Gynecologic Causes of Acute Pelvic Pain

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Disclosures

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Preview:
Emphasis on diagnosis and what’s new

- Adnexal Torsion
- Ruptured Ovarian Cyst
- PID
- Tubo-ovarian abscess (TOA)
- Myomas
- Endometriosis
  - CPP exacerbation, Dysmenorrhea, Mittleschmerz, Ovarian hyperstimulation syndrome. Hematometra

Non-Gyn Acute Pelvic Pain

Pregnant:
- ECTOPIC ECTOPIC ECTOPIC
- Abortion
- Ruptured Corpus Luteum Cyst
- Degenerating Fibroid
- Later pregnancy issues
- Everything else on the non-pregnant list

GU: stones, cystitis, pyelonephritis
GI: constipation, appendicitis, diverticulitis, SBO, volvulus, IBD, intussusception, perforated viscous, gastroenteritis, incarcerated hernia, bleeding peptic ulcer, ischemic bowel
Musculoskeletal: muscle strain/injury, herniated disc, arthritis, infection, neoplasm
Other: abdominal aneurysm; abdominal angina; porphyria, sickle cell crisis, abdominal migraine
The Case of Ms. A

- Ms. A is a healthy, 41 year old Arabic-speaking woman, G3P3, who presented to the ER with LLQ pain.
- She was not pregnant. She also had a low grade fever and intermittent nausea and vomiting. The pain was sudden in onset and at times radiated down her left leg. It was worse when it first started and subsequently waned and waned but was still 7 out of 10 when we saw her. It was worse with movement. She has never had pain like this before.
- She had one sexual partner (her husband), no history of STD’s and used OCP’s for irregular bleeding. She was on day 3 of her pill pack. Except for the N/V, she had no other GI symptoms. She also reported no vaginal discharge, no dysuria and ROS was negative.

Physical Exam

- **T=38.3.** Other VS Normal
- Mod distress but stoic, difficulty changing positions in bed, pain worse when lying flat.
- **Abd:** Soft, ND, +BS. Localized rebound in LLQ. Large firm mass in lower pelvis, tender. Negative bed shake.
- **Pelvic:** Speculum-no mucopus, nl cervix etc. BME: Difficult b/c of pt discomfort but approx 16 wk mass-likely uterus, mod tender. Cervical motion tenderness in both directions. Left adnexal tenderness, unable to palpate adnexa b/c of pain.
- **Rectal:** Confirms above. Hem Neg.

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- **Rectal:** Confirms above. Hem Neg.
What’s our DDx?

1. Adnexal Torsion *(abrupt onset, vomiting, intermittent)*
2. Ruptured Ovarian Cyst *(abrupt, peritoneal signs, including CMT)*
3. PID/TOA *(febrile, CMT, peritoneal signs)*
4. Myoma twisted *(see #1, 16 wk uterus)*
5. Myoma degenerating *(febrile, CMT, fibroids)*

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Question #1

In a patient presenting with acute abdomino-pelvic pain, ultrasound will provide a definitive diagnosis for which of the following (all that apply):

1. PID
2. TOA (tubo-ovarian abscess)
3. Ruptured ovarian cyst
4. Endometriosis
5. Adnexal torsion
6. Torsion of a pedunculated myoma
7. Degeneration of a myoma

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Could it be a fibroid?

- Fibroids rarely cause acute or severe pain.
- Acute pain only if:
  - degenerating
  - twisting on a pedicle
  - prolapsing through the cervix
- **Torsion of fibroid** → presentation identical to adnexal torsion but u/s shows solid mass
- **Prolapsing fibroid** → Waves of crampy abdominal pain accompanied by bleeding. Easily diagnosed on speculum exam.

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Pedunculated fibroids can twist

- Presentation very similar to ovarian torsion: sudden onset severe pelvic pain, perhaps intermittent, assoc N/V, generalized tenderness
- Relatively rare
Degenerating myoma

- Rare
- More in large myomas (>10cm) and in pregnancy
- Onset gradual, not acute
- **Physical exam**: localized tenderness over myoma, tender uterus, possibly CMT. Typically no peritoneal signs. Possible low grade fever, slight ↑WBC.
- **U/S**: will show presence of large fibroid. Less reliable for diagnosis of degeneration but might see cystic changes suggestive of degeneration

Back to pt: Labs/Studies

**Labs:**
- Initial: WBC 11.4, 6.4 PMNs, Hct 37, Plts, Lytes, LFT's, amylase all normal. 
- Later: WBC 16.2, 14 PMNs, Hct 32.5

**Studies:**
- Abd Series: Negative
- Ultrasound: large fibroid uterus (17 x 10 x 11). Small amount of free fluid. Right ovary nl. Left ovary enlarged at 5.2 cm.
- Differential per radiology: torsion, TOA, ectopic

**Further work-up:** Surgery consulted—felt not diverticulitis.

Question #2

A sexually active woman presents with gradual onset of worsening pelvic pain. In addition to abdomino-pelvic tenderness and pelvic organ tenderness on exam, which of the following findings must be present to make the diagnosis of PID prior to treating it?

1. Fever >38.0
2. CMT (cervical motion tenderness)
3. Cervical muc-po
4. Increased white cell count
5. Ultrasound showing pyosalpinx
6. Absence of a competing diagnosis
Could it be PID?

- **Onset/location:** Subacute (1-2 days) onset of dull bilateral and central pelvic pain
- **Progression/Assoc sx:** Pain gradually worsens and can be severe. Feel ill. "PID shuffle". Possible fever, vag discharge, diarrhea, N/V. Worse with movement and lying flat.
- **Risk Factors:** Age < 25, Multiple/new partners, unprotected sex, h/o STD. New IUD (<20 days). Douching. Identify lesbian/bi
- **PROTECTIVE:** pregnancy, condoms, tubal ligation, OCP’s, possibly levonorgestrel IUD (52mg)

PID Etiology

- **PID**= ascending infection of upper genital tract: salpingitis, peritonitis, endometritis, TOA (tubo-ovarian abscess)
- **Etiology:** polymicrobial (GC, CT, mycoplasma, gardnerella, prevotella, Ecoli, Hflu, peptostrepto, other anaerobic/aerobic vaginal flora). Similar to flora seen with BV.
- 2/3 have concomitant BV
- GC/CT is **declining** in PID (< 50% are +)

Role of Mycoplasma Genitalium

- Controversy: unclear if pathogen or bystander
- Difficult to culture, PCR shows MG in ~15% with PID
- Most studies cross-sectional. Need more longitudinal studies to establish causality
  - 2 cohort studies show 8-13 fold increase in PID in women with MG. Largest cohort study showed no association.
- Unclear if assoc with long term sequelae. Implicated in tubal factor infertility in one study
- Has been associated with treatment failure. Some strains resistant to tetracycline

PID

- Minimum criteria per CDC is pain + pelvic organ tenderness (**CMT or adx or uterine**) without competing diagnosis.
- Additional evidence improves specificity: ↑ WBC, fever, ↑ ESR, ↑ CRP mucopus from cervix, WBC on wet mount, EMB showing infection
- Clinical diagnosis has a PPV for salpingitis of 65%–90% compared with laparoscopy
- **DIAGNOSIS OF EXCLUSION!** r/o appy, UTI, etc.
**PID Clinical Pearls**

- Range of severity from asymptomatic to sepsis.
- Best to over-treat to avoid long-term sequelae of chronic pelvic pain, infertility, ectopic.
  - In PEACH trial, in treated women, infertility=17%, recurrent PID=14%, CPP=37%.
  - Infertility increased with delay in treatment (>3 days), severity of illness, number of episodes PID.
- Negative GC and CT does not rule out PID—continue full course Abx.
- Repeat pelvic exam in 2-3 days (to ensure improving).
- TREAT PARTNER, check for other STI’s (HIV, RPR).

**CDC 2015 PID treatment**

**Outpatient:**
- Cetriaxone 250mg IM or cefoxitin 2g IM + probenecid 1g or other parenteral third-generation cephalosporin (ceftriaxone, cefotaxime)
  
  *Plus* doxy 100 mg bid for 14 d
  
  +/- Metronidazole 500 mg bid for 14 d

**Inpatient:**
- Cefotetan (q12) or cefoxetin (q6) 2g IV + doxy 100 mg po bid for 14 days or gent + clinda (900 mg q8)
- 24 hours after improvement, can switch to Doxy only to complete 14 days unless TOA present, then use Clinda or Flagyl + Doxy

**What’s new 2015 CDC for PID**

- Quinolone resistant GC: ceftriaxone 250 mg IM *plus* azithromycin 1 g PO (or alternative combo) get culture to check susceptibility.
- Greater emphasis on adding metronidazole to all regimens to cover anaerobes.
- Insufficient evidence to warrant removal of IUD ie. treat through the PID.
- Possible association of PID with Mycoplasma Genitalium (azithro better than doxy for this).

**Q2: ... which of the following findings must be present to make the diagnosis of PID prior to treating it?**

1. Fever (increases specificity but not necessary for diagnosis)
2. CMT (CMT is a subset of pelvic organ tenderness)
3. Cervical muco-pus (increases specificity)
4. Increased white cell count (increases specificity)
5. Ultrasound showing pyosalpinx (*u/s not necessary unless worry for TOA*)
6. Absence of a competing diagnosis *****
Tubo-ovarian abcess

- No clear risk factors in those with PID
- Diagnosis via ultrasound or CT. Suspect when not improving after 2 days of abx (80% of treatment failures due to TOA)
- Tubo-ovarian complex (TOC): radiologic diagnosis. Ovary can still be seen separate from tubal mass. Unclear if should receive IV antibiotics (given lack of evidence, low threshold to admit)

TOA: Treatment Evolving

- Historically, treated surgically.
- In 90’s, trial of IV Abx. Surgery only if not improved within 3 days. Abx alone: 75% effective
- IR-guided (U/S or CT) aspiration or catheter placement has become accepted part of treatment (in conjunction with ABX).

TOA: Drainage

- Questions: (insufficient evidence to answer)
  - Timing - antibiotic trial and drainage only if fails?
  - Do in all or a subset (eg. only if >5cm)?
- Largest study of aspiration (n=302):
  - 1/3 needed more than one aspiration
  - 7% eventually needed surgery
- A smaller study of transgluteal CT-guided catheter placement also with high success rate but more painful procedure
TOA: Treatment

- All must be admitted for broad spectrum IV abx with anaerobic coverage
- For small (<5cm) abscesses and for TOC, antibiotics alone may be ok
- Draining larger abscesses may speed recovery and decrease hospitalization
- Unclear how long to continue IV Abx. Older studies recommend 7 days. CDC: at least 1 additional day after clinical improvement.
- In older women, repeat U/S after resolution to r/o malignancy

Back to Pt: Follow-up

- Given unclear diagnosis, Ms A was admitted for observation. Not taken directly to OR b/c no further children desired.
- Over the course of the evening/night, she became febrile and was started on antibiotics for presumed PID vs diverticulitis.
- Given difficulty imaging ovary on ultrasound, and unclear diagnosis, an MRI was obtained which confirmed large myomatous uterus and showed non-specific enlargement of left ovary, 9x5x6. No evidence of malignancy. No diverticulitis.

Could it be torsion?

- **Onset and progression:** Acute onset of severe pain. “Stabbing” in 70%. Can be preceded by exercise, sex, BM. Classically intermittent though not always. Often can elicit a history of similar though less severe pain prior to presentation. Can radiate to back, flank, groin (50%)
- **Assoc Sx:** Very often assoc with N/V (70%) and sweating. Sometimes low grade fever.
Torsion: Physical exam

PE:
• Usually writhing in pain
• May have unilateral tenderness (abd, adx, CMT) or NOT
• Typically do not have peritoneal signs (unless long standing necrosis)
• Minority will have fever

Labs:
• Mod inc WBC (in minority). WBC not associated with severity of torsion.

Pathophysiology

• Elongated utero-ovarian ligament (more common in kids) and/or increase in weight of ovary or tube due to cyst, mass or swelling*
• Adnexa twists on its vascular pedicle
• As venous flow is impeded, ovary swells, further impeding vascular flow
• Result is ischemia and eventually necrosis
*Only 5-10% occur in normal sized ovaries (up to 50% in kids)— and these are at higher risk of recurrence

Adnexal torsion: Risk Factors

• Most common to twist: dermoid > serous cysts > hemorrhagic cysts
• Cyst size: majority >= 5 cm. Even very large cysts (20 cm) can twist
• Location: Right (2/3) > > Left
• Age: Reproductive aged >> post-menopausal

Adnexal torsion: Risk Factors (cont’d)

• More common in:
  – ovarian hyperstimulation syndrome (8% risk)
  – pregnancy
• Less common in:
  – cancer
  – endometrioma
  – tubo-ovarian abscess
• Tubal torsion is rare: increased after tubal ligation
Ovarian torsion in a patient with acute pelvic pain 2 weeks postpartum. Sonography showed a markedly enlarged right ovary with no flow on color Doppler (not shown).

**Role of Imaging**

- **Primary goal**: determine if ovary is enlarged
- Ultrasound preferred but CT can reveal presence of mass. Inter-observer reliability with CT is only “fair”.¹
- Doppler ultrasound can demonstrate presence or absence of blood flow. However, presence of flow does not rule out torsion and absence does not rule it in.
- Torsion remains a clinical diagnosis and surgery is only way to confirm

**Ultrasound to diagnose torsion**

- Studies small, most retrospective
- Skill, experience required (i.e. sensitivity and specificity in practice less than in research studies)
- Study of 199 women with acute pelvic pain:

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<th>Finding</th>
<th>Sensitivity</th>
<th>Specificity</th>
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<tr>
<td>Tissue edema</td>
<td>22%</td>
<td>100%</td>
</tr>
<tr>
<td>Absent intra-ovarian vascularity</td>
<td>52%</td>
<td>91%</td>
</tr>
<tr>
<td>Absent arterial flow</td>
<td>76%</td>
<td>99%</td>
</tr>
<tr>
<td>Absent venous flow</td>
<td>100%</td>
<td>97%</td>
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</tbody>
</table>
- Other studies report sensitivity 43%, specificity 92% for absent venous flow. Sensitivity of subjective assessment in diagnosing adnexal torsion was 54%²

**Torsion treatment**

- Historically, oophorectomy universally recommended due to fear of embolism. Not borne out by literature
- Remove cyst if present
- If no cyst present, consider fixing ovary (oophoropexy) to prevent recurrence
- Usually able to do via laparoscopy
**Oophorectomy or not?**

- Typically, ovary untwisted and observed to determine if viable, but visual determination is unreliable.
- Recent small cohort studies have found that ovarian function is preserved in 88-100% with simple untwisting even if ovary appears dusky (u/s studies of follicles).
- Case reports of subsequent necrosis and sepsis, so only offer to women desiring future reproduction.

**How long before the ovary dies?**

- Unknown
- Depends on degree of ischemia
- One study in children found median time from onset of pain of 14 hrs in those with viable ovary vs 27 hrs with non-viable ovary.

Early diagnosis critical to save ovarian function. Call gyn early (even before ultrasound if high suspicion).

**Could it be a ruptured cyst?**

- Asymptomatic >> extremely painful >> unstable
- **Onset:** Sudden, mod to severe pain. Often preceded by sex, exercise or BM. Typically starts on one side and becomes generalized lower pelvic pain.
- **Assoc Sx:** Often N/V at onset which subsides. Possible low grade fever or dizziness. Worse with movement and lying flat.
- **Progression:** Pain usually begins to recede within hours but can take as long as a day. Symptoms due to blood in abdomen (eg bloating, constipation), can take 2 weeks to subside.

**Ruptured ovarian cyst**

- Common!
- Corpus luteum cyst > follicular cyst
  >>> dermoid, endometrioma, TOA
- Usually occurs in luteal phase. Period often late or accompanied by mid-cycle spotting.
- Pain due to either blood from rupture site accumulating within ovary and stretching capsule or irritation of peritoneum by blood.
- Much higher risk if anticoagulated or bleeding disorder (von-wd). Slightly decreased risk on OCP's.
Diagnosis and treatment

• **Diagnosis:** DIAGNOSIS OF EXCLUSION. U/S often not helpful: cyst may or may not be present, free fluid may or may not be increased. Gold standard is laparoscopy (seldom used).

• **Treatment:**
  - Usually outpatient. Ensure stable HCT. Pain meds. Close follow-up to ensure improving.
  - Admit for observation if pain severe or unsure of diagnosis.
  - Laparoscopy: if hemodynamically unstable, worried about torsion or not improved within 24 hrs.

Prevention of recurrence? OCP’s

**No:**

- High dose (50mcg) pills known to suppress follicular cysts but risks do not justify use for this
- Most low dose pills: evidence is mixed and benefit is modest (25% decrease) at best. (~30% of cycles are ovulatory on OCP)

**Yes:**

- Desogestrel 75mg pills much lower rate of ovulation (1%)

Prevention of recurrence?

**No:**

- LNG IUD (52mg): higher rate of cysts than control (hysterectomy)
- ETG implant: suppresses ovulation but higher rate of cysts than control (copper-T)

**Yes:**

- DMPA: known to suppress ovulation reliably and expected to decrease hemorrhagic cysts.
- Leuprolide acetate (GnRH agonist) also effective but more side effects
Women on anti-coagulation

- Ovarian cyst rupture can be associated with life-threatening hemoperitoneum
- Recommend DMPA or Leuprolide acetate to prevent (desogestrel w/o estrogen not avail in U.S.)
- Depo-provera can be given sub-q if concern for hematoma with intra-muscular injection

Could it be endometriosis?

- May cause acute pelvic pain either at time of period (acute dysmenorrhea) or due to endometrioma cyst rupture.
- History of prior dysmenorrhea, dyspareunea or pelvic pain
- Rupture of endometrioma is uncommon but would present similarly to ovarian cyst rupture

Q1: ...ultrasound will provide a definitive diagnosis for ___?

1. PID (can be useful to r/o competing diagnoses)
2. TOA ***can be definitive
3. Ruptured ovarian cyst (even if it shows a cyst or increased free fluid, diagnosis is clinical)
4. Endometriosis (only useful if endometrioma present)
5. Adnexal torsion (to rule in an adnexal mass, presence/absence of flow not definitive)
6. Torsion of a pedunculated myoma (to rule in a myoma, twisting will not be visible)
7. Degeneration of a myoma (to rule in a myoma, may or may not show signs of degeneration)

Case Summary

- Given lack of improvement on antibiotics and possibility of torsion, plan made to go to OR. Given symptomatic fibroids, patient desired hysterectomy at same time if possible.
- Op findings: large fibroid uterus, ruptured left ovarian cyst with large clot adherent to ovary but no active bleeding. Not twisted at time of surgery but path reported evidence of torsion. No evidence of degenerating myoma.
Conclusions: Acute Pelvic Pain

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<thead>
<tr>
<th>• Ovarian torsion:</th>
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<tr>
<td>– Diagnosis of exclusion (U/S not diagnostic)</td>
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<td>– Delay leads to ovarian death, so refer to gyn or go to</td>
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<td>surgery earlier rather than later.</td>
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<td>– Leaving dusky ovary in-situ is becoming an acceptable</td>
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<td>option though studies are still small</td>
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<td>– Overtreatment acceptable to prevent sequelae</td>
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<td>– Avoid florquinolones due to resistant GC</td>
</tr>
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<td>– Ok to keep IUD in place</td>
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<th>• TOA:</th>
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<td>– Diagnosis via ultrasound.</td>
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<td>– Admission and IV abx required +/- IR drainage</td>
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