

A Systematic Approach for the Assessment and Diagnosis of Abdominal Pain in the Premenopausal Female

Cornell Calinescu, MD
Ilissa Jackson, PA-C
Mark Mauriello, MD
Ilya Chern, MD
E. Robert Schwarz, MD

Abstract

The complaint of abdominal pain in a premenopausal female is a challenging task for any medical provider faced with making an accurate diagnosis. The pathophysiology of women has to be considered when a female patient is presenting with a complaint of abdominal pain. Sometimes the diagnosis is easy to make, other times it can be elusive. The variance of a patient's initial clinical presentation providers should trust their medical knowledge, their medical work up, and their instincts when making the final diagnosis. As always, the most life-threatening causes of the patient's pain should be ruled out. Our article will provide medical providers a systematic approach for the assessment and diagnosis of abdominal pain in the premenopausal female.

Each year approximately 3.4 million patients present to the emergency department with the chief complaint of abdominal pain. Their symptoms range broadly from the colicky pain of acute cholecystitis to the sharp, migrating pain of the right lower quadrant in acute appendicitis.¹ Abdominal pain is one of the most challenging complaints to diagnose accurately, as 34% of abdominal pain is categorized as nonspecific.² Given what is known about the extent of abdominal pathology and the broad range of diagnostic testing available, there still remains a level of uncertainty when discharging the patient whose workup has been negative. An algorithmic approach, which is directed by

the location of the pain including a comprehensive history and physical as well as appropriate laboratory and radiographic tests, will allow for more accurate disposition and treatment. This paper addresses abdominal pain in women of childbearing age (Table 1).

Acute abdominal pain is defined as pain of one week's duration or less. Abdominal pain can be divided into three categories: visceral, parietal, and referred. Visceral pain, caused by stretching of the fibers which innervate the walls of hollow or solid organs, can be described as a steady ache or discomfort to excruciating or colicky, again, often making the diagnosis a challenge.⁴ Pain can, however, be localized to the organ(s) involved, since the visceral afferents follow a segmental distribution. For example, foregut organs, including the stomach, duodenum, and biliary tract, produce pain in the epigastric area.

Parietal pain is caused by irritation of the fibers that innervate the parietal peritoneum. This type of pain can be localized to the dermatome area superficial to the site of the painful stimulus. This differs from visceral pain in that visceral pain is usually felt in the midline due to the bilateral innervation of intraperitoneal organs. Visceral and parietal pains are not necessarily discrete. They can sometimes blend together, and as a disease process evolves, parietal signs, such as tenderness, guarding, rebound, and rigidity, usually overpower visceral signs.^{4,6}

Table 1: Abdominal Pain in Women of Child-Bearing Age

Diagnosis	History	Exam	Additional Testing	Treatment
Appendicitis ^{1,6,8,9}	Periumbilical pain, non-specific pain, fever, nausea, vomiting, diarrhea, anorexia	Tenderness (diffuse) McBurney's point, Rovsing's sign, rebounds, guarding, psoas sign	Pregnancy test, CBC, chemistry, LFTs, UA, CT abd/pelvis, ultrasound (if pregnant)	Fluid resuscitation, analgesics, antibiotics, surgery
Ovarian cysts (torted, ruptured, or infected) ⁵	Sudden onset of pelvic pain, usually unilateral	Tenderness, peritoneal signs	Pregnancy test, CBC, UA, ultrasound	Expectant management, hormone replacement, biopsy, removal, laparoscopy
Hydatidiform molar pregnancy ¹⁰	Lower abdominal pain (atypical), irregular vaginal bleeding, hyperemesis	Tender lower abdominal mass, uterus larger than expected	Pregnancy test, CBC, UA, ultrasound	Uterine suction or surgical curettage, F/U serum hCG, may need chemotherapy
Ovarian torsion ¹¹	Sudden onset of pelvic pain, usually unilateral, history of cyst or tumor	Tenderness, peritoneal signs may indicate rupture	Pregnancy test, CBC, UA, ultrasound with color Doppler flow	Surgery/laparoscopy
Pelvic Inflammatory Disease ^{1,5}	Lower abdominal pain, pelvic pain, unilateral or bilateral, fever, urinary sx, vaginal bleeding/discharge	Fever, tenderness, cervical motion tenderness (CMT), mucopurulent discharge	Pregnancy test, CBC, cervical cultures, ESR, CRP, ultrasound	Analgesia, removal of IUD, if present, antibiotics, possibly surgery if abscess is present/laparoscopy
Tuboovarian abscess ⁵	Fever, unilateral lower abdominal or pelvic pain, vaginal bleeding or discharge	Fever, lower abdominal/adnexal tenderness, CMT	Pregnancy test, CBC, cervical cultures, ultrasound	Analgesia, antibiotics, surgery/laparoscopy
Endometriosis ^{12,13}	Dysmenorrhea, chronic pelvic pain, usually in 30s/40s	Pelvic or ovarian tenderness or enlargement	Pregnancy test, CBC, urinalysis, ultrasound	Hormonal therapy, analgesia, laparoscopy, pregnancy may lead to remission/cure
Ectopic pregnancy ⁵	Abdominal pain, sudden and sharp if ruptured, vaginal bleeding, amenorrhea,	Shock, syncope, hypovolemia peritoneal signs, adnexal mass/tenderness, CMT, vaginal bleeding, Chadwick sign	Pregnancy test, ultrasound, progesterone level	Laparoscopy, salpingectomy, salpingostomy, Methotrexate
Leiomyomas (fibroids) ⁶	Pelvic pain or mass	Tenderness, pelvic or abdominal mass	Pregnancy test, ultrasound	Analgesia, hormonal therapy, myomectomy, hysterectomy
Adenomyosis ⁵	Dysmenorrhea, menorrhagia	Symmetrically enlarged uterus or fibroid-like mass	Pregnancy test, CBC, Ultrasound	Analgesia, hormonal therapy, laparoscopy/hysterectomy
Diverticulitis (uncommon but should be considered) ⁶	Steroid use, LLQ pain, constipation, nausea/vomiting, fever, diarrhea, urinary symptoms,	Tenderness at LLQ, rebound, guarding, peritonitis, sepsis	Pregnancy test, CT abdomen/pelvis, acute abdominal series	Inpatient: NPO, fluids, antibiotics, bowel rest, NGT suction, surgery
Incarcerated hernia ⁴	Abdominal, pelvic, inguinal pain, mass, distention, vomiting	Distention, non-reducible mass	Acute abdominal series, ultrasound, CT abdomen/pelvis	Attempt reduction ONLY IF RECENT ONSET; otherwise, surgery, analgesia, antibiotics
Cholecystitis/cholelithiasis/choolangitis ^{4,14}	Abdominal pain (colicky early...parietal later), fever, nausea, vomiting, anorexia, tachycardia	RUQ pain (colicky early...parietal later), Murphy's sign, jaundice, AMS and shock (with cholangitis)	CBC, chemistry, LFTs, lipase, pregnancy test, U/A, ultrasound, CT, HIDA scan	
Ulcerative colitis ⁴	Typical: bloody diarrhea, constipation, rectal bleeding, severe: frequent BMs, fever, tachycardia, anemia, weight loss, hypoalbuminemia		CBC, chemistry, LFTs, stool cultures, sigmoid/colonoscopy	IV steroids, fluids, replete electrolytes, broad-spectrum ABT, hyperalimentation, topical steroids, sulfasalazine, 5-aminosalicylics, topical steroids
Crohn's disease ⁴	Acute or chronic abdominal pain, fever, diarrhea, perianal fistulas, abscesses, rectal prolapse, vomiting, palpable mass, arthritis, uveitis, liver disease		CBC, chemistry, abdominal series, barium enema, upper GI series colonoscopy, CT	IV fluids, replete electrolytes, NGT suction for obstruction, broad-spectrum ABT, IV steroids, sulfasalazine, 5-aminosalicylates, topical steroids, others, symptomatic treatment, surgery
Irritable Bowel Syndrome (IBS) ^{3,16}	Chronic or recurrent abdominal pain or discomfort with altered bowel habits.	Psychosocial interview with positive stress related symptoms	Rome III criteria using bowel habit predominance for diagnosis, symptom-based diagnosis.	Good provider-patient relationship, diet alterations, antidiarrheal agents/ laxatives, SSRIs
Pancreatitis ^{4,14}	Acute or chronic-most often caused by alcohol use or gallstones-epigastric pain, mid-back pain, diffuse abdominal pain	Epigastric tenderness or generalized tenderness, nausea, vomiting, jaundice, fever	CBC, chemistry including LFTs, amylase/lipase, ultrasound, CT radionuclide scanning, MRCP	Supportive, IV fluids, analgesics, possible surgery for abscess drainage, parenteral feeding if severe, antibiotics
Urinary retention ⁴	Distended bladder and lower abdominal pain	Solid mass palpable, midline lower abdominal tenderness to palpation	Urinary catheterization, urinalysis, additional labs if indicated	Urinary catheter will diagnose and provide relief; follow up urology
Nephrolithiasis ^{6,15}	Abrupt onset of unilateral flank pain with possible radiation to groin/labia, hematuria, lower quadrant pain, dysuria, urgency	Unilateral CVA tenderness, nausea, vomiting	Urinalysis, KUB, ultrasound, CT, IVP, 24-hour urine	Analgesia, fluids, treatment of underlying conditions (hyperparathyroid, hypercalciuria, hyperuricosuria), ESWL, nephrolithotomy ureteroscopic stone removal, calculi urine strainer, antibiotics if necessary

Referred pain is pain that is felt at a location distant from the diseased organ. It is based on patterns of developmental embryology, similar to visceral pain, and it is usually ipsilateral and produces symptoms as opposed to signs.⁴

Abdominal pain can be intraabdominal or extraabdominal. Intraabdominal causes include gastrointestinal, genitourinary, and gynecologic. Extraabdominal pain causes include cardiopulmonary, toxic, metabolic, neurogenic, or have abdominal wall etiology. Another classification, vascular, is less common and generally not considered in the childbearing-aged female, but should be considered in the differential.^{4,5} As previously stated, nonspecific abdominal pain is the most common cause in the emergency department (ED).^{2,3}

History

A full history includes pain attributes, symptoms, and a past medical and surgical history. Past medical history should include current and recently added medications, especially antibiotics and NSAIDs, past hospitalizations, surgeries, diabetes, trauma, or other chronic conditions. A social history should also be obtained, including tobacco, alcohol, and recreational drug use. One also needs to consider occupation and living conditions as well as assess the psych-social mental status of a given patient. During the history, the pain's onset, duration, severity, location, quality and aggravating and relieving factors are principle characteristics to be noted.⁷ Gastrointestinal (GI) symptoms, including anorexia, nausea, vomiting, diarrhea, and constipation are helpful.¹⁵

The most common symptom pointing to a genitourinary (GU) cause of abdominal pain is an alteration in micturition, including frequency, urgency, dysuria, hematuria, incomplete emptying, or incontinence. A gynecologic (GYN) etiology is difficult to distinguish from a GI cause of pain and so a thorough GYN history should be obtained, including regularity of menses, sexual activity, STD history, including PID, vaginal bleeding or discharge, pregnancies, miscarriages, abortions, ectopic pregnancies, fibroids or cysts, and pelvic surgeries or laparoscopies.^{5,6}

Physical Exam

General Appearance can give the clinician some sense of the severity of pain. A pale, diaphoretic, grimacing patient would be of concern; however, the pain of early appendicitis may be vague and mild, so any abdominal pain should be taken seriously. Patients who are unable to sit still are most likely experiencing visceral pain, whereas those who prefer to remain immobile most likely have peritoneal pathology.⁴

Vital signs should be monitored continuously as subtle changes in temperature, blood pressure, respiratory rate, and pulse can indicate various pathophysiologic changes. In evaluating vital signs, consider factors such as age, medications, and concomitant medical conditions, which may alter normal processes. For example, if taking orthostatic vitals, a patient on a beta-blocker

may not show a suspected increase in the pulse if hypovolemia is suspected.

The abdominal exam includes inspection, auscultation, and palpation. Any distention, scars, or obvious masses should be noted. Hyperactive bowel sounds can be helpful in evaluating a small bowel obstruction, and, although they help with this diagnosis, they are of limited value.^{1,4} Normal or absent bowel sounds, in addition, are not entirely valuable.

Palpation reveals the most information and should be performed gently and beginning farthest away from the area of the most pain.⁴ Patients can assist with the exam by palpating with the clinician. The knees may also be flexed to aid in patient comfort and can also decrease involuntary guarding. Tenderness is a sign elicited by palpation and can be specific or diffuse. Rigidity, rebound, and referred pain can be indicative of peritoneal irritation.^{1,4,6} Enlargement of the liver, spleen, bladder, and palpable masses should be noted.

The pelvic exam is essential in this population and may provide additional information not otherwise obtainable by simple palpation. Cultures should be taken and tested for gonorrhea, Chlamydia, and other infections. A rectal exam is useful with suspected GI bleeding, and rectal pain on exam can indicate appendicitis, PID, and ectopic pregnancy.^{5,6,7}

Laboratory and Radiographic Tests

Although limited, the complete blood count (CBC) and acute abdominal series are the most commonly used studies in the evaluation of abdominal pain. One should be suspicious of a very high white blood cell count; however, one should not be reassured by a normal white count or a nonspecific bowel gas pattern.⁷ If obstruction or perforation is suspected, abdominal films or ultrasound may be helpful. Computed tomography (CT) can detect almost any abnormality.¹ In the childbearing-aged female, a pregnancy test should be obtained quickly, and its result received as rapidly as possible.^{6,7} If the pregnancy test is positive, then radiation exposure should be avoided, and ultrasonography (US) will be the radiographic test of choice in evaluating lower quadrant abdominal pain.⁶

Specific Diagnoses

The majority of final diagnoses in acute abdominal pain include nonspecific abdominal pain, appendicitis, and biliary tract disease. Specifically for females of childbearing age, the differential diagnosis of nontraumatic abdominal and pelvic pain and their presentations and treatments are shown in Table 1.

Despite the multitude of distinct causes of abdominal pain and the various studies available to diagnose a patient, the clinician may find himself discharging a patient home with a nonspecific diagnosis. Before doing so, however, one must consider other factors when making a disposition determination for the female patient. A patient who appears ill or who is immunocompromised should be seriously considered for admission. One with

intractable abdominal pain, uncontrolled vomiting, or altered mental status should stay for further work up. At times a patient may have to be admitted for social reasons, either homelessness, alcohol abuse, or drug abuse. Clinicians should trust their instincts and may even admit a patient with non-specific abdominal pain, which could possibly be diagnosed later as appendicitis. Regardless of one's decision to admit or discharge a patient, the most life-threatening causes of the patient's pain should always be ruled out. The pathophysiology of women has to be taken under consideration when a female patient is presenting with a complaint of abdominal pain.⁵

Cornell Calinescu, MD, is Assistant Medical Director, Department of Emergency Medicine, Plantation General Hospital, Plantation, FL.

Ilissa Jackson, PA-C, is Physician Assistant, Department of Emergency Medicine, Plantation General Hospital, Plantation, FL, and Graduate Professor, Physician Assistant Program, Keiser University.

Mark Mauriello, MD, is Medical Director and Assistant to Research and Case Management at St. Michael's Medical Center, Norwick, NJ.

Ilya Chern, MD, is Medical Director, Department of Emergency Medicine, Plantation General Hospital, Plantation Florida.

E. Robert Schwarz, MD, is Professor and Chair, Department of Family Medicine and Community Health, Miller School of Medicine, University of Miami, FL.

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Updated Information

Mark Mauriello, MD, is a Medical Resident in Internal Medicine at Baton Rouge General Medical Center, Baton Rouge, LA.

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