Pelvic Inflammatory Disease: Tricky diagnosis Twitter/Instagram: **@emboardbombs**

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Introduction

Pelvic inflammatory disease (PID) is an acute infection of the upper female genital tract that ascends from an anatomically lower region. It involves any or all the uterus or ovaries. 85% of cases of PID are caused by sexually transmitted organisms. PID accounts for a frequent cause of ED visits and can be tough to diagnose as STI testing results typically aren't available at the time of evaluation. However, it is critical that you recognize and treat PID appropriately because it can cause severe long-term complications for the patient. Gonorrhea is on the rise along with other sexually transmitted infections. STIs can present a challenge to physicians as there is no *clear* diagnostic test.

Pathophysiology

The most common causes of PID are *Neisseria gonorrhoeae* (often the most severe cases), *Chlamydia trachomatis,* and sometimes *Mycoplasma genitalium*.[2–6] Rare, nonsexual causes include *E. coli* and other GI organisms. On the exam, *Chlamydia* is the most common cause, so always pick that, but in real life these infections are typically polymicrobial. *Chlamydia* **is the most common cause of STIs** in the world. There are over 1.5 million cases annually. Gonococcal PID is more clinically severe than PID caused by *Chlamydia*.

Risk factors

Those with multiple sexual partners are at highest risk of developing PID. Younger age (15-25 years old), previous STIs, and lack of barrier contraception are also risk factors. Prior PID carries a 25% risk of recurrence. African American ethnicity carries a higher risk as well. Interestingly, PID is very rare in pregnancy after 12 weeks.

Although condoms have been found to prevent over 50% of STI infections if used correctly, consistent condom use in never-married women is unfortunately <30%. Most male partners have asymptomatic infections (~30%), so transmission is easy to females when many are completely unaware.

Despite historical opinion, modern IUDs do not cause any significant increased risk for PID. The risk of PID is limited to the first 3 weeks post-insertion, but beyond that, nope.

What about removing an IUD in the ED if there is active infection? We *strongly* caution against this. First, this is 100% wrong on test questions. Exams never want you removing a woman's birth control.
Secondly, most guidelines note that leaving an IUD in place while treating PID is totally reasonable, with inpatient assessment versus outpatient follow up by gynecology to determine removal if there is no improvement.

Clinical features

Besides risk factors, the history and physical exam provide the greatest combination of diagnostic power (65-90% sensitivity). Presumptive diagnosis is enough to begin treatment, as the risk of not treating is too great due to complication of infertility, morbidity and mortality. You should have a very low threshold to suspect PID and initiate treatment in any young, sexually active female with a suggestive history and physical exam.

The history should focus on the patient's sexual history: sexual practices, number of sexual partners, any new partners, anal intercourse, history of prior STI, partner STI history, use of barrier contraceptives.

Symptoms often develop acutely over a few days, although a slower process can happen. PID has a broad spectrum of presentation, ranging from virtually asymptomatic, mild abdominal discomfort to intra-abdominal sepsis that leads to infertility or even mortality. The most important symptom is lower abdominal pain that is often bilateral and <2 weeks in duration. Many report that it worsens with coitus, with sudden movement, or before or during menses. [7–9]

Other GU symptoms can include purulent vaginal discharge, abnormal uterine bleeding, and urinary frequency. [10,11] These are not necessary for diagnosis, but just note that they can be there.

The pelvic exam has come under fire for being poorly specific and poorly sensitive. We agree that the exam alone is not diagnostic, but it is often a necessary part of the physical exam in those with pelvic pain and/or vaginal discharge/bleeding. Physical exam will show tenderness to palpation of lower abdomen. More severe cases can have rebound tenderness, fever, or decreased bowel sounds. Your key, **pathognomonic finding** is **cervical motion, uterine, and/or adnexal tenderness**, all on bimanual physical exam. [11,12] While this will likely be your exam answer, in real life, this isn't seen in most patients.

<u>Complications that could be seen on exam</u>

If the patient has concurrent RUQ tenderness to palpation, it is likely perihepatitis caused by PID (Fitz-Hugh Curtis syndrome). [13] This happens when the liver capsule becomes inflamed – but note that there is no stromal involvement. This means that ALT and AST are *minimally* elevated if at all. It is rare- only seen in ~10% of PID cases. Pain classically is pleuritic, often radiating to the shoulder. On laparoscope, there have been adhesions visualized on the liver capsule ("violin-strings"). Be careful as this presentation often distracts the clinician away from the pelvis and takes them down a road of "biliary pathology".

If you feel a distinct adnexal mass on exam, it is likely a tubo-ovarian abscess caused by PID. This is pretty rare and will likely present with more severe abdominal pain as well as fever. Check out the TOA section below for more info.

Diagnosis
Did you take a good history? Did you do a physical and pelvic exam? Did you find a sexually active female with lower abdominal pain and cervical motion, uterine, or adnexal tenderness? PID is a clinical diagnosis, so go ahead and order those empiric antibiotics. [14] Always make sure to grab a pregnancy test, and don't forget to order HIV testing and syphilis serology (e.g. RPR). The NAAT for *Chlamydia trachomatis, Neisseria gonorrhoeae,* and *Mycoplasma genitalium* can either be collected via the urine or on pelvic exam. Urine nucleic acid tests are just about as sensitive as those performed using the pelvic exam, but if you are doing the pelvic exam, it is preferred you collect them during your speculum examination as these have slightly higher sensitivity. Make sure to always collect a microscopy of vaginal discharge as well to look for trichomonas. This is another STI that needs antibiotic therapy.

If you want to go the extra mile or have suspicion of another diagnosis or TOA, you could order a transvaginal US, pelvic CT or pelvic MRI, which may show thickened and fluid-filled fallopian tubes as well as hyperemia of pelvic structures on Doppler. If you find that, it will only support your diagnosis; if you don't, no big deal. Absence of this doesn't mean there isn't PID present. [15–18]

Management
Takeaway: *The sooner you get antibiotics on board, the better!*
There are multiple complications that can come from PID, so the threshold to treat should be low.

First thing's first, should they stay, or should they go?
Indications for hospitalization are high fever, N/V, severe abdominal pain, pelvic abscess, possible need for invasive evaluation or surgical intervention, limited PO intake from N/V, pregnancy, intolerance or resistance to oral meds, and real concern for nonadherence to therapy.[7]
Easy summary: any patient who has vital sign abnormalities (fever, tachycardia, looks unwell) and/or cannot tolerate PO should be admitted.

<u>If they're going to be hospitalized</u>, start them on cefoxitin 2 g IV q6hr or cefotetan 2 g IV BID + doxycycline 100 mg PO or IV BID. [7]

<u>If they're going home</u>, give them ceftriaxone IM 500 mg for patients <150 kg or 1 g for patients >150 kg + 100 mg Doxycycline PO BID for 14 days. If the patient had gynecologic instrumentation in the past 2-3 weeks, add metronidazole 500 mg PO BID for 14 days.[7] If they have an IUD they need to see their OB/GYN or PCP (whoever put it in) and ensure their condition improves or else the IUD may need removal. Before the patient leaves, be sure to counsel them on importance of medication adherence and avoiding intercourse until treatment is done. Try to treat their partner as well to avoid re-infection. Some states allow you to write an Rx script for partners.

<u>Tubo-ovarian abscess (TOA)</u>
TOA is a walled abscess of the fallopian tube that extends into the ovary that is often found as a complication of PID. However, it can also stem from infection at other locations. TOA is a rare, but serious complication. Rupture of a TOA can be life threatening. The infectious agents causing a TOA are often polymicrobial, made of both aerobic and anaerobic organisms. [19]

Clinical features
TOA patients present similarly to those with PID with lower abdominal pain, fever, chills, and vaginal discharge. TOA differs from PID in that the patient may not present as acutely. [20–22] You may be able palpate an adnexal mass on bimanual exam.
If the TOA has ruptured, the patient will present will a more acute picture and will likely show signs of sepsis. [19]

Diagnosis
Diagnosis follows the same steps as PID. In addition, grab a pelvic ultrasound or CT to better identify the abscess. On ultrasound, you will see a multilocular mass with signs of inflammatory debris. [20,21,23] On CT, you will also be able to see inflammatory signs and note the rim enhancing thick walls of the mass. [24]

Management
If signs of peritonitis are present, be concerned for rupture. This is now a surgical emergency! [25] Even if these signs aren't present, surgery and drainage is often advised if the abscess is >7 cm.

If the patient is stable with an abscess <7 cm, you can treat with one of the following antibiotic regimens:

- 2 g cefotetan IV q12hr + 100 mg doxycycline PO or IV q12hr (same regimen as for PID)
- 2 g cefoxitin IV q6hr + 100 mg doxycycline PO or IV q12hr (same regimen as for PID)
- 900 mg clindamycin IV q8hr + 2 mg/kg loading dose gentamicin IV or IM then 1.5 mg/kg q8hr
- 2 g ampicillin IV q6hr + 900 mg clindamycin IV q8hr + 2 mg/kg loading dose gentamicin IV or IM then 1.5 mg/kg q8hr
- 3 g ampicillin-sulbactam IV q6hr + 100 mg doxycycline IV q12hr

If the patient is postmenopausal, you should evaluate for possibility of underlying malignancy since a high rate of concurrence has been found among the two. [26–29]

References: for a complete list, check out our website under this topic heading and scroll to the bottom of the page.