



## Chapter 27 – Abdominal Pain

### Episode overview:

- 1) List and explain 8 causes of life-threatening abdominal pain
- 2) List 15 causes of extra-abdominopelvic abdominal pain

### Wisecracks:

- 1) Why is WBC of so little utility in abdominal pain?
  - 2) When is an abdominal x-ray useful in investigating abdominal pain?
- 

### Rosen's in Perspective

- Common and challenging presentation:
  - History and physical examination can be misleading
  - Serious pain can be benign and mild pain can be serious

### Epidemiology

- Groups that require special consideration in the work up:
  - **Elderly**
    - Commonly missed diagnoses
      - Diverticulitis
      - Ruptured AAA
      - Mesenteric ischemia
  - **Immunocompromised** (uncontrolled DM, HIV, liver disease, chemo)
    - Presentation can be misleading due to lack of an inflammatory response
  - **Women of reproductive age**
    - Pelvic organs can lead to more missed pathologies
    - Ectopic pregnancy

### Pathophysiology

Pain is derived from three pathways:

- i. Visceral
- ii. Somatic
- iii. Referred



### Visceral pain:

- Stimulation from autonomic nerves in the visceral peritoneum surrounding organs
  - A result of gas, fluid, stretching, edema, blood, cysts, abscesses
  - If the affected organ undergoes peristalsis, then the pain is usually intermittent, crampy and/or colicky in nature
  
- Pain follows the embryonic somatic segments:
  - Upper, periumbilical, lower abdominal pain
    - Foregut = upper pain = from stomach, duodenum, liver, pancreas
    - Midgut = periumbilical pain = small bowel, proximal colon, appendix
    - Hindgut = lower abdominal pain = distal colon, genitourinary tract
  - Localization of pain only occurs when the **parietal peritoneum** becomes affected by the inflammatory process

### Somatic pain:

- Occurs with irritation of parietal peritoneum, thereby allowing the patient to localize exactly the location of the pain.

### Referred pain:

- “Pain felt at a distance from its originating source”
- This is due to peripheral afferent nerve fibers entering varying spinal cord levels

## Questions:

### 1) List and explain 8 causes of life-threatening abdominal pain

Life threatening causes of abdominal pain:

#### 1. Ruptured ectopic pregnancy

- a. Females of childbearing age. 1/100 pregnancies
- b. Risk factors:
  - i. Non-white race, older age, history of STI/PID, infertility treatment, IUD in the last year, tubal ligation, previous ectopic pregnancy, smoking, fallopian surgery
- c. Symptoms: Severe, sharp pain or may be diffuse with shock or peritonitis
  - With or without vaginal bleeding.
- d. Physical exam features do not rule in or out the diagnosis
  - Abdominal and vaginal symptoms may or may not be present.
- e. FAST exam, U/S, BHcG necessary

#### 2. Ruptured or leaking abdominal aneurysm

- a. Increases with advanced age, men, or HTN, DM, smoking, COPD, CAD, connective tissue disease, trauma
- b. Symptoms: usually asymptomatic until rupture
  - i. ACUTE onset epigastric, back pain WITH syncope and shock. May radiate to back, groin, testes.



- ii. May have normal vital signs with normal exam and normal femoral pulses.
- c. Abdominal plain films - abnormal in 80% of cases; can do FAST
  - CT abdomen is test of choice.

### 3. Mesenteric ischemia

- a. Peak: elders, CV disease, CHF, arrhythmias, sepsis, dehydration
  - **70% mortality**
- b. Mesenteric venous thrombosis - associated with hypercoagulable states
  - Haematological, inflammation, trauma
- c. Types of lesions:
  - i. Arterial occlusion - sudden / emboli / low flow atherosclerosis
- d. Symptoms: periumbilical then diffuse pain, with nausea and vomiting, at times postprandial.
- e. May have a normal exam
- f. Labs: Metabolic acidosis with lactic acidemia. **NEED CT** to diagnosis.

### 4. Intestinal obstruction

- a. Peaks in infants and the elderly or post-operative
- b. Etiology:
  - i. **Adhesions**, cancer, hernias, volvulus, infarctions,
  - ii. Usually have normal vitals until bowel strangulation or dehydration occurs

### 5. Perforated viscus

- a. Incidence increases with advancing age (risks: diverticular dz & PUD)
  - i. Duodenal ulcer erodes through stomach
  - ii. Colonic diverticula
    - Gallbladder and large bowel perforations are rare
  - iii. Symptoms: acute onset epigastric pain, vomiting, then developing into a fever
  - iv. Diffuse board-like abdomen with guarding, tachycardia, fever
  - v. Upright radiograph shows air under diaphragm in 70-80% of cases

### 6. Acute pancreatitis

- a. Peaks in adulthood - alcoholism, biliary tract disease or manipulation
  - i. Hyperlipidemia, hypercalcemia, ERCP, cancer, ischemia, trauma, ARDS, spontaneous hemorrhage into the pancreas
- b. Sx: acute onset epigastric pain, more than findings on exam
- c. Rarely have rebounding or guarding because the organ is retroperitoneal
- d. Grey turner's or cullen's sign may be present if it is hemorrhagic
- e. Workup:
  - i. Lipase, U/S+/- CT scan can show necrosis or abscess



**7. Ascending cholangitis**

Charcot's Triad

- Fever
- RUQ
- Jaundice

**Antibiotics on board ASAP**

**8. Complicated diverticulitis or appendicitis (ruptured or with abscesses)**

- IV fluid resuscitation + IV Antibiotics; Surgery

**2) List 15 causes of extra-abdominopelvic abdominal pain**

- Must consider extra-abdominal causes of pain - See box 27-1

**Box 27-1 Important Extra-abdominopelvic Causes of Abdominal Pain**

**Thoracic**  
Myocardial infarction or unstable angina  
Pneumonia  
Pulmonary embolism  
Herniated thoracic disk (neuralgia)  
Pericarditis or myocarditis

**Genitourinary**  
Testicular torsion

**Abdominal Wall**  
Muscle spasm  
Muscle hematoma  
Herpes zoster

**Infectious**  
Streptococcal pharyngitis (more often in children)  
Rocky Mountain spotted fever  
Mononucleosis

**Systemic**  
Diabetic ketoacidosis  
Alcoholic ketoacidosis  
Uremia  
Sickle cell disease  
Porphyria  
Systemic lupus erythematosus  
Vasculitis  
Glaucoma  
Hyperthyroidism

**Toxic**  
Methanol poisoning  
Heavy metal toxicity  
Scorpion bite  
Snake bite  
Black widow spider bite

Adapted from Purcell TB: Nonsurgical and extraperitoneal causes of abdominal pain. Emerg Med Clin North Am 7:721, 1989.



- Key is to visualize what's "around" the black box of the peritoneal cavity!
  
- 1. Thoracic
  - a. **MI / angina**
  - b. **Pneumonia / PE**
  - c. **Perimyocarditis**
- 2. GU
  - a. **Torsion of the testicles**
  - b. **Penile pathology**
  - c. **Intra-vaginal foreign body / mass / pathology**
- 3. Superficial
  - a. **Muscle hematoma or herpes zoster**
- 4. Systemic
  - a. Infectious
    - i. Pharyngitis (in kids)
    - ii. RMSF
    - iii. **Mononucleosis**
  - b. Metabolic
    - i. **DKA**
    - ii. Sickle cell disease
    - iii. SLE / vasculitis
    - iv. Porphyria
- 5. Toxic
  - a. Methanol / Heavy metal poisoning
  - b. Scorpion bite / snake bite / **black widow spider bite**

## Wisecracks:

### 1) Why does the WBC have so little utility in abdominal pain?

- Blood work:
  - **"The WBC count is neither sensitive nor specific to be a discriminatory test to establish or rule out serious causes of abdominal pain"**
  - **Serial WBCs have FAILED at distinguishing surgical from non-surgical pathologies**
  - **\*\*\*WBC is never helpful, except when they indicate immunosuppression\*\*\***



## 2) When is an abdominal x-ray useful in investigating abdominal pain?

Has little utility in centres with CT imaging available.

I love LITFL:

**“Gasses, masses, bones, stones” approach**

Check out: <http://lifeinthefastlane.com/investigations/axr-interpretation/>

Useful for:

- Query foreign body / body packers/stuffers
  - Shout-out to: <http://lifeinthefastlane.com/top-ten-foreign-bodies/>
- Query drug overdose
  - Check out: <http://www.ncbi.nlm.nih.gov/pubmed/3813170>
  - Iron, mercury, calcium carbonate, chloral hydrate, acetazolamide, potassium chloride tabs
- Query perforated viscus
- Pediatric population exceptions
  - Neonates / kids
    - Volvulus / Malrotation
    - NEC

Notice that small bowel obstruction and constipation **are not** suggested indications for getting an abdominal x-ray - especially in centres where CT is available.