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Acute Pelvic Pain

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■ INTRODUCTION

The accurate clinical diagnosis of a reproductive age woman presenting with acute pelvic or abdominal pain is a challenge. Pelvic pain is a common presenting symptom of many gynecologic disorders. However, it also may be seen with disorders of the gastrointestinal, urinary, and musculoskeletal systems. To determine the etiology of the pain, the clinician must use the history, physical examination, and diagnostic tests as tools. In this chapter, we will present a framework to assist in classifying and diagnosing acute pelvic pain. We will then outline the role of the history, physical examination, and laboratory tests and conclude with a brief discussion of selected specific disorders.

■ DIFFERENTIAL DIAGNOSIS OF ACUTE PELVIC PAIN

Numerous studies have confirmed that it is often difficult to arrive at a definitive diagnosis in women of reproductive age with acute pelvic pain. A comprehensive evaluation leading to a timely diagnosis will reduce the morbidity associated with delayed diagnosis.

To assist with diagnosing acute pelvic pain, it is convenient to divide the causes into pregnancy related, gynecologic, and nongynecologic. The gynecologic causes can be further subdivided into infectious and noninfectious. This classification is presented in Table 16-1.

■ HISTORY

The first step in evaluating the patient with acute pelvic pain is to obtain a careful history, which can be the

source of important diagnostic clues. The essential features of the history are presented in Table 16-2.

■ AGE

Infectious causes of pain such as pelvic inflammatory disease (PID) and appendicitis are more common in younger women (adolescents and women younger than 30 years), while disorders such as diverticulitis are more commonly seen in women older than 40 years. The differential diagnosis of pain grouped by patient age is presented in Table 16-3.

■ PAIN CHARACTERISTICS

Pain of sudden onset suggests an acute event, while pain that is more gradual may be seen with subacute or progressive conditions. The differential diagnosis of pain grouped by time of onset is presented in Table 16-4. The location of the pain may also be helpful, although different etiologies can lead to pain in the same region. The uterus, cervix, and adnexae share visceral innervation with the lower ileum, the sigmoid, and rectum (T10 to L1), and pain from any of these structures may be felt in the same place. Diffuse and generalized pain should alert the clinician to the possibility of peritonitis.

Although pain quality and severity are nonspecific, they may provide some clue about the etiology. Abrupt and severe pain is typically associated with perforation (ectopic pregnancy), strangulation (ovarian torsion), or hemorrhage (ovarian cysts). Crampy pain is often seen with dysmenorrhea or spontaneous abortion. Colicky

TABLE 16-1 The Differential Diagnosis of Acute Pelvic Pain**1. Pregnancy related**

Spontaneous abortion
Threatened
Complete
Incomplete
Septic
Ectopic pregnancy

2. Gynecologic: infectious

Endometritis
PID/salpingitis
TOA

3. Gynecologic: noninfectious

Dysmenorrhea
Uterine fibroids
Endometriosis
Mittelschmerz (midcycle ovulatory pain)
Ovarian cysts
Rupture
Hemorrhage
Torsion
Ovarian cancer/tumor
Ovarian hyperstimulation syndrome

4. Nongynecologic

Gastrointestinal
Appendicitis
Gastroenteritis
Diverticulitis
Inflammatory bowel disease
Irritable bowel syndrome
Bowel obstruction
Mesenteric lymphadenitis
Constipation
Abdominopelvic adhesions
Urinary tract
Lower urinary tract infection/cystitis
Interstitial cystitis
Pyelonephritis
Nephrolithiasis
Musculoskeletal
Strained tendons/muscles
Joint infection/inflammation
Hernia
Other
Aortic aneurysm
Aortic dissection
Porphyria

PID = pelvic inflammatory disease; TOA = tubo-ovarian abscess.

TABLE 16-2 Historic Data Useful in the Differential Diagnosis of Acute Pelvic Pain**1. Patient Age****2. Pain Characteristics**

Onset
Position
Quality
Radiation
Severity
Aggravating/alleviating factors
Associated symptoms
Urinary symptoms
Gastrointestinal symptoms
Fever/chills
Vaginal bleeding
Vaginal discharge
Treatment tried

3. Obstetrical and Gynecologic History

LMP
STIs/PID
Ectopic pregnancy
Uterine fibroids/ovarian cysts
Menstrual history
Contraceptive history
Sexual history

4. Medical/Surgical History**5. Social History**

Marital status

LMP = last menstrual period; STI = sexually transmitted infection; PID = pelvic inflammatory disease

TABLE 16-3 Differential Diagnoses: Grouped by Age

1. Menarche to Age 21 Years	Spontaneous abortion
Dysmenorrhea	Ectopic pregnancy
PID	PID
Ovarian cysts	Irritable bowel syndrome
Rupture	3. Age 35 to Menopause
Hemorrhage	Uterine fibroids
Torsion	Endometriosis
Pregnancy	Ovarian cancer/tumor
Spontaneous abortion	Pregnancy
Ectopic pregnancy	Abortion
Appendicitis	Ectopic pregnancy
Inflammatory bowel disease	Nephrolithiasis
2. Aged 21 to 35 Years	Irritable bowel syndrome
Ovarian cysts	Diverticulitis
Endometriosis	Hernias
Pregnancy	PID
PID = pelvic inflammatory disease	
Note: There is considerable overlap between age groups, and disorders are not listed in order of frequency.	

TABLE 16-4 Differential Diagnoses Grouped by Time of Onset

1. Acute Onset (seconds–minutes)	3. Slow Onset (days–weeks)
Ovarian cysts	Neoplasms
Rupture	Cystitis
Hemorrhage	Pyelonephritis
Torsion	Ectopic pregnancy
Rupture	PID
TOA	Diverticulitis
Abdominal aortic aneurysm	Abortion
Ectopic pregnancy	Abdominal aortic aneurysm
Aortic dissection	4. Chronic Onset (weeks–months)
Nephrolithiasis	Neoplasms
2. Gradual Onset (hours–days)	Endometriosis
Appendicitis	Uterine fibroids
Diverticulitis	Chronic pelvic pain
Herpes zoster	Domestic violence/sexual abuse
Gastroenteritis	Diverticular disease
Mittelschmerz	Irritable bowel syndrome
Primary dysmenorrhea	Inflammatory bowel disease
Abortion	
TOA = tubo-ovarian abscess; PID = pelvic inflammatory disease.	

pain typifies ovarian torsion or nephrolithiasis. Burning or aching pain often occurs with inflammatory processes, such as appendicitis or PID.

■ ASSOCIATED SYMPTOMS

Associated symptoms are often helpful when trying to narrow in on a diagnosis. Pain with fever suggests an infectious or inflammatory etiology, such as appendicitis, PID, or a tubo-ovarian abscess (TOA). Nausea, vomiting, and anorexia are nonspecific symptoms of peritoneal irritation that can be seen with inflammatory conditions and hemoperitoneum. Vaginal discharge can be seen with infectious conditions of the female genital tract, such as cervicitis or PID. Vaginal bleeding may be associated with pregnancy-related disorders, abnormalities of the menstrual cycle, PID, or pathology of the uterus or cervix.

■ AGGRAVATING AND ALLEVIATING FACTORS

Changes in pain may occur in relation to menses, coitus, activity, diet, bowel movements, or voiding. These pain characteristics may help in narrowing the differential diagnosis.

■ OBSTETRIC AND GYNECOLOGIC HISTORY

A complete obstetric and gynecologic history, including menstrual, contraceptive, and sexual histories, is essential. The patient's gravidity, parity, and past obstetric history should be established. The past gynecologic history, including previous episodes of sexually transmitted infections (STIs), PID, and ectopic pregnancy, is important.

A menstrual history, including last normal menstrual period, can be helpful. The results of some studies have suggested that PID is more likely to occur in the first half of the menstrual cycle, while appendicitis is randomly distributed. A contraceptive history is also of diagnostic value. Women not using reliable contraception are at risk for pregnancy. Women not using barrier methods of contraception are at increased risk for STIs and PID, while those using barrier methods or combined oral contraceptives have a reduction in the risk of PID of approximately 50%. The presence of an intrauterine contraceptive device (IUD) increases the risk for developing acute PID, particularly around the time of insertion, but does not increase the absolute risk for developing an ectopic pregnancy. However, an IUD is more effective at preventing

intrauterine versus extrauterine gestation, so a pregnancy that occurs with an IUD in place has a 10-fold increased risk of being ectopic.

Finally, a sexual history is important (see Chapter 2). Information about sexual habits and risky behavior, current partners, new sexual partners in the past 3–6 months, and number of lifetime partners helps the clinician to estimate the patient's risk of STIs and PID.

■ MEDICAL AND SURGICAL HISTORY

A history of urinary or gastrointestinal tract disorders may be a clue to the current problem. Surgical history may help to rule out certain disorders, such as appendicitis, or heighten awareness of the possibility of other problems, such as ectopic pregnancy in a patient with previous pelvic or tubal surgery.

■ PHYSICAL EXAMINATION

Observation is an important first step and often helps to assess the severity of the patient's condition. Vital signs, especially temperature, must be obtained. Fever can help to identify an inflammatory process but may not help to specify which one. If hemorrhage is suspected, such as in ruptured ectopic pregnancy or hemorrhagic ovarian cysts, orthostatic pulse and blood pressure should be measured to evaluate for hypovolemia.

The important components of the abdominal examination include inspection, auscultation, percussion, and palpation. Percussion and palpation can help to identify masses and peritoneal irritation. Peritoneal irritation is confirmed by the presence of rebound tenderness, involuntary guarding, and increased pain with motion or cough.

The next step in the physical examination is the pelvic examination. This is most easily organized from external to internal structures. The external genitalia should be carefully inspected for lesions (see discussion in Chapter 4 about examining the female patient). The presence of inguinal adenopathy suggests a local infectious process. On speculum examination, the vagina and cervix should be visualized. Lesions, blood, or discharge should be noted. The presence of cervical discharge, erythema, or friability should alert the clinician to the possibility of cervicitis or PID. Grossly purulent cervical discharge (mucopus) reflects a high concentration of polymorphonuclear leukocytes in the mucus, but the presence of mucopus has not been shown to accurately predict PID. On internal pelvic examination, the first

step should be an assessment for cervical motion tenderness (CMT) or “excitation.” Its presence is nonspecific and may indicate PID, ectopic pregnancy, endometriosis, ovarian cysts, or appendicitis. Next, a bimanual examination should be performed, with assessment of the uterus and adnexae. Pain on bimanual examination may occur with endometritis, degenerating uterine fibroids, endometriosis, PID, ovarian cysts or torsion, ectopic pregnancy, or appendicitis. Finally, digital rectal and rectovaginal examinations should be considered, especially if the diagnosis is unclear.

When interpreting the pelvic examination, remember that movement of the pelvic organs will be painful if peritoneal irritation is present, regardless of the cause. Therefore, CMT and adnexal tenderness may be found with a variety of disorders. In one study that compared findings in patients with PID and appendicitis, CMT was found significantly more often in patients with PID but was still found in 28% of patients with appendicitis. Adnexal tenderness was found with equal frequency in both groups but was usually limited to the right side in patients with appendicitis and was usually, but not always, bilateral in patients with PID.

■ DIAGNOSTIC TESTS AND IMAGING

Laboratory and diagnostic imaging tests may be helpful with the differential diagnosis of acute pelvic pain but should be interpreted cautiously. Baseline tests should include at least a complete blood count (CBC) and highly sensitive urine pregnancy test. A serum beta human chorionic gonadotropin (β -hCG) pregnancy test may also be considered, although urine tests are highly accurate. In one study, the peripheral white blood cell (WBC) count was significantly higher in those with appendicitis than in those with PID (15.3 vs. 12.7, $p < 0.01$). However, note that the CBC has a low sensitivity and specificity. The hematocrit is low in roughly one-third of patients with ectopic pregnancy but normal in another third. In studies, a normal WBC count has been found in more than half of patients with PID and in one-third of patients with acute appendicitis, while an elevated WBC count is commonly seen in patients with ectopic pregnancies and bleeding corpus luteum cysts. The erythrocyte sedimentation rate (ESR) is another nonspecific sign of inflammation. It is classically elevated in PID but can be normal in up to 25% of patients.

A urinalysis should be performed on every patient with acute pelvic pain to rule out the presence of a urinary tract infection or stone. Care must be taken with

specimen collection to avoid contamination by vaginal or cervical discharge. Cervical, urine, or vaginal swab specimens should be obtained to test for *Neisseria gonorrhoeae* and *Chlamydia trachomatis* (see Chapter 5). Vaginal fluid should be collected for pH measurement, saline wet mount, and potassium hydroxide (KOH) preparation to diagnosis bacterial vaginosis, *Trichomonas vaginalis*, and yeast infection (see Chapter 7). The majority of women with PID will have leukocytes present on wet mount.

Imaging studies, especially ultrasound, may be useful in making the diagnosis. Ultrasound is invaluable in evaluating the gynecologic organs and may help to identify ovarian cysts, pelvic masses, and uterine lesions, such as fibroids. Transvaginal ultrasound may offer more information than abdominal or pelvic ultrasound. The utility of ultrasound in the work-up for PID and TOA is discussed elsewhere in Chapter 8. Computed tomography (CT) and magnetic resonance imaging (MRI) scanning may also be useful to evaluate women presenting with pelvic pain, especially if a nongynecologic cause is part of the differential diagnosis.

In difficult cases, diagnostic laparoscopy is perhaps the most definitive way to arrive at a diagnosis in a patient with acute pelvic pain. It is the best and most reliable method to achieve a complete evaluation of the pelvic structures and allows direct visual access to the peritoneal cavity. Although laparoscopy is minimally invasive, it does carry some risks with it. Vascular injuries, injuries to the gastrointestinal tract, and urinary tract have been reported with a risk estimated at 2/1000 to 3/1000.

■ INTERPRETATION OF PATIENT WORK-UP

To establish a working diagnosis in the woman of reproductive age with acute pelvic pain, the clinician must use all of the tools previously discussed. Clinical history, physical examination, laboratory tests, and imaging procedures are useful in providing diagnostic clues, but they may lack adequate sensitivity or specificity to make a final diagnosis. Despite a comprehensive history and physical examination, a significant proportion of patients with acute pelvic pain will continue to have an unclear diagnosis.

■ PREGNANCY-RELATED CAUSES OF ACUTE PELVIC PAIN

The most common pregnancy-related causes of acute pelvic pain are abortion (threatened, incomplete, and septic) and ectopic pregnancy.

Spontaneous Abortion

Spontaneous abortion is defined as a pregnancy that ends spontaneously before 20 weeks of gestation and is estimated to occur in 15–20% of all pregnancies. Classic symptoms are amenorrhea followed by abdominal pain and vaginal bleeding. The pain is typically midline and crampy. The differential diagnosis includes an ectopic gestation until the pregnancy is proved to be intrauterine.

Ectopic Pregnancy

Ectopic pregnancy should be considered as a diagnosis in any sexually active woman who presents with acute pelvic pain. It occurs when a fertilized ovum implants at any site outside of the endometrial cavity. In most cases, implantation occurs in the fallopian tube, but ectopic pregnancies have been reported in the ovary, cervix, and peritoneal cavity. The most important risk factor is a history of salpingitis. Other risk factors include prior tubal surgery or ligation, current IUD use, and prior ectopic pregnancy. After one ectopic pregnancy, there is a 10–20% chance that the next pregnancy will be ectopic.

Pelvic pain is the most common single symptom in patients with ectopic pregnancy. The nature of the pain is variable and may be well localized or more generalized if intraperitoneal bleeding has occurred. A history of abnormal bleeding is also often present. The physical examination of patients with ectopic pregnancy can also be variable and can range from subtle findings to shock if a rupture occurs. An adnexal mass is only palpable in roughly one-third of patients.

The mainstays of diagnosis with ectopic pregnancy are urine or serum β -hCG and ultrasound. Currently available highly sensitive urine tests can detect hCG levels as low as 25 mIU/mL. Current serum assays for β -hCG are also sensitive, and a negative result rules out pregnancy. A single level has limited utility, but serial measurements are useful. The β -hCG should rise by 65% or greater in a 48-hour period in a normal intrauterine gestation. A slow rise or a plateau in the level should alert the clinician to the presence of an abnormal pregnancy. Ultrasound can also be of great value in diagnosing ectopic pregnancy. A viable intrauterine pregnancy should be seen on transabdominal ultrasound at an β -hCG level of 6500 mIU/mL and on transvaginal ultrasound at a level of 1000–2000 mIU/mL. If an intrauterine gestation is seen, an ectopic pregnancy can be essentially ruled out as the likelihood of coexisting gestations is exceptionally rare in spontaneous conception.

■ INFECTIOUS GYNECOLOGIC CAUSES OF ACUTE PELVIC PAIN

Infectious gynecologic causes of acute pelvic pain include endometritis, PID, and tubo-ovarian abscess.

Endometritis

Endometritis is defined as an infection of the lining of the uterus. It may occur postpartum (following vaginal delivery or cesarean section) or as part of the progression of ascending infection from the cervix to the fallopian tubes. It may also be found following instrumentation of the endometrial cavity, such as with elective abortion, hysteroscopy, or dilatation and curettage.

Endometritis is a polymicrobial infection. Organisms include aerobic and anaerobic bacteria, *Mycoplasma hominis*, *Ureaplasma urealyticum*, *N. gonorrhoeae*, *C. trachomatis*, and perhaps *Mycoplasma genitalium*. Patients typically present with fever, abdominal pain, and vaginal discharge. Uterine tenderness is usually found on examination. Patients often have an elevated WBC count. Endometritis can progress to myometritis, parametritis, or peritonitis. Some authors advocate the use of endometrial culture using a sampling device to make the diagnosis. Because of its polymicrobial nature, treatment should be with an antibiotic regimen covering a broad spectrum of bacteria. Dilatation and curettage is necessary in the setting of retained products of conception.

Pelvic Inflammatory Disease (PID) and Tubo-Ovarian Abscess (TOA)

Pelvic inflammatory disease (PID) is discussed in detail in Chapter 8. The clinical diagnosis of PID is often difficult to make. There is no single historical, physical, or laboratory finding that is both sensitive and specific for the diagnosis of PID. The most common nongynecologic disorder to be confused with PID is appendicitis.

Lower abdominal pain is the most consistent symptom in patients with confirmed PID. In most cases, the pain has been present for less than 3 weeks, and often for less than 1 week. Pain lasting longer than 3 weeks is unlikely to be caused by PID. Patients may also complain of other nonspecific symptoms, including vaginal discharge or bleeding, nausea, vomiting, a change in bowel habits, and urinary symptoms. The specificity of any single symptom is low.

On physical examination, fever is sometimes seen but is not always present. On abdominal and pelvic examination, it is common to find bilateral lower abdominal,

uterine, adnexal, and cervical motion tenderness (or CMT, known also as cervical excitation). The Centers for Disease Control and Prevention (CDC) in its 2010 guidelines, list lower abdominal pain, and uterine/adnexal or CMT as the minimum criteria for diagnosing PID. Treatment for PID is outlined in Chapter 8 and in the CDC Treatment Guidelines (CDC 2010).

TOAs occur in 15–34% of women with acute PID. The proximity of the ovary to the fallopian tube places it at risk for infection, and the abscess may spread to involve other contiguous structures, such as bowel, bladder, or the opposite adnexa. The diagnosis of TOA is most accurately made with ultrasound, typically appearing as a complex or cystic adnexal mass with multiple internal echoes.

■ NONINFECTIOUS GYNECOLOGIC CAUSES OF ACUTE PELVIC PAIN

Noninfectious gynecologic cause of acute pelvic pain include dysmenorrhea, uterine fibroids, endometriosis, Mittelschmerz, ovarian cysts, adnexal torsion, ovarian cancer or tumors, ovarian hyperstimulation syndrome (OHSS), and pain following sexual assault.

Dysmenorrhea

Dysmenorrhea usually appears within 1 to 2 years of menarche, when ovulatory cycles are established. It is more commonly a cause of chronic than acute pain. It is caused by an increased production of, or response to, endometrial prostaglandins. It typically presents as recurrent and crampy suprapubic pain occurring in the first few days of the menstrual cycle. The treatment is with prostaglandin synthase inhibitors, such as nonsteroidal anti-inflammatory drugs (NSAIDs), or combined oral contraceptives.

Uterine Fibroids

Uterine fibroids are benign estrogen-responsive growths arising from the myometrium. They are the most common neoplasm of the female pelvis and occur in 20–25% of women of reproductive age. The most common age for presentation with pain is older than 35 years. Patients often present with a sensation of pressure in the pelvis, and acute pain is uncommon unless there is fibroid degeneration or torsion. Physical examination may reveal an irregularly enlarged and firm uterus that is often nontender. Diagnostic evaluation is best accomplished with ultrasound. Management is either medical with NSAIDs, hormonal suppression with GnRH agonists, or surgical with myomectomy or hysterectomy.

Endometriosis

Endometriosis is defined as the presence of endometrial tissue (glands and stroma) outside of the uterus. It is most commonly found in the pelvis, on the pelvic organs and peritoneum. The prevalence varies widely in studies but is probably between 5% and 20% of reproductive-aged women. Roughly, one-third of women with endometriosis are asymptomatic. Of those with symptoms, chronic pelvic pain is common, although acute pain may also be seen. Dysmenorrhea that begins after years of pain-free menses suggests endometriosis. Other symptoms that may occur include dyspareunia (painful intercourse) and pain with urination or bowel movements. Classic physical examination findings include a fixed and retroverted uterus, tenderness and nodularity in the cul-de-sac and on the uterosacral ligaments, and ovarian enlargement. Treatment is either medical or surgical. Medical therapy includes oral contraceptives, progestins, Danazol, or GnRH agonists. The objective of surgical therapy is to restore normal anatomy and to remove or ablate as much disease as possible, and this can be accomplished with laparoscopy or laparotomy.

Ovarian Cysts

Physiological cysts of the ovary, such as follicular and corpus luteum cysts, should not cause pain unless they lead to rupture, hemorrhage, or torsion. In the absence of complications, these cysts are best managed expectantly, as they usually resolve spontaneously within 4 to 8 weeks.

Rupture of a follicular cyst leads to release of fluid, which may irritate the peritoneum and cause pain. This pain is typically sudden in onset and may be severe but resolves without treatment. Corpus luteum cysts are vascular, and rupture can lead to severe hemorrhage and pain that can be indistinguishable from the pain of a ruptured ectopic pregnancy. Serum β -hCG and ultrasound are helpful in making a diagnosis. If the diagnosis of a ruptured corpus luteum cyst is confirmed and the patient is stable, expectant management may be appropriate. If significant hemorrhage is suspected or the patient is unstable, surgery is required.

Adnexal Torsion

Adnexal torsion occurs when the adnexa twists on its connection to the uterus, the utero-ovarian ligament. Torsion most commonly involves the ovary but may involve the fallopian tube as well. Torsion is usually

preceded by enlargement of the ovary with an ovarian cyst or neoplasm; torsion of the normal ovary and adnexa is uncommon. Adnexal torsion is an acute surgical emergency. With torsion, the blood supply to the adnexa is interrupted, and this can lead to necrosis and infarction.

Adnexal torsion usually occurs in women of reproductive age. Patients typically present with sudden and severe unilateral, colicky, lower abdominal pain. In two-thirds of cases, there is associated nausea and vomiting. Physical examination reveals an enlarged, tender adnexal mass in up to 90% of patients. There may also be abdominal tenderness and guarding. Patients are usually afebrile, but an elevation in the WBC count may be seen. The management is surgical and is typically done with laparoscopy. The current surgical approach involves untwisting the adnexa and assessing its viability. If it is gangrenous, it must be removed. If an ovarian cyst is present, a cystectomy should be done to obtain a histological diagnosis.

Domestic Violence and Sexual Assault

Of particular importance is the patient who presents with pelvic pain following an episode of domestic violence or sexual assault. It is estimated that up to 44% of all women have been the victims of an actual or attempted assault at some time in their lives. Women who have suffered abuse may account for 22–35% of women seeking care for any reason in an emergency department. Finally, it has been estimated that 2 million cases of domestic violence occur each year in the United States. The patient may present with vague symptoms and pain that is not well localized and may not volunteer that she has been the victim of assault. These patients need to be evaluated by clinicians familiar with the appropriate counseling and specimen collection techniques. Most hospitals will have an assault or crisis team with a protocol for evaluating and managing these patients. Physical examination is tailored to a systematic search for injuries and to the collection of samples. Appropriate work-up includes screening for sexually transmitted disease, hepatitis B and C, and pregnancy and human immunodeficiency virus (HIV) testing. Consideration must also be given to emergency contraception and prophylaxis for STDs and HIV. (See Chapter 33.)

■ NONGYNECOLOGIC CAUSES OF ACUTE PELVIC PAIN

Nongynecologic causes of acute pelvic pain include disorders of the gastrointestinal, urinary, and musculoskeletal systems.

Gastrointestinal

Disorders of the gastrointestinal tract that lead to acute pelvic pain include appendicitis, gastroenteritis, diverticulitis, inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), bowel obstruction, mesenteric lymphadenitis, and constipation.

In women of reproductive age, acute appendicitis is the most common nongynecologic disorder for which PID is mistaken. There is often a prodromal period of vague abdominal discomfort followed by periumbilical pain that ultimately shifts to the right lower quadrant. Associated symptoms include nausea, vomiting, and anorexia. Initial physical examination findings are right lower quadrant tenderness and low-grade fever. With progression of the condition, local inflammation of the parietal peritoneum produces peritoneal signs on examination. Diagnostic studies that may be helpful include CBC (which often shows an elevated WBC count) and abdominal imaging. Abdominal ultrasound and CT may demonstrate edema of the appendiceal wall or an abscess. The treatment of acute appendicitis is surgical.

The diagnosis of acute appendicitis in young women is especially difficult because of the significant overlap with gynecologic disorders in symptoms and signs. The most common gynecologic disorder to be confused with appendicitis is PID. Both of these disorders can present with acute pelvic pain, fever, CMT, and adnexal tenderness on physical examination. When peritoneal irritation is present, movement of the pelvic organs (and especially the cervix) during bimanual examination will be painful. Therefore, a finding of CMT does not rule out appendicitis. In one study that compared findings among patients with acute appendicitis and PID, some distinguishing features were identified. Nausea and vomiting were usually present in patients with appendicitis but only in roughly half of those with PID. On physical examination, findings were usually localized to the right lower quadrant in patients with appendicitis, while they tended to be bilateral in patients with PID. Finally, the total WBC count was higher in patients with appendicitis than in those with PID.

Gastroenteritis and diverticulitis may also present with acute pain and fever. Gastroenteritis can occur at any age and is often accompanied by nausea, vomiting, and diarrhea. Diverticulitis is typically seen in women older than 40 years. The presentation is often similar to appendicitis except that the pain is usually on the left side. IBD, IBS, bowel obstruction, mesenteric lymphadenitis, and constipation can all present

with acute pelvic pain and should be considered in the differential diagnosis.

Urinary Tract Disorders

Disorders of the urinary tract that lead to acute pelvic pain include lower urinary tract infection, pyelonephritis, and nephrolithiasis (see also Chapter 24). With lower urinary tract infection, typical symptoms and signs include dysuria, urgency, frequency, and suprapubic tenderness. Systemic symptoms are absent. Treatment can usually be accomplished with oral antibiotics. With pyelonephritis, patients are often unwell and typically present with dysuria, urgency, frequency, fever, and chills. Tenderness is localized to the costovertebral angle and flank. Urinalysis is positive for bacteria and white blood cells, and there is usually an elevated WBC count.

Nephrolithiasis leads to pain due to the distention and muscular contraction of the urinary tract against obstruction. Patients present with severe and colicky pain that may radiate down the flank and into the pelvis. There may be associated nausea and vomiting, but no fever. Urinalysis is positive for blood, and imaging studies reveal the stone and a dilated ureter or kidney. Management is usually expectant and involves analgesia and hydration.

Musculoskeletal

Disorders of the musculoskeletal system that lead to acute pelvic pain include muscle or tendon strains, and joint infections or inflammation. Musculoskeletal pain is most commonly confused with pain originating from the urinary tract. The diagnosis can usually be made with history and physical examination alone. On examination, tenderness tends to be superficial. Most pain experienced principally in the lower back rather than in the pelvis is musculoskeletal in origin. Management is usually medical, with muscle relaxants or NSAIDs.

■ CONCLUSION

The woman of reproductive age presenting with acute pelvic or abdominal pain remains one of the great diagnostic dilemmas of clinical medicine. Pelvic pain is a common presenting symptom of many gynecologic disorders. The differential diagnosis also includes various disorders of the gastrointestinal, urinary, and musculoskeletal systems. To assist with the diagnosis, it is convenient to divide the causes into pregnancy related, gynecologic, and nongynecologic. The gynecologic

causes can be further subdivided into infectious and noninfectious. The history, physical examination, and diagnostic tests should then be used to determine the etiology of the pain. By using a methodical and systematic approach, the clinician will increase his or her chance of arriving at the correct diagnosis.

■ KEY POINTS

- It is often difficult to arrive at a definitive diagnosis in women of reproductive age with acute pelvic pain. To determine the etiology of the pain, the clinician must use the history, physical examination, and diagnostic tests as tools.
- The uterus, cervix, and adnexae share visceral innervation with the lower ileum, the sigmoid, and rectum (T10 to L1), and pain from any of these structures may be felt in the same place.
- A menstrual history is essential in evaluating the woman of reproductive age with acute pelvic pain. A pregnancy test must be done to rule out pregnancy. If the test is positive, an ectopic pregnancy must be considered in the differential diagnosis.
- A careful abdominal and pelvic examination is useful. When interpreting the pelvic examination, remember that movement of the pelvic organs will be painful if peritoneal irritation is present, regardless of the cause.
- Transvaginal ultrasound may be useful as a diagnostic tool in women with pelvic pain, as it usually allows good visualization of the gynecologic organs.
- No single historical, physical, or laboratory finding is both sensitive and specific for diagnosing pelvic inflammatory disease (PID). Women present with a wide variety of symptoms and signs that often overlap with other disorders, so the clinician must have a high index of suspicion for this possible diagnosis.
- One-third of women with endometriosis are asymptomatic. Of those with symptoms, the most common are pelvic pain, dysmenorrhea, and dyspareunia. Pain from endometriosis is more often chronic rather than acute.
- Adnexal torsion is an acute surgical emergency.
- The possibility of domestic assault must always be considered when women present with acute pelvic pain.

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