

Abdominal Pain among Older Adults

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As the population is aging, physicians from all specialties are expected to see more older adults at their outpatient practices and in the acute settings. Abdominal pain remains one of the most common and potentially serious complaints that emergency physicians encounter. Vascular pathology should be considered early in the diagnostic course of all older adults who have abdominal pain because the time for intervention is critical.

Key words: abdominal pain, older adults, management of acute abdominal pain

Introduction

A thorough workup and broad differential diagnosis are essential elements to establishing a correct diagnosis. Older adults may have delayed presentations of serious illnesses, and their signs and symptoms of disease may be atypical. If a diagnosis is unclear, an early surgical consultation and hospital admission should always be considered.

In Canada, 13.7% of the population is older than 65 years¹ and this number is expected to increase to 20% by the year 2030. As a result, the number of older patients who present to the emergency department (ED) with abdominal pain complaint will increase. This complaint must be considered seriously because nearly half of patients >65 years who present to the ED with abdominal pain are admitted, and as many as one-third require surgical intervention at some time during their admission.² Older adults may initially present to outpatient offices but frequently need additional evaluation in a more acute setting, either an ED or an inpatient unit. Older adults with abdominal pain who present to the ED typically require many resources (diagnostic tests, medications, and length of stay in the ED) and careful assessment for the decision of admission versus discharge. Of those older adults who have abdomi-

nal pain and are discharged home, nearly one-third return to the ED with continued symptoms.

Presenting Symptoms

When assessing older adults who have abdominal pain, health care providers should remember that chronological age may not fully reflect patients' physiological age. The overall health condition should be considered.³

Pain presentation in older adults may vary due to physiological changes, comorbidities, and polypharmacy. Difficulties with history-taking are often encountered; causes may be acute (delirium) or relate to coexisting morbidity (aphasia, dementia). Altered pain perception such as painless cardiac ischemia has been well described among older adults.⁴ Screening the medications list for side effects and interactions can provide an important element in the diagnosis.

A full history of the abdominal pain is crucial, including the pain description and character, location, onset, radiation, severity, duration, alleviating and aggravating factors, and previous episodes. These are outlined in Table 1.

Physical Examination

General appearance is the first step in a physical examination, followed by over-

all volume status. The evaluation of vital signs is an important step, although vital signs may be normal despite serious intra-abdominal pathology. Table 2 outlines the changes in vital signs that are essential to keep in mind when evaluating older adults.

The abdomen should be assessed fully, paying attention to note scars of previous surgeries, distension, organomegaly, ecchymosis, masses, or bruits. The abdominal musculature is often thin in older adults, leading to less guarding and rigidity, even in the presence of frank peritonitis. A detailed search for hernias should be conducted because they may be a cause of bowel obstruction and strangulation. The rectal examination may reveal the presence of gross or occult blood and may be the only way to discover prostatitis as a source of pain.

The physical examination should not be limited to the abdomen. Conjunctivae should be examined for pallor. The cardiopulmonary examination is crucial. It may suggest a diagnosis by showing signs of pneumonia, congestive heart failure, pericarditis, or pulmonary emboli. The presence of atrial fibrillation is of particular significance because this increases the risk for mesenteric ischemia. Examination of the extremities may reveal the presence of peripheral emboli or stigmata of vascular disease. Neurological findings of a previous cerebrovascular accident also may be a clue to underlying vascular disease.

Diagnostic Studies

Laboratory Studies

Laboratory studies should be ordered for older adults who have acute abdominal pain. Laboratory values are often normal despite the presence of surgical disease. High amylase is nonspecific, and although elevations may indicate pancreatitis, they also may be seen in mesenteric ischemia. Hematuria is commonly seen in individuals who have nephrolithiasis or a urinary tract infection, but it also may be found in cases of appendicitis, diverticulitis, or even ruptured abdominal aortic aneurysm (AAA). An electrocardiogram should be obtained early in

the workup of older adults who have abdominal pain.

Imaging Studies Plain Radiography

Plain radiography is useful in the evaluation for free intraperitoneal air, signs of obstruction, and the rare case of foreign body ingestion or insertion.

Ultrasonography

The use of ultrasonography may be limited by body habitus, bowel gas, and operator dependence. Ultrasonography is the imaging modality of choice for biliary and pelvic diseases, and it is useful for diagnosing AAA.

Computerized Tomography

Computerized tomography (CT) is highly sensitive for diagnosing perforation, AAA, appendicitis, and other common

entities. It is more useful than angiography in cases of suspected mesenteric venous thrombosis; however, angiography is the gold standard.

Angiography

Angiography is the gold standard when acute mesenteric ischemia is highly suspected. Preoperative angiography should be pursued for diagnostic and therapeutic reasons.

Differential Diagnosis

Acute abdominal pain can be categorized in multiple methods. The most common method is by dividing the causes into two main categories, such as surgical versus nonsurgical pain, and intra-abdominal versus extra-abdominal causes.

Biliary Tract Disease

Biliary disease is the leading reason for

acute abdominal surgery among older adults. The mortality rate for emergency cholecystectomy is four times higher than for an elective cholecystectomy. The risk for complications in older adults has been always high. Complications may include gallbladder perforation, gangrene, emphysematous cholecystitis, ascending cholangitis, gallstone ileus, choledocholithiasis, and gallstone-induced pancreatitis.⁶

Older adults who have cholecystitis have symptoms of right upper quadrant or epigastric pain with tenderness over the gallbladder. Other signs may be absent—more than half of older adults who have acute cholecystitis have no nausea or vomiting, and half also lack fever. Older adults have an increased likelihood of acalculous cholecystitis. A radionuclide (hepatobiliary iminodiacetic acid scan [HIDA]) scan should be

Table 1: Components of Pain History

Component	Details
Pain description	Aching or gnawing pain suggestive of visceral pain; the characteristically “sharp,” more defined and localized somatic pain associated with peritonitis
Location	Embryological origins of abdominal organs determine where a patient “feels” visceral pain: <ul style="list-style-type: none"> • Stomach, pancreas, liver, biliary system, and proximal duodenum have pain localized at the epigastric region • Small intestines, the proximal third of the colon and the appendix have pain referred to the periumbilical region • Bladder, uterus, and distal two-thirds of the colon cause pain in the left lower quadrant or suprapubic region • Retroperitoneal structures such as the aorta and kidneys often cause pain in the back
Onset	Acute-onset pain should alert the clinician to the possibility of an intra-abdominal catastrophe, especially a perforated viscus, a ruptured abdominal aortic aneurysm, or another vascular emergency
Radiation	Helpful most of the time; for example, radiation of pain to the back in the case of ruptured aortic aneurysm
Intensity	Severe pain should raise concerns about a serious underlying cause; however, older adults might have a serious intra-abdominal catastrophe with only mild pain
Duration and progression	Persistent, worsening pain is worrisome, whereas pain that grows less severe is typically favourable; serious entities generally present early, but delays may occur
Associated events	Anorexia, vomiting, diarrhea, and urinary symptoms should be investigated; pain frequently precedes vomiting in surgical conditions
Aggravating and alleviating factors	Pain with movement means peritoneal irritation—this is a key feature to discern during the interview; pain with eating or fear of food signifies mesenteric ischemia; the patient should be asked about any self-treatments
Previous episodes	Recurrent episodes generally point to a medical cause, with the exceptions of mesenteric ischemia (intestinal angina), biliary disease, and partial bowel obstruction

ordered in cases with negative findings on ultrasonography, combined with a high clinical suspicion for cholecystitis. Delayed surgical treatment is associated with increased morbidity and mortality.⁷

Appendicitis

Appendicitis is common in middle age; however, it is also the third most common indication for abdominal surgery in the older adult population. The mortality rate in the general population is <1%, whereas among older adults it ranges from 4–8%. Older adults account for half of all deaths from appendicitis.⁸

Older adults with appendicitis tend to present late, and symptoms are atypical. Twenty percent of older adults who have appendicitis present after 3 days of symptoms, and another 5–10% after 1 week of symptoms.⁹ Classic symptoms of fever, anorexia, right lower quadrant pain, and leukocytosis are seen in <30% of older patients. So, nearly half of patients are afebrile, half demonstrate no rebound or involuntary guarding, and nearly one quarter have no right lower quadrant tenderness at all. Early surgical consultation should be obtained in suspicious or equivocal cases because delays in diagnosis lead to an increased risk for perforation, with resultant increases in morbidity and mortality.

Small Bowel Obstruction

Hernias and adhesions from prior surgeries are the most common causes of small bowel obstruction (SBO). The symptoms of SBO are usually typical. Abdominal pain, distension, and vomiting commonly are seen, accompanied by constipation. Diarrhea may be present because of hyperperistalsis distal to the obstruction. It remains the second most common condition (behind appendicitis) to be inappropriately discharged home. The mortality rate for SBO in the older adult population remains high at 14–35%. Although plain radiographs may show SBO, abdominal CT is more sensitive and may lead to the definitive cause of the obstruction.

Large Bowel Obstruction

Large bowel obstruction (LBO) is usual-

Table 2: Changes to Vital Signs Indicating Possible Intra-abdominal Pathology

Vital Sign	Change
Temperature	Often normothermic or even hypothermic
Heart rate	Tachycardia not often detected due to heart rate control medications (e.g., beta-blockers, digoxin, or calcium channel blockers) or intrinsic cardiac conduction system abnormalities
Blood pressure	Do not look for low or normal-appearing blood pressure; normal blood pressure may reflect significant hypotension for a patient who has chronic hypertension
Breathing rate	Tachypnea should be noted; though it may reflect the expected response to pain, it also may be a compensatory mechanism for progressive acidosis caused by sepsis or ischemic bowel

ly caused by cancer, diverticulitis, or volvulus. It is less common than SBO. The classic description is abdominal pain, severe constipation, and intractable vomiting. However, nearly 20% of older adults have diarrhea, and only half report constipation or vomiting. The mortality rate of nearly 40% is mainly due to late diagnosis. Volvulus causes only 15% of cases of LBO but is more likely to require emergent surgical intervention. Symptomatology depends on the site of the volvulus. Sigmoid volvulus accounts for nearly 80% of cases and tends to present with a more gradual onset of pain. Virtually all cases of cecal volvulus require operative repair, whereas selected cases of sigmoid volvulus can be managed nonoperatively by decompressing the bowel with a rectal tube placed by way of a sigmoidoscope (Figure 1).¹⁰

Pancreatitis

Pancreatitis remains the most common nonsurgical abdominal condition in the older adult population. The incidence of pancreatitis increases 200-fold after the age of 65 years. Similar to most other abdominal conditions, the mortality rate among older adults is much higher than for younger adults, approaching 40% after the age of 70 years.¹¹ The presentation among older adults is varied. It may present classically with a boring pain radiating to the back that is associated with nausea, vomiting, and dehydration. About 10%

of cases of pancreatitis in older adults may present initially with hypotension and altered mental status. A CT scan should always be performed in an older adult with pancreatitis, especially if there are signs of impending sepsis.

Peptic Ulcer Disease

Pain is the presenting symptom in 50% of older adults with peptic ulcer disease. Complications are perforation, hemorrhage, gastric outlet obstruction, and penetration into an adjacent viscous.

Rigidity is absent in nearly 80%.¹² Free intraperitoneal air seen on plain radiographs is absent in 40% of patients who have perforation. When it is present, it is often best visualized on a lateral film, which frequently is not obtained. The mortality of perforation in the general population is approximately 10%, whereas in the older adult population it is 30% and increases eightfold if the diagnosis is delayed by 24 hours.

Hemorrhagic complications of peptic ulcer disease are also more common in older adults and more often require surgery and blood transfusions.

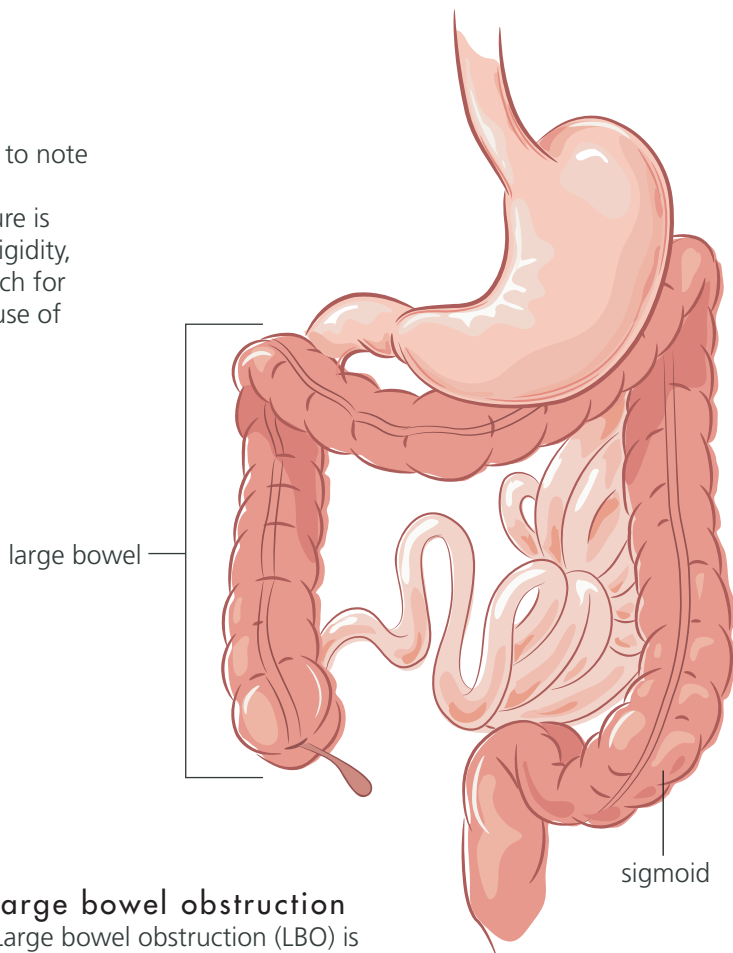
Diverticular Disease

Diverticular disease increases in prevalence with age. The incidence is approximately 50% among individuals older than age 70 years and 80% after age 85 years. Diverticular disease typically manifests as lower gastrointestinal bleeding or diverticulitis.

Figure 1:
Large Bowel Obstruction: Volvulus

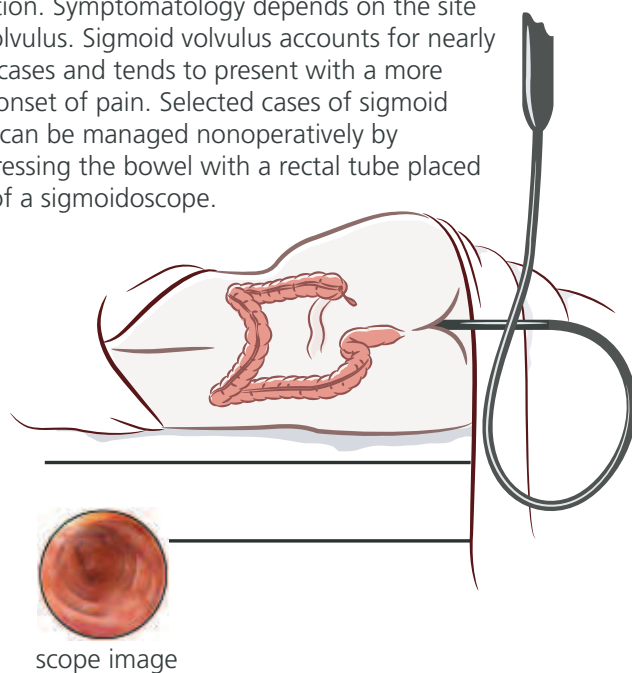
physical examination

The abdomen should be assessed fully, paying attention to note scars of previous surgeries, distension, organomegaly, ecchymosis, masses, or bruits. The abdominal musculature is often thin in older adults, leading to less guarding and rigidity, even in the presence of frank peritonitis. A detailed search for hernias should be conducted because they may be a cause of bowel obstruction and strangulation.



large bowel obstruction

Large bowel obstruction (LBO) is usually caused by cancer, diverticulitis, or volvulus. Volvulus causes only 15% of cases of LBO but is more likely to require emergent surgical intervention. Symptomatology depends on the site of the volvulus. Sigmoid volvulus accounts for nearly 80% of cases and tends to present with a more gradual onset of pain. Selected cases of sigmoid volvulus can be managed nonoperatively by decompressing the bowel with a rectal tube placed by way of a sigmoidoscope.



Abdominal Pain

The classic findings of nausea, distension, fever, palpable left lower quadrant mass, and leukocytosis are frequently absent. As with many other conditions in this population, leukocytosis may be lacking in a large number of cases. Irritation of the bladder or ureter by the inflamed diverticulum may induce pyuria or hematuria and result in the erroneous diagnosis of nephrolithiasis or urinary tract infection. Diverticulitis may in turn result in abscess formation, bowel obstruction, free perforation, or fistula and may be a cause of overwhelming sepsis.

Diverticulosis is the most common etiology of lower gastrointestinal bleeding among older adults, and it may result in massive bleeding. Unfortunately, it is misdiagnosed 50% of the time.¹³ Abdominal and pelvic CT scans can usually help with the diagnosis. Early diverticulitis and early appendicitis may be missed by CT scan.

Vascular Catastrophes Ruptured Abdominal Aortic Aneurysm

Ruptured AAA remains the 13th leading cause of death in the U.S. The mortality is extremely high. Although the diagnosis is fairly straightforward for the older adult who has abdominal pain, hypovolemic shock, and a pulsatile abdominal mass, this is the exception rather than the rule. Hypotension is absent in nearly 65% of cases, presumably because of tamponade in the left retroperitoneal space. Atypical presentations are common, and the misdiagnosis rate is as high as 30–50%.

Individuals who have a ruptured AAA often have back pain radiating toward the groin; this is associated with microscopic hematuria caused by irritation of the ureter by the AAA. As a general rule, any older adults presenting with symptoms of new-onset nephrolithiasis should have an evaluation of their aorta to detect AAA. This can be accomplished using ultrasonography or noncontrast CT scan, which is often used to diagnose renal colic. Conditions that are mimicked by ruptured AAA include renal colic, diverticulitis, lower

gastrointestinal bleed (from an aortoenteric fistula), and acute coronary syndrome (if the patient presents with syncope). Any patient who has had a previous aneurysm repair and who presents with gastrointestinal bleeding must be considered to have an aortoenteric fistula until proven otherwise. Delayed diagnosis increases mortality. The diagnosis of AAA should be considered for any patient who has syncope or hypotension in combination with abdominal or back pain.

Treatment decisions should be based on the stability of the patient. Early consultation with a vascular surgeon in suspected cases of AAA is essential. High-suspicion cases should be transferred to operating room emergently.

Advanced age is not a contraindication for repair. Mortality rates do not differ significantly with age, and AAA rupture is uniformly fatal without surgical treatment.

Mesenteric Ischemia

Acute mesenteric ischemia is one of the most difficult diagnoses to make. It requires a high index of suspicion, coupled with the willingness to image suspected cases aggressively. It presents as severe abdominal pain out of proportion to the physical examination and may be associated with vomiting and diarrhea. Typically the patient has risk factors for embolic disease, such as atrial fibrillation or valvular disease. Patients who have superior mesenteric artery thrombosis typically have a long history of pain after meals (intestinal angina) and may report “food fear” and a subsequent weight loss.

The physical examination is often benign. Abdominal tenderness, peritoneal signs, and bloody stools are absent early in the course until transmural necrosis develops. No specific laboratory studies have been found to date. A leukocytosis is generally present, as are some degree of metabolic acidosis and elevated lactate. Hyperamylasemia frequently is seen, but clinicians should not be confused with a diagnosis of pancreatitis.

Angiography remains the gold stan-

dard. The early, aggressive use of angiography is the only step that has been shown to reduce overall mortality from mesenteric ischemia.¹⁴ Treatment of acute mesenteric ischemia is primarily surgical, although there have been studies investigating intra-arterial thrombolytics, vasodilators, and angioplasty.^{15,16}

Extra-abdominal Causes

Older adults who have abdominal pain often have causes for their pain located outside of the abdominal cavity. The most important is acute myocardial infarction (MI). Older adults who have acute MI frequently lack chest pain. Nearly one-third of women older than age 65 years have abdominal pain as their presenting symptom of acute MI.¹⁷ Abdominal pain also may accompany other cardiac causes, such as decompensated heart failure, pericarditis, and endocarditis.

Pulmonary etiologies, including lower lobe pneumonias or pulmonary emboli, also may cause abdominal pain. Pleural effusions, empyemas, and pneumothoraces can mimic intra-abdominal conditions. Endocrine conditions, such as diabetic ketoacidosis, hypercalcemia, and adrenal crisis, may result in nonspecific abdomen pain. Herpes zoster, porphyria, medication effects, and gynecological or genitourinary conditions are additional etiologies to consider.

Conclusion

Given the likelihood of atypical presentations, unreliability of physical examination findings, and lack of sensitivity of laboratory testing, the older adult who has abdominal pain should be approached systematically, keeping the differential diagnosis broad and searching for potentially life-threatening etiologies. The clinician should keep in mind that a lack of findings in the history, normal vital signs, and laboratory values that are seemingly normal or laboratory abnormalities that do not explain the patient's presentation are common among older adults. Imaging and early surgical consultation are encouraged. Serial examinations and even serial labo-

Key Points

Abdominal pain among older adults is a common complaint with broad differential diagnosis.

Atypical and delayed presentation is common.

The lack of abnormalities in vitals signs despite serious intra-abdominal causes.

Repeat examinations and early surgical consult if the diagnosis is not clear.

The threshold for an inpatient admission for older adults should be low.

ratory studies are vital to rule out serious conditions.

The option to admit to the hospital or to an observation unit for further monitoring should always be kept in mind if the discharge diagnosis is not clear. Those patients who are selected for discharge home should have a repeat abdominal examination documented, an improvement in their clinical course noted, a normal imaging study in most cases, and the ability to tolerate oral nutrition. They also should have a reliable caretaker and a timely follow-up evaluation.

Finally, the clinician should avoid labelling undifferentiated abdominal pain with a more benign diagnosis, such as gastroenteritis. Patients should be informed that the cause of their symptoms is unclear, and they should be given specific instructions to monitor for certain signs and symptoms or to seek further medical attention.



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