CHAPTER 33

Acute Pelvic Pain in Women
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PERSPECTIVE
Women of childbearing age with low abdominal pain often have pathologic conditions related to the female reproductive system or bladder, although additional causes also should be considered.

Epidemiology
Acute pain caused by pelvic pathology is common, and the presenting complaint may be diffuse or lower abdominal pain, pelvic pain, or low back pain. A patient with chronic pelvic pain may also have an acute process, either related to the chronic condition or arising de novo.

Over one third of reproductive-age women will experience nonmenstrual pelvic pain. Among diagnoses for women with pain caused by gynecologic disorders in the emergency department, pelvic inflammatory disease (PID) and lower genital tract infections (e.g., cervicitis, candidiasis, Bartholin’s abscess) account for almost half. Other common diagnoses are menstrual disorders, noninflammatory ovarian and tubal pathology (including cysts and torsion), and ectopic pregnancy. In the general population, ectopic pregnancy accounts for 2% of first-trimester pregnancies; however, among women visiting the emergency department with vaginal bleeding or abdominal pain in the first trimester of pregnancy, the incidence of ectopic pregnancy is as high as 18%.1

Younger patients and those with multiple sexual partners are more likely to have PID, and a previous episode increases the likelihood of a subsequent episode.2 The risk of ectopic pregnancy is higher in women who have had PID, pelvic surgery, or a prior ectopic pregnancy, as well as in women with an intrauterine device. Heterotopic pregnancy is of special concern in women undergoing fertility treatment. The incidence of heterotopic pregnancy in the general population was 1 in 30,000 patients in 1948 and is currently reported to be as high as 1 in 8000. It is much more common in women undergoing assisted reproductive techniques (in vitro fertilization and ovulation-stimulating medications), with an incidence of 1 in 100.3 Common nongynecologic diseases, such as appendicitis, diverticulitis, urinary tract infection, and urolithiasis, remain important considerations in the woman with acute pelvic pain. Box 33-1 lists conditions accounting for pelvic pain in most women.

Some causes of pelvic pain may lead to serious sequelae. PID carries the short-term risk of tubo-ovarian abscess and the long-term risks of impaired fertility, chronic pelvic pain, and increased predisposition to ectopic pregnancy.4 Rupture of an ectopic pregnancy or a hemorrhagic ovarian cyst may be life-threatening. Unrecognized abuse may have serious or lethal consequences as well.

Pathophysiology
The female pelvis contains the vagina, uterus, fallopian tubes and ovaries, ureters and urinary bladder, and sigmoid colon and rectum, as well as components of the vascular and musculoskeletal systems. Although pelvic pain often originates from the reproductive organs, it may arise from any structures that lie adjacent to or course through the pelvis. Visceral pain afferents supplying the pelvic organs have common innervation with the appendix, ureters, and colon. Their significant overlap makes accurate localization difficult for both patient and clinician. Pain may be initiated by inflammation, distention, or ischemia of an organ or by spillage of blood, pus, or other material into the pelvis. Parietal pain develops when the afferent nerves in the parietal peritoneum adjacent to an affected organ are stimulated.

DIAGNOSTIC APPROACH
Differential Considerations
The differential diagnosis of pelvic pain is broad (see Box 33-1). Most causes of pelvic pain fit into three categories: (1) the reproductive tract, (2) the urinary tract, and (3) the intestinal tract. Because a subset of pelvic pain is found only in pregnancy, the pregnancy test is a key branch point in the diagnostic process. Potential pregnancy-related disorders can be divided into complications of early pregnancy and complications that occur further along in pregnancy. Although the specific cause of pelvic pain cannot always be determined at the initial ED visit, an organized approach usually leads to the confirmation or exclusion of disorders most likely to result in significant morbidity and/or mortality.

Pivotal Findings
It is rare that any particular finding on history or physical examination (summarized in Table 33-1) is reliable enough to conclusively make or exclude a particular diagnosis, so ancillary testing (beyond a simple pregnancy test) is commonly required in the evaluation of patients with acute pelvic pain.

The bimanual examination may at times provide important information; however, findings on pelvic examination can be
Box 33-1 Causes of Pelvic Pain in Women

Reproductive Tract
- Ovarian torsion
- Ovarian cyst
- Pelvic inflammatory disease
- Salpingitis, tubo-ovarian abscess
- Endometritis
- Endometriosis
- Uterine perforation
- Uterine fibroids
- Dysmenorrhea
- Neoplasm

Pregnancy-Related
First Trimester
- Ectopic pregnancy
- Threatened abortion
- Nonviable pregnancy
- Ovarian hyperstimulation syndrome

Second and Third Trimesters
- Placenta previa
- Placental abruption
- Round ligament pain
- Labor or Braxton-Hicks contractions
- Uterine rupture

Intestinal Tract
- Appendicitis
- Diverticulitis

Table 33-1 Differentiation of Common or Potentially Catastrophic Causes of Pelvic Pain

<table>
<thead>
<tr>
<th>CAUSATIVE DISORDER OR CONDITION</th>
<th>PAIN HISTORY</th>
<th>ASSOCIATED SYMPTOMS</th>
<th>SUPPORTING HISTORY</th>
<th>PREVALENCE IN ED</th>
<th>PHYSICAL EXAMINATION</th>
<th>USEFUL TESTS</th>
<th>ATYPICAL OR ADDITIONAL ASPECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ectopic pregnancy (critical if ruptured)</td>
<td>Classically severe, sharp, lateral pelvic pain, but severity, location, and quality highly variable.</td>
<td>Vaginal bleeding (often mild, can be absent).</td>
<td>Missed period; history of previous ectopic pregnancy, infertility, pelvic surgery, PID, or IUD use.</td>
<td>Common</td>
<td>Classically unilateral adnexal tenderness, adnexal mass, and CMT.</td>
<td>Pelvic US, quantitative β-hCG, T&amp;C, laparoscopy.</td>
<td>Cannot reliably exclude diagnosis based on history and physical examination. Severe pain, hypotension, or peritonitis suggests rupture.</td>
</tr>
<tr>
<td>Ruptured ovarian cyst (emergent—critical with significant hemorrhage; otherwise, urgent)</td>
<td>Abrupt moderate to severe lateral pain.</td>
<td>Light-headedness if bleeding is severe; rectal pain arises from fluid in cul-de-sac.</td>
<td>Uncommon</td>
<td>Hypotension and tachycardia if blood loss is significant; possible peritonitis.</td>
<td>Pelvic US, CBC, T&amp;C.</td>
<td>Physical examination findings often do not correlate with volume of blood in pelvis at US.</td>
<td></td>
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<tr>
<td>Appendicitis (emergent)</td>
<td>Duration often &lt;48 hr, generalized followed by localized RLQ pain.</td>
<td>Low-grade fever, nausea, anorexia.</td>
<td>Migration of pain to RLQ from center, abdominal pain before vomiting.</td>
<td>Common</td>
<td>RLQ tenderness, possible peritonitis.</td>
<td>US or CT in unclear cases.</td>
<td>Early in course, tenderness may be minimal or poorly localized.</td>
</tr>
</tbody>
</table>
subjective and unreliable and may be most helpful to localize the process to one side or the other or to help focus the workup of the pathologic process to the reproductive organs.

A sequential approach, as outlined next, can progressively limit the diagnostic possibilities until a sound provisional diagnosis is reached.

**Symptoms**

The location of pain and the radiation pattern often are helpful in focusing the differential diagnosis toward a specific cause or group of causes. Lateral pelvic pain is often related to a process in the tube or ovary. However, with right-sided pain, appendicitis is considered, and in left-sided pain (especially in patients older than 40 years), the differential diagnosis includes diverticulitis and colitis. Urolithiasis may also manifest as lateral pelvic pain, especially when the stone is at the ureterovesicular junction. Central pelvic pain usually is caused by processes involving the uterus or bladder or both adnexae. Pain radiating to the rectum may be secondary to pooling of fluid or blood in the cul-de-sac. Diffuse pain may occur with a central or bilateral process, such as PID, or with diffuse peritonitis from infection or intra-abdominal hemorrhage.

Information regarding the onset and duration of pain may be useful. Patients with uncomplicated appendicitis (without perforation or abscess) typically are seen within 48 hours of symptom onset. Sudden-onset pain suggests acute intrapelvic hemorrhage, cystic rupture, ovarian torsion, or ureterolithiasis. Gradual-onset pain is more consistent with inflammation (such as in PID) or obstruction. Chronic or recurrent pain is consistent with endometriosis, recurrent ovarian cysts, or a persistent ovarian mass. The quality of pain may often but not always differentiate the crampy,
intermittent pattern of muscular contractions along a hollow viscus (arising from, e.g., uterine, ureteral, or bowel pathology) from the steady, progressive pain associated with inflammatory or neoplastic causes. Pain associated with PID often manifests at the end of menses. Ovarian cyst pain may fluctuate through several menstrual cycles and result in rupture, which often occurs in the middle of the menstrual cycle.

Fever and chills are more common with an infectious process. Nausea and vomiting occur more frequently when the process originates within the gastrointestinal tract but also may accompany ovarian torsion, ureteral colic, other causes of severe pain, and pregnancy. Dysuria occurs in many local vulvar and vaginal processes, such as herpesvirus infection, candidiasis, and other types of vulvovaginitis, but urinary urgency typically signals an irritated bladder or urethra and should focus attention on the urinary tract.

Information about the patient’s last menstrual period, pattern of menses, and sexual activity pattern is useful but cannot rule out pregnancy. In a pregnant patient, the obstetric history may provide some helpful diagnostic clues. Recurrent spontaneous abortion or previous ectopic pregnancy increases the likelihood of these conditions, respectively. Patients who are actively undergoing infertility treatment are at increased risk for ectopic pregnancy, heterotopic pregnancy, ovarian torsion, and ovarian hyperstimulation syndrome. Round ligament pain is usually noted in the second trimester. Postpartum patients are at increased risk for endometritis.

The presence, quantity, and duration of associated vaginal bleeding should be ascertained. (See also Chapters 34 and 178.) In a nonpregnant patient, bleeding may be associated with PID, trauma, dysfunctional uterine bleeding, or cervical or uterine cancer. In a pregnant patient, bleeding may be associated with a subchorionic hemorrhage in an otherwise viable pregnancy, an ectopic pregnancy, a nonviable intrauterine pregnancy (IUP) (which may continue to cause bleeding after expulsion of the uterine contents, especially if any products of conception are retained), or later in pregnancy with placenta previa or abruption. In some cases the amount of bleeding may be substantial enough to necessitate blood transfusion and surgical intervention.

As part of the past medical history, any recent procedures should be ascertained. All women should be interviewed in private to permit disclosure of sensitive information, such as a sexual history, a known pregnancy, or a recent abortion. The onset of pelvic pain shortly after uterine instrumentation increases the possibility of uterine perforation or infection. Sexual history is important, with an emphasis on recent sexual contact and previous history of sexually transmitted disease.

Signs

The physical examination is directed toward the abdomen and pelvis. Pelvic examination is performed in virtually all patients, including pregnant patients at less than 20 weeks of gestation. Pregnant patients beyond 20 weeks of gestation with complaints of vaginal bleeding should undergo transabdominal pelvic ultrasound study for placental localization before the pelvic examination (see Chapter 178), have a fetal heart rate measured and documented, and may need a timely obstetric consultation.

Abnormal vaginal discharge may be seen in a variety of conditions, including vaginitis, cervicitis, endometritis, PID, and retained foreign body. Cervical motion tenderness most commonly indicates reproductive tract inflammation but also occurs with irritation of adjacent structures (e.g., cystitis, appendicitis). Although an open os is most consistent with an incomplete or inevitable abortion, it does not definitively exclude an ectopic pregnancy. A large uterus in a nonpregnant patient may indicate fibroids. Fundal tenderness is often difficult to distinguish from cystitis but can suggest PID, endometritis, or necrotic fibroids. Unilateral adnexal masses and tenderness are suggestive of an ovarian cyst, ectopic pregnancy, tubo-ovarian abscess, or ovarian torsion.

The constellation of adnexal tenderness, uterine tenderness, and cervical motion tenderness is classically associated with PID, although the diagnosis should be made without the presence of all three signs and may be initiated with only one sign in an at risk patient per the CDC 2010 Guidelines.

Laboratory Tests and Imaging

A pregnancy test is required in almost all patients of childbearing age with a complaint of abdominal pain, irrespective of sexual history or reported contraception use. Very few exceptions to this rule exist, such as a documented hysterosalpingectomy. A positive test result may indicate intrauterine or extrauterine pregnancy or, rarely, molar pregnancy or cancer. Urinalysis of a clean-catch specimen can identify nitrites and pyuria from a urinary tract infection, or hematuria, consistent with urolithiasis and hemorrhagic cystitis. The absence of hematuria does not rule out a ureteral stone, although it lowers the likelihood, and pyuria can be seen in extravesicular conditions, such as appendicitis. Urinalysis should be performed in all pregnant patients with pelvic pain even if their symptoms do not include urinary tract complaints, as urinary tract infection is associated with prematurity, low birth weight, and other complications of pregnancy.

Patients who may be hemorrhaging either internally or externally should have the hemoglobin and hematocrit checked, and type and crossmatch should be performed. Pregnant patients with mild vaginal bleeding also require blood typing to identify Rh-negative patients who will require RhoGAM.

Patients with a positive pregnancy test result should undergo a bedside ED ultrasound or formal ultrasound examination to evaluate for ectopic pregnancy. Identification of an IUP by ultrasound imaging excludes ectopic pregnancy with a high degree of certainty, as heterotopic pregnancy is exceedingly rare in patients who are not undergoing assisted reproduction. Conversely, a patient with a positive pregnancy test in whom a definite IUP cannot be seen is presumed to have an ectopic pregnancy until proven otherwise. In addition, the presence of a gestational sac alone is not enough to confirm an IUP; experienced sonographers can use the double decidual sign, but it is recommended that less experienced sonographers visualize a yolk sac or an embryo for definitive ultrasonographic confirmation of an IUP. A complex adnexal mass, tubal ring, extrauterine yolk sac or embryo, or free fluid is indicative of a probable ectopic pregnancy. The presence of free intra-abdominal fluid on ultrasound with a negative urine pregnancy test is consistent with hemorrhage or a ruptured hemorrhagic ovarian cyst. Regardless of cause, intra-abdominal free fluid is presumed to be blood and is addressed expediently.

DIAGNOSTIC ALGORITHM

The algorithm in Figure 33-1 is designed to help focus further testing and progress to a rational provisional diagnosis. It is not unusual, however, for common diseases to manifest in uncommon ways or for more than one disease to be present, and tests are interpreted carefully in the context of the individual patient’s presentation. As examples, patients with a positive result on urinalysis testing may also have appendicitis, and pregnant patients may also have ovarian torsion. With certain diseases, such as endometriosis, definitive testing is not available in the ED, and the patient’s history may be the most important discriminator.

After an initial history and physical examination, the pregnancy test determines the subsequent priorities. When a threatened
abortion is most likely, unilateral pain may prompt further evaluation for torsion. An empty uterus on ultrasound imaging, or any ultrasound study that cannot confirm a definite IUP, could be consistent with an ectopic pregnancy, a spontaneous abortion, or a very early normal pregnancy. Patients past 20 weeks of gestation will require observation with fetal monitoring.

Nonpregnant patients with pain that seems to be gynecologic in nature should be assessed for hemorrhage from a ruptured ovarian cyst; for ovarian torsion (see Chapter 100); and for infection, including cervicitis, endometritis, PID, salpingitis, and tubo-ovarian abscess. Although the history and physical examination often are sufficient to diagnose infection, ultrasound assessment is helpful if torsion, tubo-ovarian abscess, or ruptured hemorrhagic cyst is suspected. Ultrasound findings also may support a diagnosis of PID if evidence of salpingitis is noted, or of a simple ruptured cyst if a characteristic ovarian appearance is combined with presence of a small amount of free fluid. Although not as reliable as CT scanning, ultrasound may be used to examine the appendix.

Because in practice it is difficult to differentiate some gynecologic origins of pain from classic intra-abdominal causes (such as right ovarian pathology from appendicitis), the workup may require an ultrasound study or a CT scan, or both. If the cause appears to be most likely gynecologic, then an ultrasound examination of the ovary and then the appendix is more reasonable, followed by a CT scan if the ultrasound findings are negative and the presentation is possibly consistent with appendicitis or other alternate diagnoses. Patients whose pain does not seem to be from the reproductive tract often have urinary infections or stones, abdominal sources of pain (see Chapter 27), musculoskeletal pathology, may be victims of abuse, or may have depression. Vascular causes of pain are possible but uncommon.

If the available data either do not make sense or conflict with the clinical gestalt, execution of the following three steps should be considered. (1) Ensure that emergent, life-threatening diagnoses have been addressed (e.g., ectopic pregnancy is ruled out). (2) Move back up the algorithm and reassess whether the presentation may be atypical (e.g., reconsider appendicitis as a consideration). (3) If emergent causes are unlikely and sufficient consideration was given to less likely disorders without uncovering a cause, consider the possibility of depression or abuse before disposition. Follow-up planning for all patients is recommended.

**EMPIRICAL MANAGEMENT**

An algorithm for management of patients with acute pelvic pain is presented in **Figure 33-2**. Patients who are in extremis are most likely to be hemorrhaging, although on occasion septic shock may be the cause. Ectopic pregnancy, placental abruption, and hemorrhagic ovarian cyst may cause life-threatening hemorrhage with no or minimal vaginal bleeding. Patients with these disorders need rapid treatment with fluid and blood products and may require surgical intervention before stabilization can be achieved. A bedside ultrasound may help the clinician reach the presumptive diagnosis expeditiously. Septic shock may be a consequence for diagnosis.
Figure 33-2. Management algorithm for acute pelvic pain: critical patients and right lower quadrant pain presentations. CT, computed tomography; FAST, focused assessment with sonography for trauma; GYN, gynecology; β-hCG, β-human chorionic gonadotropin; Hgb, hemoglobin; IUP, intrauterine pregnancy; IV, intravenous; OB, obstetrics; PID, pelvic inflammatory disease; STAT, immediately; US, ultrasound; UTI, urinary tract infection.
of abdominal or pelvic processes and may require both general surgical and gynecologic consultations, as well as admission to an intensive care setting.

In patients with both critical and noncritical conditions, early administration of analgesia is advisable, both for patient comfort and to improve the yield of examinations. Intravenous opioids, such as morphine, are rapid and effective, titratable, and safe in pregnancy. Patients who do not appear ill and for whom a sound provisional diagnosis is reached may be discharged with close follow-up and appropriate precautions. However, pregnant patients who are at more than 20 weeks of gestation should be referred to the obstetric service for observation. Abdominal trauma in pregnancy, especially later in pregnancy, arouses additional concerns not addressed in this chapter, and patients should undergo monitoring before discharge.

The references for this chapter can be found online by accessing the accompanying Expert Consult website.
References