased risk of uterine atony and smooth muscle relaxation in high doses
- Analgesia post delivery of fetus
- Anticipation of possible hemorrhagic complication post delivery and administration of oxytocin

Emergence:

- extubation when fully awake
- difficult intubation extubation precautions

Postoperative:

- Analgesia

- Anticipated Complications (not specific to prolapsed cord; but post partum complications):
  - PPH
  - AFE
  - PE

Pathophysiology:

- Overt Prolapse: fetal umbilical cord prolapse beyond the presenting part, often beyond the cervical os and into the vagina. Most common type of uterine cord prolapse. Requires ruptured membranes. Cord is overtly palpable or visible on examination.
- Occult prolapse: cord descends alongside but not beyond the presenting part, can occur with intact or ruptured membranes. Difficult to diagnose in antepartum period but can be characterized by fetal bradycardia.

Usually diagnosed by fetal bradycardia or non reassuring fetal heart rate. DDx includes: placenta abruption, uterine rupture, vasa previa, maternal hypotension

Epidemiology:

1. Incidence: 0.14-0.62% of all live births
2. Significant reduction in perinatal morbidity/mortality secondary to UCP likely secondary to prompt caesarean delivery after diagnosis and improvement in NICU care

Predisposing Factors:

1. Fetomaternal Factors contributing to inadequate filling of the maternal pelvis by the fetus
   i. Prematurity
   ii. Fetal malpresentation (worst with transverse > breech > vertex)
   iii. Multiple gestation (2nd twin, usually secondary to malpresentation)
   iv. Rupture of membranes (gush of fluid can carry cord beyond presenting part)
   v. Polyhydramnios: unengaged presenting part or unstable lie
   vi. Long umbilical cord
   vii. Pelvic anatomical abnormalities
2. Obstetrical intervention (disengagement of fetal head and high outward flow of amniotic fluid carrying cord with it)
   i. Artificial rupture of membranes
   ii. Fetal scalp electrode placement
   iii. Manual rotation of fetal head
   iv. Amnioreduction or infusion
   v. Forceps or vacuum
   vi. External cephalic version with ruptured membranes

References:

UpToDate.com; Management and Pathophysiology of Uterine Cord Prolapse
Stoeltings Anesthesia and Coexisting Disease
Chestnut's Obstetrical Anesthesia