ER EVALUATION OF ABNORMAL UTERINE BLEEDING: SPECIAL FOCUS IN THE OBESE PATIENT

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DISCLOSURES

None
OBJECTIVES

- Review menstrual cycle physiology
- Review the history and physical exam pertinent to women with genital tract bleeding presenting to the ER
- Discuss differential diagnosis of AUB in adults
- Discuss an emergent procedure to be done at ER if no gynecologist is available
- Discuss specific issues of AUB in the obese population presenting to the ER for evaluation
APPROACH TO VAGINAL BLEEDING IN THE EMERGENCY DEPARTMENT

- Understanding of the menstrual cycle
- Organized approach to patient evaluation with appropriate history and PE
- Form an appropriate differential diagnosis and treatment plan

- Patient age
  - Pre menarche
  - Reproductive age
  - Post menopausal

- Pregnancy status
  - Gestational age
  - Chronicity and severity of bleeding

- Patient comorbidities
  - Hematologic problems
  - Obesity
  - Endocrine dysfunction

- Use of medications
  - Anticoagulants
Physiology of the Menstrual Cycle

- Menarche age ~12.5 years
- Duration ~4 days (1-8 days)
- Typical blood loss of ~50 cc (20-80 cc) per cycle
- Complex hormonal feedback mechanism
  - Hypothalamus-pituitary-ovary
PHYSIOLOGY OF THE MENSTRUAL CYCLE

Follicular phase
- GnRH is secreted by the hypothalamus which then stimulates the pituitary to release both LH and FSH
- In the ovary, under the influence of LH and FSH a dominant follicle matures and increasing levels of estrogen are secreted
- After estrogen levels reach a threshold level, a surge in LH occurs, which triggers ovulation and the beginning of the luteal phase

Luteal phase
- Under the influence of LH, the ruptured dominant follicle rapidly evolves into the corpus luteum, which secretes progesterone.
- If pregnancy does not occur, the corpus luteum involutes 14 days after ovulation, progesterone levels fall, and menstruation occurs
ENDOMETRIUM

- undergoes characteristic changes in structure and thickness during the course of each menstrual cycle

- **proliferative phase of endometrial maturation**
  - primarily influenced by estrogen and occurs during the follicular phase
  - the endometrial glands and stroma grow and proliferate, causing the endometrium to thicken

- **secretory phase of endometrial maturation**
  - primarily influenced by progesterone and occurs in the luteal phase
  - endometrial glands mature and develop secretory vacuoles
  - drop in progesterone during the latter part of the luteal phase triggers release of prostaglandins which cause vasospasm of the arteries feeding the spongy and compact layers of the endometrium
  - sloughing of the outer layers of the endometrium
HISTORY

**AMOUNT OF BLEEDING**
- Women with heavy bleeding typically need to change pads/tampons every 3 hours or less

**TIMING**
- LMP
- Is it early, late, missed a menstrual period?

**R/O Pregnancy** in all reproductive age women

**OBGYN history:** outcome of all prior pregnancies, current or recent methods of contraception, and any pelvic infections

**Systemic disease:** DM, thyroid dysfunction, hematologic conditions

**Current medications**
- Hormone replacement therapy, anticoagulants, thyroid medication, etc
HISTORY

❖ associated symptoms
  ❖ Fever and chills may suggest UTI or PID
  ❖ Pelvic pain - uterine or ovarian etiology
  ❖ History of bleeding from multiple sites, easy bruisability, prolonged heavy periods since menarche, or a family history of a bleeding disorder suggests a coagulation disorder
  ❖ Weight gain, chronic fatigue, cold intolerance, constipation, alopecia, or skin changes suggests hypothyroidism
  ❖ Obesity, hirsutism, and irregular periods are suggestive of PCOS
  ❖ Headache with visual changes is suggestive of a pituitary tumor
  ❖ Recent significant weight gain or loss, an eating disorder, or major stress may disturb hormonal regulation of the menstrual cycle.

❖ Patient age alters the differential diagnosis
  ❖ >35 y/o increases the risk of endometrial carcinoma in any patient with excessive uterine bleeding
Vital signs to assess for hemodynamic instability

General appearance may suggest a diagnosis

- Pale skin or conjunctiva suggests anemia
- Mucosal hemorrhage, purpura, or petechiae suggests a bleeding disorder
- Obesity along with hirsutism suggests polycystic ovarian syndrome
- Virilization or a cushingoid appearance suggests a hormonally active tumor (ovary or adrenal)
- Visual field deficits and nipple discharge suggestive of a pituitary tumor
- Peripheral edema, hair loss, and decreased reflexes associated with hypothyroidism
PHYSICAL EXAM

❖ Abdominal exam
  ❖ Abdominal mass can represent a uterine fibroid or ovarian mass
  ❖ Peritoneal signs may be present with PID, a hemorrhagic ovarian cyst, or a ruptured ectopic pregnancy

❖ Pelvic exam
  ❖ Volume and site of bleeding
  ❖ Foreign body or traumatic injury, products of conception or vaginal discharge
  ❖ Uterine size and surface contour, adnexal mass or tenderness, and cervical motion tenderness

❖ Bimanual pelvic exam is not performed in pregnant patients with vaginal bleeding at their third trimester until placenta previa is ruled out.
  ❖ Speculum exam can be performed with caution to document the source of bleeding.
ANCILLARY STUDIES

- Pregnancy tests
  - qualitative urine test (hCG)
  - quantitative serum hCG
  - Symptomatic patients with hCG levels <1000 mIU/mL are 4X more likely to have an ectopic pregnancy than those with higher levels

- Transvaginal ultrasound
  - document IUP vs ectopic pregnancy
    - as early as 35 days gestation, or an hCG level of > 1500 IU/L.
  - In patients with third-trimester bleeding, transvaginal ultrasound is very sensitive in identifying placenta previa, but less sensitive in identifying placental abruption
  - ruptured ovarian cyst and ovarian torsion.

- CBC and blood type and crossmatch blood sample for any woman with severe or symptomatic vaginal bleeding who may require transfusion
  - If a coagulopathy is suspected, a platelet count and PT, PTT, INR is obtained

- Vaginal cultures are obtained if infection is a concern
DIFFERENTIAL DIAGNOSIS

Life-threatening causes of genital tract bleeding in early pregnancy

❖ **Ruptured ectopic pregnancy**
  ❖ Clinical manifestations typically appear six to eight weeks after the LMP but can occur later.
  ❖ classic symptoms of abdominal pain, amenorrhea, and vaginal bleeding
  ❖ Exam findings can range from unremarkable to profound shock

Life-threatening causes of genital tract bleeding in late pregnancy and the peripartum period include:

❖ **Placental abruption**
  ❖ classic presentation is painful vaginal bleeding.
  ❖ amount of vaginal bleeding does not correlate well with the extent of maternal hemorrhage
  ❖ Ultrasound is not sensitive for detecting abruption.

❖ **Placenta previa**
  ❖ Classic presentation is painless vaginal bleeding
  ❖ Ultrasound is a useful tool for diagnosis

❖ **Postpartum hemorrhage**
  ❖ Uterine atony, retained products of conception, uterus subinvolution
Other non pregnancy related life-threatening causes of genital tract bleeding

- **Acute severe menorrhagia**
  - Hormonal imbalance, such as anovulatory bleeding in obese patients
  - Endometrial hyperplasia or endometrial cancer
  - Cervical cancer
  - Hematologic/ coagulation disorders

- **Genital trauma**
  - accidents
  - sexual and physical abuse:
    - Rates of domestic abuse increase during pregnancy, and abuse remains an important cause of maternal morbidity and mortality.
DIFFERENTIAL DIAGNOSIS

Other important causes of genital tract bleeding

- **Ruptured ovarian cyst**
  - Light vaginal bleeding may also occur. Ectopic pregnancy must be ruled out.

- **Spontaneous abortion**
  - History of amenorrhea, vaginal bleeding, and pelvic pain
  - Cervix is open and products of conception can be visualized in the vagina or cervical os
  - US the cornerstone of diagnosis and ruling out ectopic pregnancy

- **Drugs** (eg, hormones, anticoagulants, chemotherapeutic agents, steroids).

- **Gynecologic infections** (PID)

- **Foreign bodies** (eg, tampon, intrauterine device).
COMMON CAUSES OF GENITAL TRACT BLEEDING IN PREMENOPAUSAL WOMEN

- Dysfunctional uterine bleeding
- Uterine leiomyoma
- Uterine polyps
- Infection
- Endocrine dysfunction
COMMON CAUSES OF POSTMENOPAUSAL BLEEDING

❖ Atrophic endometrium
  ❖ Most common cause
  ❖ but not severe bleeding

❖ Cancer
  ❖ Endometrial cancer
  ❖ Cervical cancer
NON GYNECOLOGIC CAUSES

- Urinary tract disease
  - Infection/ hemorrhagic cystitis
  - Bladder cancer

- lower gastrointestinal bleeding
  - Hemorrhoids
  - IBD
  - colorectal cancer
DIAGNOSTIC APPROACH

Basic questions to answer that helps you approach the case

- Is the patient hemodynamically unstable?
- Is the patient pregnant? If yes, is it early or late pregnancy?
- If not pregnant, what are the most important diagnoses to consider in this patient's age group?
DETERMINE HEMODYNAMIC STATUS

- Hemodynamically unstable patients
  - resuscitated in standard fashion: airway assessment, placement of two large bore peripheral IV lines, and T&C match of blood in preparation for transfusion

- Determine pregnancy status immediately.
  - Pregnant patients with hemodynamic instability from blood loss require immediate obstetrical consultation and often require surgery or delivery.
HEMODYNAMICALLY UNSTABLE WOMEN

- require immediate intervention
- If presents to an ambulatory setting-transfer immediately to an acute care setting.
- Hemodynamic instability in a nonpregnant patient with significant blood loss is treated initially with IV boluses of crystalloid, and possibly PRBC transfusion. The clinician then determines whether blood loss is ongoing.
- Emergent gynecologic consultation
- If immediate gyn evaluation is unavailable attempt Intrauterine tamponade at ER
- Help decrease profuse uterine bleeding in an unstable woman and with administration of IVFs and BT, stabilize the patient while more definitive therapy is implemented
Use an intrauterine balloon (large foley balloon) or gauze packing.
- With speculum visualize and sterilize the cervix with an iodine swab.
- Stabilize the cervix with single tooth tenaculum or ring forceps on the anterior cervical lip.
- Grasp the balloon or gauze with a long Kelly or ring forceps and thread it in through the cervical os into the uterus.

When a balloon is used, it is inflated after it is inserted into the uterus
- A 30 mL Foley catheter is used commonly, but if bleeding continues and the uterus is enlarged a larger balloon may be required
- the Bakri balloon used for postpartum hemorrhage has a 300 mL capacity

When gauze is used, a continuous piece of gauze is preferred
- The gauze can be impregnated with 5000 units thrombin in 5 mL sterile saline to enhance clotting

Consult GYN STAT if not done already
PREMENOPAUSAL PATIENT- NON PREGNANT

- ruptured ovarian cyst, ovarian torsion, dysfunctional uterine bleeding, uterine leiomyoma, uterine polyps and PID.

- dysfunctional uterine bleeding (DUB)
  - AUB unrelated to anatomic lesions of the uterus
  - most common cause of painless vaginal bleeding
  - 80% of episodes are 2ry to failure to ovulate, the other 20% are due to dysfunction of corpus luteum or an atrophic endometrium.
  - If bleeding is severe, it can be managed with IV or oral estrogen.

- Endometrial cancer
  - can present with vaginal bleeding in patients as young as 35 with risk factors
  - family history of cancer, obesity, chronic estrogen therapy, chronic anovulation, PCOS
  - caution prescribing OCPS or administering estrogen IV to patients with suspected DUB who have predisposing risk factors for endometrial cancer
PERI AND POST MENOPAUSAL PATIENT

- The primary concern in nonpregnant patient over 35 is endometrial cancer.
- Ultrasound or hysteroscopy with endometrial biopsy may be needed.
- Other important issues
  - anticoagulant medications, hormonal medications, and underlying coagulopathy.
- If stable hemodynamically the need for blood transfusion is based on Hgb level and the presence of comorbidities that affect the ability to tolerate anemia, such as CAD
- All patients with significant anemia should be started on iron
- most patients with vaginal bleeding can be managed as outpatients, but will depend on hemodynamic status, severity of ongoing blood loss, degree of anemia, and presence of major comorbidities.
# Risk factors for endometrial cancer

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Relative risk (RR) (other statistics are noted when used)</th>
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<tbody>
<tr>
<td>Increasing age</td>
<td>1.4% endometrial cancer prevalence in women 50 to 70 years old</td>
</tr>
<tr>
<td>Unopposed estrogen therapy</td>
<td>2 to 10</td>
</tr>
<tr>
<td>Tamoxifen therapy</td>
<td>2</td>
</tr>
<tr>
<td>Early menarche</td>
<td>NA</td>
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<tr>
<td>Late menopause (after age 55)</td>
<td>2</td>
</tr>
<tr>
<td>Nulliparity</td>
<td>2</td>
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<tr>
<td>Polycystic ovary syndrome (chronic anovulation)</td>
<td>3</td>
</tr>
<tr>
<td>Obesity</td>
<td>2 to 4</td>
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<tr>
<td>Diabetes mellitus</td>
<td>2</td>
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<tr>
<td>Estrogen-secreting tumor</td>
<td>NA</td>
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<tr>
<td>Lynch syndrome (hereditary nonpolyposis colorectal cancer)</td>
<td>22 to 50% lifetime risk</td>
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<tr>
<td>Cowden syndrome</td>
<td>13 to 19% lifetime risk</td>
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<tr>
<td>Family history of endometrial, ovarian, breast, or colon cancer</td>
<td>NA</td>
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NA: RR not available.

OBESE PATIENTS

- Commonly presents with AUB due to anovulatory cycles
  - PCOS (ANOVLATORY CYCLES, HIRSUTISM, HYPERANDROGENISM, INFERTILITY)

- Obesity is well known risk factor for endometrial cancer and it has reached epidemic levels in US and PR

- Breast and endometrial cancers remain the most common types of malignancies in obese women and they can present at young ages
  - Prolonged unopposed estrogen stimuli on endometrial and breast tissue

- Frequently presents with other endocrine dysfunctions that also contribute to the bleeding problem.

- These patients need hormonal treatment to avoid complications of endometrial hyperplasia, and endometrial or breast cancer
  - Progesterone only contraceptives (IUD: Mirena, Skyla, Liletta or Nexplanon implant, depoprovera or provera orally)
  - Combined contraceptives (pills, nuva ring, patch)
QUESTIONS?