Ex-utero Intrapartum Therapy (EXIT)

Labor and Delivery Nursing Guidelines

Purpose – provide fetal intervention during the intrapartum period prior to removing fetus from maternal support (placenta) to reduce morbidity from fetal to neonatal life transition by controlled uterine hypotonia to preserve uteroplacental circulation

Staff:

- OB Circulator nurse (scrub not necessary, but nice if available)
- OB Scrub
- Neonatal Scrub
- Faculty MFM; MFM physician for sonography; OB physician as assistant
- OB Anesthesia
- Neonatal/perinatal medicine team
- Fetal/neonatal surgery; specialty as indicated by procedure
- Pediatric surgery for thoracic mass
- ENT/pediatric anesthesia for airway as indicated

Indications: Suspected high risk of fetal airway obstruction at delivery

- Congenital high airway obstruction (CHAOS)
- Fetal neck mass
- Severe micrognathia
    - Usually in setting of glossoptosis and polyhydramnios
- Fetal thoracic mass with high risk of cardiovascular compromise at delivery
    - BPS/CPAM with hydrops/impending hydrops/cardiac compression
- EXIT to ECMO – congenital diaphragmatic hernia

Pre-op evaluation:

- Maternal CBC and type and screen and second ABO/Rh sample
- Set up blood for fetal transfusion– contact transfusion medicine
- Set up blood for maternal transfusion
- Antenatal corticosteroids as indicated
- Obtain EFW by US within 5 days of procedure
- Multidisciplinary team (including nursing) walk through prior to procedure as indicated

Equipment list in OR:

- GE US machine from triage
- Probe cover and US sterile drape with sterile and non-sterile conduction gel
- Amnioinfusion pump (level 1 infusion device), set AI pump at 1000cc/hr infusion rate, tubing, warmed LR (3 liters total please)
- ENT tower as applicable
- Pediatric surgery table/instruments
- Fetal intravenous line set up (for use on sterile field)
- Fetal/neonatal pulse ox lead/cable

- 1 cc syringe x 12
- Sterile labels/sterile marker
- Cesarean drape
- Cesarean instrument pack (instruments, lap sponges)
    - Cesarean delivery sutures
- Table cover
- Bandage
- Sequential compression device
- Uterine stapler (two boxes – 4 stapling devices)
- Amnioinfusion catheter

Medications:

- Fetal blood: O negative, leukocyte-reduced, CMV negative RBC's (transfusion medicine) for fetal transfusion
- Sterile saline
- Fetal medications available and labeled for MFM administration
    - Vecuronium – 0.1 mg/kg fetal weight
    - Pancuronium -0.1-0.3 mg/kg fetal weight
    - Fentanyl
    - Epinephrine - 1:10,000; 0.01-0.03mg/kg
    - Atropine
- pitocin (20units in 500cc for post procedure infusion)
- methergine 0.25mg IM
- carboprost 0.25mg IM for atony post delivery

Prep/positioning:

- Low lithotomy supine position with left lateral tilt (bovie pad not needed); allen-stirrups
- Place foley after spinal
- Cesarean prep and drape
- SCD's in place

Procedure briefly:

Prior to procedure: MFM: Ultrasound for placental location and presentation. Determine skin and uterine incision

Anesthesia: GET anesthesia in OR. Maintain baseline maternal BP and ensure stability prior to skin incision. Pre-incision antibiotics. Evaluation of placental location prior to uterine incision with US.

Hysterotomy: abdominal incision per maternal habitus and presentation. Uterine incision per presentation and placental location. Ensure uterine relaxation prior to incision, after bladder flap. Uterine relaxation with inhalation anesthesia, IV nitroglycerine (50 – 100 ug IV), or terbutaline (0.25mg IV, sc). Uterine incision started with 1cm incision; incision then extended with stapler. Amnion opened prior to incision and tacked to uterine wall, IUPC placed, and infusion started. Continuous fetal echo for fetal monitoring. Head and shoulders delivered to maternal left. Pulse ox placed on fetal hand and fetal IV placed as indicated.

For airway procedure:

Airway management: MFM with continuous cardiac echo for heart rate, ENT with evaluation for airway. At same time, as able neonatology place fetal pulse ox (normal >40% - 60-70%), and consider fetal IV. Stepwise procedure from direct laryngoscopy – rigid/flex bronchoscopy – tracheostomy. ENT and ENT scrub determine time and stepwise procedure planned for airway management. Monitor of uterine incision time by second circulator to indicate when next airway step should be performed. Consider ET, IV medication (epi 1:10,000 0.01-0.03mg/kg) for bradycardia. After airway secure, complete delivery and transfer baby to NCCC for continued care. Consider termination of EXIT for persistent fetal bradycardia not responsive to conservative measures.

For thoracic mass resection:

After delivery, removal of placenta. IV pitocin 20 units in 500cc for restoration of uterine tone. Methergine/carboprost prn for uterine atony. Consider B-Lynch suture for atony unresponsive to medication. Patient consented for hysterectomy/ transfusion.

Documentation:

- Nursing: .fetalprocedures

Specimen:

- Possible fetal cord blood for:
    - Karyotype, array, DNA extract and hold
    - PCR for parvo, CMV, toxo
- May have amniotic fluid for karyotype, array, save cells

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Post procedure – recovery – discharge:

- Usual post cesarean delivery care
- PACU recovery with transition to labor and delivery or post partum unit based on status during and after the procedure