Educational Topic 23: Third Trimester Bleeding

Rationale: Bleeding in the third trimester requires prompt evaluation and management to reduce maternal and fetal morbidity and mortality.

Intended Learning Outcomes:

A student should be able to:

- List the causes of third trimester bleeding
- Describe the initial evaluation of a patient with third trimester bleeding
- Differentiate the signs and symptoms of third trimester bleeding
- List the maternal and fetal complications of placental previa and abruption placenta
- Describe the initial evaluation and management plan for acute blood loss
- List the indications and potential complications of blood product transfusion

TEACHING CASE

CASE: A 25-year-old G2P1 woman at 32 weeks gestation is brought to labor and delivery by her husband. About an hour before, she was watching television when she noted a sudden gush of bright red blood vaginally. The bleeding was heavy and soaked through her clothes, and she has continued to bleed since then. She denies any cramps or abdominal pain. She says that her last sexual intercourse was a week ago. A review of her prenatal chart finds nothing remarkable other than a borderline high blood pressure from her first prenatal visit that has not required medication. There is no mention of bleeding prior to this episode. She had an ultrasound to confirm pregnancy at 14 weeks, but none since.

Physical examination reveals an extremely pale woman whose blood pressure is 98/60, pulse 130, respirations 30, temperature 99°F. Her abdomen is soft without guarding or rebound to palpation, and the uterus is nontender and firm, but not rigid. Fundal height is 33cm. Fetal heart tones are in the 140s with good variability. The external monitor reveals uterine irritability, but no discrete contractions are seen. There is a steady stream of bright red blood coming from her vagina.
COMPETENCY-BASED DISCUSSION & KEY TEACHING POINTS:

Competencies addressed:
- Patient Care
- Medical Knowledge
- Systems-Based Practice

1. What is your differential diagnosis for potential causes of bleeding for this patient?

- Placental abruption
- Placenta Previa
- Vasa Previa
- Genital lacerations/trauma (e.g. labial, vaginal or cervical)
- Foreign body
- Cervical/vaginal cancer
- Cervicitis
- Bloody show

2. What steps would you take to evaluate this patient?

The key teaching points for this question is for the student to discuss a systematic approach to patient evaluation, which includes not only identifying the etiology of the bleeding, but also evaluation of both the maternal and fetal status.

- Assess maternal hemodynamic status:
  - Serial vital signs
  - Hematologic studies to assess for acute anemia and DIC
- Confirm placental location
  - Avoid digital cervical exam
  - Sonographic evaluation of placental location
- Assess fetal status:
  - Continuous external heart rate monitor or sonographic biophysical assessment
  - Kleihauer-Betke test for maternal-fetal hemorrhage

3. What signs and symptoms would help you differentiate the potential causes of the bleeding?

The key-learning outcome for this question is for the student to list the primary clinical characteristics that differentiate abruption and previa and discuss the epidemiology and risk factors for each.

- **Placental abruption**:
  - Epidemiology:
    - Separation of the placenta from the uterine wall prior to delivery of the fetus
    - Occurs in 1 in 100 births
    - Accounts for approximately 30% of cases of third trimester bleeding
    - 25% recurrence risk in a subsequent pregnancy
• Risk factors:
  - Hypertension (chronic or gestational)
  - Cocaine use/smoking
  - Abdominal trauma
  - Sudden uterine decompression (as with rupture of membranes)
  - Preterm premature rupture of membranes

• Clinical presentation:
  - Frequent uterine contractions or hypertonicity
  - Vaginal bleeding (sometimes catastrophic)
  - Non-reassuring fetal heart rate tracing
  - Hypofibrinogenemia supports the diagnosis
  - Disseminated intravascular coagulation occurs in 10% to 20% of severe abruption

• Placenta previa:
  • Epidemiology:
    - Occurs when placental tissue covers the cervical os.
    - Central or total placenta previa – placenta completely covers the os
    - Partial placenta previa – placenta partially covers the os (os must be partially dilated)
    - Marginal previa - the placental edge is adjacent to the os, but does not cover it
    - Low-lying placenta - the placenta approaches the os, but is not at its edge.
    - At 24 weeks, about 1 pregnancy in 20 will demonstrate ultrasound evidence of a placenta previa
    - At 40 weeks, the incidence decreases to 1 in 200
    - Accounts for approximately 20% of cases of third trimester bleeding
  • Risk factors:
    - Prior cesarean delivery
    - History of myomectomy
    - Increasing number of uterine curettages
    - Increased parity
    - Multiple gestation
    - Advanced maternal age
    - Smoking
  • Clinical presentation:
    - Bleeding is usually painless and may occur after intercourse
    - Patients may also present with contractions, thus ultrasonography is critical to differentiating from abruption

• Vasa previa:
  • Epidemiology:
    - Fetal vessels of a velamentous cord insertion cover the cervical os
    - Incidence is less than 1% of all pregnancies
  • Risk factors:
    - Multiple gestations: up to 11% in twins and up to 95% in triplets
  • Clinical presentation:
    - The diagnosis is suggested by painless vaginal bleeding in the absence of evidence of placenta previa or abruption.
• **Other causes:** causes of 3rd trimester bleeding such as cervicitis, cervical erosions, trauma, cervical cancer, foreign body or even bloody show can usually be differentiated on physical exam once the preceding etiologies are ruled out.

4. **What steps would you take to manage the low blood pressure and tachycardia that the patient is displaying?**

The key-learning outcome for this question is for the student to recognize the signs and symptoms suggestive of evolving shock related to acute blood loss and discuss the tenets of management that should include:

- Ensure adequate airway and assess vitals
  - Serial blood pressure, heart rate, and respirations
  - Continuous oxygen saturation monitor
- Establish adequate IV access
  - 2 large bore IVs or central venous line
- Monitor blood and coagulation profiles
  - Serial CBC and platelet counts
  - Serial prothrombin time, partial thromboplastin time, and fibrinogen
- Volume resuscitation
  - Crystalloid
  - Packed red blood cells
  - Platelets, fresh frozen plasma and cryoprecipitate as indicated
- Monitor vitals and response to therapy:
  - Serial blood pressure, heart rate, and respirations
  - Continuous oxygen saturation monitor
  - Continuous urine output assessment via indwelling Foley catheter
- Management of the patient with significant 3rd trimester hemorrhage, when the fetus is mature, is hemodynamic stabilization and delivery
  - Vaginal delivery is generally precluded in the setting of abruption with persistent hemodynamic instability
  - Cesarean delivery is required for all cases of previa and vasa previa

5. **Under what circumstances would you consider blood product transfusion?**

The key teaching points for this question is for the student to list the possible parameters for blood transfusion, in addition to listing the common transfusion complications:

- **Indications for blood product transfusion**
  - Acute blood loss of 30-40% blood volume
  - Chronic blood loss with hemoglobin <6g/dL or <10 g/dL in patients with cardiovascular or pulmonary problems
  - Abnormalities of the coagulation system
    - Fibrinogen < 150 mg/dL
    - Prolongation of PTT
    - Platelets < 20,000
    - Platelets < 50,000 and cesarean delivery
- Blood products

<table>
<thead>
<tr>
<th>Product (mL)</th>
<th>Contents</th>
<th>Uses and effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Blood (1 unit = 500mL)</td>
<td>All components</td>
<td>Rarely used. Only in the setting of massive bleeding</td>
</tr>
<tr>
<td>Packed RBC (1 unit = 350 mL)</td>
<td>RBC only</td>
<td>One unit increased hematocrit by 3 percentage points</td>
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<tr>
<td>Frozen plasma (1 unit = 200–300 mL)</td>
<td>All clotting factors, no platelets</td>
<td>Use for deficiencies in multiple clotting factors. One unit of FFP increased fibrinogen by 7-10 mg/dL</td>
</tr>
<tr>
<td>Cryoprecipitate (1 bag = 10-15 mL)</td>
<td>Fibrinogen, factors VIII, XIII, vWF</td>
<td>Ten bags of cryoprecipitate will raise plasma fibrinogen by 70 mg/dL in a 70 kg recipient</td>
</tr>
<tr>
<td>Platelets (1 unit = 50mL)</td>
<td>Platelets</td>
<td>Six units of whole blood-derived or one unit of apheresis-derived platelets will raise the platelet count by approximately 30,000/µL</td>
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- Complications
  - Febrile non-hemolytic and chill-rigor reactions
  - Acute hemolytic reaction due to ABO incompatible transfusion
  - Delayed hemolytic transfusion reaction
  - Transfusion-related acute lung injury
  - Allergic reactions to unknown blood components
  - Volume overload
  - Graft vs. Host Disease (GVHD)
  - Infectious complications (HIV, Hep B, Hep C, etc)

REFERENCES
