**Acute Pelvic Pain and Gynecologic Emergencies**

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**Case Study**

- Ms R is a 27 year old woman seen with worsening unilateral pelvic pain over the past 24 hours
- She is 7 weeks from her last menstrual period and has used contraception inconsistently
- On PE, she has ½ RLQ tenderness with mild rebound tenderness on the same side
- Bimanual exam reveals a right-sided 4-5 cm tender, cystic mass and a 7 week size uterus

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**Case Study**

Her clinical presentation is most consistent with
1. Ruptured ectopic pregnancy
2. Adnexal torsion
3. Ovarian hemorrhage
4. Ovarian rupture
5. All of the above

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**Ob-Gyn For Dummies**

*Until proven otherwise*

- All vaginal bleeding is due to pregnancy
- All pelvic pain is due to ectopic pregnancy

*Most diagnoses can be made with*

- History and physical exam
- b-hCG testing
- Pelvic (vaginal probe) ultrasound

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**Differential Dx: Acute Pelvic Pain**

*Gynecologic Origin*

- Infection
  - Acute salpingitis (PID)
  - Tubo-ovarian abscess (TOA)
- Complications of Pregnancy
  - Ectopic pregnancy
  - Septic abortion
  - Post-partum or post-abortion endometritis
  - Post-medical abortion sepsis

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**Differential Dx: Acute Pelvic Pain**

*Gynecologic Origin*

- Adnexal Accidents
  - Ovarian torsion
  - Ovarian rupture
  - Ovarian hemorrhage
- Other Gynecologic Problems
  - Flare of symptoms from endometriosis
  - Ovulation (mittelschmerz)
Differential Dx: Acute Pelvic Pain

**Non-Gynecologic Origin**
- Gastrointestinal
  - Appendicitis or appendiceal abscess
  - Inflammatory bowel disease
- Urinary Tract
  - Acute cystitis or pyelonephritis
  - Ureteral stone
- Orthopedic
  - Lumbo-sacral muscle spasm
  - Lumbar disc disease

**Adnexal Torsion (AT)**
- 80% of AT cases in reproductive aged women
  - 10% in postmenopausal women
  - 10% in premenarchal girls (often normal ovary)
- Predisposing factors
  - Mobile ovarian cyst; dermoid or functional cyst
  - Previous abdominal surgery
  - Pregnancy (14% of women with torsion)
  - Ovarian hyperstimulation (fertility drugs)
- More common on right side

**Adnexal Torsion (AT)**
- 3% of all gynecologic emergencies
- Due to twisting of ovarian mass on pedicles: utero-ovarian ligament and infundibulo-pelvic ligament
  - Involvement of tube or ovary; usually both
  - Edema develops when venous outflow blocked
  - Ischemia, hemorrhage develop as arterial inflow blocked

**Adnexal Torsion (AT)**
- Presentation
  - Recent physical activity, especially common during or after intercourse
  - Acute onset of unilateral pelvic (+ flank) pain
    - Ipsilateral to AT in 75%
    - If torsion is intermittent with spontaneous untwisting, symptoms may be recurrent

**Adnexal Torsion (AT)**
- Physical findings
  - 50% nausea, vomiting
  - 43% ▲ WBC
  - 34% peritoneal signs
  - 20% fever
- Pain often intense initially, then improves with ischemia and loss of nerve transmission
- Exam: unilateral tender adnexal mass...may become palpable over time with increasing venous congestion

**Adnexal Torsion (AT)**
- Evaluation
  - Ultrasound shows unilateral ovarian cyst (avg = 9.5 cm) in 77%; solid mass in 23%
  - CT and MRI (usually done as incidental studies)
    - 84% fallopian tube thickening
    - 84% smooth wall thickening of the adnexal mass
    - 64% ascites
    - 36% uterine deviation toward affected side
  - Color Doppler US flow studies
    - Reduced or absent vascular flow is suggestive of AT
  - Diagnosis should not be based solely on this finding, as 45% of women with AT have normal flow
CT Features of Adnexal Torsion

Hiller N. et al, AJR 2007; 189:124

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<thead>
<tr>
<th>CT Finding</th>
<th>No.</th>
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<td>Adnexal enlargement (4-30 cm)</td>
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<td>Smooth margins</td>
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<td>Mesenteric thickening</td>
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<td>Deviation of uterus to side of involved ovary</td>
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<td>Whirl sign</td>
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Adnexal Torsion

- **Management**
  - Minimize time from diagnosis to treatment order to improve likelihood of ovarian salvage
  - Diagnostic laparoscopy to confirm and treat
    - Unwind complex (detorsion); PTE rate is 0.2%
    - 58% are functional cysts; cystectomy not necessary
    - Avoid oophorectomy, as black-blue appearance of adnexa is due to vascular stasis, not gangrene
  - After detorsion alone, ovarian function is maintained in 88-100% of cases
  - If functional cyst, avoid recurrence with OCs

Ovarian Hemorrhage

- **Due to intracapsular or extracapsular hemorrhage**
  - Usually spontaneous, but often activity-related
  - More frequent in pregnancy
- **Intracapsular hemorrhage**
  - Acute onset of severe unilateral abdominal pain
  - Exam shows unilateral cystic adnexal mass
  - Sonogram confirms, but may be difficult to differentiate from adnexal torsion
  - Pelvic ultrasound: no free fluid

Ovarian Hemorrhage

- **Extracapsular hemorrhage**
  - Acute onset of diffuse lower abdominal pain
  - Exam shows diffuse pelvic tenderness, one side worse
  - Pelvic ultrasound
    - Mixed attenuation adnexal mass
    - Fluid with internal echogenicity surrounding uterus and adnexa
- **Management**
  - Suspect self-limited bleed: observation only, with serial hematocrits
  - Unclear diagnosis or severe bleed: treat at laparoscopy

Ovarian Rupture

- Acute rupture of ovarian cyst, with spillage of contents
  - Follicular fluid: transient pain; self-limited
  - Dermoid or endometrioma: chemical peritonitis
  - Exam always shows diffuse pelvic pain; may not be able to detect cyst, since it has deflated
  - Pelvic ultrasound: intraperitoneal fluid
  - Culdocentesis positive for offending substance
- **Treatment**
  - Follicle fluid: expectant management
  - Endometrioma, dermoid: irrigate pelvis, resect cyst

Ovarian Rupture

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What’s First: CT or Ultrasound?

CT or MRI*: abdomen and pelvis

CT or MRI* preferred
- Ovarian torsion
- Peritonitis
  - Appendicitis
  - Diverticular disease
  - Tubo-ovarian abscess
- If pregnant + peritonitis, MRI only (no CT)

Ultrasound preferred
- Positive pregnancy test
- Ovarian hemorrhage
- Ovarian rupture
- Asymptomatic adnexal mass

CT and MR Features of GYN Abnormalities in Women With Pelvic Pain

UtZ unnecessary
- Benign lesion
- Patient needs immediate surgery
- Variant of normal anatomy

UtZ necessary
- Uncharacteristic of a benign lesion
- Indeterminate risk for malignancy
- Suspicious characteristics of malignancy


Post Pregnancy Acute Pelvic Pain

- After delivery
  - Post-partum endometritis
- After abortion
  - Post abortal syndrome (PAS)
  - Physiologic uterine cramps
  - Undetected perforation
  - Ectopic pregnancy
  - Post-abortal endometritis
  - Post-medical abortion shock

Post-Partum Endometritis: Predisposing Factors

- Chorioamnionitis in labor
- Caesarean section
- Carriage of group B Strep
- Prolonged rupture of membranes
- Prolonged labor
- Multiple vaginal examinations in labor
- Intrapartum fetal monitoring
- Manual placental removal

Post-Partum Endometritis

- Incidence: 2-5% vaginal deliveries; 5-30% C/S
- Symptoms
  - Often starts <2-3 days post-partum; may be delayed up to two weeks
  - Abdominal pain, malaise, fever, sweats, chills, and purulent lochia
- Signs
  - Fever
  - Uterine tenderness
  - Adnexa usually non-tender

Post-Partum Endometritis

- If post-partum fever, endometritis is a diagnosis of exclusion
  - Catheter-drawn urinalysis (to exclude pyelonephritis)
  - Breast exam (to exclude mastitis or abscess)
  - Episiotomy or abdominal incision for wound infection
  - Extremity exam (to exclude thrombophlebitis)
- Management
  - Probe uterine cavity with ring forceps to detect retained membranes or placental fragment
  - Dilate cervix as forceps is withdrawn through os
  - Either culture endometrium or treat empirically
Post-Partum Endometritis: Treatment

- Most cases require admission for IV antibiotics
  - Clindamycin + gentamycin good first-line abx
  - If no response <48 hours, add ampicillin
  - If all fails, heparinize for presumed septic pelvic thrombophlebitis
- Mild post-partum endometritis (14 days)
  - Oral fluoroquinolones + metronidazole
  - Doxycycline + metronidazole
  - Amoxicillin/clavulanate (Augmentin)

Post Abortal Syndrome (PAS)

- Incidence: 0.2%; assoc with small flexible cannula
- Uterus fills with clots, os blocked, can’t contract; hypotonia leads to continued bleeding
- Presentation: 1 hour - 7 days post-operatively
- Symptoms: intense uterine cramps/ abdominal pain (one side worse), diaphoretic, lightheaded
- Signs: uterus tender, tense, enlarged
- Treatment: reevacuation, methylergonovine x 3d

Physiologic Uterine Cramps

- Uterine cramps, bleeding often increases 3-5 days after the abortion procedure
  - Lasts for 1-3 days, then cases
- Diagnosis
  - Uterus firm, external os closed
  - No (or minimal) corpus tenderness
  - UTZ shows linear stripe (empty cavity)
- Treatment consists of NSAIDs, abdominal heat, rest, and time

Undetected Perforation

- May cause delayed hemoperitoneum or peritonitis
- Usual presentations are
  - Broad ligament hematoma
  - Acute peritoneal signs with findings of infection or sepsis: uterine perforation with bowel injury
  - Diffuse pelvic and cul-de-sac tenderness: perforation with hemoperitoneum
- Management
  - Uncertain diagnosis: diagnostic laparoscopy
  - Diagnosis certain: exploratory laparotomy

Post-Abortal Endometritis

- Incidence: 0.5-3% of abortions
- Risk factors
  - Advanced gestational age
  - Local anesthesia
  - Untreated GC or chlamydia
- Presentation
  - Uncomplicated: uterus firm, os closed, no abdominal signs
  - RPOC + Endometritis: uterus tender, boggy, enlarged; open os; adnexa non-tender or mildly tender
  - Septic abortion: uterus and adnexa tender, febrile, tachycardia, peritoneal signs
- Treatment:
  - Uncomplicated: doxycycline + metronidazole x 14 days; optional reaspiration
  - RPOC + Endometritis: antibiotics x 14 days, always reaspirate
  - Septic abortion: hospitalize; double or triple antibiotics; reaspiration as soon as stable; KUB for evidence of perforation or Clostridia

Post-Abortal Endometritis

- Pregnancy test result can be positive or negative
- Treatment:
  - Uncomplicated: doxycycline + metronidazole x 14 days; optional reaspiration
  - RPOC + Endometritis: antibiotics x 14 days, always reaspirate
  - Septic abortion: hospitalize; double or triple antibiotics; reaspiration as soon as stable; KUB for evidence of perforation or Clostridia
Post-Ovulatory Fertility Control

LMP 14 21 28 35 42 49 56 63

- ECP
- IUD
- Mifepristone (+MTX)
- Methotrexate
- Suction Curettage

Mifepristone + Misoprostol Protocol

1st visit
Counseling + pelvic ultrasound
Mifepristone PO
2 days

2nd visit
Misoprostol 400 mcg PO (or PV)
Observation for 4 hrs
(Bleeding for 9-16 days)
2 weeks

3rd visit
Follow up examination

Fatal Infections Associated with Medical Abortion

- Four reported cases of death after mifepristone abortion due to septic shock
  - All cases in California
  - All occurred within one week of abortion
  - All had vaginal (vs. oral) misoprostol
  - All women were previously healthy
  - All had complete uterine evacuation
  - All died very rapidly
  - All had evidence of bacterial infection with Clostridium sordellii

- No direct relation to misoprostol or mifepristone
- Risk estimates
  - 4 deaths in 450,000 med abortions: 1/100,000
  - Surgical abortions < 9 weeks: 0.1/100,000
- C. sordellii infections
  - Gram negative anaerobe
  - Produces exotoxin that triggers toxic shock
  - Reported after vaginal and C/S delivery, SAB
  - Non-obstetrical cases reported in men, women

Fatal Infections Associated with Medical Abortion

- Clinical findings: toxic-shock syndrome
  - Absence of fever
  - Dramatic increase in WBC
  - Effect of “leaky capillaries”
    » Tachycardia (>120 beats/min)
    » Refractory hypotension (low blood pressure)
    » Hemoconcentration (high hematocrit)
    » Edema; effusions in lungs, abdomen

Fischer M, NEJM 2005;353:2552
**Medical Abortion: Take Home Messages**

- **Counseling**
  - Mention risk in informed consent process
  - Explain symptoms to watch for after procedure
- **Maintain high index of suspicion**, esp. if myalgia, headache, cramps (+ fever)
- Treat as toxic shock syndrome: fluids, antibiotics
- **No data on value of antibiotic prophylaxis**
- Stay tuned for new developments, especially regarding the role of vaginal misoprostol

**Vaginal Bleeding...What’s Normal?**

- **Onset of menses**
  - By 16 years old with 2nd sex characteristics
  - Start w/u at 14 y.o. if no sexual development
- **Cycle length**: 25-35 days
- **Menstrual flow**: 20-80 cc. per menses
  - Average flow: 35 cc.

**Abnormal Vaginal Bleeding (AVB)**

- **Abnormal amount of bleeding**
  - **Menorrhagia** (hypermennorrhea)
    - Prolonged duration of menses
    - Increased amount of bleeding per day
  - **Hypomenorrhea**
    - Shorter menses
    - Less flow per day

**Menorrhagia: Perception vs. Reality**


**Abnormal Vaginal Bleeding (AVB)**

- **Abnormal timing of bleeding**
  - **Polymenorrhea**
    - Cycle length ≤ 24 days
  - **Metrorrhagia**
    - “Irregularly irregular” bleeding
  - **Intermenstrual bleeding (IMB)**
    - Bleeding between periods
  - **Post-coital bleeding (PCB)**
    - Bleeding during or after intercourse
  - **Postmenopausal bleeding (PMB)**
    - Ovarian failure + no bleeding for 6-12 months

**Abnormal Vaginal Bleeding (AVB)**

- **Decreased frequency of bleeding**
  - **Oligomenorrhea**
    - No bleeding 36 days- 3 months
  - **Amenorrhea**
    - No bleeding for at least 3 cycle intervals or 6 months
Symptomatic Presentation of AVB

- Is the patient pregnant?
- Is the bleeding ovulatory or anovulatory?

**Ovulatory = Regular**
- Menorrhagia
- Hypomenorrhea
- Polymenorrhea
- IMB
- PCB

**Anovulatory = Irregular or no bleeding**
- Menorrhagia
- Metrorrhagia
- Oligomenorrhea
- Amenorrhea
- Post-menopausal

AVB: Structural Conditions

- **Corpus Neoplasms**
  - **Submucous myoma**
    - Menorrhagia; rarely IMB; never metrorrhagia
  - **Leiomyosarcoma**
    - Post-menopausal bleeding
  - **Adenomyosis**
    - Menorrhagia, dyspareunia, chronic pelvic pain, sometimes menorrhagia

AVB: Structural Conditions

- **Endometrial Neoplasms**
  - Adenomatous hyperplasia → atypical AH → endometrial carcinoma
    - Peri- or post-menopausal bleeding
  - Metrorrhagia in chronic anovulator
  - Endometrial polyp
    - IMB or PCB in 30-50 year old woman

- **Cervix Neoplasms**
  - Squamous cell carcinoma
  - Adenocarcinoma

AVB: Structural Conditions

- **Vaginal Neoplasms**
  - Squamous cell ca, clear cell (DES)
  - Childhood tumors

- **Trauma/ foreign body**
  - Vaginal wall laceration
  - Hymeneal ring tear/laceration
  - Vaginal foreign body
    - Most common cause of premenarchal bleeding

AVB: Non-Structural Conditions

- **Inflammatory conditions**
  - Endometrium
    - Post-partum and post-abortion endometritis
  - Endometritis component of PID
  - Cervix
    - Mucopurulent cervicitis (chlamydia, GC)
  - Benign cervical ectropion
  - Vagina
    - Atrophic vaginitis, severe vaginal trichomoniasis

Abnormal Vaginal Bleeding

- Hx, PE, Preg test

  - Preg test POS
    - Pregnant
    - Location
    - Viability
    - GA Dating
  - Preg test NEG
    - Anovulation
    - Iatrogenic
    - (Oligo) Anovulation
    - Structural
    - Non-Structural
    - Estrogenic
    - Hypo-E

- MYOMA
  - Polyp
  - Foreign body
  - LCP
  - Coagulopathy
  - LPD
  - Thyroid dz

- Menarche
- Menopause
- PCOS
- Hyperplasia
- EM Cancer
- Hypothal dysfuncti
- Pituitary dysfunction
- Ovarian dysfunction
- PID
- Cervicitis
- Atrophic vag
- Coagulopathy
- LPD
- Thyroid dz
AVB: Non-structural Conditions

- **Clotting factor deficiency**
  - Liver disease
  - Congenital (Von Willebrands Disease)
- **Thrombocytopenia**
  - ITP, aplastic anemia with platelet count <20,000/mm³

AVB: Non-structural Conditions

- **Coagulopathy**
  - Menorrhagia: rarely IMB or PCB
  - Congenital factor deficiencies mainly in teenagers with menorrhagia since menarche
  - Thrombocytopenias
    »Easy bruising, bleeding gums, slow to clot
    »Suppress menses with oral progestins (e.g. continuous OCs) until platelets are up

Normal Ovarian Hormone Cycle

- **Estrogen**
- **Progesterone**

Abnormal Ovarian Hormone Cycles

- **Estrogen**
- **Progesterone**

Dysfunctional Uterine Bleeding

- What causes anovulatory bleeding?
  - Excess **androgen**: PCOS; acute stress
  - Excess **estrogen**: unopposed exogenous or endogenous estrogen
  - Excess **prolactin**: prolactinoma, drugs, lactation
  - Age-related: peri-menarche, perimenopause

AVB: History

- Is the patient pregnant?
  - Pregnancy sx's, esp. breast tenderness
  - Intercourse pattern, contraceptive use
- Is bleeding ovulatory or anovulatory?
  - **Bleeding pattern**: regular, irregular, none
  - **Molimenal sx's**: only in ovulatory cycles
  - Previous history of menstrual disorders
  - Recent onset weight gain or hirsuitism
  - Hx bleeding dyscrasia or endocrinopathy
AVB: Physical Exam
- General: BMI > 30, acne, hirsutism (PCOS)
- Breasts: galactorrhea
- Abdomen: uterine enlargement, abdominal pain
- Pelvic: uterine enlargement or softness, masses
- Cervical mucus

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<th>Pre-ovul</th>
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AVB: Laboratory
- Urine highly sensitive pregnancy test
  - Quantitative B-hCG is not necessary
- CBC
  - Find severe anemia; baseline value for observation
  - Platelet estimation (detect thrombocytopenia)
- Coagulation panel
  - Teens c menorrhagia or suspect coagulopathy
- Recurrent anovulatory bleeds
  - TSH, PRL
- Gonadotropin levels rarely helpful

AVB: Presentation-based Management
- Acute dysfunctional (anovulatory) bleeding
- Recurrent dysfunctional bleeding
- Polymenorrhea
- Post-menopausal bleeding
- Post-coital bleeding
- Recurrent (ovulatory) menorrhagia
- Hormonal contraceptive bleeding

Management of Episodic DUB
- Substitute a pharmacologic luteal phase for missed physiologic luteal phase
- If minimal bleeding for a few days
  - Rx MPA 10 mg QD (or microP, 200 BID) x10d
  - Bleeding stops < 3 days; w/d after progestin
- Moderate or heavy bleeding > 3 days
  - Monophasic OC given BID-TID x 5-7 days
  - OC “taper” (QID-TID- BID-QD) and then stopping is illogical and should not be used
- Torrential bleed: surgical curettage (MUA)

Mechanism of “Chemical Curettage”
- Estrogen
- Progesterone
- High dose OCs x 7 days
  - E stabilizes EM
  - P matures EM

Management of Recurrent DUB
- Pregnancy: cycle with clomiphene or metformin
- Contraception: cycle with OC
- Not interested in pregnancy or contraception
  - MPA or microP first 10-14 days each month
  - Withdraw every other month if pt prefers
- Peri-menopausal bleeding
  - Once hyperplasia excluded, goal=cycle control
    - Low estrogen dose OC
    - Cyclic sequential HT
Time flies like an arrow...
Fruit flies like a banana