Placenta Previa

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ABSTRACT:

Audience: Emergency medicine residents and new residency graduates preparing for oral board examinations.

Introduction: Placenta previa is a serious cause of vaginal bleeding in the second half of pregnancy that can have potentially life-threatening effects including maternal or fetal hemorrhage, distress or death of the fetus.

Objectives: By the end of this oral board case, the learner will be able to:

1. List the potential causes of vaginal bleeding in pregnancy after 20 weeks including placental abruption, placenta previa and vasa previa.
2. Describe the bedside stabilization and evaluation in a pregnant patient with vaginal bleeding after 20 weeks.
    a. Stabilize the mother (patient) including placing two large bore intravenous (IV) lines, administer an IV fluid bolus, obtaining complete blood count (CBC), coagulation studies, and type & cross matching blood.
    b. Transvaginal ultrasound to determine the placental location.
    c. Sterile speculum examination. A digital or speculum pelvic examination should NOT be performed until a transvaginal ultrasound is performed to determine placental location. The resident should understand that performing a digital or speculum exam in a patient with placenta previa or vasa previa can cause or exacerbate hemorrhage. If these two conditions are not present on ultrasound, then a sterile speculum exam may be performed to further examine the bleeding.
3. Contrast the typical presentation of placenta previa with that of placental abruption.
    a. Placenta Previa usually causes painless vaginal bleeding. Part of the placenta is located near or over the internal cervical orifice.
    b. Placental Abruption usually causes painful vaginal bleeding. There is premature separation of the placenta from the uterine lining.

4. Describe the appropriate disposition of a patient with a pregnancy over 20 weeks with vaginal bleeding. After initial workup and stabilization these women are usually admitted for fetal monitoring, observation and consultation by the obstetrician (OB/gyn).

Methods: Oral boards case

Topics: Vaginal bleeding, pregnancy complications, placental abruption, placenta previa, vasa previa, OB/gyn, obstetrics.

USER GUIDE

List of Resources:

Learner Audience:
Medical students, interns, junior residents, senior residents, midwives, advanced practice providers.

Time Required for Implementation:
Case: 20 minutes
Debriefing: 5-10 minutes
Learners per instructor: 3:1

Topics:
Vaginal bleeding, pregnancy complications, placental abruption, placenta previa, vasa previa, OB/gyn, obstetrics.

Objectives:
By the end of this oral board case, the learner will be able to:

1. List the potential causes of vaginal bleeding in pregnancy after 20 weeks including placental abruption, placenta previa and vasa previa.
2. Describe the bedside stabilization and evaluation in a pregnant patient with vaginal bleeding after 20 weeks.
3. Contrast the typical presentation of placenta previa with that of placental abruption.
4. Describe the appropriate disposition of a patient with a pregnancy over 20 weeks with vaginal bleeding.

Linked objectives and methods:
The resident must demonstrate management of a female patient with a pregnancy over 20 weeks with vaginal bleeding. This includes all of the following without assistance by any faculty or other educational resources:

1. Performance of a history and physical examination.
2. Stabilization of the patient (objective 2).
3. List the differential diagnoses (objective 1).
4. Avoidance of a speculum or bimanual pelvic examination until a transvaginal ultrasound is performed and placenta previa is ruled out.
5. Determine the correct disposition (objective 4).

The oral board format allows the faculty to observe the resident in a simulated real-time environment having to make decisions and recall information under some pressure due to performing in front of an audience. This environment is good preparation for the oral board certification test after residency. During debriefing the instructor can clarify any points of confusion or errors and contrast the typical presentation of placenta previa with that of placental abruption (objective 3).

Recommended pre-reading for instructor:

- Young JS. Maternal emergencies after 20 weeks of pregnancy and in the postpartum period. In: Tintinalli JE, Stapczynski J, Ma O, Yealy DM, Meckler GD, Cline DM, eds. *Tintinalli's Emergency Medicine: A Comprehensive Study Guide*. 8th ed. New York, NY: McGraw-Hill; 2016:3048-3055.

Results and tips for successful implementation:

- This case works well for oral board examination. One resident is presented with the case introduction, including a brief story of the patient's chief complaint and method of arrival (private vehicle). The resident asks for further details and desired data points from the faculty member who has the full case information. The resident must ask for any desired information including vital signs and test results. They must voice any interventions they wish to perform on the patient including initial stabilization, giving any fluids or medications, and calling for admission.
- I used this case with multiple residents during didactics when we had a rotating case station oral boards simulation. I found that most of them did not know they were not supposed to perform a sterile speculum or digital pelvic examination prior to obtaining a transvaginal pelvic ultrasound to determine the placental location. That was the main critical error and teaching point most of them gleaned from this case. The other main teaching point was just knowing the differential diagnosis of bleeding after 20 weeks in pregnancy and the typical symptoms of each of these diagnoses.

Pearls:

- What are the steps in evaluating and examining a patient in the 2nd half of pregnancy with bleeding?
  - Stabilize the mother (patient.)
  - May do transabdominal ultrasound at bedside if machine available to estimate fetal age.
  - Must do a formal transvaginal ultrasound prior to doing a speculum or digital pelvic examination to determine location of placenta. A speculum or bimanual exam may induce significant, even fatal, hemorrhage.
  - If transvaginal ultrasound does not show

placenta previa or vasa previa then sterile speculum may be performed to evaluate the extent of bleeding, to assess for rupture of membranes, and to visualize the cervix.

- What is the differential diagnosis for vaginal bleeding over 20 weeks?
    - Placenta previa
    - Vasa previa.
    - Placental abruption
- What are the usual symptoms of placental abruption?
    - Symptoms are dependent on the degree of abruption; however, they typically include: vaginal bleeding, lower abdominal or back pain, uterine tenderness, and fetal distress. Other symptoms may include uterine contractions or premature labor, maternal hypotension or tachycardia, coagulopathy, nausea and vomiting. A high index of suspicion for placental abruption should be maintained for pregnant females presenting with complaints of acute lower abdominal pain with or without vaginal bleeding.
- What causes placental abruption?
    - The cause is usually unknown but can be associated with trauma including domestic violence. Consider this diagnosis even in minor trauma. Documented additional risks include the following: substance abuse, smoking, advanced maternal age, multiparity, eclampsia, chronic or acute hypotension, oligohydramnios, and chorioamnionitis.
- How do you diagnose placental abruption?
    - The diagnosis is made clinically but fetal monitoring should be performed to evaluate for fetal distress. Fetal distress is highly sensitive for this condition.
    - Transvaginal ultrasound is used to exclude placenta previa but generally is not sensitive in detection of placental abruption. Ultrasound can detect a retroplacental hematoma. MRI is diagnostic, however this requires moving a potentially unstable patient outside of the ED to obtain imaging.
- What are the typical symptoms in placenta previa?
    - Painless bright red vaginal bleeding.
- What are risks for placenta previa?
    - Advanced maternal age, previous uterine surgeries (including Cesarean section), minority group or low socioeconomic status, smoking and cocaine use.
- What is vasa previa?
    - Vasa previa is a condition in late pregnancy in which the fetal blood vessels are positioned in the amniotic membrane within the cervix. This complication usually occurs during delivery when the cervix is dilated which causes the vessels to tear or become compressed. This may result in fetal hemorrhage, distress, and demise. This condition is extremely rare and can occasionally be diagnosed in early pregnancy by ultrasound.
- What is the treatment for these conditions?
    - The emergency department treatment should include stabilizing the mother, assessing for fetal distress using cardiotocographic monitoring and consulting obstetrics.

References/suggestions for further reading:

1. Young JS. Maternal emergencies after 20 weeks of pregnancy and in the postpartum period. In: Tintinalli JE, Stapczynski J, Ma O, Yealy DM, Meckler GD, Cline DM, eds. *Tintinalli's Emergency Medicine: A Comprehensive Study Guide*. 8th ed. New York, NY: McGraw-Hill; 2016:3048-3055.
2. Gaufberg SV. Emergent management of abruptio placentae. In: Lo BM, ed. Medscape. WebMD LLC. https://emedicine.medscape.com/article/795514-overview. Updated December 29, 2015. Accessed October 14, 2017.
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FOR EXAMINER ONLY

Oral Case Summary

Diagnosis: Placenta Previa

Case Summary: 27-year-old female, G5P1SA3, presents ambulatory with complaint of vaginal bleeding for the past 3 days. She states the bleeding is bright red in color and she is filling about 1 pad/hr. She denies any abdominal pain. She estimates she is about 4 months pregnant but has had no prenatal care and does not know her estimated due date.

Review of Systems:
General: No fever or chills.
Head, eyes, ears, nose, throat (HEENT): No headaches or visual changes.
Cardiovascular: No chest pain.
Pulmonary: No shortness of breath or cough.
Gastrointestinal: No abdominal pain. Some nausea & vomiting.

Medications: Prenatal vitamin.

Allergies: No known drug allergies

Primary care physician: None

Past medical history: none

Past surgical history: none

Physical examination:
Vital signs: Temperature (Temp) 98, heart rate (HR) 110, blood pressure (BP) 105/75, respiratory rate (RR) 12, oxygen saturation (O_2sat) 99%.
Positive for gravid abdomen. Non-tender, no rebound, guarding or peritoneal signs. Normal bowel sounds.

Point of care ultrasound: Fetal heart tones (FHT) are 120. Head circumference approximately 20 weeks.

Order of Case:

1. Initial interview including history and physical exam.

   a. Learner should ask for a set of vitals.
      i. Nurse reports a Temperature 98, pulse 110, blood pressure 105/75, respirations 12, oxygen saturation is 99%.
2. Initial stabilization should include placement of a large bore peripheral IV, a bolus of IV fluids to address the tachycardia and recent vomiting, labs should be ordered including CBC, Type & Rh, coagulation studies, and possibly urinalysis and complete metabolic panel (CMP), the patient should be placed on the heart monitor and pulse oximetry.
3. Learner may do a bedside ultrasound (if available) to estimate gestational age of baby since the mother is unsure.
4. Learner should order a formal transvaginal ultrasound to evaluate the location of the placenta. Pelvic examination should not be done until after the ultrasound. If resident performs a pelvic exam the patient should hemorrhage and start declining and become unstable. (BP will decrease, HR will increase, becomes anxious with more pain, and decreased level of consciousness.)
5. Learner should have a working differential at this point including the 3 causes of vaginal bleeding in the pregnant female greater than 20 weeks.
6. Learner may contact OB/gyn services at this point to start arranging transfer.
7. Ultrasound shows placenta covering the os. Doctor should not do speculum exam or sterile bimanual exam. If resident performs a pelvic exam the patient should hemorrhage and start declining and become unstable. (Blood pressure will decrease, heart rate will increase, becomes anxious with more pain, and decreased level of consciousness.)
8. Learner must admit to the OB/gyn services for further monitoring and observation.

Disposition: Doctor must admit to the OB/gyn services for further monitoring and observation.

Critical Actions:

1. Ordering a stat transvaginal ultrasound to determine placenta location.
2. Ordering a blood type and Rh.
3. Avoidance of a speculum or digital pelvic examination prior to transvaginal ultrasound.
4. Admission to OB/gyn service for further observation & fetal monitoring.

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Historical Information

Chief Complaint: Vaginal bleeding

History of present illness: 27-year-old female, G5P1SA3, presents ambulatory with complaint of vaginal bleeding for the past 3 days. She states the bleeding is bright red in color and she is filling about 1 pad/hr. She denies any abdominal pain. She estimates she is about 4 months pregnant but has had no prenatal care and does not know her estimated due date. She has had some vomiting in the mornings for several weeks.

Past Medical history: G5P1SA3
Past Surgical history: None
Patients Medications: Prenatal Vitamins
Allergies: None.
Social history:

- Smoking: 1 pack per day but trying to cut down
- Alcohol use: none
- Drug use: none

Family history: Father with heart disease. Mother with thyroid problems.

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Physical Exam Information

Vitals: Heart rate (HR) 110 Blood pressure (BP) 105/75 Respiratory rate (RR) 12
Temperature (T) 98.0°C Oxygen saturation (O_2Sat) 99% on RA (room air)

General appearance: awake, alert, answers questions appropriately

Primary survey:

- **Airway:** speaking normal, no distress
- **Breathing:** lungs clear to auscultation bilaterally
- **Circulation:** good color and temperature of all 4 extremities, pulses present and equal in all 4 extremities

Physical examination:

- **General appearance:** awake, alert, answers questions appropriately, no distress, good color, no diaphoresis
- **HEENT:** within normal limits
- **Neck:** supple neck, no nuchal rigidity
- **Chest:** lungs clear to auscultation bilaterally, no wheezes, rhonchi or rales
- **Cardiovascular:** tachycardic, within normal limits
- **Abdominal/GI:** positive for gravid abdomen, no rebound, guarding or peritoneal signs, bowel sounds present
- **Genitourinary:** blood coming from vagina. Pelvic exam should be deferred for patient safety. If pelvic exam performed large amount of maroon colored blood will be flowing from the os, too much blood to visualize the os.
- **Rectal:** within normal limits
- **Extremities:** within normal limits
- **Back:** within normal limits
- **Neuro:** Glascow coma scale (GCS) 15, within normal limits, including the absence of clonus.
- **Skin:** No rash, bruising, purpura or petechia
- **Lymph:** within normal limits
- **Psych:** slightly anxious and seems tearful secondary to pain

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Critical Actions and Cueing Guidelines

1. **Ordering a stat transvaginal ultrasound to determine placenta location.**
    a. Cueing Guidelines:
    Patient asks “is my baby alright?”

2. **Order a blood type and Rh**
    a. Cueing Guidelines:
    The nurse asks you “do I need to send any blood work?”

3. **Avoidance of a speculum or digital pelvic examination prior to the transvaginal ultrasound.**
    This is important to avoid in placenta previa because it could cause life- threatening bleeding.

4. **Admission to OB/gyn services for further observation & fetal monitoring.**
    a. Cueing Guidelines:
    Patient asks the learner “Doctor what are we going to do? I’m worried about my baby? Can I go home?”

ORAL BOARDS ASSESSMENT

Placenta Previa

Learner: _____

Critical Actions:

- ☐ Ordering a stat transvaginal ultrasound to determine placenta location.
- ☐ Ordering a blood type and Rh.
- ☐ Avoidance of a speculum or digital pelvic examination.
- ☐ Admission to OB/gyn services for further observation & fetal monitoring.

Summative and formative comments:

Milestone assessment:

	Milestone	Did not achieve level 1	Level 1	Level 2	Level 3
1	**Emergency Stabilization (PC1)**	☐ Did not achieve Level 1	☐ Recognizes abnormal vital signs	☐ Recognizes an unstable patient, requiring intervention Performs primary assessment Discerns data to formulate a diagnostic impression/plan	☐ Manages and prioritizes critical actions in a critically ill patient Reassesses after implementing a stabilizing intervention
2	**Performance of focused history and physical (PC2)**	☐ Did not achieve Level 1	☐ Performs a reliable, comprehensive history and physical exam	☐ Performs and communicates a focused history and physical exam based on chief complaint and urgent issues	☐ Prioritizes essential components of history and physical exam given dynamic circumstances

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Carrick A. Placenta Previa. JETem 2017. 2(4):O1-18. https://doi.org/10.21980/J8J911

ORAL BOARDS ASSESSMENT

Placenta Previa

Learner: _____

	Milestone	Did not achieve level 1	Level 1	Level 2	Level 3
3	**Diagnostic studies (PC3)**	☐ Did not achieve Level 1	☐ Determines the necessity of diagnostic studies	☐ Orders appropriate diagnostic studies Performs appropriate bedside diagnostic studies/procedures	☐ Prioritizes essential testing Interprets results of diagnostic studies Considers risks, benefits, contraindications, and alternatives to a diagnostic study or procedure
4	**Diagnosis (PC4)**	☐ Did not achieve Level 1	☐ Considers a list of potential diagnoses	☐ Considers an appropriate list of potential diagnosis May or may not make correct diagnosis	☐ Makes the appropriate diagnosis Considers other potential diagnoses, avoiding premature closure
5	**Pharmacotherapy (PC5)**	☐ Did not achieve Level 1	☐ Asks patient for drug allergies	☐ Selects an appropriate medication for therapeutic intervention, considering potential adverse effects	☐ Selects the most appropriate medication(s) and understands mechanism of action, effect, and potential side effects Considers and recognizes drug-drug interactions
6	**Observation and reassessment (PC6)**	☐ Did not achieve Level 1	☐ Reevaluates patient at least one time during the case	☐ Reevaluates patient after most therapeutic interventions	☐ Consistently evaluates the effectiveness of therapies at appropriate intervals
7	**Disposition (PC7)**	☐ Did not achieve Level 1	☐ Appropriately selects whether to admit or discharge the patient	☐ Appropriately selects whether to admit or discharge Involves the expertise of some of the appropriate specialists	☐ Educates the patient appropriately about their disposition Assigns patient to an appropriate level of care (ICU/Tele/Floor) Involves expertise of all appropriate specialists

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ORAL BOARDS ASSESSMENT

Placenta Previa

Learner: _____

	Milestone	Did not achieve level 1	Level 1	Level 2	Level 3
22	**Patient centered communication (ICS1)**	☐ **Did not achieve level 1**	☐ **Establishes rapport and demonstrates empathy to patient (and family)** **Listens effectively**	☐ **Elicits patient's reason for seeking health care**	☐ **Manages patient expectations in a manner that minimizes potential for stress, conflict, and misunderstanding.**
23	**Team management (ICS2)**	☐ **Did not achieve level 1**	☐ **Recognizes other members of the patient care team during case (nurse, techs)**	☐ **Communicates pertinent information to other healthcare colleagues**	☐ **Communicates a clear, succinct, and appropriate handoff with specialists and other colleagues** **Communicates effectively with ancillary staff**

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Stimulus Inventory

#1 Patient Information Form

#2 Complete blood count (CBC)

#3 Type and Rh

#4 Urinalysis

#5 Transvaginal ultrasound report

Stimulus #1

Patient Information

Patient's Name: **Ms. Robinson**

Age: **27**

Gender: **Female**

Chief Complaint: **Vaginal bleeding**

Person Providing History: Patient

Vital Signs:

Temp: **98.0°F**

BP: **105/75**

P: **110**

RR: **12**

Pulse Ox: **99% on room air**

Stimulus #2

Complete blood count

WBC	**9,000/mm^3**
Hgb	**10 g/dL**
Hct	**30 %**
Platelets	**200 x 10^3/mm^3**

Differential

Neutrophils	**55%**
Lymphocytes	**40%**
Monocytes	**5%**
Eosinophils	**0%**
Bands	**0%**

Stimulus #3

Type & Rh

O Positive

Stimulus #4

Urinalysis

Appearance	**bloody**
Color	**red**
Glucose	**Neg**
Ketones	**trace**
Sp Gravity	**1.03**
Blood	**too numerous to count**
pH	**7.0**
Protein	**large**
Nitrite	**Neg**
Leukocyte	**trace**
WBC	**0-5/HPF**
RBC	**too numerous to count**
Squamous Cells	**10/HPF**
Bacteria	**None**
Upreg	**Neg**
Urine Toxicology	**Neg**

Stimulus #5

Transvaginal Ultrasound Reports

Live intrauterine single fetus measuring 20 weeks, 4 days. Fetal heart tones at 120. Placenta partially covering the internal os consistent with placenta previa.