Approach to Abdominal Mass

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OBJECTIVES :

- Definition
- Classification of abdominal masses
- History
- Physical examination
- Investigation
- Management

Definition

Abdominal mass:
is a localized enlargement or swelling in the abdomen which lies anterior to the paraspinous muscles, and bounded superiorly by costal margins, inferiorly by iliac crest and symphysis pubis, and posteriorly by lumbar vertebrae that may be identified upon palpation of the abdomen, or with the use of medical imaging.

Causes of abdominal masses

- **Pathological causes:**
  1. Inflammatory
  2. Cystic
  3. Neoplastic (benign or malignant)
  4. Hernia
- **Physiological causes:**
  1. Stool
  2. Distended bladder
  3. Pregnancy

Presentation

- 1. Swelling or lump
  2. Pain
  3. Abdominal discomfort
  4. Bloating

- Many abdominal masses may be discovered incidentally.

How to Approach

- Site depending on which quadrant the mass in , we differentiate the cause

- Associated signs and symptoms

- Proper history and physical examination.

- Lab investigations and imaging.

- Management.

HISTORY TAKING

History taking

- **Patient profile:**
  - name
  - age (The patient's age helps to narrow the potential etiologies of an abdominal mass)
  - gender
  - marital status
  - occupation
  - address
  - route of admission

History taking – cont.

Chief complaint (what brought you to the hospital?)

HISTORY OF PRESENTING ILLNESS:

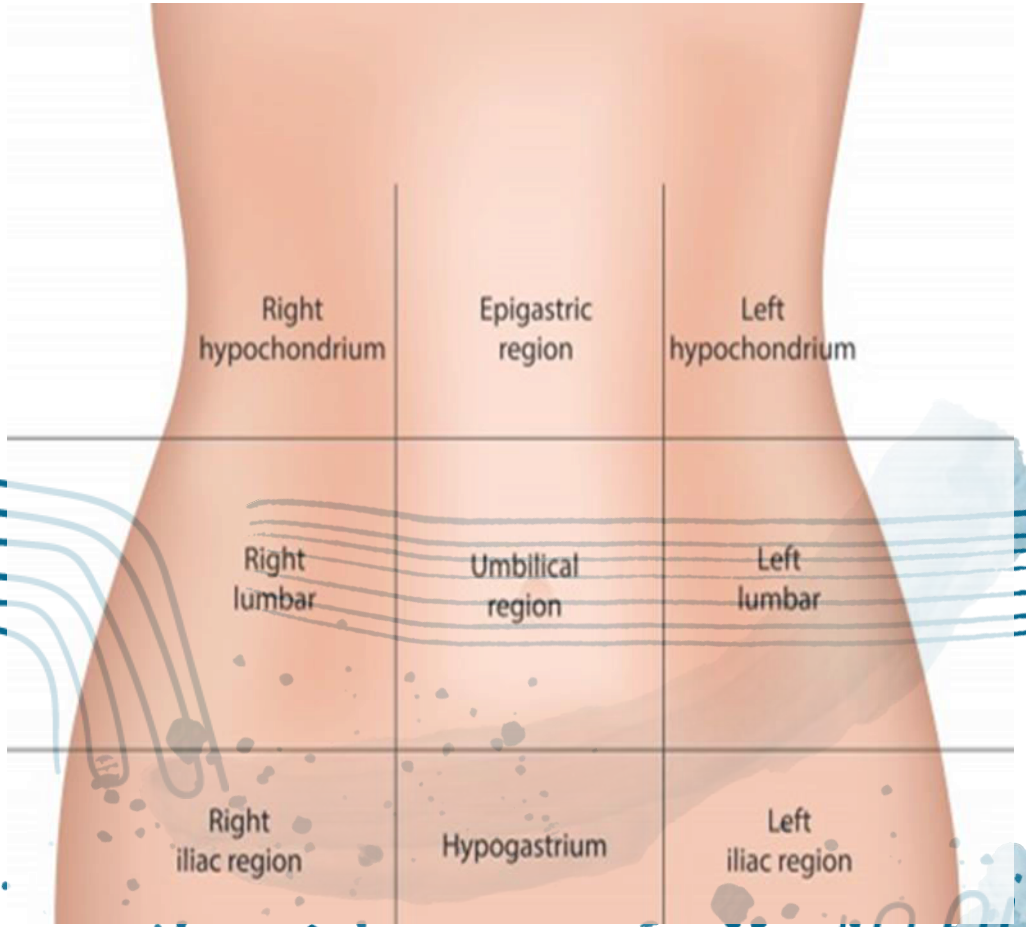
- Site?
- when was it first noticed?
- changes in size or position?
- mobile or fixed?
-tender?
-punctum ? squeezes out?
-soft ,hard , firm?
- rate of growth? (masses that grow faster are more likely to be malignant).
- if it is always there or does it come and go?
- Painful ,painless? do SOCRATES

History taking – cont.

- **Constitutional symptoms:**
  - Weight loss
  - Anorexia
  - Fatigue
  - Sweating
  - Nausea/vomiting
- **Associated symptoms:**
- **Systemic overview:**

SITE

WE CAN CLASSIFY THE ABDOMINAL MASSES ACCORDING TO THE SITE



Right Upper Quadrant

- **Hepatomegaly**
  (infective, neoplastic, cirrhotic, metabolic, drugs and toxins)
- **Gallbladder enlargement**
  (cystic duct obstruction, common bile duct obstruction)
- **Gastric carcinoma**
- **Right subphrenic abscess**
  (accumulation of the fluid between diaphragm and liver)
- **Subhepatic abscess**

Left Upper Quadrant

- Splenomegaly
  (infective, blood disease, metabolic, circulatory, neoplastic)
- Gastric carcinoma
- Pancreatic enlargement
- Left subphrenic abscess

Splenomegaly , ask about: fever, malaise, anorexia, weakness and fatigue from anemia

Epigastric Region

- Hepatomegaly
- Gastric carcinoma
- Pancreatic enlargement
- Abdominal Aortic Aneurysm (AAA)
- Colon cancer
- Mesenteric cyst

Aortic aneurysm, ask about : risk factors of CVS diseases as smoking, HTN and early death in the family

Flank areas

- Enlargement of kidney
  (malignancy, hydronephrosis, pyonephrosis, cystic disease)
- Adrenal tumors, Adrenal cyst

Umbilical Region

- Abdominal Aortic Aneurysm (AAA)
- Volvulus
- Hernia
- Intestinal neoplasm

Right Lower Quadrant (Right iliac fossa)

- Appendix mass / abscess
- Psoas abscess
- Ovarian tumor / cyst
- Colon tumor
- Undescended testis
- Iliac lymphadenopathy

Left Lower Quadrant (Left iliac fossa)

- Sigmoid diverticulitis
- Psoas abscess
- Ovarian tumor / cysts
- Sigmoid tumor
- Undescended testis
- Iliac lymphadenopathy

Suprapubic Region

- Distended bladder
- Uterine fibroma
- Ovarian tumor / cysts

Site

Right hypochondium Cholecystitis +gallbladder ca Hepatomegaly (liver ca , cavernous hemangioma , adenoma)	**Epigastric** Hepatomegaly Gastric ca Pancreatic abscess/pseudocyst	**Left hypochondium** Gastric ca Pancreatic abscess/pseudocyst Splenomegaly Colon ca RCC Hydronephrosis
Right flank RCC Hydronephrosis	**Periumilical** AAA Hernia (umbilical , epigastric , para umbilical) Crohn's disease	**Left flank** RCC Hydronephrosis
Right iliac fossa Colon ca Crohn's disease Appendix mass/abscess Iliac lypmadenopathy Psoas abscess Ovarian cyst /fibroid	**Suprapubic** Distended bladder Neuroblastoma	**Left iliac fossa** Colorectal ca Diverticular disease Iliac lypmadenopathy Psoas abscess Ovarian cyst /fibroid

Cont. – History taking

Past surgical and medical Hx:

Comorbidities:

Hypertension, DM , H.pylori infection (gastric ca), IBD , colonic polyps

Family Hx:

Familial adenomatous polyposis (colon and gastric ca), any family history of ca, gall stones and hemochromatosis

Social Hx :

(smoking, alcohol, low fiber diet and high fiber diet)

Allergies:

PHYSICAL EXAMINATION

Physical Examination

- ✓ introduce yourself , take permission , privacy , general observation
- ✓ The abdomen is inspected by positioning the patient supine on an examining table or bed, arms by his sides
- ✓ Good lighting is essential
- ✓ Good exposure (from the **Supraclavicular to mid thigh**): this is very important for many reasons

Abdominal Examination

- The examination should be systematic using the following sequence:

1) Inspection
2) Palpation
3) Percussion
4) Auscultation

Inspection

- **from the foot of the bed comment on**

1) contour of the abdomen :

- Flat abdomen -> normal
- distended abdomen:

Generalized : 6 F's (Fetus, Fat, Flatus ,Fluid, Feces, fatal growths)

Localized : gross organ enlargement or a mass

- scaphoid (like a spoon) – esophageal CA as a result of sever weight loss.

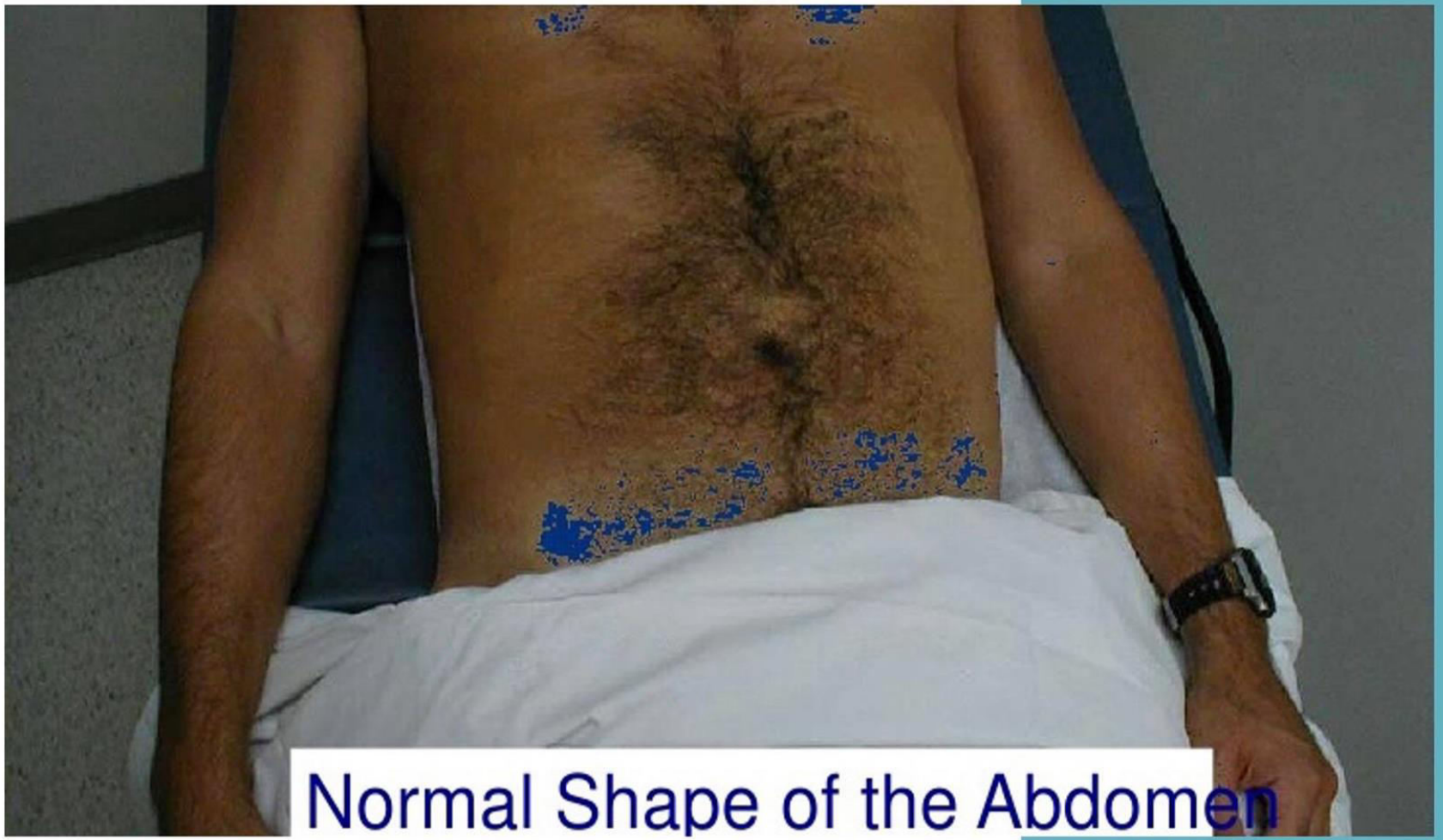
2) abdominal movement with respiration

if abdomen not move with respiration – catastrophic sign –indicated peritonitis /perforated viscus

3) the symmetry of the abdomen and presence of bulges

4) The umbilicus – it is center and inverted

- Deep than normal → obesity
- Everted → hernia, tumor, ascites



Normal Shape of the Abdomen


Localized Enlargement

Inspection– Cont

- **From the right side of the patient :**

➢ Hair Distribution→ suprapubic hair normal in males but if seen on female suspect adrenal tumors

➢ Dilated veins on the abdominal wall → if you find radiating tortuous veins around the umbilicus and this reflects Portal Hypertension. --- caput medusa

➢ Finding pulsations

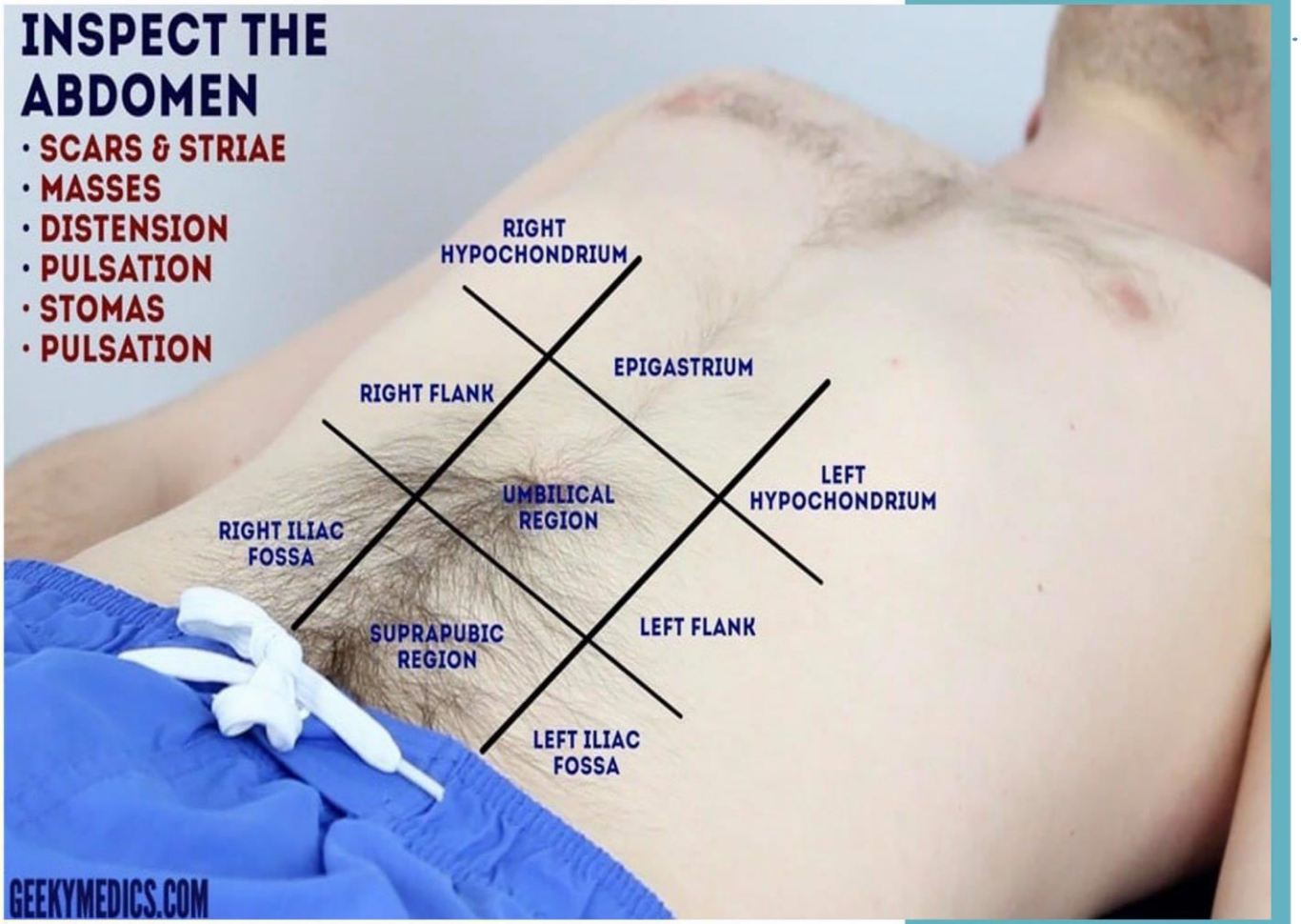
➢ Skin lesions : scars or striae(loss weight , pregnant afterbirth , corticosteroid , adrenal tumor)

➢ Hernial orifices :

-Better on standing

-Ask him to cough

-Look for expansile impulse


INSPECT THE ABDOMEN
• SCARS & STRIAE
• MASSES
• DISTENSION
• PULSATION
• STOMAS
• PULSATION
RIGHT HYPOCHONDRIUM
EPIGASTRIUM
RIGHT FLANK
LEFT HYPOCHONDRIUM
UMBILICAL REGION
RIGHT ILIAC FOSSA
SUPRAPUBIC REGION
LEFT FLANK
LEFT ILIAC FOSSA
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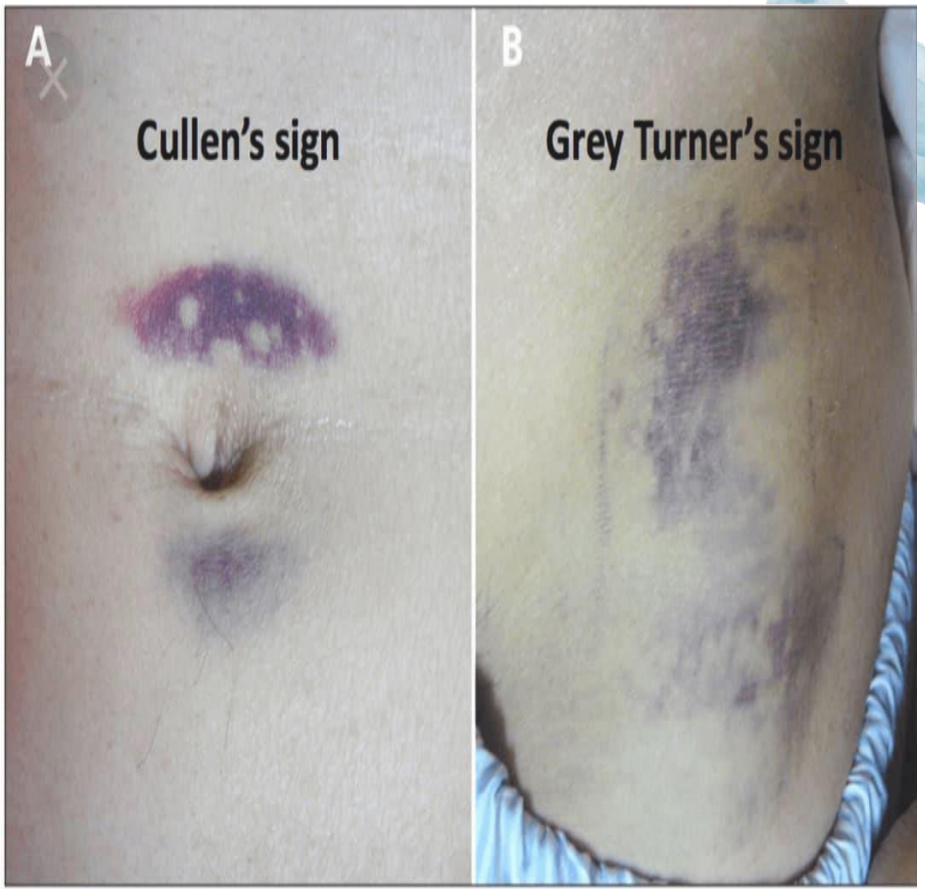
striae

Caput medusae

Cullen's sign: bluish discoloration around the umbilicus from retroperitoneal hemorrhage tracking around to the anterior abdominal wall through the fascia planes (hemorrhagic pancreatitis)

Grey Turner's sign: ecchymosis of the flanks (hemorrhagic pancreatitis)



- NOTE : IF AN INGUINAL HERNIA BECOMES IRREDUCIBLE AND TENSE THERE MAY BE NO COUGH IMPULSES. DIFFERENTIAL DIAGNOSIS WOULD INCLUDE A LYMPH NODE GROIN MASS OR AN ABDOMINAL MASS.

Palpation

- Ask patients with abdominal pain to point to the area of greatest pain. Then reassure them that you will try to minimize their discomfort and examine that point last.
- **Superficial palpation:**

gently examine the abdominal wall with the fingertips.

This will demonstrate the crunching feeling of crepitus of the abdominal wall, a sign of gas or fluid within the subcutaneous tissues. In addition, it will demonstrate any irregularities of the abdominal wall (such as lipomas or hernias) and give some idea as to areas of tenderness and superficial masses

Guarding : which is a voluntary muscle spasm

Rigidity : involuntary muscle contraction (clear-cut sign of peritoneal inflammation)

- **Deep palpation:**

areas of deep tenderness or masses , you can check for rebound tenderness at the right iliac fossa too.

- **Palpation of Organomegaly (Liver , spleen , kidneys , urinary bladder)**

Palpation – Cont

- **Palpation for masses:**

- Is it an enlarged abdominal organ or separate from the solid organs?
- If separate, is it a tumor, abscess or palpable feces within the colon?
- Is it within anterior abdominal wall or within abdominal cavity?

Palpation – Cont

- The patient should be relaxed

- mass from anterior abdominal wall will usually be **mobile**
- contracting the abdominal wall muscles (ask the patient to lift their legs with the knees extended) lumps superficial to the abdominal wall muscles - **more obvious**
- attached to the deep fascia - become **less mobile**.
- arising within the muscle layer - become **fixed** and remain **unchanged in size**
- Lumps arising deep to the abdominal wall (i.e. within the peritoneal cavity or behind the peritoneum) - become **impalpable or less prominent**
- Intraperitoneal lumps in contact with the diaphragm will **move on respiration** (i.e. swellings arising from liver, gall bladder, spleen, stomach, kidneys and suprarenals).
- Retroperitoneal masses are usually **fixed.**

Percussion

- the normal abdomen on percussion is **tympanic**
- A dull area may draw your attention to a mass that was missed on palpation
- a fluid filled cyst → dull on percussion
- an air-filled structure → tympanic upon percussion
- Percussion is Useful to determining organ size, such as the liver.
- Test for ascites :
  - Shifting dullness
  - Transmitted thrill

Auscultation

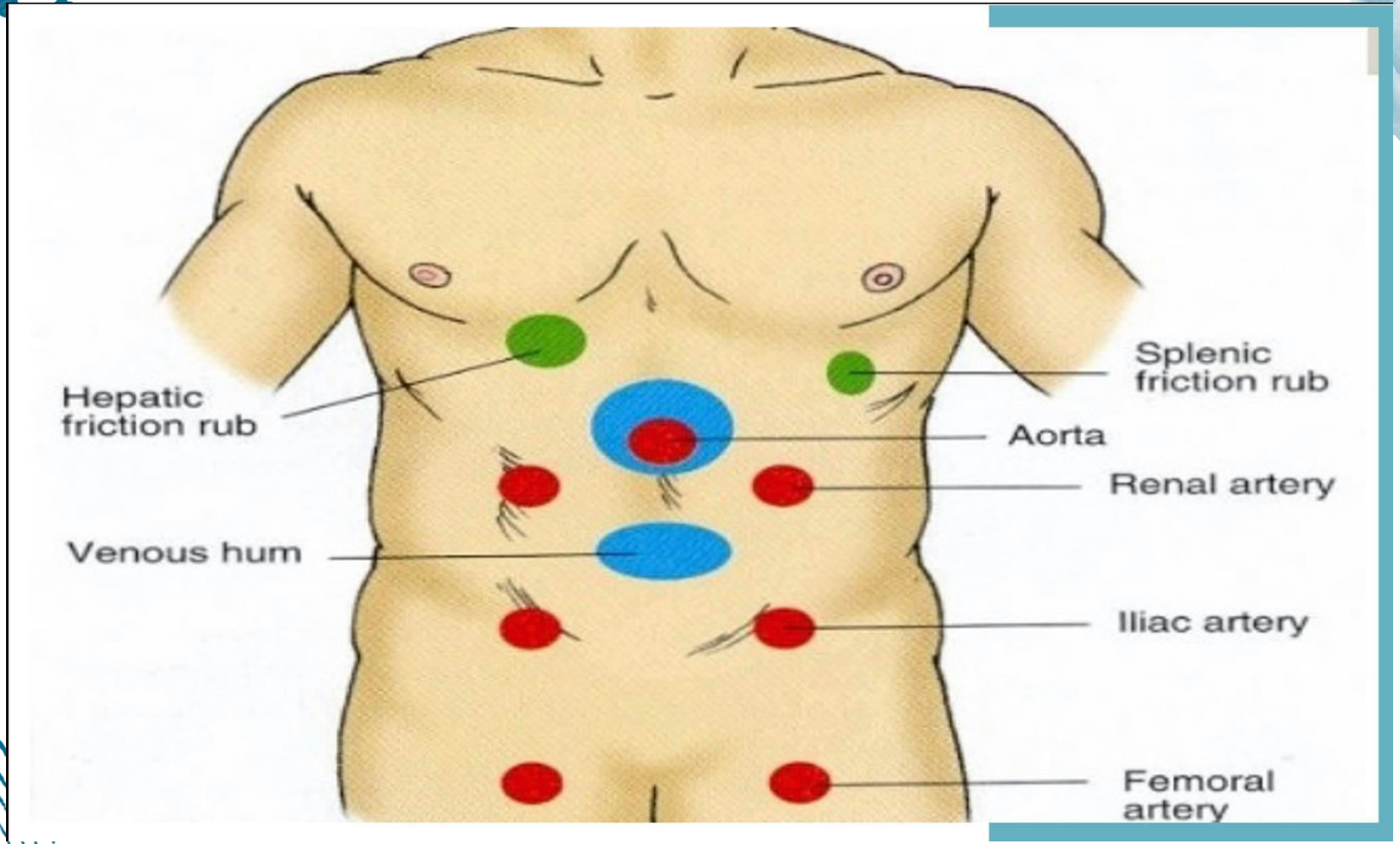
Listen to the bowel sounds

- Normal bowel sounds are low-pitched gurgles

- Absent/diminished bowel sounds indicate an ileus

- High pitched and "tinkling" sounds indicate bowel obstruction

- **Bruits** (aneurysm) are wind or whistling sounds heard over major arteries. The area over the aorta, both renal arteries and the iliac arteries. Caused by narrowing inside artery /systole /high pitched/ diaphragm
- **Friction Rubs** (mass) are infrequently found on abdominal examination but can occur over the liver, spleen, or an abdominal mass. Hear it at the end of inspiration.
- Venous Hum: low pitch heard during systole and diastole, heard over the liver= pathognomonic for hepatocellular carcinoma


Hepatic friction rub
Splenic friction rub
Aorta
Renal artery
Venous hum
Iliac artery
Femoral artery

Determinants for any mass or lump

6 S + 3 T

1. **Site:** must be described in exact anatomical terms using distance measured from bony points
2. **Skin:** color, ulcerated or inflamed
3. **Shape:** kidney shape , pear shape .. etc.
4. **Surface:** smooth , nodular , irregular
5. **Size**
6. **Scars:** indicates previous surgery
7. **Temperature:** is it hot / cold
8. **Tenderness**
9. **Transillumination :** a lump that transilluminates contains water , serum , lymph , plasma or highly refractile fat . **Blood and tissues don't transilluminate**

CAMPFIRE

- **Consistency:** **stony hard, firm, rubbery, spongy and soft**
- **Attachment (to skin ,,)**
- **Mobility**

Move lump in two directions, right-angled to each other. Then repeat exam when muscle contracted

- Bone: immobile.
- Muscle: contraction reduces lump mobility.
- Subcutaneous: skin can move over lump.
- Skin: moves with skin..

- **Pulsation** (expansile / transmitted) : when the mass pulsate you must find whether the pulsations are being transmitted to the mass from elsewhere or arising from artery itself *AAA *.
- **Fluctuation : + in fluid filled masses.**
- **Compressibility and reducibility : if it disappears or not after gentle pressing ? , return on coughing ?.**
- **Regional lymph nodes.**
- **Edge :** **- well defined regular suggests benign mass**
  - well defined + irregular suggests malignant mass
  - ill defined + diffuse suggests inflammatory mass

4 things frequently missed in abd exam

- Make sure to complete them before finishing your abdominal examination

1- Inspect for hernia
2- Palpate for hernia
3- Renal artery should be examined bilaterally (compare)
4- Don’t finish the exam without doing PR exam,

“the only exception to not do PR exam is:
if you don’t have fingers
or
the patient doesn’t have an anus”

Investigations

- Sometimes, the diagnosis of any abdominal mass remains unknown even after a comprehensive clinical history and physical examination; in such cases, further studies are required.

1. Imaging studies
2 . Laboratory studies

Imaging studies

- Abdominal CT scan
- Abdominal ultrasound
- Abdominal x-ray
- Barium enema, Barium meal
- Laparoscopy
- Colonoscopy
- MRI
- EGD (esophagogastroduodenoscopy)

Abdominal CT

It makes a detailed picture of the structures inside the abdomen.

This test may help detect or diagnose:

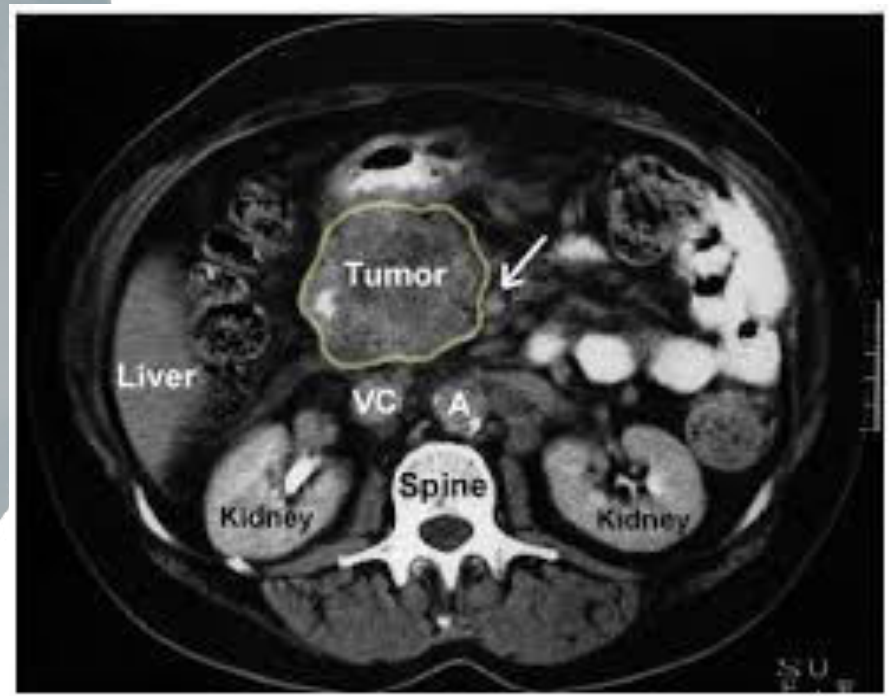
- palpable abdominal mass
- kidney stones (to check for size and location of the stones)
- unexplained weight loss
- infections, such as appendicitis
- to check for intestinal obstruction
- inflammation of the intestines, such as Crohn's disease
- injuries following trauma
- recent cancer diagnosis
- blood clots

Keep in mind renal functions and iv contrast allergies.

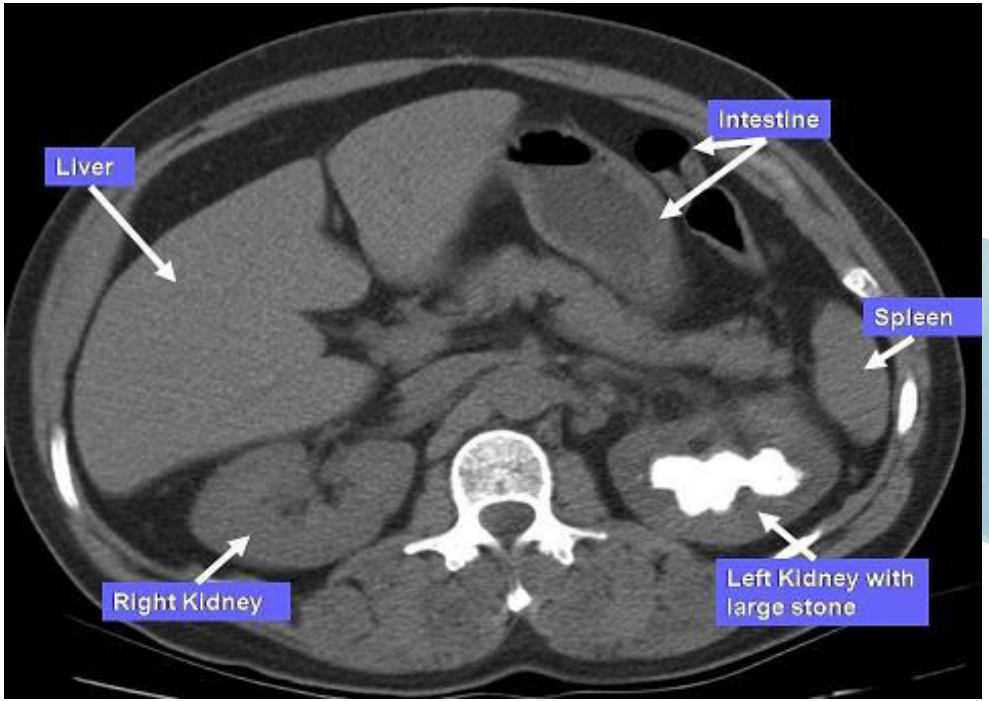
Prior in assessing abdomen, pelvis and retroperitoneal structures.

Abdominal CT – Examples

Pancreatic tumor



Nephrolithiasis

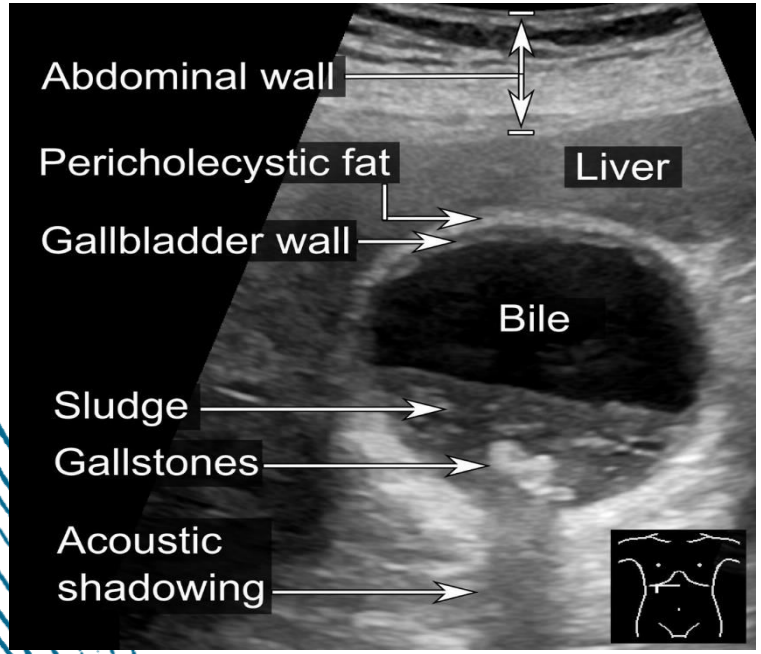


Abdominal Ultrasound

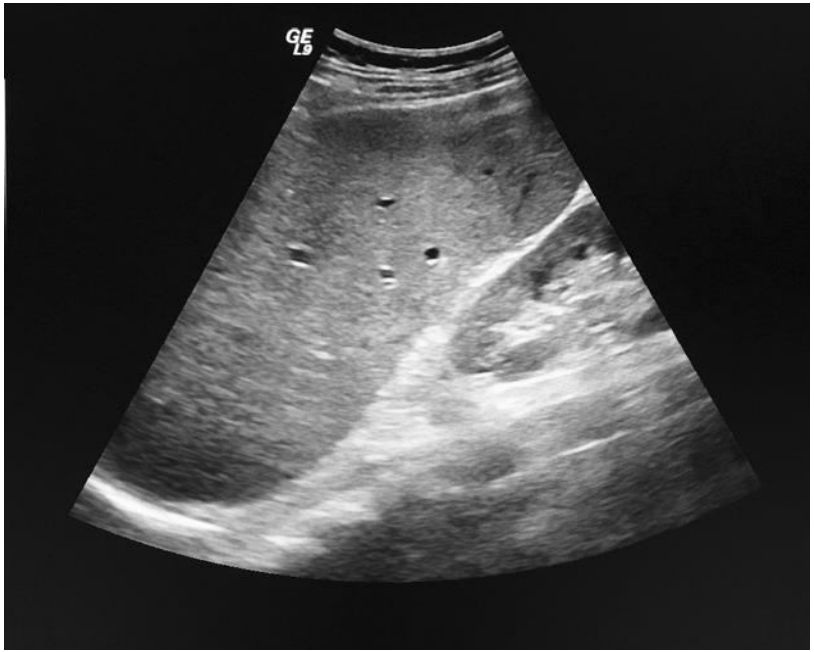
- It uses high frequency sound waves to produce two-dimensional images of the body's soft tissues.
- Many possible conditions can be revealed by an abdominal ultrasound, some of these include:
  - Abdominal aortic aneurysm
  - Hydronephrosis
  - Gallstones
  - Hepatomegaly
  - Splenomegaly
  - Abnormal growths - tumors, cysts, abscesses, scar tissue and accessory organs. In particular, potentially malignant solid tumors can be distinguished from benign fluid-filled cysts.

Abdominal Ultrasound - Examples

Gallstones



Splenomegaly

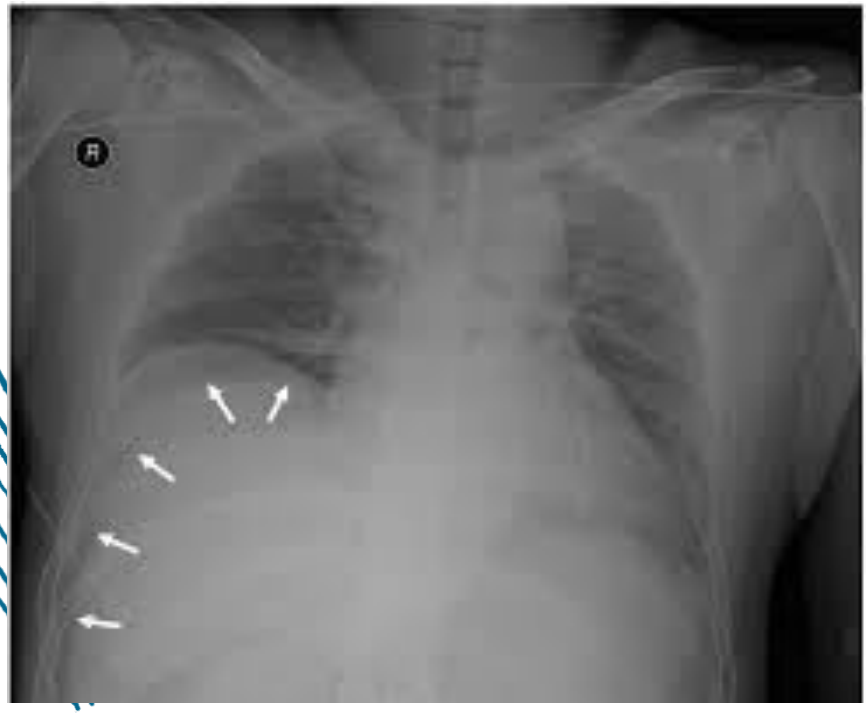


Abdominal X-ray

- An abdominal X-ray can show the size, shape, and position of the liver, spleen, and kidneys. Look for stones in the gallbladder, kidneys, ureters, or bladder. Look for air outside of the bowel (intestines).

Abdominal X-ray - Examples

Subphrenic abscess



Uterine Fibromyoma

Barium enema

- Is the study of the large bowel with double contrast (Barium and air).
- It is used to detect and diagnose:

  - Colon cancer, although it is used much less often than in the past.

  - Inflammatory bowel disease (IBD)

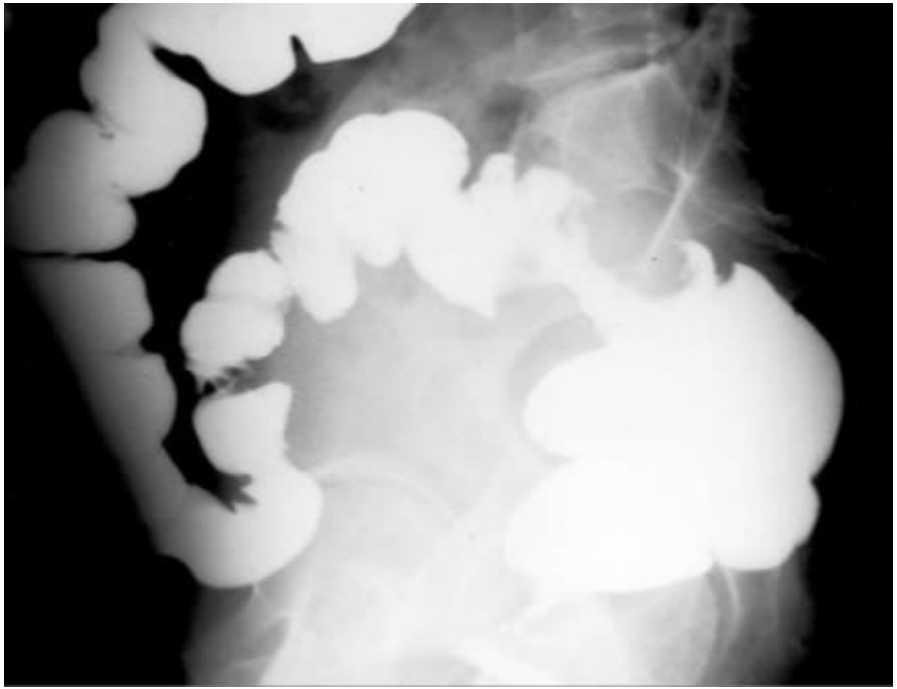
  - Large bowel obstruction / volvulus.

  - Diverticular disease

Barium enema - Examples

Diverticulitis

Colon cancer

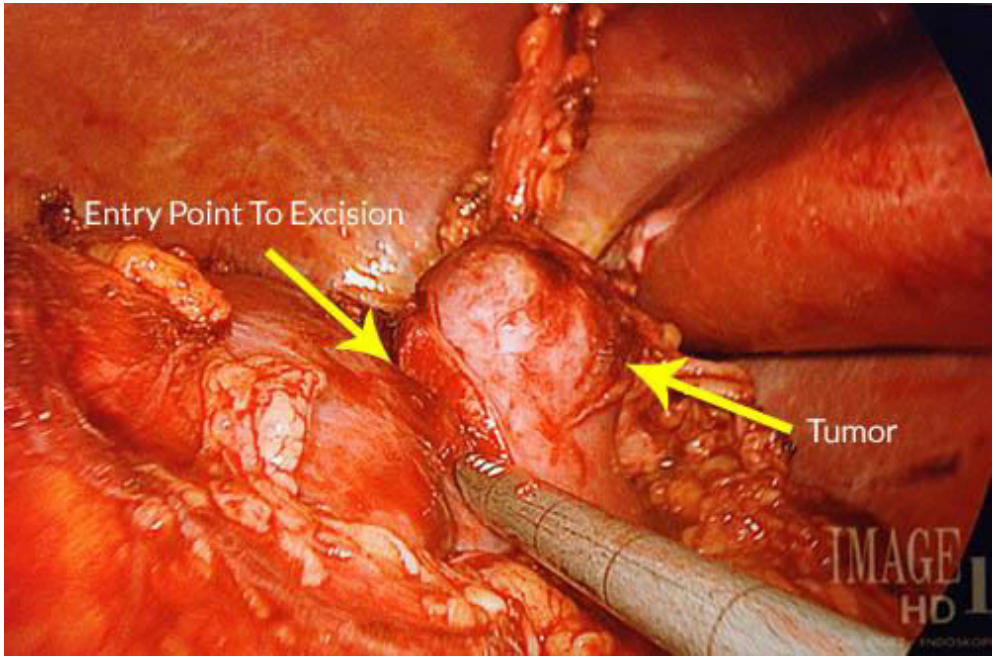


Laparoscopy

- laparoscopy, is a surgical diagnostic procedure used to examine the organs inside the abdomen. It's a low-risk, minimally invasive procedure that requires only small incisions.
- Laparoscopy uses an instrument called a laparoscope to look at the abdominal organs.

Laparoscopy - Example

Kidney tumor



Colonoscopy

This test can help diagnose:

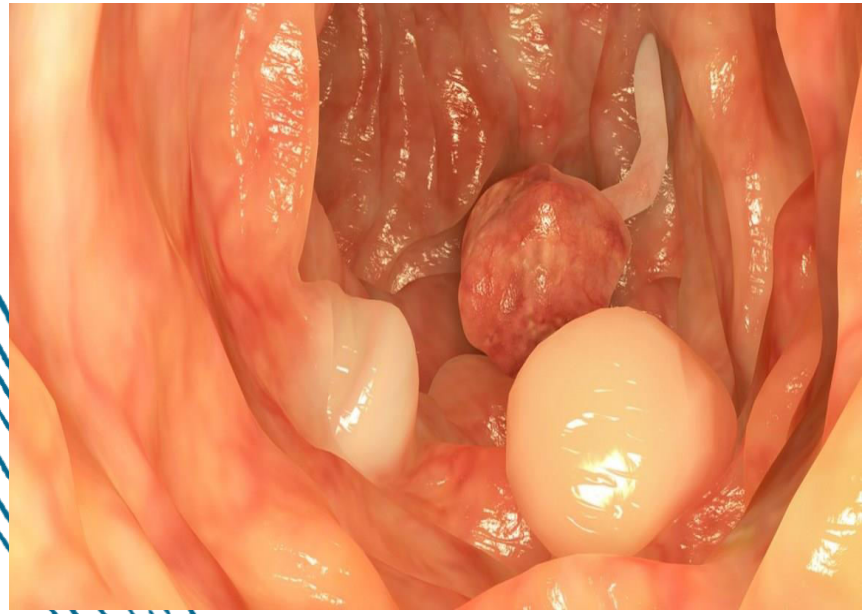
- Bowel obstruction
- Colon polyps
- Diverticulosis
- Inflammatory bowel disease

Can also be used to:

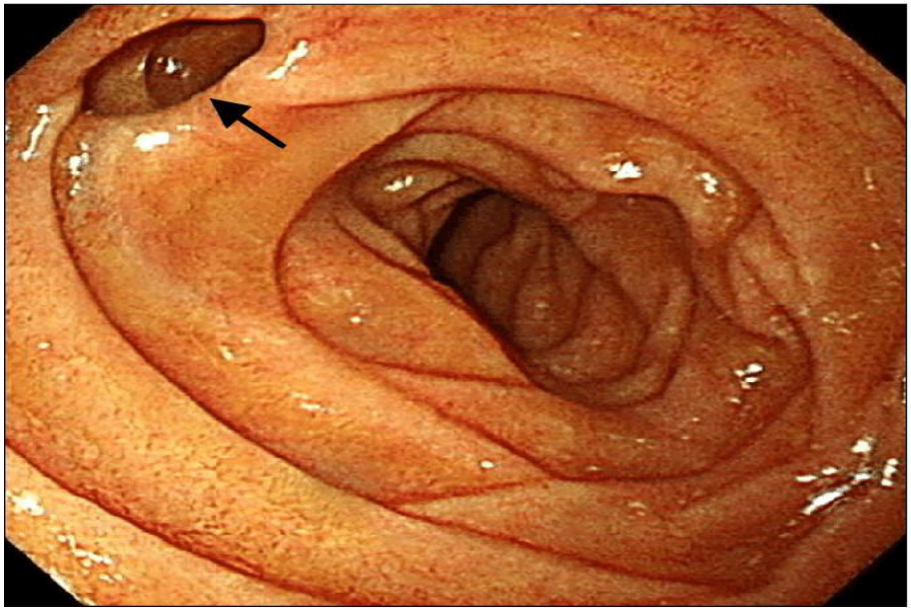
- Determine the cause of blood, mucus, or pus in the stool
- Confirm findings of another test or x-rays
- Take a biopsy of a growth
- To screen for colorectal cancer

Colonoscopy - Examples

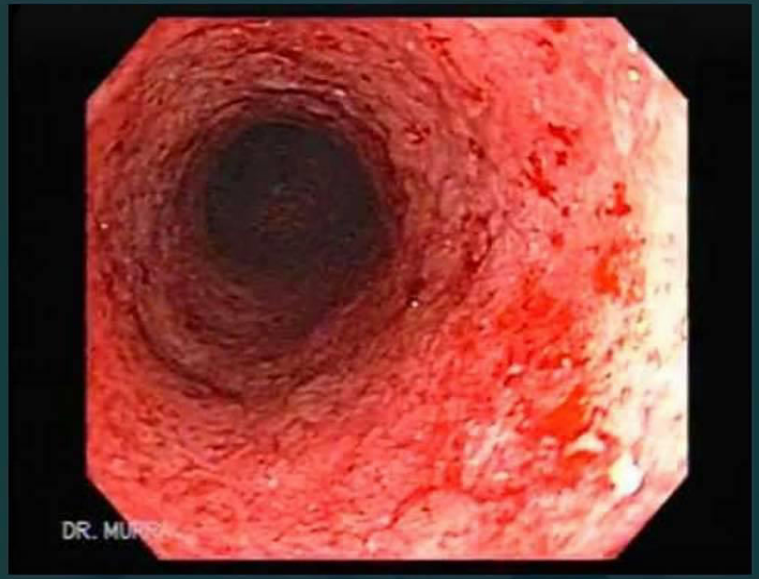
Polyps

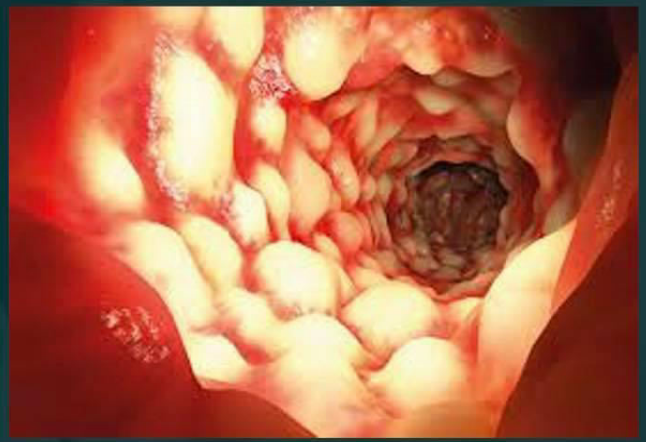


Diverticulitis



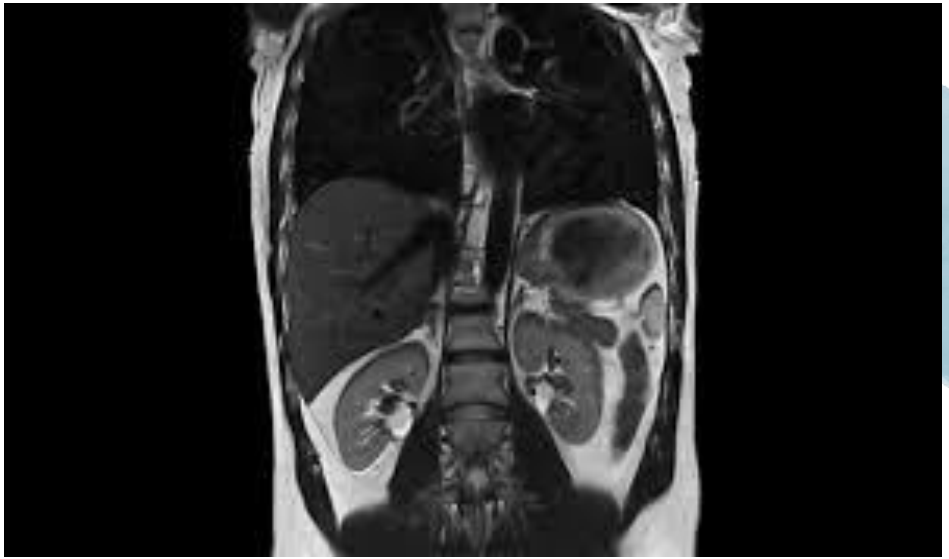
Ulcerative Colitis Vs. Crohn's Disease



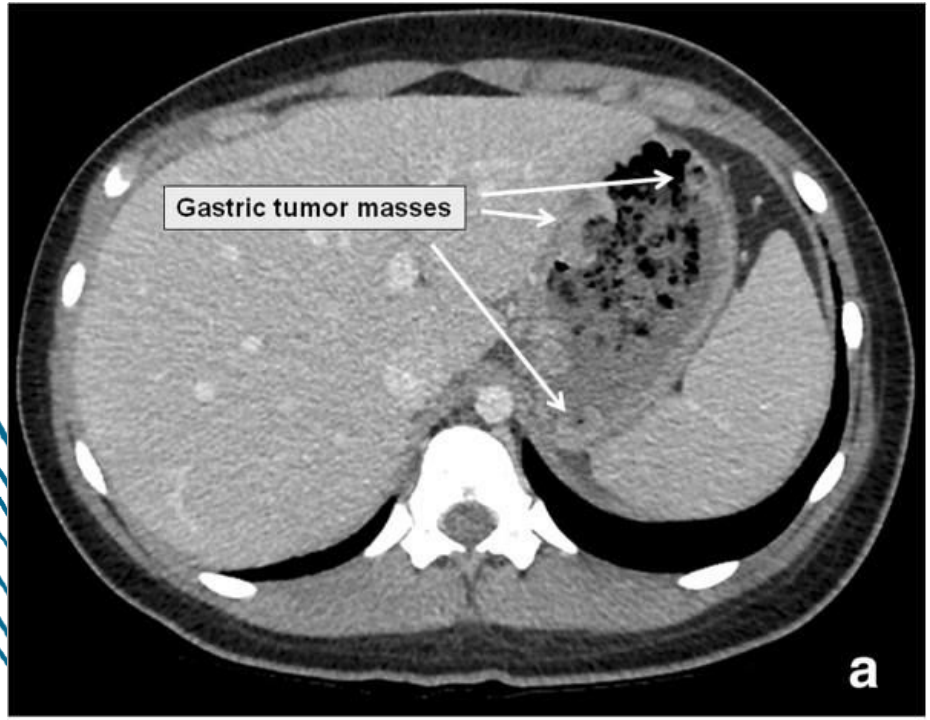


MRI

- **Magnetic resonance imaging (MRI) is a medical imaging technique used in radiology to form pictures of the anatomy and the physiological processes of the body.**



MRI - Example

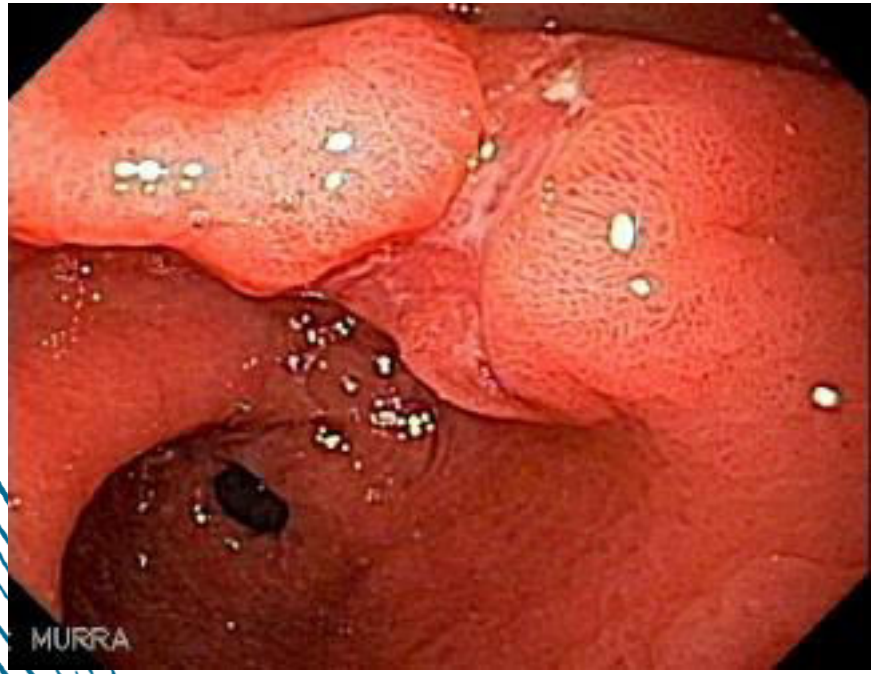


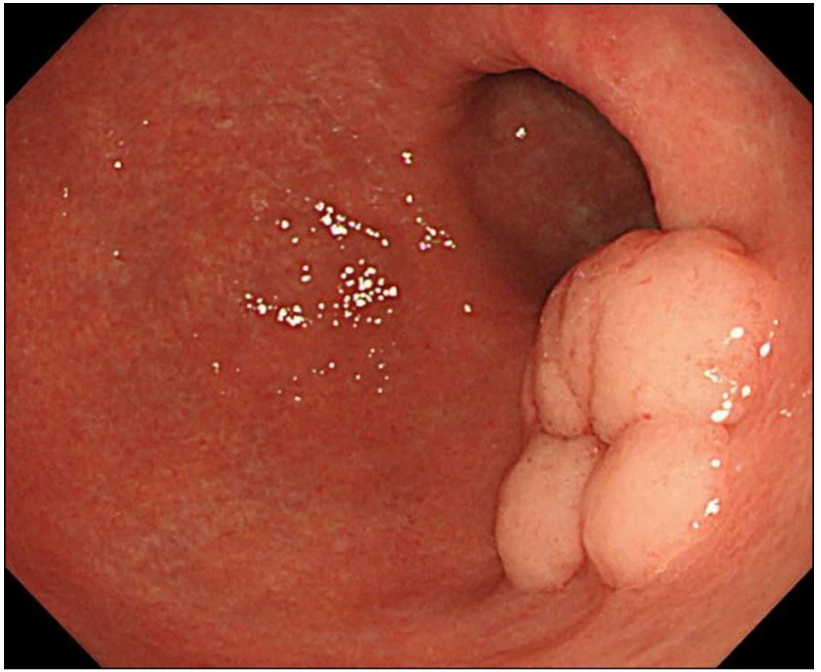
EGD (Upper Endoscopy)

- An **EGD** is a procedure in which a thin scope with a light and camera at its tip is used to look inside the upper digestive tract; the esophagus, stomach, and the duodenum. It's also called an **esophagogastroduodenoscopy**.

EGD - Examples

Gastric Adenocarcinoma





Laboratory Studies

- Guided by findings on history and physical examination
- Studies to be considered include:
  - ➢ Urinalysis
  - ➢ Complete blood cell count (CBC): anemia, leukocytosis, thrombocytopenia
  - ➢ Chemistry profile (electrolyte, blood urea nitrogen [BUN], and creatinine concentrations, as well as liver function tests).

Laboratory Studies – Cont.

- An abnormal laboratory value sometimes plays an important role in establishing the pathogenesis of an abdominal mass.

For example:

1. **Albumin levels are decreased in chronic liver disease, such as cirrhosis.**

2. **Alkaline phosphatase (ALP) levels in plasma will rise with large bile duct obstruction, intrahepatic cholestasis or infiltrative diseases of the liver.**

3. **AST/ALT elevations instead of ALP elevations favor liver cell necrosis such as liver tumors.**

Laboratory Studies – Cont.

4. If **direct bilirubin** is elevated, then the liver is conjugating bilirubin normally, but is not able to excrete it. Bile duct obstruction by gallstones or cancer should be suspected.

5. **Tumor markers** (e.g., carcinoembryonic antigen [CEA], the cancer antigens CA 19-9 and CA 125, and a-fetoprotein [AFP]).

6. **Serum amylase** is increased in at least 75% of pancreatitis cases as well as pancreatic pseudocysts.

MANAGEMENT

Treatment

- **Depending on the cause of the mass, treatment may consist of medication, surgery, or specialized care.**
- The most common treatment options to eliminate abdominal masses include:
  1. medications to correct hormones
  2. surgical removal of the mass
  3. methods to shrink the mass
  4. chemotherapy
  5. radiation therapy

Treatment – Cont.

- If you have cysts in your abdomen that are large or causing considerable pain, your doctor may opt to remove them through surgery. Surgical removal is also used to remove tumors. However, if removal is dangerous, your surgeon may suggest methods to shrink the mass instead.
- Chemotherapy or radiation treatment may also be suggested to shrink the mass. Once the mass reaches a smaller size, your doctor may opt to end the chemotherapy and remove the mass through surgery. This option is often used for people who have cancerous abdominal masses.
- Masses that are caused by changes in hormones, such as ovarian cysts, may be treated through hormone replacement medication or low dose hormone birth control pills

Thank you