Abruptio Placentae

Separation of the placenta from the decidua basalis before delivery of the fetus, occurring in ~1% of pregnancies and potentially resulting in massive hemorrhage requiring simultaneous assessment & management

ANESTHETIC CONSIDERATIONS:

1. Considerations of the Pregnant Pt:
    a. 2 patients
    b. potentially difficult airway
    c. rapid desaturation due to increased O2 consumption and decreased FRC
    d. aspiration risk and rapid sequence induction
    e. aortocaval compression
    f. physiologic changes of pregnancy
3. Complications of Abruption:
    a. Massive hemorrhage, DIC, & transfusion
    b. Maternal & fetal morbidity & mortality
4. Risk factors: trauma, cocaine / EtOH use, HTN, smoking, increased age / parity, PROM, history of prior abruption

ANESTHETIC GOALS:

- Optimize uteroplacental perfusion
- Maintain adequate circulating blood volume and coagulation factors
- Clear lines of communications regarding ongoing HD & coagulation status

HISTORY

- Hx / PE may be limited d/t emergent conditions and should be directed to evaluating urgency of intervention:
    - **Non-reassuring FHR**
    - **On-going blood loss**
    - **Maternal hypotension**
    - **Coagulopathy** (DIC) occurs in 10-20% of severe abruptions and is usually associated with fetal demise (rarely observed in live baby) although mild abruption can be associated with **hypofibrinogenemia** without DIC
    - **Any of these 4 = urgent / emergency and may r/o RA**
- AMPLE at minimum, if time permits standard obstetric history in addition to:
    - Risk factors: trauma, EtOH or cocaine use, HTN d/o
    - S&S:
        - Vaginal bleeding occurs in > 80% cases, however, assess for other causes of bleeding including placenta previa & uterine rupture
            - Amount of bleeding DOES NOT REFLECT EXTENT of hemorrhage since occult bleeding occurs
        - Abdominal / back pain occurs in 50% of cases
        - Uterine tenderness can also occur

PHYSICAL

- **HEENT – Airway exam:** Mallampati class, TM distance, neck ROM, AO extension, dentition
- **CVS -** Vaginal bleeding and firm, tender uterus; hypotension, tachycardia, low CVP & wedge pressures, decreased u/o
- **HEME -** Hypotension, tachycardia, bleeding from puncture sites, easy bruising
- **RENAL -** Signs of hypovolemia
- **UTERUS / VAGINA -** Tender, firm uterus; vaginal bleeding may be < CV signs and symptoms, indicating concealed hemorrhage
- **FETUS -** Fetal movement, HR

INVESTIGATIONS

- **Labs** immediately drawn:
    - CBC for Hb, Plts
    - X-match
    - DIC investigation: PLT, INR, PTT, fibrinogen, FDP
    - ABG: Hb, acid/base status, Ca, lactate
- **Imaging**
    - Fetal U/S (may be inaccurate since bleeding can show up as "thickened placenta")
- **Special**
    - FHR & tocodynometry

OPTIMIZATION

- Maternal & fetal resuscitation:
    - Supplemental O_2 (improves fetal oxygenation)
    - IV Fluid Bolus (improves uteroplacental perfusion)
    - LEFT LATERAL DECUBITUS positioning (avoid aortocaval compression to optimize placental perfusion)
    - Ephedrine / phenylephrine for hypotension (in addition to volume)
    - Uterine tone:
        - Stop oxytocin
        - Consider tocolytics (NTG 50 mcg boluses, $MgSO_4$, beta-2 agonists)
    - Consider steroids if 24-32 weeks
    - OR prep:
        - Mobilization of resources - RNs, surgeon, prep & drape
        - Aspiration prophylaxis
        - Topicalization of A/W if AFOI likely
- Aspiration prophylaxis

- Definitive management = delivery of the fetus and placenta
- Under certain circumstances, delivery may be delayed to allow fetal lung maturity if patient is preterm w/ minimal abruption and no fetal distress

ANESTHETIC OPTIONS

- Major decision point: options will be limited by:
  - Fetal distress
  - Hypovolemia
  - Coagulopathy
- Follow emergent C/S pathway if any of above r/o LEA & vaginal delivery
- Epidural analgesia appropriate if volume status can be maintained and if hemorrhage controllable
  - Technique not different from that for normal labor & vaginal delivery except that the smallest effective doses should be utilized
  - Combined spinal / epidural with narcotics and local anesthetic may be useful

ANESTHETIC SETUP

- **Drugs**
  - Standard emergency drugs & inotrope / pressor infusions
- **Equipment**
  - CAS monitors + 5-lead ECG
  - **2nd set of skilled hands**
  - Multiple large bore IVs
  - Foley
  - Warmers & rapid infusion device
  - Art-line & central access time permitting +/- PAC depending upon severity of hemorrhage; decreased u/o not responsive to simple fluid challenges

MANAGEMENT OF ANESTHESIA

- **Induction**
  - Aspiration prophylaxis, RSI w/ cricoid
  - Be prepared for occult hemorrhage resulting in hypotension post induction - consider ketamine 1-1.5 mg/kg instead of STP for induction
- **Maintenance**
  - Evaluate urgency of delivery and prepare for:
    - Massive blood loss w/:
      - At least 2 large-bore IVs
      - PRBCs
      - Coagulopathy: FFP, PLT, cryoprecipitate or Factor replacement
    - Requirement for multiple uterotonic agents:
      - Oxytocin boluses and infusion (20-40 mU in 1 L NS)
      - Hemabate (250 mcg IM or intramyometrial)
      - Ergot (0.2 mg IM; NOT in presence of HTN)
      - Couvelaire uterus may be resistant to uterotonic agents
    - Requirement for emergent hysterectomy or uterine artery ligation
- **Emergence**
  - Awake extubation required

DISPOSITION & MONITORING

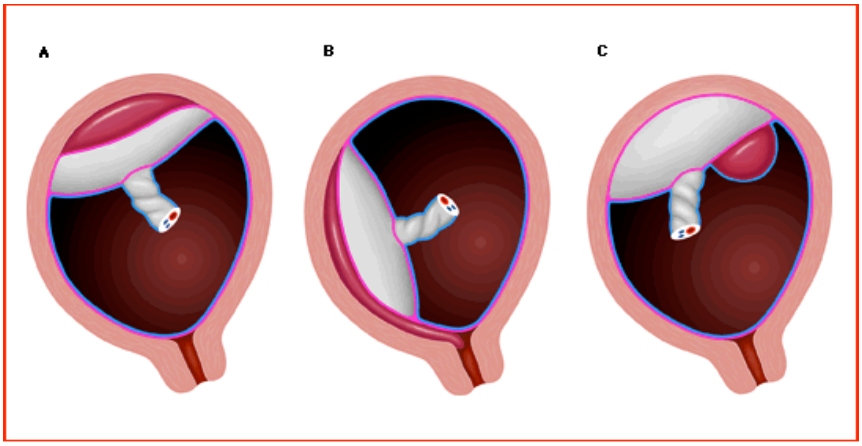
- Patient needs to be in an appropriately staffed & equipped recovery / ICU area
- Be alert for continuing uterine hemorrhage and / or development of coagulopathy
- Continue intraoperative monitoring

COMPLICATIONS

- Uncontrollable hemorrhage, DIC & massive transfusion in face of surgeon wanting to "save uterus"

PATHOPHYSIOLOGY

- Definition = premature separation of a normally implanted placenta
- 1:80 deliveries
- RF:
  - Cocaine use
  - Heavy EtOH use
  - HTN
  - Trauma
  - Smoking
  - Increased age / parity
  - Prior abruption
- Pathophysiology:
  - Normal maternal EBL w/ placental separation is limited by constriction of the spiral arteries of the decidua basalis due to contraction of the myometrium
  - Most abruptions are partial - only part of the placenta detaches from the uterus



Types of abruption (A) Concealed abruption with bleeding confined to the area behind the placenta. (B) Complete placental separation with subchorionic bleed dissecting between the chorion and endometrium; if separation involves only the margin of the placenta, it is called marginal abruption. (C) Subamniotic hemorrhage extends anterior to the placenta and is contained between the amnion and chorion, it is limited by reflection of the amnion on the placental insertion site of the umbilical cord. Subamniotic bleeding is rare. Rupture of the amnion and chorion may occur allowing blood from an abruption to flow into the amniotic cavity. red = hematoma, blue line = amnion, pink line = chorion. Modified from Trop, I, Levine, D. Hemorrage During Pregnancy: Sonography and MR Imaging. AJR Am J Roentgenol

    - Unfortunately, the uterus can't "selectively" constrict only the abrupted area, thus on-going maternal blood loss can result
    - The decrease in placental surface area may also result in fetal asphyxia
    - The massive blood loss can result in a coagulopathy:
        - Thrombocytopenia
        - Decreased fibrinogen
        - Decreased Factors V & VIII
        - Eventually DIC may result w/ fibrin-split products secondary to activation of:
            - Circulating plasminogen
            - Placental thromboplastin
- Outcomes:
    - 90% = mild or moderate abruptions w/out significant HD problems
    - 10% = severe abruptions:
        - 1 in 750 deliveries = fetal demise, accounting for about 15% of third trimester stillbirths
            - 20% of deaths occur *in utero* prior to hospital presentation
        - Severe neurologic damage may occur in surviving neonates
        - 10% - 20% have DIC
- Vaginal blood loss can be deceptive as > 3000 cc of blood can be sequestered behind the placenta in a concealed hemorrhage
- Massive blood loss can occur b/c:
    - Inability of uterus to selectively constrict abrupted area before placenta is delivered
    - Blood infiltrating the myometrium may result in a "Couvelaire" uterus, preventing adequate uterine contraction even following delivery
    - Coagulopathy