



# Acute abdomen

## Objectives:

- Aetiology
- Pathophysiology of abdominal pain
  - Somatic pain
  - Visceral pain
- Pathogenesis
  - Inflammation
  - Obstruction
  - Infarction
- Clinical assessment
  - History
  - Examination
  - Investigation
- Management
- Peritonitis
  - Primary peritonitis
  - Post-operative peritonitis
- Intra-abdominal abscess
- Intestinal obstruction
- Acute appendicitis
- Non-specific abdominal pain(NSAP)
- Gynecological causes of the acute abdomen
  - Mittelschmerz and ruptured corpus luteum
  - Ruptured ectopic pregnancy
  - Torsion of an ovarian cyst
  - Acute salpingitis

## Resources:

- Davidson's
- Raslan's notes
- Surgical recall.
- Team 434 notes
- Macleod's
- Slides
- Doctor's notes
- Team 432

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**Don't you Dare Panic !!** What is required isn't much but we did elaborate a little bit to understand (U CAN TOTALLY SKIP'EM) instead of memorizing. So take a deep breath and start **وَسْمِ اللّٰه**

**"You're required to know THE APPROACH & Acute appendicitis by History, Examination and Investigation. Others like aetiology, pathogenesis etc.. only read them but they won't come in the OSCE or MCQ's"**

## ● Introduction:

The 'acute abdomen' a term that encompasses a spectrum of surgical, medical and gynaecological conditions, ranging from the trivial to the life-threatening situations.

We can say its an "acute abdominal pain" if it was **less than 1 week's duration** requiring admission to hospital. (Traumatic conditions considered separately)

- **Acute abdomen denotes any sudden, spontaneous, non-traumatic disorder in the abdominal area that requires urgent surgery in most cases.**
- **Not all cases require surgery** for example : pancreatitis, some cases of bowel obstruction → conservative treatment.
- **Not every acute abdomen will present with pain.** For example: internal bleeding, Diabetic and immunocompromised patient won't present with pain. Due to absent/weak innervation that won't be recognized by the brain.

The highest mortality rates are associated with:

- laparotomy<sup>1</sup> for unresectable cancer,
- ruptured abdominal aortic aneurysm
- perforated bowel.

morbidity and mortality rates varies with age "increases w/ elderly".

## Basic review:

- Transudate is fluid PUSHED through the capillary due to high PRESSURE within the capillary.
- Exudate is fluid that LEAKS around the cells of the capillaries caused by INFLAMMATION.I

## Pathophysiology: either somatic or visceral

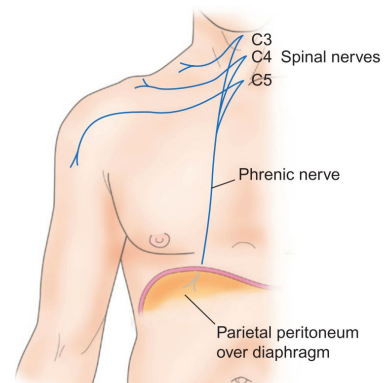
### Somatic (parietal) pain

The parietal peritoneum is sensitive to **mechanical, thermal or chemical** stimulation, so when irritated, a reflex contraction of muscles, causing **guarding**<sup>2</sup> and **hyperaesthesia**<sup>3</sup> of skin.

**Peripheral** diaphragmatic irritation leads to **tenderness and rigidity**, & when irritated **Centrally**, pain is referred **shoulder area**. (see pic)

**Eg : throbbing or aching, can be superficial (skin, muscle..) or deep (tendon, joints..)**

**{Somatic pain is classically described as sharp, & usually well localized}**



### Visceral pain

mediated through the **sympathetic** branches.

Visceral pain is **insensitive** to mechanical.. stimulation, therefore can be handled, cut or cauterized painlessly.

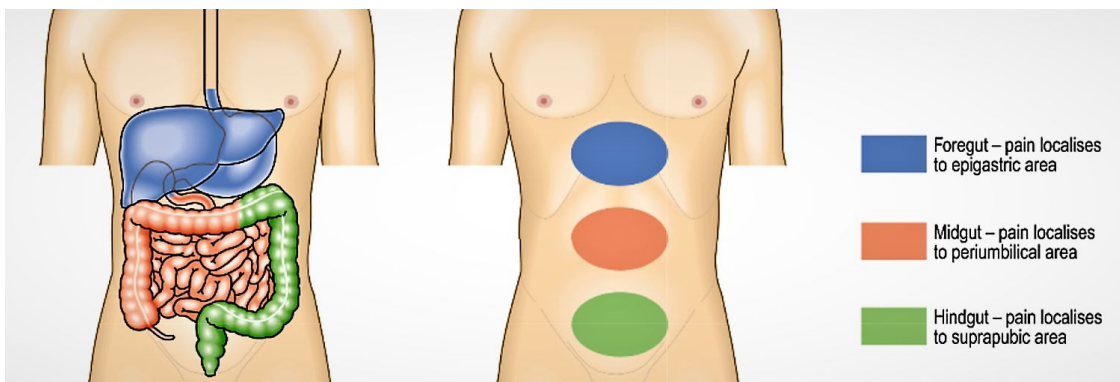
However, they are **sensitive to tension**, whether due to overdistension, spasm or ischaemia.

**Eg : organ related either inflammation or cramps etc.**

**{Visceral pain is typically described as dull & deep-seated - uncomfortable}.**

**Therefore referred to overlying skin of the abdominal wall according to the dermatome level:**

Source of pain	Intestine & its outgrowths (the liver, biliary system and pancreas)	Foregut (lower oesophagus to 2nd part of duodenum)	Midgut (2nd part of duodenum to before the splenic flexure)	Hindgut (splenic flexure to the rectum)
Referral	Midline	Epigastric	Periumbilical	Hypogastric



<sup>1</sup> surgical incision in the abdominal cavity

<sup>2</sup> rigidity of the abdominal wall

<sup>3</sup> excessive physical sensitivity,

# Surgical acute abdomen pathogenesis:

<b>Inflammation</b>	<b>Obstruction</b>	<b>Ischaemia</b>	<b>Perforation</b>
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## ● Inflammation:

No matter what the trigger of the inflammation, the subsequent pathological process is the same: (arteriolar dilatation + increase in the permeability) lead to: (reactive hyperaemia of tissues + exudation of fluid into tissues) respectively.

Finally, there is migration of leukocytes from the vessels into the inflamed tissues.

### Injurious agents causing inflammation

Infective	Non Infective
<ul style="list-style-type: none"> <li>• Bacterial • Viral • Fungal • Parasitic</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical • Ischaemic or • Physical trauma &gt; eg: (heat, cold, radiation, immune relate mechanism).</li> </ul>

## Peritonitis:

the greater omentum normally alters its position upon muscle movement and peristalsis.

But in **inflammation**, {↑blood supply → ↑transudation → ↑ accumulation of a protein-rich fibrinous exudate}, it will **adhere** to and surround the abnormal organ through the fibrinous exudate; preventing spread of inflammation. thus inhibiting peristalsis, resulting in a **paralytic ileus**<sup>4</sup>, leading to intraluminal fluid accumulation → **hypovolemia**.

Classification of peritonitis	
<b>Generalized peritonitis &gt;&gt; Category<sup>5</sup> “B:Emergency” operate within 6 hours.</b>	
<p><b>Primary cause:</b> <b>infection of the peritoneal fluid</b> without intra-abdominal disease, caused by:</p> <ul style="list-style-type: none"> <li>• <b>Direct spread:</b> usually associated with continuous ambulatory peritoneal <b>dialysis</b> (CAPD) catheters</li> <li>• <b>Haematogenous spread</b></li> <li>• <b>Lymphatic spread</b></li> <li>• <b>Ascending infection:</b> from the female genital tract.</li> </ul>	<p><b>Secondary cause:</b> inflammation of the peritoneum arising from <b>an intraabdominal source</b></p> <ul style="list-style-type: none"> <li>• <b>Infectious : pathogenic</b></li> <li>• <b>Non-infectious :</b> not pathogen related, for example:               <ul style="list-style-type: none"> <li>Blood</li> <li>Ischaemia</li> <li>Bile</li> <li>Chemical</li> <li>Foreign body</li> <li>• <b>Perforation</b></li> </ul> </li> </ul> <p><u>the most common cause of generalized peritonitis is perforation of an intra-abdominal viscus.</u></p>
<b>Localised peritonitis (regarding the anatomy :RUQ OR PELVIC..) &gt;&gt; Category “C:Urgent” operate within 24 hours.</b>	
<ul style="list-style-type: none"> <li>• Usually due to spreading inflammation across the wall of any viscus.</li> </ul>	
Clinical features	
<p><b>Secondary</b> peritonitis: abdominal pain is the most common symptom, <b>sharp &amp; well localized</b>. Though it may spread.</p> <p><b>Primary</b> peritonitis: can present rather more subtly, 30% of affected individuals may be <b>asymptomatic</b>.</p>	

{‘peritonitis’ or ‘peritonism detected on clinical examination by the presence of ‘guarding’ and ‘rebound tenderness’ > is an indication of surgical intervention}.

<sup>4</sup> obstruction

<sup>5</sup> Check the table in page 12

## Primary peritonitis (uncommon) (EXTRA)

Escherichia coli is now the predominant causal organism and probably gains access through the gut wall, or rarely by bloodborne spread. Spontaneous bacterial peritonitis (SBP) seen with nephrotic syndrome, more frequently in liver cirrhosis or chronic renal failure (particularly in patients on peritoneal dialysis). Antibiotic therapy is the mainstay of treatment, but either laparoscopy may be needed to rule out a surgical cause.

## Postoperative peritonitis (EXTRA)

Persisting abdominal distension or the development of vomiting and distension after abdominal surgery. Suspicion is heightened if the patient looks unwell and has fever, tachycardia and an altered mental state. US can be used to detect collections. However **contrast enhanced CT is the best.**

Diagnosis is difficult, as:

- Patient on analgesics -> no pain.
- Any pain and tenderness may be attributed to the wound.
- The postsurgical 24–48-hour period, bowel sounds are absent and the abdomen is distended.

## Intra-abdominal ABSCESS (EXTRA)

**Aetiology:** either in conjunction with or as a complication of an underlying inflammatory process or intra-abdominal surgery. Common sites for abscess formation are the subphrenic (below diaphragm) and subhepatic (below liver) spaces, the pelvis, and between loops of bowel.

- Unexplained fever after peritoneal infection or operation (think of abscess as it gives rise to pyrexia, tachycardia and clinical signs of toxicity. Leukocytosis and raised C-reactive protein are usual).
- **Pelvic abscesses:** sometimes spontaneous **rectal discharge** occurs and urgency of defecation, diarrhoea and a boggy (spongy) swelling in the pouch of Douglas on rectal examination.
- **Subphrenic abscess:** **Pain and tenderness over the rib cage, shoulder-tip pain and a 'sympathetic'<sup>6</sup> pleural effusion.**

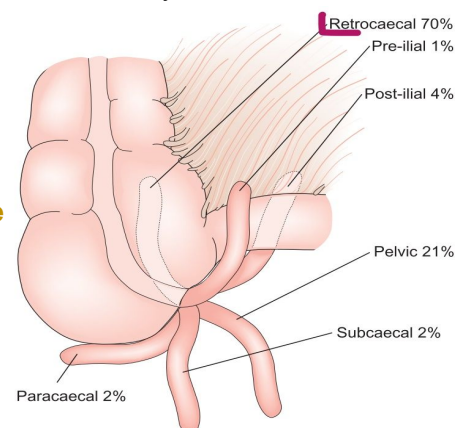
The site of the abscess may be suspected from the history and clinical examination, but localizing signs are few, particularly with subphrenic abscess.

**Complications:** 1) generalized peritonitis (rupture). 2) bleeding (vessels erosion). 3) septicaemia.

## Acute Appendicitis:

### Anatomy:

- Its commonly 6–9 cm long<sup>7</sup> supplied by **appendicular artery**, a branch of the ileocolic artery.
- The position of the appendix is variable, depending on its length and mobility. In cadaveric (post-mortem) dissections, the most common site is **retrocaecal**, but data from diagnostic laparoscopy indicate that the pelvic position is probably more common.



### Aetiology:

Despite its prevalence, **cause remains unclear**. One of the popular Theories : “**fibres lacking diet**”. Others have suggested that **viral infection** may be an aetiological agent, as there is an association between appendicitis and concurrent viral illness and because there is a seasonal variation in the incidence of appendicitis.

### Pathogenesis >> Obstruction (EXTRA)

Obstruction of the lumen of the appendix is thought to play the main role in the initiation of inflammation. What are the causes ?

- Lymphoid hyperplasia, Faecoliths<sup>8</sup> (stony mass of feces) and strictures
- Rarely: parasite, foreign body, tumor (carcinoid).

Following obstruction, the wall of the appendix becomes inflamed spreading till the serosal layers. >venous congestion> compromise arteries> may progress to ischaemia and infarction. Organisms from appendix cause liquefaction of the wall and ultimately perforation.

As a result of the transmural inflammation>adhesions> area of sepsis... If left untreated>mass or abscess.

### Hx. (IMPORTANT)

**Site:** Dull centrally then moves and become constant and well localized.

**Onset:** gradual onset over a 24-48 hour.

**Character:** colicky & becomes sharper with time.

**Radiation:** to the right iliac fossa “the most discriminating”. Meaning parietal peritoneum involved.

**Aggravated:** by coughing and movement so patients present with shallow breathing.

Always important to consider **additional symptoms** (anorexia, **nausea/vomiting, fever & tachycardia**).

**Time:** no particular association

<sup>6</sup> exudative effusion due to disease in a near structure (eg:rupture of an amebic hepatic abscess)

<sup>7</sup> Actually it ranges between 2-25 cm long !!!

<sup>8</sup> Or fecaliths

The finding of tenderness and **guarding** in the right iliac fossa usually makes the diagnosis without the need for other investigations.

- most common cause of acute abdominal pain requiring surgery.
- uncommon in patients below the age of 2 and above the age of 65
- peak incidence between 8 and 14 years. No gender significance

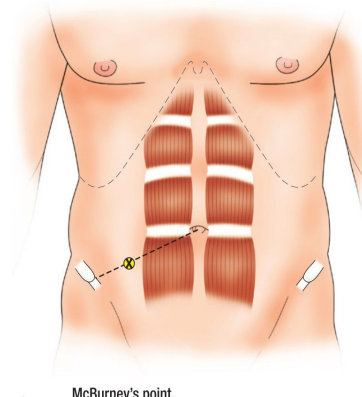
**12-year-old boy who present with an acute abdominal pain, appendicitis is suspected.**

**Examination:** How does the patient walk into the examination room or get onto the bed? hunched over, like 'an old man', Do they look unwell? Kids with appendicitis generally nagging, not asking for food, & unwell, flushed and has a dry furred<sup>9</sup> tongue with a fetor (Foul smell).

Classically, the area of maximal tenderness is over **McBurney's point, with guarding and rebound tenderness** (pain upon removal of pressure). Palpation in the **LEFT** iliac fossa may **reproduce the pain** in the **RIGHT** iliac fossa (**Rovsing's sign**) and the patient may find it painful to extend the right hip owing to irritation of the psoas muscle (psoas stretch sign).

#### Complications:

1. **Generalized peritonitis** due to perforation or if the inflamed area is not walled off by omentum and loops of bowel (no adhesions).
2. If walling off does occur it will create area of sepsis if untreated, either an **appendix mass or an abscess will develop.**
3. Gangrenous appendicitis (remember ischaemia) and perforation



**Investigations:** based on clinical assessment / no specific diagnostic tests.

- CBC ordered to look for ↑ (WBC) count and ↓ Hgb.
- Urine dipstick and microscopy and culture should be performed to exclude infection
- Abdominal CT or US, t to rule out pancreatitis, tumors and ischemia.

(appendix is close to the bladder>> may produce +/- symptoms of frequency and dysuria)

#### Management:

almost always **SURGICAL Urgent operation within 24 hours**; increasingly, laparoscopic appendicectomy, especially if a diagnostic laparoscopy was done. If surgery isn't possible Antibiotics are used. (not favoured due to recurrences). by the time the patient presents, a mass can be felt & no signs of peritonitis >> IV fluids and antibiotics is the treatment of choice. Then when do we operate? Do US if a periappendicular abscess is present > Drain!. If successful we do prophylactic interval appendectomy 3–6 months later. But **if abscess w/ inflamed appendix do Open Appendectomy to remove and clean area.**

### ● **Infarction:** e.g. acute mesenteric ischemia

In the context of abdominal pain, intestinal infarction is the **most common cause**. Histopathological feature is **ischaemic coagulative necrosis w/ inflammation along the margins**.

**Aetiology** by vasoconstrictive drugs, non-occlusive (shock) or **occlusive**:

- **Arterial**: Embolism (sudden), Thrombosis (gradual), Outer compression.
- **Venous**: Thrombosis, compression.

#### Clinical features:

severe abdominal pain. The onset depends on the nature of the underlying process. **Commonly presents with bloody diarrhea**. Infarction and ischaemia are potent triggers of inflammation.

### ● **Perforation:**

Weakening of the wall of the viscus, might follow degeneration, inflammation, infection or ischaemia. An increase in the intraluminal pressure of a viscus (in a closed-loop obstruction), peptic ulceration or acute appendicitis will predispose to perforation. & it can be iatrogenic by laparoscopy or endoscopy. **Usually perforated bowel, commonly duodenal ulcer perforation, shows subdiaphragmatic air on X-Ray.**

#### Clinical features:

**sudden onset + well localized** to the affected area. The clinical picture depends on the nature of the perforated viscus (sterility and toxicity of its material) , & the speed with which the perforation is surrounded and sealed (if at all) by the adjacent structures and omentum. **Eg:** Gastrointestinal perforation> **severe pain** elevated by movement, w/ **nausea, vomiting and hematemesis**. Later symptoms include **fever** and/or **chills**. The inevitable peritoneal contamination will lead to either localized or generalized peritonitis.

- **AAA rupture > Category "A" immediate operation**

<sup>9</sup> White coated

● **Obstruction:**

Impedance in the flow by something in the lumen or in the walls or even an extrinsic compression. The smooth muscles will contract reflexly in an effort to overcome the impedance. **This reflex contraction produces 'colicky pain'** (lasts for short period "secs or mins", eases off then returns again like LABOUR). The **exception** to this rule is **'biliary colic'**.

The gallbladder and biliary system has **little smooth muscle** in its wall and attempts to contract **more continuously** than 'colicky'. If the obstruction is not overcome the end result depends on the structure obstructed.

If the urinary bladder there will be proximal dilatation to ureter and Hydronephrosis > postrenal kidney failure. But if it's an inguinal hernia obstruction, proximal dilatation of the intestine (usually associated with vomiting) but may also result in ischaemia of the bowel wall, leading to infarction and perforation.

**Usually shows on an erect X-Ray film >> air-fluid level (has to be 3 or more to be of significance)**  
**If Complete obstruction > Category "B"; Partial obstruction > Category "C"**

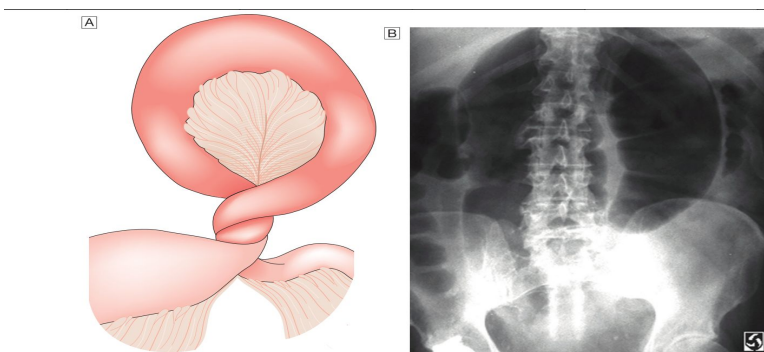
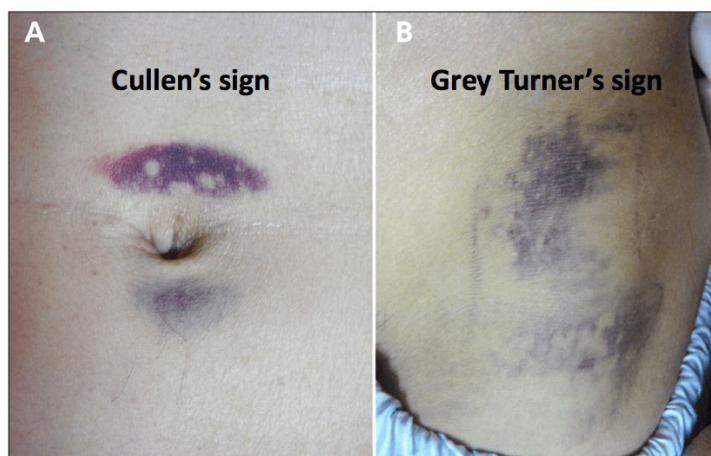


Fig. 12.2 Volvulus: an example of closed-loop obstruction. [A] Diagrammatic representation of a volvulus. [B] X-ray showing volvulus of sigmoid colon.

<b>Murphy's</b>	Acute pain elicited when the gallbladder strikes the examiner hands with deep inspiration, indicates acute cholecystitis
<b>Boas's</b>	Radiation of the pain to the tip of the scapula with hyperaesthetic skin, indicates acute cholecystitis
<b>Rovsing's</b>	In acute appendicitis palpation in the left iliac Fossa produces a pain in the right iliac fossa
<b>In Cases of severe acute pancreatitis</b>	
<b>Cullen's</b>	Discolouration/ bruising around umbilicus. used to be associated with ruptured ectopic pregnancy
<b>Grey Turner's<sup>10</sup></b>	Discolouration/ bruising of the flanks. A classic finding of retroperitoneal bleeding around the kidneys and pancreas.



<sup>10</sup> Takes 24–48 hours to develop. A result of liberated pancreatic enzymes causing the diffusion of fat necrosis and inflammation, with retroperitoneal or intra-abdominal bleeding

## Recall:

### **What is acute appendicitis?**

Obstruction of the appendiceal lumen (fecalith, lymphoid hyperplasia), producing a closed loop with resultant inflammation that can lead to necrosis and perforation.

### **What is its claim to fame?**

Most common surgical disease requiring emergency surgery in children

### **What is the usual presentation?**

Onset of referred or periumbilical pain followed by anorexia, nausea, and vomiting (Note: Unlike gastroenteritis, pain precedes vomiting, then migrates to the RLQ, where it intensifies from local peritoneal irritation) If the patient is hungry and can eat, seriously question the diagnosis of appendicitis

**How is the diagnosis made? >>** History and physical exam

### **What are the signs/symptoms?**

Signs of peritoneal irritation may be present—guarding, muscle spasm, rebound tenderness, obturator and Psoas signs; low-grade fever rising to high grade if perforation occurs

### **What is the differential diagnosis?**

Intussusception, volvulus, Meckel's diverticulum, Crohn's disease, ovarian torsion, cyst, tumor, perforated ulcer, pancreatitis, PID, ruptured ectopic pregnancy, mesenteric lymphadenitis

**What is the common bacterial cause of mesenteric lymphadenitis? >>** *Yersinia enterocolitica*

### **What are the associated lab findings with appendicitis?**

Increased WBC (>10,000 per mm<sup>3</sup> in >90% of cases, with a left shift in most)

### **What is the role of urinalysis?**

To evaluate for possible pyelonephritis or renal calculus, but mild hematuria and pyuria are common in appendicitis because of ureteral inflammation

### **What is the "hamburger" sign?**

Ask patients with suspected appendicitis if they would like a hamburger or favorite food; if they can eat, SERIOUSLY question the diagnosis

### **What radiographic studies may be performed?**

Often none; CXR to rule out RML or RLL pneumonia; abdominal films are usually nonspecific, but calcified fecalith is present in 5% of cases; U/S, CT

### **What is the treatment?**

Nonperforated: prompt appendectomy and cefoxitin to avoid perforation

Perforated—triple antibiotics, fluid resuscitation, and prompt appendectomy; all pus is drained and cultures obtained, with postoperative antibiotics continued for 5 to 7 days, +/- drain

**How long should antibiotics be administered if nonperforated? >>** 24 hours

**How long if perforated? >>** Usually 5 to 7 days or until WBCs are normal and patient is afebrile

### **What is the approximate risk of perforation?**

~25% after 24 hours from onset of symptoms

~50% by 36 hours

~75% by 48 hours

# Clinical assessment

## SOAP:

**Subjective:** History taking

**Assessment:** Investigations

**Objective:** Physical examination "what we found"

**Plan:** Treatment

95% of Diagnosis is reached through history and examination, 5% through investigations.

Example: 18 year old young female in her mid-cycle presented with right lower pain on examination there is tenderness and rebound guarding in the right iliac fossa, what is the diagnosis?

- appendicitis / ovarian rupture / ovarian cyst

What should we do ? now we need the 5% information from investigation

## 1- History taking:

<b>Personal information</b>	<p><u>patient age is very important regarding ACUTE ABDOMINAL PAIN.</u></p> <p>some diseases are common in certain age groups.</p> <ul style="list-style-type: none"> <li>- Newborn: most likely to be congenital: bowel atresia or bowel rotation or paralytic ileus.</li> <li>- Child: most likely mesenteric adenitis (lymph node inflammation)</li> <li>- Young with abdominal pain most likely to have appendicitis or pancreatitis</li> <li>- 50&gt; with AP most likely to have diverticulitis or colon cancer</li> </ul>
Most of the time patient will present with pain ( <b>SOCRATES</b> )	
<b>Site</b>	<p>the abdomen is divided into either <b>quadrants</b> or <b>ninths</b>. Ex:</p> <ul style="list-style-type: none"> <li>- RUQ pain may be due to cholecystitis</li> <li>- RLQ pain may be due to Appendicitis</li> <li>- Epigastric pain may be due to peptic ulcer/pancreatitis.</li> </ul>
<b>Onset</b>	<ul style="list-style-type: none"> <li>- sudden= perforation "always sudden in case of acute abdomen"</li> <li>- gradual= Inflammation.</li> </ul>
<b>Nature of the pain</b>	<p><u>two</u> mechanisms in the development of abdominal pain :</p> <p><b>1- obstruction :</b></p> <ul style="list-style-type: none"> <li>- Obstruction of a muscular viscus produces a colicky pain</li> <li>- Comes and goes" Spasms "</li> <li>- severe and may be relieved by <u>moving around</u> or drawing the knees up towards the chest</li> </ul> <p><b>2- inflammation :</b></p> <ul style="list-style-type: none"> <li>- constant pain</li> <li>- worsens by local or general disturbance.</li> </ul> <p>Ex: worse with movement or coughing suggests inflammation of the parietal peritoneum</p>
<b>Character</b>	<ul style="list-style-type: none"> <li>- Stabbing pain most likely muscular pain .</li> </ul> <p><b>if elderly w/ stabbing pain radiating to the back Most likely AAA (abdominal aortic aneurysm)</b></p> <ul style="list-style-type: none"> <li>- Pressure = angina</li> <li>- Colicky pain<sup>11</sup> = gall/renal stones , small bowel obstruction</li> <li>- Burning: peptic ulcer/pancreatitis/gastritis</li> <li>- Pressure like pain (Guarding) : bowel twisting / interception</li> </ul>
<b>Radiation &amp; shifting</b>	<p><b>Radiation</b> means pain extends directly from one place to another, while usually <u>remains</u> present at the site of onset , <u>due to dermatomes &amp; embryological origin</u></p> <p>Radiation usually means that other structures are becoming involved.</p> <ul style="list-style-type: none"> <li>- Ex1: pain from a duodenal ulcer may radiate through to the back, indicating that inflammation has occurred through the wall of the duodenum to involve structures of the posterior abdominal wall, such as the pancreas.</li> <li>- Ex2: cholecystitis pain radiates to the right shoulder</li> </ul> <p><b>Shifting</b> means it started in one place but "disappeared" and moved to include a new area</p> <ul style="list-style-type: none"> <li>- Ex : appendicitis , its starts in the periumbilical region then it shift to right iliac fossa due to the embryological origitation.</li> </ul>

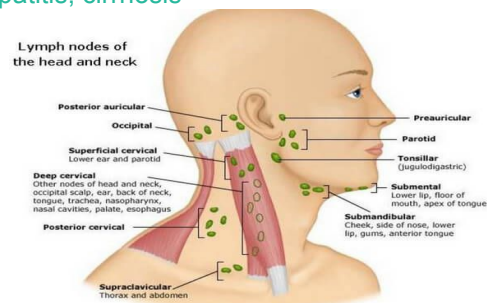
<sup>11</sup>Occurs due to muscular contractions of a hollow tube (colon, ureter, gall bladder, etc.) in an attempt to relieve an obstruction by forcing content out



<p><b>Associated Symptoms</b></p>	<p>Common associated symptoms with acute abdomen:</p> <ul style="list-style-type: none"> <li>- N/V (Nausea/vomiting) <ul style="list-style-type: none"> <li>- <b>Bilious vomiting due to excessive vomiting with an empty stomach with bile reflux and intestinal obstruction as well.</b></li> <li>- <b>Feculent Vomit in very severe stages of obstruction.</b></li> <li>- <b>Vomiting could be projectile (shooting):</b> <ul style="list-style-type: none"> <li>- <b>If newborn:</b> think congenital hypertrophic pyloric.</li> <li>- <b>If child:</b> think pyloric stenosis.</li> <li>- <b>If adult:</b> think Gastric outlet obstruction narrowing in pylorus</li> </ul> </li> </ul> </li> <li>- Diarrhea <ul style="list-style-type: none"> <li>- could be bloody like in: ulcerative colitis or ischemia</li> </ul> </li> </ul> <p><b>Diarrhoea + acute abdomen + fever &gt; think of infection with perforation like Gastroenteritis due to Salmonella causing perforation.</b></p> <ul style="list-style-type: none"> <li>- Constipation <ul style="list-style-type: none"> <li>- due to PARTIAL obstruction (usually w/ flatus<sup>12</sup>) unlike full obs.</li> </ul> </li> <li>- Fever or rigors (sepsis/inflammation) <ul style="list-style-type: none"> <li>- cholangitis</li> </ul> </li> </ul> <p><b>Jaundice + acute abdomen &gt; Think cholangitis or cholecystitis</b></p>
<p><b>Precipitating &amp; Relieving factors</b></p>	<ul style="list-style-type: none"> <li>- Example: leaning forward will relieve the pain of acute peritonitis and pancreatitis / Fatty food increase the pain of biliary colic</li> </ul>
<p><b>Severity</b></p>	<ul style="list-style-type: none"> <li>- Subjective</li> <li>- A better indication is to assess the effect of the pain on the patients' lives. For example, did they call their GP? Were they unable to attend work? Did the pain interfere with their sleep? Furthermore.</li> <li>- use a score on a numerical or pictorial scale.</li> </ul> <p><b>If 1-3 mild</b>  <b>If 4-6 moderate order IV analgesic (PRN:if needed).</b>  <b>If 7-10 severe order IV analgesics continuous infusion.</b></p>
<p><b>Progression</b></p>	<p>it may remain exactly the same, may gradually improve or worsen, or may fluctuate.</p>
<p><b>Past history</b></p>	<p>Drug history :  Ex: history of peptic ulcer, patient may present with sudden pain due to perforation if he/she is noncompliant with medication.  Ex: patient presented with acute abdominal pain and vomiting blood on Aspirin/NSAIDS therapy</p> <p>Surgical history:  patient comes to ER complains of abdominal pain, abdominal distention and vomiting. He has past surgical history of abdominal surgery, most likely he has → obstruction due to adhesion</p>

## 2- Examination:

<p><b>General observation</b></p>	<ul style="list-style-type: none"> <li>- Indicates severity of pain</li> <li>- conscious / unconscious , if the patient is subconscious/unconscious he/she needs resuscitation -&gt; start SOAP protocol from down to up "PAOS"</li> <li>- Is patient unwell/pale/sweaty/experiencing pain or well / good color / talk normally/move freely</li> <li>- vital signs indicate the hemodynamic stability.</li> <li>- Head and neck for jaundice/dehydration:</li> <li>- What causes jaundice ? <ul style="list-style-type: none"> <li>- surgery = obstruction, tumor, stones, cholangitis, cholecystitis</li> <li>- medicine = hepatocellular disease, hepatitis, cirrhosis</li> </ul> </li> <li>- In dehydration check the mucus membrane.</li> <li>- clinical evidence of anaemia,cyanosis.</li> <li>- Lymph Nodes of the neck: <ul style="list-style-type: none"> <li>- Submental</li> <li>- Submandibular</li> <li>- Preauricular</li> <li>- Posterior auricular</li> <li>- Occipital</li> <li>- Superficial Cervical</li> <li>- Deep cervical</li> <li>- posterior cervical</li> <li>- Deep cervical</li> </ul> </li> <li>- <b>Virchow's node in the left supraclavicular fossa might indicate gastric cancer , this node drains the thoracic duct -&gt;abdominal lymph nodes mainly the stomach</b></li> </ul>
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	<ul style="list-style-type: none"> <li>- In children ask them to 'blow out' and 'suck in' their abdomen and to cough = elicit pain in the presence of peritonism without laying a hand on the child's abdomen</li> <li>- <b>Hands : clubbing/ tremor/ palmar erythema/ Leukonychia/ capillary refill /pulse: volume and synchronicity</b></li> <li>- Rebound tenderness should never be elicited in children. Gentle tapping with the percussing finger will elicit the same information (tap tenderness) in a much less cruel way.</li> </ul>
<b>Chest</b>	<ul style="list-style-type: none"> <li>- <b>Inferior MI will present as epigastric pain</b></li> <li>- <b>Lower lobe/basal pneumonia may present with abdominal pain</b></li> </ul>
<b>Inspection of the abdomen</b>	<ul style="list-style-type: none"> <li>- The patient is <b>ideally</b> exposed from nipples to mid-thigh.</li> <li>- <b>look for :</b></li> <li>- <b>Scars indicate previous surgery so the patient may have adhesions</b></li> <li>- <b>Hernia ( obstructed/strangulated)</b></li> <li>- <b>Hernial orifices</b></li> <li>- <b>Dilated veins denotes portal hypertension</b></li> <li>- <b>Distended abdomen ( bowel obstruction / ascites )</b></li> <li>- <b>Asymmetry localized peritonitis: one side is moving and the other is not due to guarding; in generalised peritonitis the whole abdomen is rigid and not moving at all with inspiration.</b></li> <li>- <b>In acute appendicitis there is local peritonitis +/- perforation (you will only see the left side moving).</b></li> <li>- Positions : supine on the bed or trolley with a single pillow behind the head and shoulders and with the arms resting by their side</li> </ul>
<b>Palpation</b>	<ul style="list-style-type: none"> <li>- <b>systematic manner.</b></li> <li>- <b>superficial palpation to look for tenderness and muscle guarding which indicates that there is something wrong underneath the muscles or superficial masses (in the skin / below skin)</b></li> <li>- <b>Deep palpation usually is impossible due to guarding unless there is no guarding and no tenderness, you can do deep palpation</b></li> <li>- start <b>away</b> from the site of maximum pain and move towards the tender site, encompassing all areas</li> <li>- If the pain is due to inflammation, the approximation of the parietal peritoneum on to the inflammatory area will result in a reflex contraction of the overlying muscles (involuntary guarding). If the whole peritoneal cavity is inflamed, then there will be generalized peritonitis and the abdominal wall will be rigid (board-like rigidity).</li> <li>- rebound tenderness is an excellent indication of peritonism but is very painful and is better tested by light percussion.</li> <li>- coughing or moving is also a good indication of peritoneal inflammation.</li> <li>- If light palpation of the whole abdomen elicits no pain, the process is repeated pressing more firmly to detect deep tenderness. This will allow for the detection of organomegaly and the presence of any masses .</li> <li>- attention should be paid to the supraclavicular fossae, axillae and cervical regions for the presence of lymphadenopathy.</li> <li>- The hernial orifices must also be specifically examined, as must the male external genitalia, looking for tenderness and masses within the scrotum.</li> </ul>
<b>Percussion</b>	<ul style="list-style-type: none"> <li>- <b>Check for Ascites</b></li> <li>- <b>to determine the presence of fluid within the peritoneal cavity.</b></li> <li>- <b>normally resonant because of the presence of gas-containing bowel.</b></li> <li>- <b>The liver gives a dull note to percussion</b> anteriorly from the level of the right fifth rib to the right costal margin, and loss of liver dullness to percussion may represent free intraperitoneal gas. The presence of suprapubic dullness may indicate a full bladder due to urinary retention. If there is free intraperitoneal fluid, the percussion note will be dull in the flanks. The site of the dullness moves as the patient rolls onto his or her side (shifting dullness). One litre or more of fluid is required before this sign can be elicited.</li> </ul>
<b>Auscultation</b>	<ul style="list-style-type: none"> <li>- <b>Auscultate for bowel sounds , the best area is <b>McBurney's point</b> ( <math>\frac{1}{3}</math> - <math>\frac{2}{3}</math> between anteriore superior iliac spine and umbilicus )</b></li> <li>- <b>Why is this the best area? because the ileocecal junction is there, and creates bowel sound when content empties into cecum.</b></li> <li>- <b>exaggerated bowel sounds = early sign of obstruction</b></li> <li>- <b>Absent bowel sounds = paralytic ileus ( postoperative only for few days / peritonitis )</b></li> <li>- gurgling noises if it contains a mixture of fluid and gas.</li> <li>- Normally low-pitched sounds and occur every few seconds. Their absence over a 30-second period suggests that peristalsis has ceased, a condition termed ileus , This may be due to generalized peritonitis or atony of the bowel smooth muscle, such as might follow a prolonged period of obstruction. Increased peristalsis produces a higher volume, pitch and frequency of the bowel sounds and can be</li> </ul>

	<p>heard in mechanical obstruction (often described as ‘tingling’), in addition to conditions such as gastroenteritis.</p> <ul style="list-style-type: none"> <li>- bowel sounds should be described as present and normal, present and abnormal, or absent.</li> </ul> <p>Auscultation should continue over the course of the aorta and the iliac arteries, listening for the presence of bruits, which are indicative of turbulent flow.</p> <p>If gastric outlet obstruction is clinically suspected, the patient’s abdomen may be shaken from side to side in an attempt to elicit a ‘succussion splash’</p>
<b>Genitalia</b>	Ex : check genitalia in infants e.g. for infected hydrocele or torsion
<b>Vaginal examination</b>	<p>In Young female :</p> <ul style="list-style-type: none"> <li>- Salpingitis</li> <li>- Salpingo-ovaritis</li> <li>- oophoritis/salpingo-oophoritis</li> <li>- Ectopic pregnancy</li> <li>- ruptured graafian cyst</li> </ul>
<b>PR examination</b>	<ul style="list-style-type: none"> <li>- Rectal masses may obstruct the leading to megacolon perforation leading to peritonitis</li> <li>- Blood = GI bleeding</li> <li>- tenderness</li> </ul>

### Inspection of the abdomen may reveal a wealth of information: extra

<b>Abdominal swellings</b>	<ul style="list-style-type: none"> <li>- Enlargement of liver/spleen/kidneys</li> <li>- Tumours of bowel/ovaries/intra-abdominal / retroperitoneal structures</li> </ul>
<b>scars</b>	<ul style="list-style-type: none"> <li>- previous surgery</li> <li>- important in the presence of bowel obstruction secondary to adhesions</li> <li>- All scars should be tested for the presence of herniation.</li> </ul>
<b>Distended veins</b>	<ul style="list-style-type: none"> <li>- secondary to portal hypertension</li> <li>- occlusion of the inferior vena cava</li> </ul>
<b>Generally distended</b>	<ul style="list-style-type: none"> <li>- intra-abdominal blood or fluid</li> <li>- intestinal obstruction “ intestinal peristalsis may be visible, if the patient is thin “</li> </ul>

### Summary of examination:

Table 12.8 Checklist for examination of the acute abdomen

Method	Question	Significance
<b>Inspection</b>	<p>What is the abdominal contour?</p> <p>Does the abdomen move with respiration?</p> <p>Can the patient blow out/suck in the abdomen?</p> <p>Does the patient lie still or writhe about?</p> <p>Are there visible abnormalities?</p>	<p>Distension: intestinal obstruction or ascites</p> <p>Rigid abdomen: peritonitis</p> <p>Rigid abdomen: peritonitis</p> <p>Fear of movement: peritonitis</p> <p>Writhes about: colic</p> <p>Scars: relevant previous illness, adhesions</p> <p>Hernia: intestinal obstruction</p> <p>Visible peristalsis: intestinal obstruction</p> <p>Visible masses: relevant pathology</p>
<b>Gentle palpation</b>	Is there tenderness, guarding or rigidity?	<p>Tenderness/guarding: inflamed parietal peritoneum</p> <p>Rigidity: peritonitis</p>
<b>Deep palpation</b>	<p>Are there abnormal masses/palpable organs?</p> <p>Is there rebound tenderness?</p>	<p>Palpable organs/masses: relevant pathology</p> <p>Rebound tenderness: peritonitis</p>
<b>Percussion</b>	Is the percussion note abnormal?	<p>Resonance: intestinal obstruction</p> <p>Loss of liver dullness: gastrointestinal perforation</p> <p>Dullness: free fluid, full bladder</p> <p>Shifting dullness: free fluid</p>
<b>Auscultation</b>	<p>Are bowel sounds present/abnormal?</p> <p>Is there a bruit?</p>	<p>Absent sounds: paralytic ileus</p> <p>Hyperactive sounds: mechanical obstruction, gastroenteritis</p> <p>Bruit: vascular disease</p>
<p><b>Do not forget to:</b></p> <p>Examine the groin</p> <p>Consider a digital rectal examination</p> <p>Consider a vaginal examination when appropriate</p> <p>Examine the chest</p>		

## Investigations:

The most common investigations carried out on the patient with acute abdominal pain include:

- full blood count (CBC)
- urea and electrolytes (U&Es)
- Amylase
- C-reactive protein
- liver function tests
- plain radiology (erect chest and supine abdominal X-rays)
- ultrasound scan.

<b>amylase</b>	<ul style="list-style-type: none"> <li>- serum amylase greater than three times the upper limit of normal is highly suggestive of <b>acute pancreatitis</b>.</li> <li>- <b>Note:</b> serum amylase return to normal after 48 hours of the onset of pain , what to do ? serum lipase more sensitive</li> </ul>
<b>Lactate</b>	<ul style="list-style-type: none"> <li>- To rule out ischemia</li> </ul>
<b>Raised C-reactive protein and leukocytosis</b>	<ul style="list-style-type: none"> <li>- <b>persistent</b> elevation suggests underlying inflammation and/or infection</li> </ul>
<b>Liver function test</b>	<ul style="list-style-type: none"> <li>- biliary disorders</li> <li>- gamma glutamyl transferase (GGT) sensitive test for possible stones in the common bile duct (choledocholithiasis).</li> <li>- <b>Ex:</b> patient with jaundice is it obstruction or hepatocellular (note : both will present with pain)</li> <li>- High Transaminase AST/ALT = hepatitis → severe pain</li> <li>- increase alkaline phosphatase + bilirubin +direct bilirubin + gamma glutamate = obstructive jaundice = stones *cholangitis</li> </ul>
<b>electrolytes</b>	<ul style="list-style-type: none"> <li>- hyponatremia / hypokalemia in patients who might be hypovolaemic/dehydrated</li> <li>- low Na happen in dehydration or diarrhea low K happen in vomiting</li> </ul>
<b>FBC/CBC</b>	<ul style="list-style-type: none"> <li>- Rule out anemia in bowel ischemia/bleeding per rectum /ulcerative colitis</li> <li>- WBC for infection</li> <li>- platelets count</li> </ul>
<b>Renal function test BUN / creatinine</b>	<ul style="list-style-type: none"> <li>- To rule out ending stage renal failure = prerenal azotemia</li> </ul>
<b>Arterial Blood gas sample</b>	<ul style="list-style-type: none"> <li>- To monitor the acid-base status and the efficacy of gas exchange</li> <li>- metabolic acidosis + elevated lactate level indicates sepsis / intestinal ischaemia</li> <li>- In acidosis we use ringer lactate</li> <li>- Alkalosis we use normal saline</li> </ul>
<b>Serum calcium</b>	<ul style="list-style-type: none"> <li>- <b>Hypercalcaemia :</b> <ul style="list-style-type: none"> <li>- abnormal gastrointestinal motility</li> <li>- Nephrolithiasis</li> <li>- peptic ulcer disease</li> <li>- pancreatitis</li> <li>- Malignancy</li> </ul> </li> <li>- <b>Hypocalcemia :</b> <ul style="list-style-type: none"> <li>- poor prognostic factors in patients with severe acute pancreatitis.</li> </ul> </li> </ul>
<b>Sickle test</b>	<ul style="list-style-type: none"> <li>- Sickle cell crises are a rare cause of acute abdominal pain.</li> </ul>
<b>glucose</b>	<ul style="list-style-type: none"> <li>- diabetic ketoacidosis may present with acute abdominal pain</li> </ul>

## Radiological investigations:

<b>CXR</b>	<ul style="list-style-type: none"> <li>- abdominal gases ( under the diaphragm ) caused by perforation of hollow viscus “ commonly duodenal ulcer perforation”</li> <li>- rule out cardiomegaly and lobar/basal pneumonia</li> </ul>
<b>AXR Abdominal X-Ray</b>	<ul style="list-style-type: none"> <li>- Radiologic signs of bowel obstruction : <ul style="list-style-type: none"> <li>- sigmoid volvulus (coffee bean sign)</li> <li>- Dilated bowel/gastroenteritis</li> <li>- <b>air-fluid level More than 3 levels indicate significant obstruction</b></li> </ul> </li> </ul>
<b>KUB</b>	<ul style="list-style-type: none"> <li>- for renal stones.</li> </ul>
<b>Ultrasound</b>	<ul style="list-style-type: none"> <li>- to rule out stones <u>especially</u> in the gallbladder</li> <li>- Fluid around gallbladder</li> <li>- Gallbladder wall thickness</li> <li>- ascites, pyelonephritis, polycystic ovarian disease, biliary obstruction</li> <li>- Intra-peritoneal fluids in case of infection or perforation</li> </ul>
<b>CT +/- contrast</b>	<ul style="list-style-type: none"> <li>- Tumors</li> <li>- Bowel inflammation</li> <li>- Used in <u>early</u> appendicitis because the symptoms are vague</li> <li>- +/- contrast : <ul style="list-style-type: none"> <li>- without contrast if you want to see the hernial content</li> <li>- With contrast for ischemia</li> </ul> </li> <li>- rule out pancreatitis, tumors and bowel ischemia.</li> </ul>
<b>Angiography /Duplex</b>	<ul style="list-style-type: none"> <li>- Use angio if there is ischemia or aortic aneurysm</li> <li>- Duplex = flow of the blood is it adequate or not</li> <li>- Duplex to rule out DVT</li> <li>- If mesenteric ischemia caused by thrombus or embolus is suspected</li> <li>- We usually do CT and angiography</li> <li>- Angiography : If they match no blood in the vessel and bowel is edematous this is gangrene.</li> <li>- Duplex: for peripheral blood vessels .</li> </ul>

## Management: (4 categories)

<b>Category A (CAT 1)</b>	<p>Immediate operation:</p> <ul style="list-style-type: none"> <li>- Patients in shock ( hypotensive ) due to ruptured AAA (abdominal aortic aneurysm)</li> <li>- Trauma</li> <li>- Bleeding</li> </ul>
<b>Category B (CAT 2)</b>	<p>Preoperative preparation and emergency operation within 6 hours</p> <ul style="list-style-type: none"> <li>- Complete obstruction, Ruptured viscus (ruptured appendicitis , ruptured diverticulitis , perforated duodenal ulcer<sup>13</sup> causing generalized peritonitis, still have time to stabilize the pt. By giving IV fluids, antibiotic.</li> </ul>
<b>Category C (CAT 3)</b>	<p>Urgent operation within 24 hours</p> <ul style="list-style-type: none"> <li>- acute appendicitis, partial bowel obstruction</li> </ul>
<b>Category D (CAT 4)</b>	<p>Conservative treatment (elective) :</p> <ul style="list-style-type: none"> <li>- In acute pancreatitis, operation will worsen the condition - except when there is pancreatic abscess or necrosis we operate on them</li> <li>- IBD , Cholecystitis</li> </ul> <p>Patients should be admitted for observation then discharge</p>

<sup>13</sup>closure, supported by the application of an graham omental patch.

### Case 1:

A 35-year-old male presented to the ER with 2 days history of abdominal pain. He took antacids but did not help him at all!

#### Subjective "History Taking":

35 year old, male, 2 days history of abdominal pain. He took antacids but there is no effect on him

#### Objective "Physical Examination":

When you examine the patient try to avoid the painful area in the beginning of the examination.

#### Assessment "Investigations":

CBC , Electrolytes, Chest x-ray.

#### DDx:

- Acute appendicitis
- PUD
- Bowel obstruction.

#### Plan "Treatment":

- IV antibiotics
- Surgery Appendectomy (Category C)

### Case 4:

A 54 year-old lady presented to the ER complaining of generalized abdominal pain associated with vomiting, constipation for 2 days, and abdominal distention. She had an emergency cesarean section for her 5th baby 5 years back.

#### Subjective "History Taking":

54 year old, Female, C.C. of generalized abdominal pain with vomiting, constipation and abdominal distention for 2 days, came through ER, had an emergency cesarean Section for her 5th baby 5 years back. (history of sx suspect adhesions)

#### Objective "Physical Examination":

Abdominal distention is present. Hyperactive bowel sounds occur early as GI contents attempt to overcome the obstruction; hypoactive bowel sounds occur late.

Exclude incarcerated hernias of the groin, femoral triangle, and obturator foramina.

Proper genitourinary and pelvic examinations are essential.

Check for symptoms commonly believed to be more diagnostic of intestinal ischemia, including the following:

1. Fever (temperature  $>100^{\circ}\text{F}$ )
2. Tachycardia ( $>100$  beats/min)
3. Peritoneal signs

#### Assessment "Investigations":

The most common cause is postsurgical adhesions. And since the patient had an operation 5 years ago she might have a chronic obstruction. Serum chemistries, Blood urea nitrogen (BUN) level, Creatinine Complete blood count (CBC), Lactate dehydrogenase tests , Urinalysis, Type and crossmatch, Phosphate level, Creatine kinase level

Abdominal X-ray: Dilated small-bowel loops with (more than six) air-fluid levels in supine and erect abdominal radiographs.

If symptoms Suggest obs. But not seen on xray do CT.

#### DDx:

- Small bowel obstruction
- Incarcerated groin hernia
- Hernia
- Malignant tumor

#### Plan "Treatment":

- Aggressive fluid resuscitation
- Bowel decompression
- Administration of analgesia and antiemetic
- Early surgical consultation
- Administration of antibiotics. (Antibiotics are used to cover against gram -ve and anaerobic organisms)
- Blood pressure and cardiac monitoring.

### Case 3:

A 73 year-old male developed atrial fibrillation while recovering from an acute MI in the medical ward. The surgery team was consulted to evaluate a new onset of severe mid abdominal pain.

#### Subjective "History Taking":

73 year old, Male, History of an acute MI complicated by Afib, complaining of new onset severe mid abdominal pain.  
(Thromboembolic phenomena may lead to intestinal ischemia)

#### Objective "Physical Examination":

pain with subjective symptoms disproportionate to their objective findings.

#### Assessment "Investigations":

Any patient with an arrhythmia such as atrial fibrillation who complains of abdominal pain is highly suspected of having embolization to the superior mesenteric artery until proved otherwise, As soon as AMI is suspected:

1. Surgical consultation
2. CT angiography

#### DDx:

- Cholangitis
- Cholecystitis
- Acute mesenteric ischemia
- Ileus
- Gastric Volvulus

#### Plan "Treatment":

- Surgical revascularization (**Category B**)
- Vascular interventional radiological thrombolytic medical treatment.

### Case 4:

A 55 year-old businessman presented to the ER with severe abdominal pain since 6 hours when he felt something like a burst in his abdomen. He is known with PUD and H-pylori but he was not taking his medications regularly!!

#### Subjective "History Taking":

55 year old, male, known case PUD and H-pylori. Presented to the ER with severe abdominal pain for 6 hours.

#### Objective "Physical Examination":

On abdominal examination the patient is uncomfortable and in pain.

#### Assessment "Investigations":

CBC, Electrolytes, Chest x-ray

#### DDx:

- Perforated duodenal ulcer
- peritonitis

#### Plan "Treatment":

- Stabilize patient
- Aggressive fluid resuscitation
- Antibiotics to eradicate H. pylori
- Surgery (surgical repair by graham patch) (**Category B**)

## Recall:

### What are peritoneal signs in acute abdomen?

Signs of peritoneal irritation: extreme tenderness, percussion tenderness, rebound tenderness, voluntary guarding, motion pain, involuntary guarding/ rigidity (late)

### Define the following terms:

**Rebound tenderness:** Pain upon releasing the palpating hand pushing on the abdomen

**Voluntary guarding:** Abdominal muscle contraction with palpation of the abdomen

**Involuntary guarding:** Rigid abdomen as the muscles "guard" involuntarily

**Colic:** Intermittent severe pain (because of intermittent contraction of a hollow viscus against an obstruction)

**What conditions can mask abdominal pain?** Steroids, diabetes, paraplegia

### What important questions should be asked when obtaining the history of a patient with an acute abdomen?

"Have you had this pain before?" "On a scale from 1 to 10, how would you rank this pain?"

"Fever/chills?" "Duration?" (comes and goes vs. constant) "Quality?" (sharp vs. dull) "Does anything make the pain better or worse?" "Migration?" "Point of maximal pain?" "Urinary symptoms?" "Nausea, vomiting, or diarrhea?"

"Anorexia?" "Constipation?" "Last bowel movement?" "Any change in bowel habits?" "Any relation to eating?" "Last menses?" "Last meal?" "Vaginal discharge?" "Melena?" "Hematochezia?" "Hematemesis?" "Medications?" "Allergies?"

"Past medical history?" "Past surgical history?" "Family history?" "Tobacco/EtOH/drugs?"

**What should go first? Auscultation or palpation?** Auscultation

**What is the best way to have a patient localize abdominal pain?** finger pointing

### LUQ:

PUD, perforated ulcer, gastritis, splenic injury, abscess, reflux, dissecting aortic aneurysm, thoracic causes, pyelonephritis, nephrolithiasis, hiatal hernia (strangulated paraesophageal hernia), Boerhaave's syndrome, Mallory-Weiss tear, splenic artery aneurysm, colon disease

### LLQ:

Diverticulitis, sigmoid volvulus, perforated colon, colon cancer, urinary tract infection, small bowel obstruction, inflammatory bowel disease, nephrolithiasis, pyelonephritis, fluid accumulation from aneurysm or perforation, referred hip pain, gynecologic causes, appendicitis (rare)

### RLQ:

Appendicitis! And same as LLQ; also mesenteric lymphadenitis, cecal diverticulitis, Meckel's diverticulum, intussusception

### What is the differential diagnosis of epigastric pain?

PUD, gastritis, MI, pancreatitis, biliary colic, gastric volvulus, Mallory-Weiss

### What is the differential diagnosis of gynecologic pain?

Ovarian cyst, ovarian torsion, PID, tubo-ovarian abscess (TOA), pregnancy, ectopic pregnancy, endometriosis, cancer of the cervix/uterus/ovary, endometrioma, gynecologic tumor, torsion of cyst or fallopian tube.

### What is the differential diagnosis of thoracic causes of abdominal pain?

MI (especially inferior), pneumonia, dissecting aorta, aortic aneurysm, empyema, esophageal rupture/tear, PTX, esophageal foreign body

### What is the differential diagnosis of scrotal causes of lower abdominal pain?

Testicular torsion, epididymitis, orchitis, inguinal hernia, referred pain from nephrolithiasis or appendicitis

### What are nonsurgical causes of abdominal pain?

Gastroenteritis, DKA, sickle cell crisis, rectus sheath hematoma, acute porphyria, PID, kidney stone, pyelonephritis, hepatitis, pancreatitis, pneumonia, MI, C. difficile colitis

### What is the unique differential diagnosis for the patient with AIDS and abdominal pain?

In addition to all common abdominal conditions:

CMV (most Common)---Kaposi's sarcoma---Lymphoma---TB---MAI (Mycobacterium Avium Intracellulare)

### What are the possible causes of suprapubic pain?

Cystitis, colonic pain, gynecologic causes (and, of course, appendicitis)

### What is gastroenteritis?

Viral or bacterial infection of the GI tract, usually with vomiting and diarrhea, pain (usually after vomiting), nonsurgical

### What is classically stated to be the "great imitator"?

Constipation

### What is the most common cause of RUQ pain?

Cholelithiasis

### What is the most common cause of surgical RLQ pain?

Acute APPENDICITIS

### What is the most common cause of GI tract LLQ pain?

Diverticulitis

### Classically, what endocrine problems can cause abdominal pain?

1. Addison crisis
2. DKA (Diabetic KetoAcidosis)