Evaluation of Abnormal Uterine Bleeding

Christine M. Corbin, MD
Northwest Gynecology Associates, LLC
April 26, 2011
Outline

- Review of normal menstrual cycle physiology
- Review of normal uterine anatomy
- Pathophysiology
- Evaluation/Work-up
- Treatment Options
  - Tried and true-not so new
  - Technology era options
Menstrual cycle

- Menstruation
- Proliferative phase -- Follicular phase
- Ovulation
- Secretory phase -- Luteal phase
- Menstruation....again!
Menstruation

- Eumenorrhea- normal, predictable menstruation
  - Typically 2-7 days in length
  - Approximately 35 ml (range 10-80 ml WNL
  - Gradually increasing estrogen in early follicular phase slows flow
  - Remember...first day of bleeding = first day of “cycle”
Proliferative Phase/Follicular Phase

- Gradual increase of estrogen from developing follicle
- Uterine lining “proliferates” in response
- Increasing levels of FSH from anterior pituitary
- Follicles stimulated and compete for dominance
- “Dominant follicle” reaches maturity
- Estradiol increased due to follicle formation
- Estradiol initially suppresses production of LH
Proliferative Phase/Follicular Phase

- Length of follicular phase varies from woman to woman
- Often shorter in perimenopausal women which leads to shorter intervals between periods
- Increasing estrogen causes alteration in cervical mucus
- Mature follicle is approximately 2 cm on ultrasound measurement just prior to ovulation
Hypothalamus

GnRH

Pituitary

LH, FSH

Ovary

Estradiol, Inhibin-B
Ovulation

- Increasing estradiol surpasses threshold and stimulates release of LH from anterior pituitary
- Two different receptors for estrogen in the hypothalamus
  - Alpha receptors—for negative feedback in the E2-LH loop
  - Beta receptors—for positive feedback in E2-LH loop
Ovulation

- LH surge occurs approximately day 12
- LH surge lasts 48 hours
- Wall of follicle weakened; causes release of oocyte
- Mature ovum swept into fallopian tube by fimbria
- Fertilization occurs in fallopian tube; if no fertilization within 24 hours the ovum dissolves in tube
Secretory Phase/Luteal Phase

- After ovulation the corpus luteum forms from the ruptured site in the ovary “yellow body”
- FSH and LH cause remaining parts of the dominant follicle to form the corpus luteum
- Corpus luteum produces progesterone
- Progesterone causes endometrial changes to facilitate implantation of an embryo and raises basal body temperature
**Secretory Phase/Luteal Phase**

- Corpus luteum begins to suppress LH and FSH and thus begins to atrophy
- Progesterone levels fall and thus trigger menstruation
- Luteal phase of the cycle much more predictable—typically 14 days
- If pregnancy occurs, HCG prevents degeneration of the corpus luteum (LH and HCG similar in molecular structure)
Uterine Anatomy

- Ovary
- Fallopian Tube
- Endometrium
- Uterus
- Cervix
- Vagina
- Vulva
Uterine Anatomy

- Walls are made of smooth muscle
- Uterine body/corpus
- Uterine cervix
- Uterine lining-endometrium is the hormonally mediated layer that responds to the fluctuation of hormones during the menstrual cycle
- “Work-horse”...just does what everyone tells it to do...does not produce and hormone
Abnormal Uterine Bleeding

- Lets agree on some definitions first:
  - Menorrhagia—prolonged (>7 days) and or excessive (>80ml/d) bleeding; occurs at regular intervals
  - Metrorrhagia—Irregular bleeding that occurs at frequent intervals
  - Menometrorrhagia—Heavy and irregular bleeding
  - Intermenstrual bleeding—occurs between regularly spaced cycles
  - Midcycle spotting—typically occurs just before ovulation
Abnormal Uterine Bleeding

Definitions (cont.)

- Postmenopausal bleeding — recurrence of bleeding after >12 continuous months from last period
- Amenorrhea — lack of menstrual bleeding >6 months
- Oligomenorrhea — infrequent menstruation occurring from >35 days-6 months
Evaluation of Abnormal Bleeding

- Key? Ovulatory versus anovulatory bleeding
- Always rule out pregnancy in appropriate patients
- Careful Hx, PE and basic laboratory data will yield most diagnoses
Evaluation of Abnormal Bleeding

- Ovulatory Bleeding
  - Occurs at predictable intervals
  - Predictable bleeding pattern
  - Often associated with premenstrual molimina (breast tenderness, bloating, cramping, etc.)

- Anovulatory Bleeding
  - Random bleeding pattern
  - “Double-periods”
  - Break-thru bleeding
  - Often “no warning”...no premenstrual molimina
Evaluation of Abnormal Uterine Bleeding

- History
- Physical Exam
- Lab studies
- Imaging Studies
- Diagnostic Procedures
AUB Evaluation: History

- Menarche?
- LMP?
- “Typical cycle” description
- Gravida/para
- Risk for pregnancy?
- Contraceptive use?
- STI risk/history

Risk for underlying bleeding disorder
Post-coital bleeding?
Signs/symptoms of anemia
Recent illness, stress, change in weight
Medications (exogenous hormones, blood thinners, ASA, etc)
AUB: Risk of Bleeding Disorder

- Family history of bleeding abnormalities
- Menorrhagia from onset of menarche
- Bruising without injury
- Bleeding of oral cavity/GI tract without visible lesions
- Epistaxis > 10 min
- History of bleeding complications with procedures or PPH?
AUB: Physical Exam

- Vitals; orthostatic vitals
- UPT
- Poor capillary refill, pale mucus membranes
- Skin changes: petechiae, purpura,
- Signs of hyperandrogenism: hirsutism, obesity, acne, acanthosis nigricans
- Manifestations of thyroid disorder: eye changes, tremors, skin/nail changes, goiter
AUB: Physical Exam

- Pelvic Exam
  - Vagina- Signs of trauma, lesions, infection or foreign bodies
  - Cervix- Visualize for lesions, polyps, infection, bleeding from os?
  - Uterus- Assess uterine size, mobility, tenderness, position
  - Adnexal Structures- Assess size, tenderness
  - Lymph Nodes- Inspect inguinal nodes for enlargement or tenderness
AUB: Laboratory Studies

- UPT/HCG
- CBC with platelets
- Coagulation studies: PT; PTT; VonWillebrand panel; Bleeding time
- TSH
- Prolactin
- FSH?
AUB: Laboratory Studies in suspected PCOD

- Fasting Insulin
- Fasting Blood Sugar
- 2 hr GTT, insulin level
- LH, FSH (3:1)
- 17 OH -progesterone level
- DHEA
- Free testosterone
- TSH, Prolactin
Imaging Studies

- Pelvic Ultrasound: Abdominal (full bladder!); Transvaginal; Saline infusion
- MRI: Helpful to evaluate fibroid size/location; adenomyosis...but $$$
- CT Scan: Not ideal screening tool; often used as adjuvant study to assess lymph nodes in endometrial and ovarian cancer evaluation
Pelvic Ultrasound: Are you getting bang for your patient's buck?

- **Uterus**
  - Size-length x width x depth (cm)
  - Myometrial texture- homogenous, heterogenous?
  - Masses/fibroids – Size (cm), location, impingement on endometrial cavity
  - Uterine location – anteverted; retroverted; malrotated?

- **Endometrium**
  - Lining thickness (mm)
  - Lesions (size and location)
Pelvic Ultrasound (cont.)

- Ovaries
  - Distinguish R. ovary and L. ovary
  - Size- length x width x depth
  - Cysts- size, simple/complex; cyst wall characteristics (thin walled, thick walled); doppler flow?; papillary changes?; recommendations for f/u?

- Cul de sac
  - Free fluid?
  - Simple or complex fluid
Endometrial Biopsy

- In-office procedure
- Facilitate cervical dilation w/preop cytotec 200mcg within 6 hours of procedure
- Pre-medicate with 600mg Ibuprofen one hour prior
- Pathology needs to explain/correlate with symptoms
- Negative result may need to be followed up with more definitive studies (ie...polyps often missed)
Hysteroscopy

- Diagnostic procedures can be done in office
- Allows direct visualization of cavity
- Can facilitate directed biopsies
- Can be both diagnostic and therapeutic if combined with D&C
- Advantage over SIS...can remove tissue for bx or txment of lesion at same time
Hysteroscopy

- Hystroscope
- Vacuum Syringe
- Speculum
- Cervical Seal

Vagina
Cervix
Uterus

View of uterus through a hystroscope

Uterine Cavity
Intracavitary Fibroids
AUB: Diagnostic Procedures (cont.)

- Saline Infusion Sonography
  - Radiologists often recommend if endometrial lesion suspected
  - Helps to characterize nature of lesion (polyp vs. fibroid)
  - Patient may still need Hysteroscopy, D&C
  - Uncomfortable for patient...would prefer to do only one invasive procedure if possible
AUB: Etiology

- PG complications
- Structural Abnormalities
  - Fibroids
  - Adenomyosis
  - Endometriosis
  - Endometrial polyps
- Trauma
  - Vagina, cervix, vulvar lesions
AUB: Etiology (cont.)

- Hormonal Deviations
  - Chronic anovulation
  - PCOS
  - Ovarian cysts with hormone production
  - Suppression of HPO axis
    - Illness
    - Stress
    - Low body fat (eating disorders, extreme athletes)
    - Thyroid, adrenal disorders, DM
  - Menarche/Perimenopause
AUB: Etiology (cont.)

- Coagulation Disorders
  - ITP
  - VonWillebrands
  - Platelet dysfunction
  - Liver/renal abnormalities
  - Blood thinners (Coumadin, Plavix, ASA, Lovenox, Heparin)

- Carcinoma of Genital tract
  - Vaginal, Cervical, Endometrial, Ovarian, Fallopian Tube
Menarche/Puberty Onset
- Often immature HPO axis
- Coagulation disorders-often first presentation
- Congenital genital tract disorders
  - Imperforate hymen
  - Hematocolpos
  - Duplication, Bicornuate, Unicornuate Uterus
- Early PCOD?
- PG complication?
**AUB: Etiology-Special Consideration**

- **Post Menopausal Patients**
  - Endometrial Cancer until proven otherwise
  - Benign Endometrial polyps #1 cause of PMP bleeding
  - Generous use of U/S and endometrial sampling
  - Biopsy for endometrial lining >5mm
  - Endometrial pathology unlikely if <3mm
  - Careful review of all medication...especially HRT, BHRT, “natural” remedies-especially soy based
AUB: Typical Reproductive Aged Patient

- Anovulatory Bleeding
  - Unpredictable cycle length
  - HPO axis altered - can tx underlying cause
  - Increased risk for endometrial hyperplasia
  - Polyps
    - Cervical
    - Uterine

- Ovulatory Bleeding
  - Cycle remains predictable, but heavy
  - Often associated with anatomic etiology
    - Fibroids
    - Endometriosis
    - Adenomyosis
    - Prostaglandins
Treatment Options

- Medical Therapies
  - OCPs- Cyclic and continuous options
  - Cyclic progesterone- Luteal support
  - Depo-Provera
  - Mirena IUD
  - Depo-Lupron
  - NSAIDS
  - Progestins
  - HRT?
AUB: Surgical Treatment Options

- Therapeutic D&C
- Endometrial Ablation
  - Completed childbirth
  - NOT contraception!
  - Normal endometrial biopsy
  - Optimal patient >45y/o
  - Uterine cavity criteria met
  - Reduces menstrual flow by 70-80%
  - Does not often address dysmenorrhea
Hysterectomy
- Completed childbearing
- Definitively addresses bleeding issues
- “Type” of surgery can be tailored to patient
  - Abdominal vs. Vaginal vs. Laparoscopic
  - +/- Removal of Ovaries
  - +/- Removal of Cervix
Hysterectomy Facts:

- 600,000 hysterectomies performed in US each year
- 90% of surgeries for benign conditions
- 73% include removal of ovaries
- 1/3 of US women have hysterectomy by age 60
- Unnecessary in many cases???
- Historically, uterus thought to by “source of hysteria” in women...thus “hysterectomy”
Hysterectomy Indications

- Reproductive organ cancer
- Severe symptoms of endometriosis or adenomyosis refractory to medical management
- Intractable bleeding
- Chronic pelvic pain?
- Symptomatic fibroids (bleeding, pelvic pressure and pain)
- Pelvic Organ Prolapse
- Prophylaxis in BRCA1 and BRCA2 carriers
Types of Hysterectomy

- Total Hysterectomy=Uterus and cervix removed
  - Abdominal (60%)!!!
  - Vaginal
  - Laparoscopic
  - Robotic Assisted

- Supracervical=Uterine Fundus; cervix retained
  - Abdominal
  - Laparoscopic
  - Robotic
Types of Hysterectomy (cont.)

- Radical Hysterectomy=Uterus, cervix, upper 1/3 of vagina and pelvic lymph nodes
  - Primarily done for operable cervical cancer
  - Abdominal or Robotic Assisted
Retaining Cervix at Hysterectomy

**Pros:**
- Shortens surgery time
- Less blood loss
- Less disruption of pelvic anatomy
- Less febrile morbidity
- Improved sexual fx
- Less Pelvic organ prolapse/Incontinence

**Cons:**
- 5% patients with cyclic spotting
- Still need pap screening
- Not good option if hx of abn paps
- May require removal at later date
Ovaries: “Should they stay or should they go”?

- Pendulum continues to swing...
- >45 years, traditionally removed for “prophylaxis” against ovarian cancer
- Rethinking “wisdom”
  - Increased morbidity with estrogen depletion (bones, CV risk, psychologic well-being)
  - Low lifetime risk overall of ovarian cancer (1/72)
- Removal considered in cases of severe endometriosis
- Hysterectomy may compromise ovarian blood flow; ovarian “life-expectancy” reduced 3.7yrs
Hysterectomy Risks

- Surgical Complications 1-6/1000 women
- Unintended oophrectomy and POF
- 3x> risk CV disease with uterus removed; 7x>risk of ovaries removed prematurely
- Ovarian removal <age 45 leads to 5x mortality from neurologic and mental disorders
- Increased risk of urinary incontinence, prolapse
- Sexual alteration associated with shortened vagina; no uterine spasm with orgasm
Uterine Artery Embolization

- Catheter placed into the femoral artery by invasive radiologist
- Microspheres injected into uterine artery to disrupt blood flow to uterus/fibroids
- Certain criteria for fibroid “eligibility”
- Option for poor surgical candidates
- Limited number of skilled technicians
Levonorgestrel containing IUD (Mirena)

- Alternative to Ablation and Hyst to reduce menstrual flow
- FDA approval for treatment of menorrhagia
- Good for 5 years
- Inserted in office setting
- Also provides contraception (unlike ablation)
- Uterine cavity shape and size may limit
- Reversible