Abdominal Pain

Learning Objectives:

Knowledge

At the end of the subinternship, the subinterns should be able to:

- Describe the common causes of abdominal pain in hospitalized patient including
  - Intestinal obstruction and pseudo-obstruction
  - Diverticulitis
  - Obstipation/constipation
  - Ischemic colitis
  - Acute appendicitis
  - Biliary tract and liver disease
  - Pancreatitis
  - Complications of procedures such as paracentesis, ERCP and post-catheterization hemorrhage
  - Extra-abdominal causes of abdominal pain, including pulmonary and cardiac causes
  - Genito-urinary causes including urinary tract infections, pyelonephritis, renal calculi and pelvic disorders
  - Retroperitoneal hemorrhage
- Describe the signs and symptoms specific to the above conditions
- Identify the most likely cause of abdominal pain in a specific patient
- Recognize early signs of shock with intra-abdominal catastrophe
- Recognize that intra-abdominal pathology may present atypically in immunocompromised patients

Skills

At the end of the subinternship, the subinterns should be able to:

- Conduct a targeted history
- Rapidly evaluate the inpatient who develops abdominal pain while hospitalized
- Consider the reason for hospitalization; co-morbidities; recent procedures and current medications in this evaluation
- Conduct a focused chart review
- Conduct a physical examination
- Evaluate the patient for clinical stability
- Evaluate the patient for source of abdominal pain
- Evaluate the patient for peritoneal signs
- Perform serial physical examinations on the patient to assess for progression of disease

- Develop a management plan
- Provide appropriate resuscitative and supportive measures
- Demonstrate the ability to develop a differential diagnosis utilizing the collected data
- Order appropriate laboratory and radiology studies
- Request surgical and sub-specialty consultation as appropriate
- Write an appropriately detailed cross-coverage or follow-up note to document evaluation of the patient
- Provide analgesia when appropriate

Attitudes and Professional Behavior

At the end of the subinternship, the subinterns should be able to:

- Demonstrate a compassionate attitude towards patient with abdominal pain
- Demonstrate sensitivity to patient's pain while examining the patient
- Conduct themselves professionally when communicating with colleagues and consultants

References:

- Cartwright SL, Knudson MP. Evaluation of Acute Abdominal Pain in Adults. Am Fam Physician 2008;77(7):971-978
- Chat Dang, Patrick Alguira, Alexis Dang et al. Acute abdominal pain: Four classifications can guide assessment and management. Geriatrics: March 2002;57 (3) 30-42.
- Clinical Policy: Critical Issues for the initial evaluation and management of patients presenting with chief complaint of non-traumatic acute abdominal pain. American College of Emergency Physicians. Ann Emerg Med 2000; 36(4):406-415.
- Thomas, SH, Silen W, Cheema, F, et al. Effects of morphine analgesia on diagnostic accuracy in emergency department patients with abdominal pain: A prospective randomized trial. J AM Coll Surg 2003;196:18.

Directions:

Begin by reading the references. Use the information from the background article (and other sources as appropriate) to answer the questions following each case. The questions are "open-ended" and therefore there are no right or wrong answers.

Section I

Case Scenario I:

Scenario: You are asked by your senior resident to evaluate a patient in the emergency room. Patient is a 72-year-old male with history of hypertension, diabetes, and congestive heart failure who presents to the hospital with complaints of crampy diffuse abdominal pain and hematochezia. His medications include hydrochlorothiazide, digoxin, enalapril, metoprolol and glucotrol. His past medical history is significant for benign prostatic hypertrophy, diabetic neuropathy and osteoarthritis.

A) What additional history would you like from the patient?

Whenever possible, history in a patient presenting with abdominal pain should be obtained from an unsedated patient.

Answer:

1) History that will contribute significantly to the ability to formulate a differential diagnosis
    a) Time of onset of pain and its acuteness
    b) Location of pain a and character of pain – for acute appendicitis, pain in the right lower quadrant has a high positive predictive value
    c) Radiation of the pain to other areas
    d) Presence of nausea, vomiting or anorexia
    e) Temporal progression of the location or nature of pain
    f) Changes in bowel habits – new onset of constipation has a high predictive value for the bowel obstruction
    g) Exacerbating and relieving factors
2) History that might uncover non-abdominal causes of acute abdominal pain
    a) Drug taken (licit and illicit drugs)
    b) Toxic ingestions
    c) Other non-abdominal causes of abdominal pain such as myocardial ischemia and pleurisy

B) What symptoms of abdominal pain are suggestive of surgical or emergent conditions?

Answer:

Fever, protracted vomiting, syncope or presyncope, evidence of GI blood loss and obstipation

C) What are some of the causes of diffuse abdominal pain?

Answer:

1) *Causes of diffuse abdominal pain: Pancreatitis, bowel obstruction, early appendicitis, ischemic bowel, constipation and peritonitis.*
2) *The diverse presentations of the various causes of abdominal pain can be categorized into four recognizable syndromes:*
    a) *Peritonitis*
        i) *Localized (acute appendicitis, cholecystitis, diverticulitis, pancreatitis)*
        ii) *Generalized (perforated viscus)*
    b) *Bowel obstruction*
        i) *strangulated hernia*
        ii) *Volvulus*
    c) *Abdominal Vascular catastrophe*
        i) *acute mesenteric infarction*
        ii) *ischemic colitis*
        iii) *abdominal aortic aneurysm*
    d) *Nonspecific abdominal pain or medical conditions*
        i) *drug-induced*
        ii) *constipation*
        iii) *acute gastroenteritis*
        iv) *acute MI*
        v) *lower lobe pneumonia*

D) What are some of the causes of abdominal catastrophes that you would not want to miss?

Answer:

Ischemic bowel, cholangitis, bowel perforation, splenic rupture, ruptured AAA, ectopic pregnancy, appendicitis.

Case continued…..

Physical exam revealed an elderly gentleman who appears in moderate distress secondary to his abdominal pain. On exam his pulse is 110/min, BP is 100/58, RR is 28, with a temperature of 100 degree Fahrenheit. Abdomen is minimally distended, soft but mildly tender, without organomegaly, pulsatile mass, ecchymosis or free fluid. The rest of his physical examination was within normal limits. Rectal exam reveals a diffusely large prostate with guiac positive stool.

E) What are the criteria to admit a patient presenting with abdominal pain to the hospital?

Answer:

Indications for admission include

- *Severe pain of unclear cause*
- *Peritoneal signs*
- *Unstable vital signs*
- *Suspected cholangitis, cholecystitis, bowel obstruction, appendicitis, bowel perforation, other suspected causes of abdominal catastrophes.*
- *Patients with pyelonephritis or PID with vomiting who need IV antibiotics*

- *Admitting a patient to the hospital also helps facilitate performing serial abdominal exams to assess for the progression of the disease process.*

F) Based on your history and physical examination what is your most likely diagnosis?

Answer: Acute Bowel ischemia or ischemic colitis. Initial diagnosis of bowel ischemia may be very difficult. Note: Absence of abnormal physical findings in the presence of severe, acute abdominal pain is an important feature of acute mesenteric occlusion. Mesenteric ischemia is also more likely to occur in patients with significant cardiovascular co-morbid conditions. Risk factors include arrhythmias, structural cardiac disease, hypotension, atherosclerosis and hypercoagulable states.

Case continued….
A CT scan of the abdomen was ordered in the emergency room that revealed thickened sigmoid colon with some pericolonic stranding suggestive of ischemic colitis.

G) *Outline a general approach to the management of a patient with abdominal pain. How would you manage this patient?*

Answer:

- *First and foremost assess for hemodynamic stability: In patients who are hemodynamically unstable consider sepsis, perforated viscus, and ischemic bowel. These patients need imaging studies and hospitalization*
- *Fluid resuscitation based on hemodynamic stability*
- *Inform your senior resident of your concerns regarding the patient*
- *Order appropriate imaging studies based on the signs and symptoms*
- *Obtain surgical consultation when indicated*
- *Narcotics should be used cautiously to avoid masking the pain and delay further assessment and decision making process*

Treatment of this patient:

- *Reversal of precipitating cause*
- *Fluid resuscitation and maintaining perfusion pressure*
- *Avoid vasoconstriction agents*
- *If ischemia is mild and there is no signs of peritonitis or sepsis these patients can be managed medically with oral antibiotics and a clear liquid diet.*
- *Surgery is indicated if there is evidence of bowel necrosis*

Case Scenario II:

It is 2:00AM. You are the cross covering sub-intern. A nurse from the 2nd floor (orthopedics floor) calls you about a patient, "I am calling regarding a patient of Dr Gibbons, Ms Belle Hurtz who is complaining of abdominal pain."

A) What key questions would you ask the nurse?

Answer:

1) *Questions to assess the hemodynamic stability of the patient and to assess how soon you need to evaluate the patient*
   a) *Vital signs, Blood pressure, heart rate, respiratory rate*
   b) *Mental status*
2) *Questions regarding the reason for patient's admission and hospital course*
3) *Questions that will help with developing a differential diagnosis such as recent procedures and interventions, review of current medications like narcotics, coumadin, antibiotics, previous abdominal pain, last bowel movement/ diarrhea*

Case continued….

The nurse states that the patient is a 75-year-old female with history of dementia, osteoporosis, and hypertension who had been admitted for a right hip fracture. Patient is 3 days s/p open reduction and internal fixation of her right hip fracture. Her current medications include amlodipine, morphine prn for pain, metoprolol, low molecular weight heparin and calcium.

B) What are some of the causes of abdominal pain in a hospitalized patient?

Answer:

The causes of abdominal pain in hospitalized patients can be categorized into

- *Conditions overlooked or misdiagnosed on hospital admission such as*
- *Unrelated conditions first arising in the hospital- some of the common causes of abdominal pain can present atypically in the hospitalized patients*
- *Conditions arising as direct consequence of problem related to the patient's illness such as*
  - *mesenteric ischemia,*
  - *ischemic colitis,*
  - *acalculous cholecystitis,*
  - *pancreatitis, ileus,*
  - *acute colonic pseudo-obstruction,*
  - *postsurgical complications,*
  - *post procedural complications,*
  - *clostridium difficile colitis.*

C) Identify some of the key points that you need to focus on when you arrive at the patient's bedside

Answer:

1) *Chart review: The chart review is very important part of your patient assessment. Presence of abdominal symptoms prior to hospital admission*
    a) *Hospital course*
    b) *Current medications*
    c) *Home medications especially use of chronic narcotics at home*
    d) *Antibiotics used*
    e) *Review all the diagnostic and therapeutic hospital procedures thus far*

b) Physical examination: History and physical exam needs to be repeated

    a) *Assess vital signs to assess hemodynamic stability*
    b) *Look for abdominal distension, recent incision or puncture sites, hemtomas, and presence or absence of bowel sounds, rebound tenderness or tympany.*
    c) *Pay attention to localizing symptoms - such pain in RUQ suggests cholecystitis, right lower quadrant suggests acute colonic pseudo-obstruction or appendicitis*
    d) *Rectal exam / hemoccult stools*

Case continued…..

On physical exam, the patient was drowsy with labored breathing. Her pulse was 110, BP 140/90, RR 28, temperature 100 degree Fahrenheit and a pulse ox of 94% on RA. Abdomen was distended and tympanitic with positive bowel sounds. There was no rebound tenderness or guarding. Chest had some occasional crackles in both bases. Cardiac exam: tacycardic without murmurs rubs or gallops.
Chart review: Patient was day 3 s/p open reduction and internal fixation. She received three doses of Ancef in the peri-operative period and has been receiving morphine shots every 2 hours for pain control. She has not had a bowel movement since the hospital admission and has also been noted to have a decreasing urinary output during the last shift.

D) What is your next step in the management of this patient?

Answer: ***Note***

1) *Abdominal pain in a hospitalized patient needs to be further evaluated.*
    a) *Laboratory Investigations*
    b) *CBC, UA, serum electrolytes, liver enzymes*
    c) *Amylase or lipase*
    d) *Flat and upright or right lateral decubitus abdominal radiograph*
    e) *Establish hemodynamic stability*

Case continued….

A plain X-Ray of the abdomen ordered revealed a dilated colon from the caecum to the splenic flexure. There is no evidence of stool in the rectum and descending colon. Laboratory data reveal a white blood cell count of 15,000 with a left shift. Her

electrolytes were normal except for potassium of 3.0. Her liver enzymes were within normal limits. Cathed UA specimen was normal.

E) What are the indications for other imaging modalities in a hospitalized patient with abdominal pain?

Answer:

1) *Ultrasonography is preferred if cholecystitis is suspected.*
2) *CT scan is indicated*
    a) *If you suspect appendicitis, ischemic bowel, AAA, intra-abdominal abscess, retroperitoneal hemorrhage, pancreatitis*
    b) *Patients with suspected complication of an invasive procedure – if patient develops abdominal 24-48 hours after the procedure the invasive procedure should be presumed to be the cause until proven otherwise.*
    c) *Patients with severe abdominal pain of unclear etiology*

F) Describe the further management of this patient.

1) *General guidelines in the management of a hospitalized patient with abdominal pain*
    a) *Appropriate management depends on the suspected etiology.*
    b) *Aggressive volume resuscitation as needed*
    c) *Decompression with an NG tube is indicated for patients with severe vomiting, ileus, acute colonic pseudo-obstruction or bowel obstruction*
    d) *Appropriate broad spectrum antibiotic coverage if an intra-abdominal infection is suspected*
    e) *Consultation with the surgeon or specialist based on suspected etiology, acuity of illness and hemodynamic stability*
2) *Specific diagnosis in this patient (colonic pseudo-obstruction)*
    a) *Decompression with a rectal tube and frequent re-positioning*
    b) *Colonic decompression has become a treatment of choice for this condition*
    c) *Decrease dose of narcotics*
    d) *If clinical situation worsens in spite of medical management then surgical interventions should be considered.*

G) What are some of the discharge issues you will have to deal with in this patient?

Patient can only be discharged after the gastrointestinal function returns. Patient should be tolerating at least clear liquid diet prior to discharge and follow-up and monitoring of the nutritional status is of great importance.

Section II

For each of the following clinical scenarios

- ***list your top three-four differential diagnosis***
- ***the initial diagnostic tests of choice***

Case 1

A 25 year old sexually active female presents to the ED with a 2 day history of left lower quadrant pain associated with low grade fever and chills. Patient denies vaginal discharge, dysuria, hematuria, flank pain. She also denies recent change in bladder and bowel habits. Her last menstrual period was 5 weeks prior to presentation.
Physical exam reveals a healthy female in distress secondary to abdominal pain. Temperature is 100.5 degree Fahrenheit with stable vital signs. Abdominal exam reveals tenderness in the left lower quadrant and supra-pubic region without rebound or guarding. Patient has good bowel sounds. Rest of her exam is unremarkable.

Answer:

Abdominal pain in women may be related to pathology in the pelvic organs- tubo-ovarian abscess, ectopic pregnancy, ovarian cysts. The other differentials include urinary tract infection or nephrolithiasis.

This patient needs a pelvic exam. Pelvic exam should be performed in female patients of child bearing age who present with abdominal pain.
In a female patient of child bearing age presenting with abdominal pain, perform a pregnancy test,
Pelvic sonography will help to evaluate for pregnancy or other pregnancy related complications.
Check a urine analysis.

Case 2

A 65 year old male with history of hypertension, hypercholesterolemia presents with a one day history of acute left lower quadrant pain associated with nausea and vomiting. Patient denies diarrhea, constipation, urinary symptoms, hematochezia or melena. Patient denies recent travel, sick contacts. His medications include aspirin, metoprolol and pravastatin. Review of systems is unremarkable.

On examination, temperature 101 degree Fahrenheit, BP 110/50mm Hg, PR 100/min. Cardiac and respiratory exam were unremarkable. Abdomen is minimally distended; there is tenderness in the left lower quadrant on palpation with minimal guarding. Bowel sounds are diminished. Rectal exam reveals brown stools that are heme positive.

Answer:

The main differential to consider in the evaluation of left lower quadrant pain is acute diverticulitis; other causes will include ischemic colitis, infective colitis, IBD, urinary tract infection or nephrolithiasis
Consider CT with oral and intravenous contrast to look for acute diverticulitis. If studies are normal should prompt further consideration of genitourinary pathology.

Case 3

A 45 year old obese female with history of obstructive sleep apnea and depression presents with a one day history of right upper quadrant pain that started after a eating at a cookout. Patient describes the pain initially as colicky and then has been a constant pain associated with nausea and vomiting. Patient denies fevers, chills, cough, shortness of breath, and changes in urinary habits. Patient is not a smoker and denies alcohol use. Her current medications include Prozac and she wears a CPAP at night. Review of system is negative.

On examination patient is mild distress secondary to pain. She is febrile with stable vital signs. Patient has tenderness to palpation on the right upper quadrant and epigastrium and she has a positive Murphy's sign. There is no costovertebral tenderness. Rest of her exam was unremarkable.

Answer:

Acute cholecystitis, pancreatitis, acute hepatitis
Absence of pulmonary symptoms makes pneumonia less likely. A patient presenting with acute right upper quadrant pain should also have a complete review of their urinary symptoms. Absence of these symptoms, absence of signs of costovertebral angle tenderness/suprapubic tenderness makes urinary causes less likely.

Serum lipase, liver enzymes and ultrasonography of the gall bladder
Patients with colic, fever, or positive Murphy's sign should receive Ultrasonography. Murphy's sign has a LR+ of 5.0 and LR- of 0.4 for acute cholecystitis

Case 4

You are called to evaluate a patient on the cardiac floor with complaints of abdominal pain and back pain. Patient is a 55 year old male who was admitted three days prior with acute pulmonary embolism. Patient is an otherwise healthy male with no medical problems. His PE was attributed to the DVT he developed after long transcontinental flight. Patient was started on therapeutic lovenox and Coumadin.
Patient was doing fine till the onset of abdominal pain and back pain that has been progressively getting worse. Patient denies history of trauma, no PUD.
On physical exam, patient appeared diaphoretic and in moderate distress; the patient is afebrile with a BP 90/70mm of Hg, HR 100/min, RR 24/min. Lungs were clear to auscultation bilaterally, cardiac exam revealed tachycardia without murmurs, rubs or gallops. Abdomen was diffusely tender without guarding or rebound. There was minimal ecchymosis in the left flank.

Answer:

Acute retroperitoneal hemorrhage, recurrent PE (less likely given the anticoagulation), pancreatitis.

CT scan of the abdomen to look for hemorrhage especially given this patient's presentation with abdominal pain, hypotension in a patient on anticoagulant therapy
CBC