

CHAPTER

# 30

## *Abdominal Pain in the Elderly*

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Abdominal pain is a common presentation in the elderly population. Roughly 5% to 10% of all emergency department visits are for abdominal pain, and the elderly account for about one third of these presentations. Of all patients with acute abdominal pain, about 25% are elderly patients.<sup>1</sup> As demographic changes globally are resulting in a constantly increasing proportion of elderly people, a growing number of patients presenting with abdominal pain will be of older age groups. Thus, there is a need to outline secure pathways for the process of diagnosis and treatment of such patients. The definition of elderly varies amongst different agencies, but from the healthcare perspective, age more than 60 years is classified as geriatric.

Abdominal pain in elderly patients is a challenge not only for the general practitioner but also for the surgeon and for physicians in geriatric units. Increasing age is accompanied by an increased occurrence of concurrent diseases and has also been considered to be associated with non-specific symptoms. The preliminary diagnosis at the emergency department (ED) and the diagnosis at discharge are less reliable in elderly patients than younger patients. Elderly patients more often have a specific organic complaint and present to ED after a longer period of symptoms than younger patients.<sup>2</sup> Elderly patients may present very differently than their younger counterparts.

They usually present with vague symptoms and have nonspecific findings on examination. Many elderly patients have a diminished sensorium, allowing pathology to advance to a dangerous point prior to symptom development. Because of these factors, many elderly patients with serious pathology initially are misdiagnosed with benign conditions such as gastroenteritis or constipation. They also are at greater risk of being admitted to the wrong service e.g., in internal medicine for a surgical condition and vice versa. Delay prior to correct treatment, due to an incorrect preliminary diagnosis, consequent to low symptom specificity, has been considered to lead to increased morbidity than younger patients. In addition, older patients undergoing emergency surgery have shown a higher morbidity.<sup>2</sup> Studies have demonstrated that about 50% of elderly patients presenting with acute abdominal pain need hospitalization, and 30-40% require surgery. Close to half of these patients are misdiagnosed, contributing to an overall mortality of approximately 10%. Not very infrequently, elderly with abdominal pain taken up for surgery may not have any intra-abdominal pathology, and may actually be suffering from non-abdominal disease. For a variety of reasons, the elderly, even those with serious intra-abdominal pathology, tend to have delayed presentation for medical care. This could be due to diminished pain sensation in

elderly, due to neuropathy (diabetic), or chronic use of analgesics.

Various factors affect the evaluation and outcome of elderly patients with abdominal pain. Age related decrease in the immune function; presence of underlying conditions such as diabetes or malignancy further suppressing the immunity. The elderly are more likely to have had prior abdominal surgery, making their evaluation potentially more challenging. Elderly patients often have concurrent cardiovascular and pulmonary disease, which decreases physiologic reserve. Elderly patients also have a high incidence of asymptomatic underlying pathology. Up to one half of elderly patients have underlying cholelithiasis, one half have diverticula, and 5-10% have abdominal aortic aneurysm. Common age related changes in the gastrointestinal system include degenerative changes in the mucosal linings, reduction in gut tone, reduced digestive capacity, clinically observed as dyspepsia or chronic constipation. Heart-burn and water brash occurs with altered esophageal sphincter motility.

### **Causes of abdominal pain in elderly**

Abdominal pain may be the presenting symptom in a wide range of medical and surgical diseases in elderly patients.<sup>3</sup> Elderly patients with intra-abdominal pathology are more likely to present with symptoms other than abdominal pain, such as fever, fatigue, chest pain, or altered mental status. On the other hand, the source of abdominal pain may not always be the abdomen, as quoted by Sir Zachary Cope:

“Distension, rigidity, vomiting, pain,

Are actors abdominal which often deign

To act on behalf of the chest, spine or brain . . .”

In general, diagnoses requiring surgery are far more common in the elderly. The risk of a surgical diagnosis doubles with each decade over 40. Acute, severe, worsening, or persistent abdominal pain suggests a surgical disorder.<sup>4</sup> Common surgical conditions underlying the presentation of pain in abdomen in elderly include appendicitis,

cholecystitis, diverticulitis, pancreatitis, obstruction and volvulus of gut, perforated peptic ulcer and mesenteric ischemia.<sup>5</sup> Medical conditions that can present as abdominal pain include myocardial infarction (inferior wall), diabetic ketoacidosis, hepatitis, urinary tract infection, pyelonephritis, pulmonary embolism, congestive heart failure with hepatic congestion, pneumonia, constipation, urinary retention, drug toxicity (digoxin). About 20% of patients are diagnosed as non specific abdominal pain (NSAP) even after investigative search. Salient features of some of these conditions are discussed below.

**Cholecystitis and cholelithiasis:** Biliary tract diseases common in elderly include symptomatic cholelithiasis, choledocholithiasis, calculus and acalculous cholecystitis, and ascending cholangitis. Biliary tract disease is the most common diagnosis among elderly patients presenting with abdominal pain. Approximately 30-50% of patients older than 65 years have gallstones. The mortality rate of elderly patients diagnosed with cholecystitis is approximately 10%. Cholecystitis could be acalculous in 10% of elderly patients with the condition. Classical features of right upper quadrant pain, fever and leukocytosis may not be seen in older patients. About a quarter of elderly patients have no significant pain, and less than half have fever, vomiting, or leukocytosis. Indicators such as right upper quadrant pain and Murphy's sign (i.e., inspiratory arrest with palpation of the right upper quadrant) are present in about one half of older patients with cholecystitis and are less accurate than in younger patients. Complications of acute cholecystitis occur in more than one half of all patients older than 65 years and include gallbladder perforation, emphysematous cholecystitis, ascending cholangitis, bile peritonitis and gallstone ileus. Acute ascending cholangitis rarely occurs before the age of 40 years.

**Appendicitis:** Appendicitis is a less common cause of abdominal pain in elderly patients than in younger patients. Only 10% of cases of acute appendicitis occur in patients older than 60 years,

whereas 50% of all deaths from appendicitis occur in this age group. Older patients with appendicitis are more likely to present with generalized pain, longer duration of pain, distension, rigidity, decreased bowel sounds, and a mass, which could be due to the delay in presentation, and not to a difference in the disease process. Only 20% of elderly patients present with anorexia, fever, right lower quadrant pain, and leukocytosis. The initial diagnosis is incorrect in 40-50% of patients in this age range. All of the above factors contribute to delayed diagnosis and high complication rates. A 10-year retrospective review found that the diagnosis was delayed in 35% of patients (Lee, 2000). Again, a high index of suspicion is necessary to avoid missing this diagnosis. The complication of perforation in elderly patients is approximately 50%, 5 times higher than in younger adults.

**Diverticulitis:** The formation of diverticula in the colon is largely a product of diet and age and is usually seen in patients older than 40 years. Diverticula are present in approximately 50-80% of older patients. Diverticulitis results when diverticula become obstructed by fecal matter, resulting in lymphatic obstruction, inflammation, and perforation. Majority of cases are located in the left colon; right colon being a more benign site. Atypical presentations include lack of fever, leukocytosis and absence of guaiac positive stool.

**Mesenteric ischemia:** Though it accounts for less than 1% of cases of abdominal pain in elderly patients, yet it should be an important consideration in susceptible patients as it is associated with a high mortality (70-90%), and delay in diagnosis may increase the mortality. Roughly 75% of patients with acute mesenteric ischemia are age 70 or older. Risk factors for the development of mesenteric ischemia include atrial fibrillation, atherosclerotic disease, acute myocardial infarction, and low ejection fraction. Usual presentation is with severe abdominal pain, vomiting, diarrhea, with little tenderness on examination. Occasional presentation with episodic postprandial abdominal pain, sometimes termed intestinal angina is not

uncommon. Superior mesenteric artery embolism is usually cardiac in origin from a dislodged thrombus from left atrium, left ventricle or valvular lesions. Superior mesenteric artery thrombosis is usually superimposed on chronic mesenteric ischemia from progressive atherosclerotic disease. Nonocclusive ischemia is caused by low-flow states (e.g., cardiogenic shock, sepsis, dialysis, hypovolemia); obstruction (e.g., intussusception, strangulated hernia); trauma; or medications (e.g., vasoconstrictors). Mesenteric venous thrombosis is seen in elderly patients with portal hypertension, intra-abdominal trauma or sepsis, intra-abdominal malignancy, and hypercoagulable states.

**Bowel obstruction:** This accounts for approximately 12% of cases of abdominal pain in elderly patients. Obstruction can be of either the small bowel or the large bowel, although it is difficult to distinguish the two conditions clinically. Risk factors for sigmoid volvulus include inactivity and laxative use, both of which are common in elderly patients. Sigmoid volvulus is common and often can be identified by plain abdominal radiography.

**Abdominal aortic aneurysm (AAA):** This is a disease almost exclusively of elderly patients. Approximately 5% of men older than 65 years have AAA. The male-to-female ratio is 7:1. The presentation may mimic renal colic or musculoskeletal back pain, leading to a wrong diagnosis in about 30 per cent of patients. Dissection or rupture of AAA occurs primarily in the elderly. A history of cardiovascular problems or hypertension in conjunction with abdominal, flank, or testicular pain in a middle-aged or elderly patient should always raise the possibility of AAA. The mortality in ruptured AAA is approximately 30% in hemodynamically stable patients, and this rises to 80% in elderly presenting with shock.

**Acute pancreatitis:** Factors that cause acute pancreatitis in older patients include alcoholism, biliary tract disease, infections, hypertriglyceridemia, a variety of medications,

hypercalcemia, hypothermia, and carbon monoxide exposure. Gallstone pancreatitis accounts for about 75% of cases of acute pancreatitis in older patients. The typical pain is in the mid-epigastric region, radiating to the back. Mortality rates in older patients with pancreatitis are reported to be 20 - 25 %, compared to about 8 % in the general population.

**Peptic ulcer disease (PUD):** The incidence of peptic ulcer disease is increasing among the elderly patients, due in part to the increasing use of nonsteroidal anti-inflammatory drugs (NSAIDs). Users of NSAIDs are 5-10 times more likely to develop PUD. Mortality of elderly patients with PUD is approximately 100 times higher than younger patients. Diagnosing PUD in elderly patients can be difficult in absence of typical pain; the common presentation being melena. In elderly patients perforation is often painless, and free air may be absent on plain radiographs in more than 60% of patients.

**Malignancy:** About 10% of elderly patients with NSAP have underlying malignancy. Malignancy is the most common cause of large bowel obstruction in older patients. Colon carcinoma without obstruction does not usually cause acute abdominal pain. The most common ovarian malignancy in elderly women is serous cystadenocarcinoma. Metastatic disease to the ovary can also occur; colon cancer is the most common primary source. Additionally, colon cancer can cause pelvic masses.

**Mesenteric Lymphadenitis:** Common causes of enlargement of abdominal lymph nodes could be lymphoma, tuberculosis and metastasis.

**Pelvic Inflammatory Disease:** It usually causes central lower abdominal pain in women. The pain could be dull, nagging; there may be associated vaginal discharge, pain during intercourse, and mild fever.

**Torsion of the Testis and ovary:** Testicular torsion gives rise to severe pain of sudden onset, originating in the scrotum in men, and may spread to the lower right or left abdomen, depending on

the side the torsion is occurring. The affected testis is tender to touch. Twisted ovarian cyst presents like ruptured ovarian cyst, and the diagnosis is usually differentiated by ultrasound scan.

**Gastroenteritis:** This can cause serious morbidity in elderly patients and approximately two thirds of all deaths due to gastroenteritis occur in patients older than 70 years. Vomiting and diarrhea can be caused by many illnesses. Reviews of cases of missed appendicitis reveal that approximately one half of patients initially were diagnosed with gastroenteritis.

**Hepatitis:** Elderly patients undergoing regular hemodialysis have greater susceptibility to acquisition of HCV infection than the younger patients. This could be attributed to the combined effect of immunosuppression associated with advancing age, uremia, and undernutrition. Hospitalization rates and rare complications associated with acute hepatitis A increase with age. Complications of viral hepatitis A in elderly patients include pancreatitis, ascites, prolonged cholestatic features, and death. Autoimmune chronic active hepatitis does occur in the elderly and management should be similar to younger patients, including immunosuppressive agents. Ischemic hepatitis seen in elderly patients, though uncommonly, is centrilobular necrosis which is usually associated with an acute cardiovascular event, associated with a dramatic rise in liver enzymes and a high mortality.

**Acute myocardial infarction (AMI):** Besides epigastric pain, clinicians need to be vigilant for several symptoms in acute AMI. Nausea and vomiting are common, particularly with inferior wall MI. Also, diaphoresis is frequently present with acute MI and almost always signifies a severe process. Dizziness or syncope may also be presenting symptoms. ECG changes and high cardiac markers (troponins, CPK-MB) confirm the diagnosis.

**Congestive heart failure:** Elderly patients having congestive heart failure can have abdominal pain due to congestive hepatomegaly. The pain is dull, dragging type, is present continuously, and responds to treatment of the underlying heart failure.

**Table I : Systemic examination in elderly patients with abdominal pain**

System	Finding	Comments
<b>Respiratory</b>	Rales, bronchial breathing, dullness on percussion	Pneumonia occasionally may cause abdominal pain without respiratory symptoms.
<b>Cardiovascular</b>	Epigastric pain	Acute myocardial infarction can present as epigastric pain with or without nausea and vomiting.
	Irregular pulse, hypotension	Atrial fibrillation or signs of diminished cardiac output should raise the consideration of mesenteric ischemia.
	Hypotension	Ruptured AAA, acute myocardial infarction, or septic shock to be considered.
<b>Abdominal system</b>	High-pitched bowel sounds	Consider bowel obstruction.
	Absent bowel sounds	Consider adynamic ileus or advanced bowel obstruction.
	Tympanitic notes	Seen with bowel obstruction.
	Rebound tenderness and guarding.	Elderly patients with peritonitis may lack classic peritoneal signs.
	Palpable mass	Consider malignancy, phlegmon from ruptured appendix, diverticulitis.
	Pulsatile mass	Consider AAA.
<b>Genitourinary</b>	Hernial sites	Look for hernia at the umbilicus, groin, prior surgical incisions.
	Per-rectal tenderness, fecal impaction, blood.	Complicated hemorrhoids, malignancy
	Pelvic examination	To be performed irrespective of hysterectomy or menopause.

### Clinical Assessment of Abdominal Pain in Older Patients

A careful history and physical examination as well as a high index of suspicion are crucial to prevent missed diagnoses. Elderly patients may have several limitations to give an adequate history due to altered mentation from fever or electrolyte abnormalities; cognitive impairment; decreased mentation from drugs (e.g., opiates, benzodiazepines); prior stroke; dementia; hearing difficulties; intoxication; language barriers; psychiatric disorders. Various atypical features that can prevent prompt and correct diagnosis include absence of fever despite a serious infection; absence of leukocytosis despite a surgical condition; altered pain perception from chronic pain medications; coexistent disease; four times higher likelihood of hypothermic response with a significant intra-abdominal process; lower likelihood of localized tenderness despite a focal surgical condition; reduced rebound and guarding from decreased abdominal wall musculature;

suppressed tachycardia from medications or intrinsic cardiac disease.

A proper history in an elderly patient with pain in abdomen is of paramount importance in making the right diagnosis. Key points in the history include the time of onset and course of the pain; location, quality, severity, radiation (back, groin, shoulder), aggravating and precipitating factors (food, position, medication), ability to pass stool or flatus, prior similar episodes, associated symptoms e.g. fever, chills, sweating, dysuria, hematuria, hesitancy, anorexia, nausea, vomiting, diarrhea, melena, hematochezia, chest pain, breathlessness, syncope. A past history of diabetes, hypertension, coronary artery disease, atrial fibrillation, peripheral vascular disease, abdominal surgery, smoking, alcoholism and analgesic abuse can guide to the underlying etiology.

General physical examination should focus on vital parameters, anemia, icterus, jugular venous pressure, dependent edema, petichiae, etc. A

**Table 2 : Investigations in elderly patients with abdominal pain**

Investigation	Etiologic considerations
Leukocytosis	Infection; intestinal ischemia; perforated peptic ulcer. It has poor sensitivity and specificity.
Serum electrolytes	Diabetic ketoacidosis; electrolyte abnormalities; metabolic acidosis with bowel infarction (mesenteric ischemia)
Liver function test and transaminases	Cholecystitis (most commonly elevated alkaline phosphatase, $\gamma$ -glutamyltransferase, elevated bilirubin); mesenteric ischemia (possible elevated alkaline phosphatase). Elderly patients with acute cholecystitis may not demonstrate elevations in liver enzymes.
Serum amylase	Pancreatitis (less specific than lipase); bowel obstruction; peptic ulcer perforation; bowel perforation; mesenteric ischemia
Serum lipase	Pancreatitis; bowel obstruction; duodenal ulcer
Blood cultures	Infection, sepsis
Urinalysis	Urinary tract infection; hematuria in ruptured AAA
Plain film abdominal X-ray	Bowel perforation (free air); bowel obstruction/volvulus (dilated bowel and air-fluid levels); abdominal aortic aneurysm (dilated calcified aorta); mesenteric ischemia (dilated loops, air-fluid levels, pneumatosis intestinalis [gas in bowel wall], thumbprinting [edema of bowel wall with convex indentations of lumen])
X-ray Chest	Pneumonia; free intraperitoneal air under the diaphragm in patients with ruptured viscus.
Electrocardiography	Nonabdominal emergencies such as myocardial infarction or pulmonary embolism
Ultrasonography	Cholecystitis; cholelithiasis, nephrolithiasis, urolithiasis, appendicitis (less accurate than CT, more operator dependent); screening for abdominal aortic aneurysm
Abdominal CT (with oral contrast, contrast enema, IV contrast)	Appendicitis; diverticulitis; bowel obstruction; pancreatitis (necrosis); abdominal aortic aneurysm; mesenteric ischemia. Sensitivity for diverticulitis is 99% with contrast enema; for suspected is close to 100% with IV contrast; helical CT scan is 95-100% sensitive for renal and ureteric calculi.
Pulse oximetry	Pneumonia; pulmonary embolism
Arterial blood gases	Anion gap in serious intra-abdominal process; hypoxia in pneumonia, pancreatitis; acidosis in diabetic ketoacidosis.
Angiography (CT angiography)	Mesenteric ischemia
Upper GI endoscopy, colonoscopy	Peptic ulcer, gastritis, ulcerative colitis.
Nuclear scans	HIDA (hepatic 2,6 dimethyliminodiacetic acid) scan or DISIDA (diisopropyl iminodiacetic acid) scan in suspected cholecystitis, where they have a very high negative predictive value.

diligent examination of all the systems is necessary as patients presenting with abdominal pain may actually have non-abdominal disease.<sup>5</sup>

### Investigations in elderly patients with abdominal pain

The list of investigations that may be needed to ascertain the cause of abdominal pain in elderly patients is listed below.

### Management

Treatment plan depends on the severity of presentation. A low threshold should be used for admitting elderly patients for observation. In serious patients presenting to the ED, the initial assessment includes ABC (airway, breathing and circulation) and vital signs. Patient is put under intensive care with continuous cardiac monitoring, nasal oxygen and immediate IV access is obtained. Administer IV

Normal saline (NS) or Ringer's lactate (RL) fluids to patient with suspected volume loss. Hydration should be carried out with caution in patients with underlying renal or cardiac decompensation. It is always better to institute fluids with central venous pressure (CVP) monitoring to prevent fluid overload. A Foley's catheter may be inserted to monitor fluid resuscitation. Such patients are usually kept starving (nothing by mouth) till surgical cause is ruled out. Nasogastric tube is placed in patients with suspected bowel obstruction, ileus, or upper gastro-intestinal bleed. In suspected biliary tract disease, dicyclomine may be administered for pain. NSAIDs should be administered with caution to elderly patients. In patients with undifferentiated abdominal pain, IV morphine is safe in doses of 2-4 mg; once biliary disease is ruled out (morphine causes spasm of the sphincter of Oddi). Meperidine causes less spasm of sphincter of Oddi, and is the opioid of choice in biliary tract disease. Rapid investigations should be carried out to confirm or rule out acute life threatening illnesses e.g. pneumonia, acute myocardial infarction, diabetic ketoacidosis, ruptured AAA, gut perforation and specific medical or surgical intervention should be carried out. Empirical antibiotics should be started in patients with suspected sepsis, pneumonia, cholecystitis, appendicitis, diverticulitis, or perforated viscus.

Non-emergent cases should be adequately investigated to establish the precise diagnosis, as the clinical features may be misleading in elderly patients. Surgical risk may be compounded in elderly due to frailty, comorbid diseases and diminished cardio-respiratory reserve. About 88% of older patients have comorbid conditions, compared to 48% of younger patients. More than half of the time, these comorbidities include cardiac diseases. Coagulopathy, renal failure, coronary artery disease, and chronic pulmonary disease increase the likelihood of a negative outcome, and poor tolerance to the physiologic stress imposed by an acute illness or surgery.<sup>1</sup> In some conditions, surgical risk can be circumvented by less invasive radiological procedures. Interventional radiology in acute

abdominal emergencies in elderly patients include embolization of tumor bleeding or gastrointestinal hemorrhage, and local fibrinolytic for acute arterial embolism. Nonvascular intervention includes percutaneous transhepatic gall bladder drainage for acute cholecystitis, percutaneous transhepatic biliary drainage for acute suppurant obstructive cholangitis, and abscess drainage.

## Conclusion

Abdominal pain is a common presentation in elderly population. Elderly patients rarely present with classic histories and physical signs. A low threshold should be used for surgical consultation, observation, reevaluation, or hospital admission because they often have atypical presentations for abdominal conditions. Concurrent medical problems such as cardiovascular disease, hypertension, or diabetes might place them at risk for many significant abdominal conditions. Fever cannot help to distinguish surgical from nonsurgical disorder in the elderly. Despite higher rates of perforation and sepsis, the majority of elderly patients with acute cholecystitis and appendicitis are afebrile. To overcome the diagnostic challenges in elderly, clinicians need to perform a careful history, a comprehensive physical examination, and use laboratory and radiologic tests judiciously. Imaging technology such as US and helical CT play a critical role in helping clinicians in their diagnoses. Wherever possible, interventional radiology procedures and minimal access surgeries should be preferred over conventional surgeries in high risk elderly.

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