Essential Learning

First Trimester Bleeding

- **What is the epidemiology of first trimester vaginal bleeding?**
  - First trimester vaginal bleeding affects nearly 1 in 4 pregnant women. A critical aspect of care is to recognize an ectopic pregnancy.
  - Nearly half of patients with first trimester vaginal bleeding experience a miscarriage; those who go on to have a successful pregnancy have an increased risk for early delivery and low birth weight infants. However if fetal cardiac activity is noted on ultrasound, the risk of miscarriage drops to 5-10% (though percentage is higher if a history of recurrent miscarriages exists).
  - Miscarriages are most often due to chromosomal abnormalities or uterine abnormalities and typically occur between 8 to 12 weeks gestation.

- **What are the different classifications of miscarriage?**
  - **Threatened:** vaginal bleeding while pregnant with a closed internal os
  - **Inevitable:** vaginal bleeding while pregnant with an open internal os
  - **Incomplete:** products of conception (POC) are visible at the cervical os or in the vagina
    - May evolve to septic miscarriage
  - **Completed:** all POC are expelled, both internal and external os are closed and uterus is contracted
  - **Missed:** no bleeding, os closed, non-viable embryonic structures intact
  - **Blighted Ovum:** gestational sac without any embryonic structures

- **What are key aspects of the history in a patient with first trimester vaginal bleeding?**
  - Time since last menstrual period (LMP)
  - Previous pregnancies and their courses
  - Degree and duration of bleeding
  - Characterizing any symptoms of pain, fever, or symptomatic anemia
  - Assessment of ectopic pregnancy risk factors: previous ectopic pregnancy, history of STI, history of infertility, smoking, previous PID, IUD use, history of tubal ligation

- **What are key aspects of the physical exam in a patient with first trimester vaginal bleeding?**
  - Abdominal exam with particular attention to signs of peritonitis and abdominal masses
  - Pelvic exam to assess the external and internal cervical os, degree of bleeding, presence of POC, uterine and adnexal size and tenderness
    - In hemodynamically stable patients with mild-moderate bleeding, pelvic exam may not be necessary as long as transvaginal ultrasound is performed
  - Some texts recommend gentle probing of the internal os with ring forceps to determine if the internal os is open or closed – this is NOT required
    - Do not penetrate more than 2 cm
    - Do not attempt beyond the first trimester
    - An open external os is not significant

- **What is the minimum laboratory work-up for a patient with first trimester vaginal bleeding?**
  - CBC
  - Rh type if unknown
  - Quantitative ß-hCG
  - Send any suspected POC/fetal tissue to pathology

- **What is the role of ultrasound in first trimester vaginal bleeding?**
  - *o* ACEP's clinical policy is to perform or obtain a pelvic ultrasound for symptomatic pregnant patients (presenting with abdominal pain and/or vaginal bleeding) with any β-hCG level (2018 Level B recommendation)
  - **o** All patients with an indeterminate ultrasound and positive ß-hCG require OB/GYN consultation or close follow-up for repeat ß-hCG and ultrasound testing (2018 Level C recommendation)
  - **o** The discriminatory zone is the level of β-hCG above which an intrauterine pregnancy should successfully be visualized on an ultrasound
    - The discriminatory zones for transvaginal ultrasound vary by institution but are typically ß-hCG values of 1,000 to 2,000 mIU/mL
    - Please see POCUS pearls (below) for further discussion about using discriminatory zone in clinical practice

- **What is the management of a patient with first trimester vaginal bleeding?**
  - **o** Assess hemodynamics
    - Unstable patients require dual large-bore IV access and immediate OB/GYN consultation
    - Replace blood loss if clinically indicated
  - **o** Obtain labs as described above
    - Unstable patients should have a type and crossmatch ordered
  - o Obtain transvaginal ultrasound
  - o Attempt to exclude ectopic pregnancy
  - **o** Determine need for anti-D immune globulin (Rhogam)
  - **o** Expectant management is usually sufficient for a stable patient with threatened miscarriage and without signs of infection. Miscarriage may take up to 8 weeks to complete.
  - o Treatment options for incomplete miscarriage include expectant management, medical management (misoprostol), or surgical evacuation (D&C)
    - Treatment options may be subject to state laws and restrictions

- **Why does anti-D immune globulin (Rhogam) need to be given?**
  - **o** It is used to prevent Rh-D alloimmunization, which occurs in 1.5-2% of 1st trimester miscarriages
  - **o** Rh-D alloimmunization occurs when Rh- mothers are exposed to Rh+ fetal blood. Rh- mothers develop auto-antibodies to Rh+ antigens.
    - Subsequent Rh+ fetuses are at increased risk for miscarriage and hemolytic disease of the fetus and newborn
  - **o** All Rh- patients with first trimester vaginal bleeding should receive 50 mcg if < 12wks, 300 mcg if >12wks anti-D immune globulin
    - Higher dose is acceptable at any gestational age

- **When should OB/GYN be consulted?**
  - All unstable patients
  - Moderate to severe uncontrolled bleeding
  - All ectopic pregnancies
  - Patients who desire medical or surgical management of a miscarriage
  - Suspected PID

- **What should patients be counseled on regarding threatened miscarriage?**
  - For many, the experience of a miscarriage may be marked by anxiety, grief, and guilt among other emotions; psychological support resources should be offered.
  - Counsel that miscarriage or threatened miscarriage is blameless.
  - Patients should avoid tampons and intercourse for 2 weeks but may otherwise resume usual activities.
  - Patients should be given red flag symptoms for ED return (uncontrolled bleeding, severe pain, fever).
  - Close outpatient follow-up with OB/GYN

- **POCUS Pearls**
  - An early IUP is identified on ultrasound by a yolk sac or fetal pole within a uterine gestational sac. (See **Figure 211.1, Figure 211.2, Figure 211.3**)
  - A life-threatening ectopic pregnancy may be associated with a low β-hCG. The clinician should not be dissuaded from ordering a transvaginal ultrasound based on a low β-hCG level if concerned for ectopic pregnancy.
  - There have been cases where normal pregnancies were terminated by mistake with methotrexate based on use of a discriminatory threshold (as noted above, this is a term used to describe a β-hCG level beyond which an intrauterine pregnancy should be visible on transvaginal ultrasound).
  - According to diagnostic and management guidelines published in NEJM in 2013, presumptive treatment for ectopic pregnancy should not be undertaken if there is no intrauterine fluid collection, normal (or near-normal) adnexa on ultrasonography, and a single β-hCG measurement is < 3000 mIU/mL.
  - If there is no intrauterine fluid collection, normal (or near-normal) adnexa on ultrasonography, and a single β-hCG measurement is $\geq$ 3000 mIU/mL, a viable IUP is unlikely. However, it is still generally appropriate to obtain a follow up β-hCG and ultrasound before undertaking any treatment for ectopic pregnancy.
  - The standard approach to evaluating a patient with first trimester vaginal bleeding is to obtain a transabdominal scan using a low-frequency curvilinear probe with patient having a full bladder, before examining the patient with a transvaginal scan (if needed) using an endocavitary probe after the patient has emptied her bladder.
  - In a study by Tabbut et al, a high-frequency linear probe was used to evaluate first trimester bleeding. This identified 33% of intrauterine pregnancies not seen on transabdominal scan with the curvilinear probe. Use of the linear probe may obviate the need for some transvaginal scans (with the caveat that a rare heterotopic pregnancy may be missed).

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- **References:**

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  - Image References
    - POCUS images courtesy of Dr. Scott Poland

Figure 211.1 – POCUS Transabdominal Pelvis

Figure 211.2 – POCUS Transabdominal Pelvis (with labels)

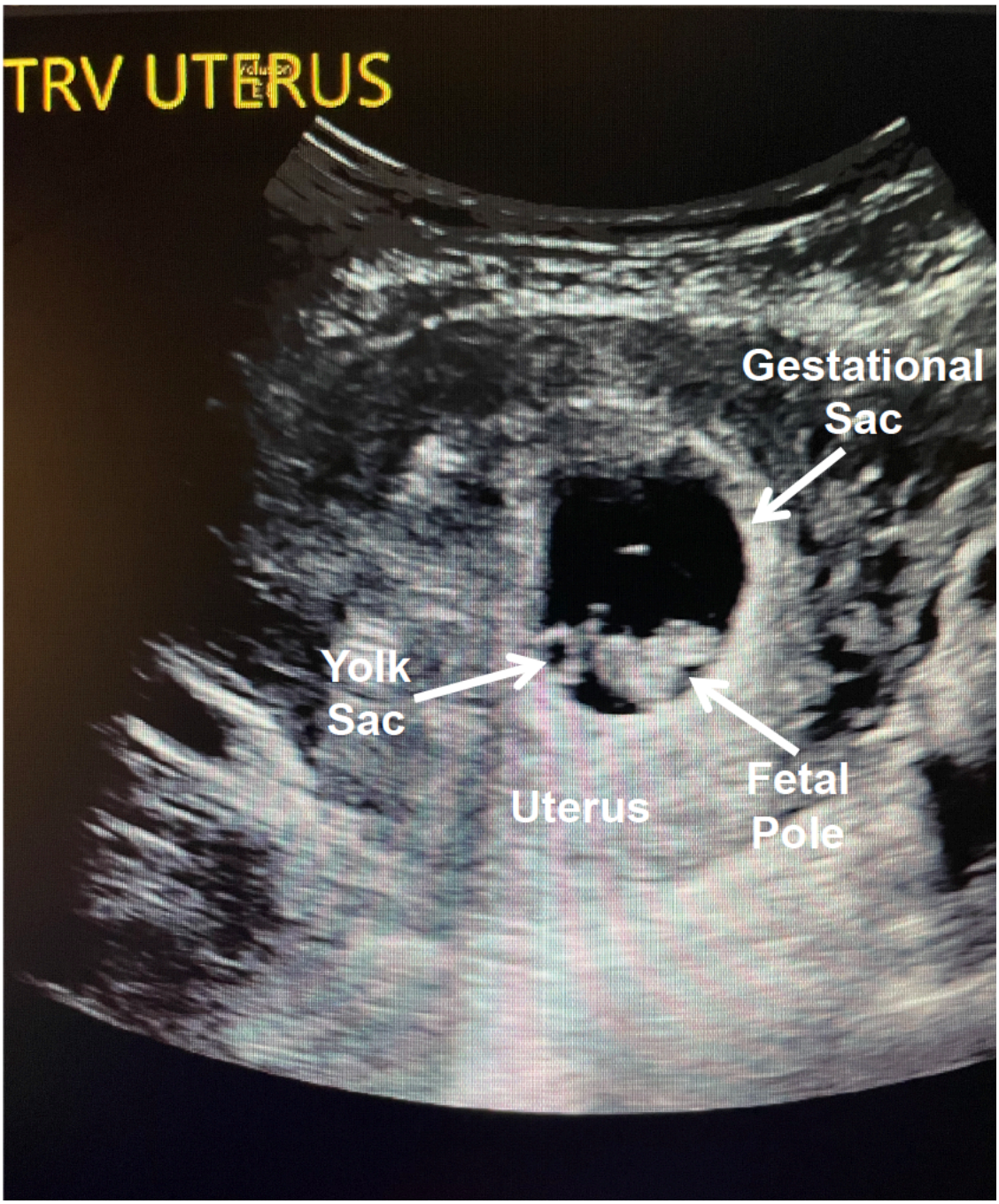

Figure 211.3: POCUS Transabdominal Pelvis (M-Mode)