

Lecture 12:

COMPREHENSIVE REVIEW OF GI IMAGING



Radiology Team
Med433

● Slides

● Explanation

● Notes

● Additions

● Important

Objectives

- ✓ Comprehensive review of the role of Imaging in various GI disorders
- ✓ Appreciate constraints and limitations
- ✓ Develop imaging vocabulary in the interpretation



Total of 6 Cases

Case 1

Intestinal obstruction.

Case 2

Liver metastasis.

Case 3

Benign stricture

Case 4

Pneumoperitoneum (Air under both diaphragms)

Case 5

Colonic strictures

Case 6

Gall stones.

Case 1

Adult patient presenting with abdominal pain, distension and vomiting for the last 24 hours.

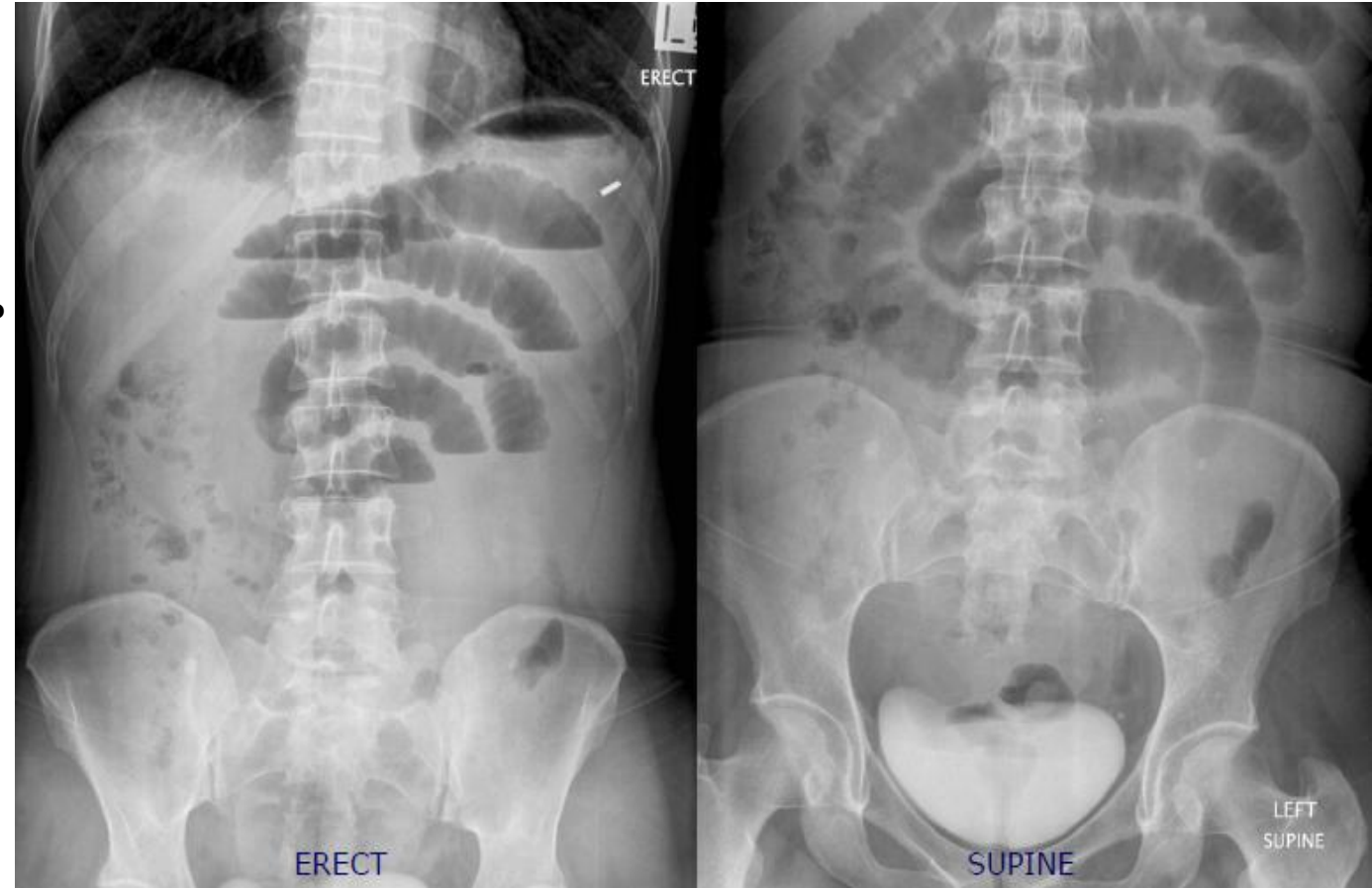
What is the most likely cause for changes seen on these abdominal X-rays?

- a- Ascites
- b- Bowel perforation.
- c- Intestinal obstruction.**
- d- Pelvic mass lesion.

Which of the following anatomical structures is abnormal based on these abdominal

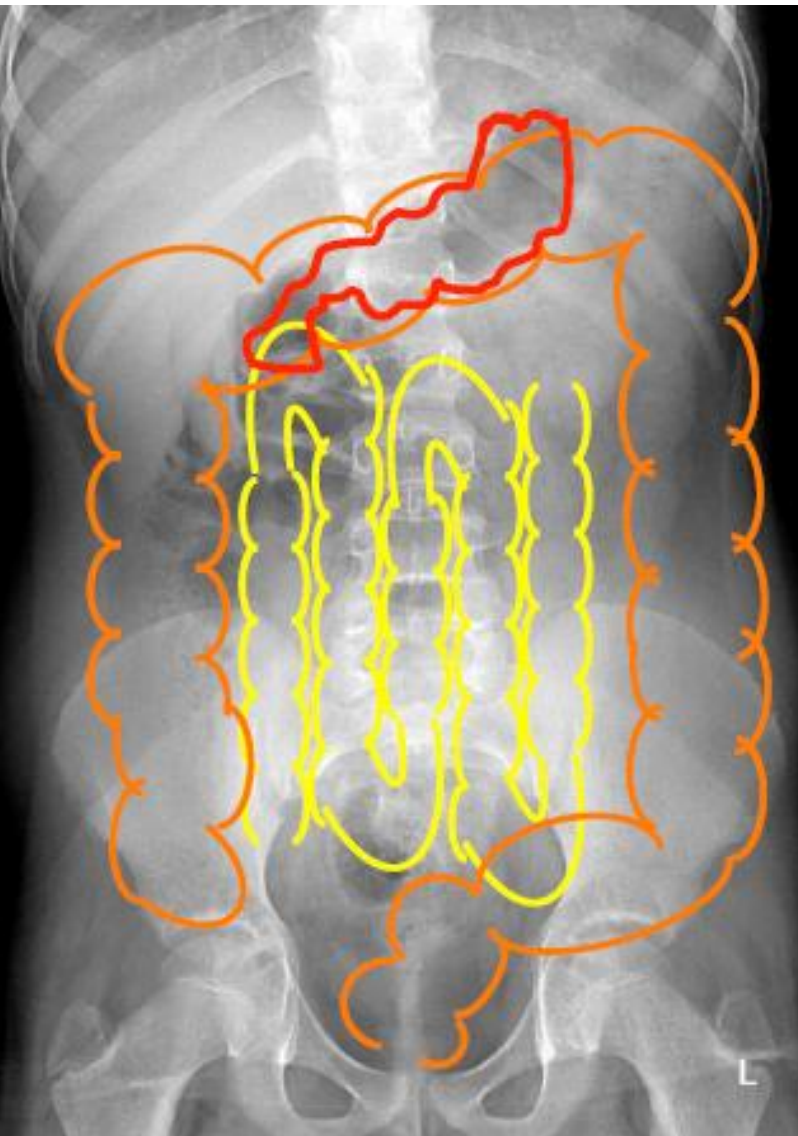
X-rays?

- a- Large bowel.(thick,short mucosal fold)in the peripheral
- b- Small bowel.(thin,long mucosal fold) in the central**
- c- Stomach.
- d- Rectum.



AXR shows: Abnormal Distention of the gas shadow inside the bowl and we can see the air-fluid level within a dilated bowel loop

PLAIN FILM - NORMAL



Normal gas pattern

Stomach, in the epigastric area - should be present unless "vomiting / NGT"

- Small bowel, 2-3 of non distended loops less than 3 cm in diameter
- Colon, always air in the rectum or sigmoid / contain stool
- Small vs Large Bowel distribution

Bowel mucosal folds

Small bowel

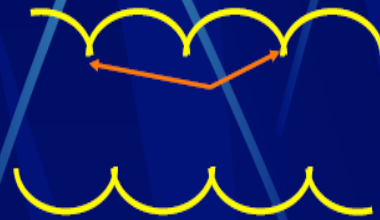
- Central
- Valvulae markings extend across lumen
- Maximum dilated diameter is 3 cm

Large bowel

- Peripheral
- Haustral markings
- Contain feces

Important!! how to differentiate between small and large bowel on X ray.

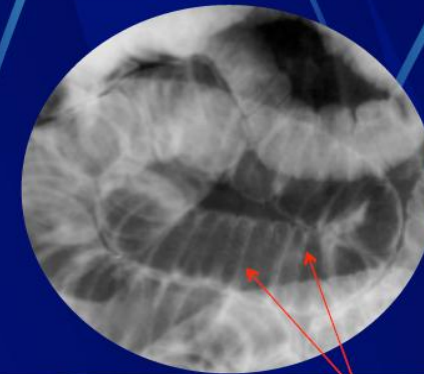
Haustral pattern in large bowel



Valvulae conniventes in small bowel



Bowel mucosal folds



Haustral pattern in large bowel

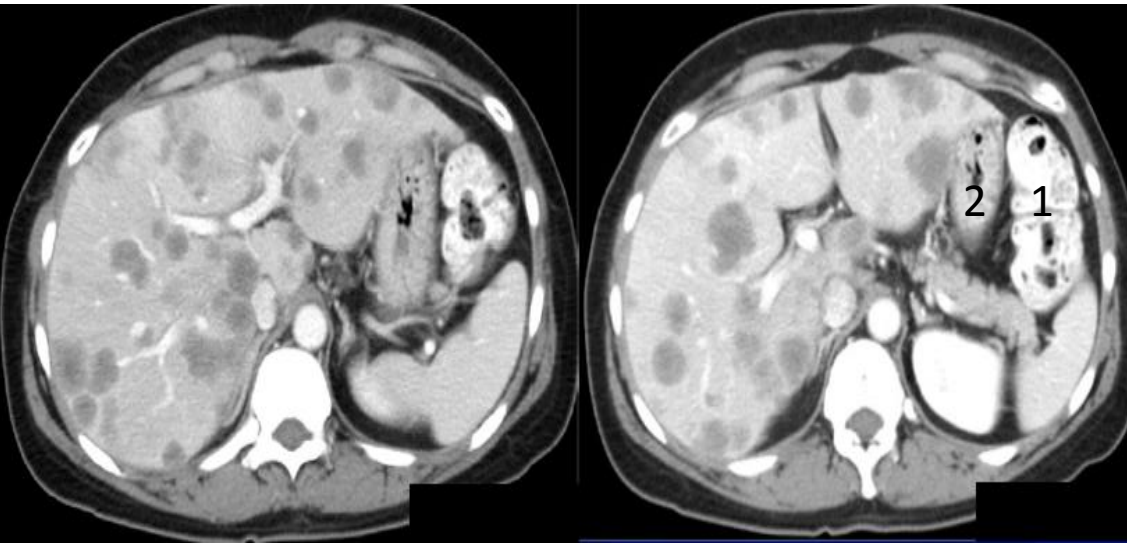


Valvulae conniventes in small bowel

Case 2

53 years old patient presenting with weight loss, vague abdominal pain, and melena.

Computed tomography of the abdomen was performed.



Which of the following abnormalities is seen based on the CT scan findings and clinical presentation?

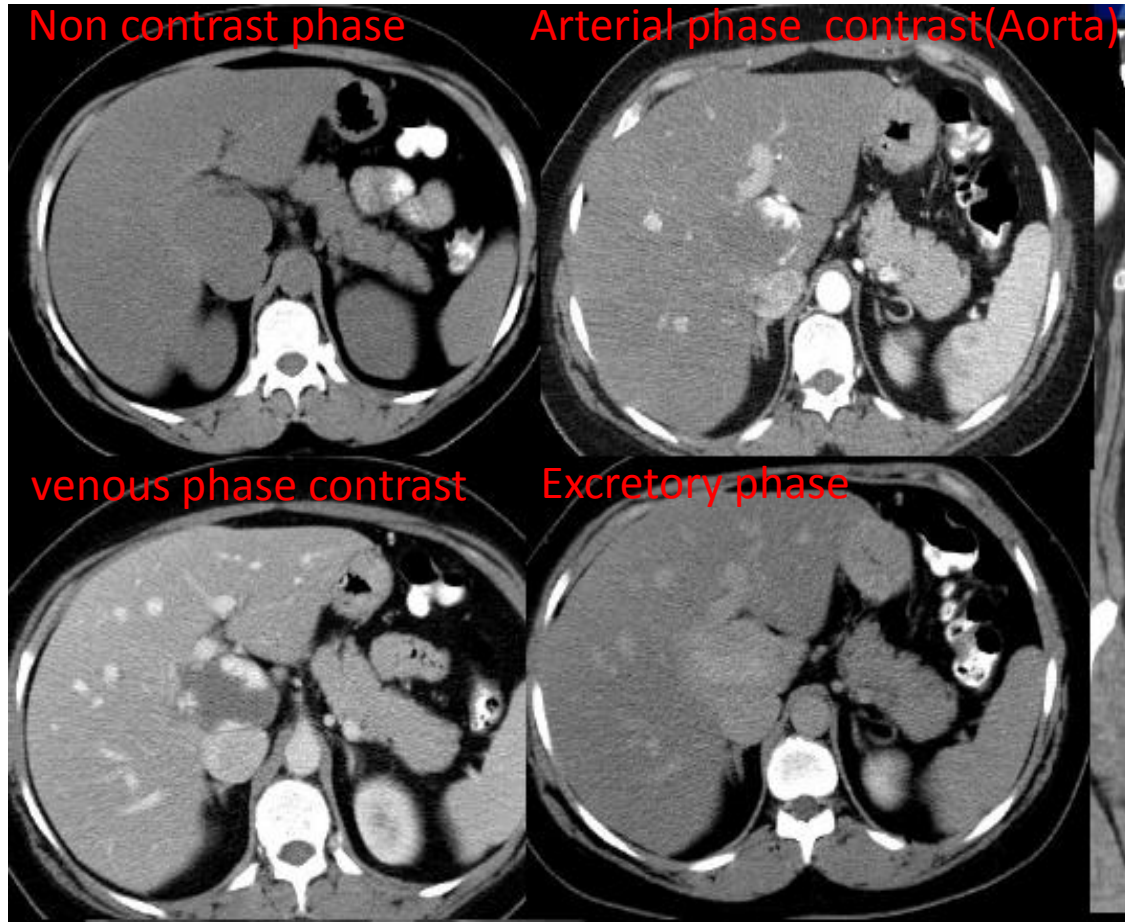
- a- Pancreatic mass.
- b- Gastric distension.
- c- Liver metastasis.
- d- Splenomegaly.

Why not Liver abscess? Its hypodense lesions, usually present with fever, no weight loss or melena. So liver metastases is the most likely cause.

This is CT contrast enhanced ,Biliary duct will appear dark because its fluid-filled Vascular structures seen inside the liver: Portal vein enhanced , Hepatic vein, Hepatic artery. The most prominent is portal vein.

1-Splenic Flexure
2-Stomach
*Both have air(black)

Contrast Phases (multiphase CT scan)

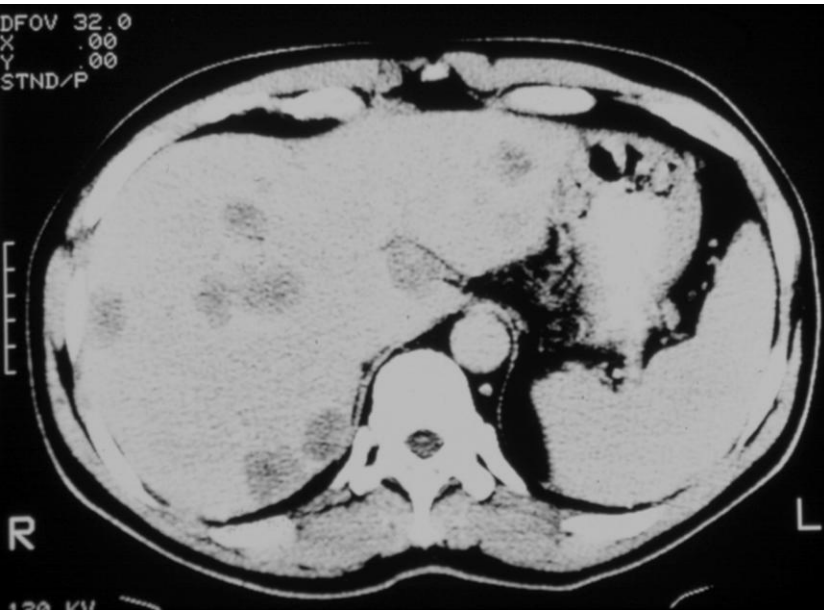


In general:

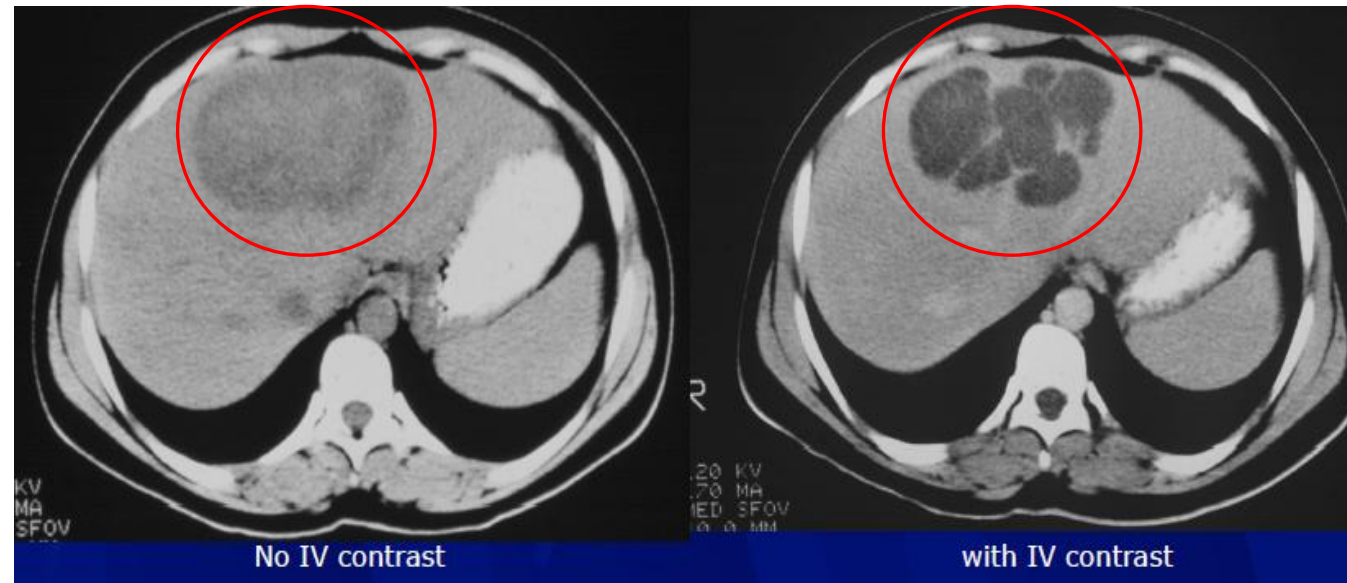
a malignant lesion: enhance in early phase and clear out the contrast rapidly due to the hypercirculation in malignant process

a benign lesion: enhance and clear out the contrast in slower way.

Hepatic hemangioma



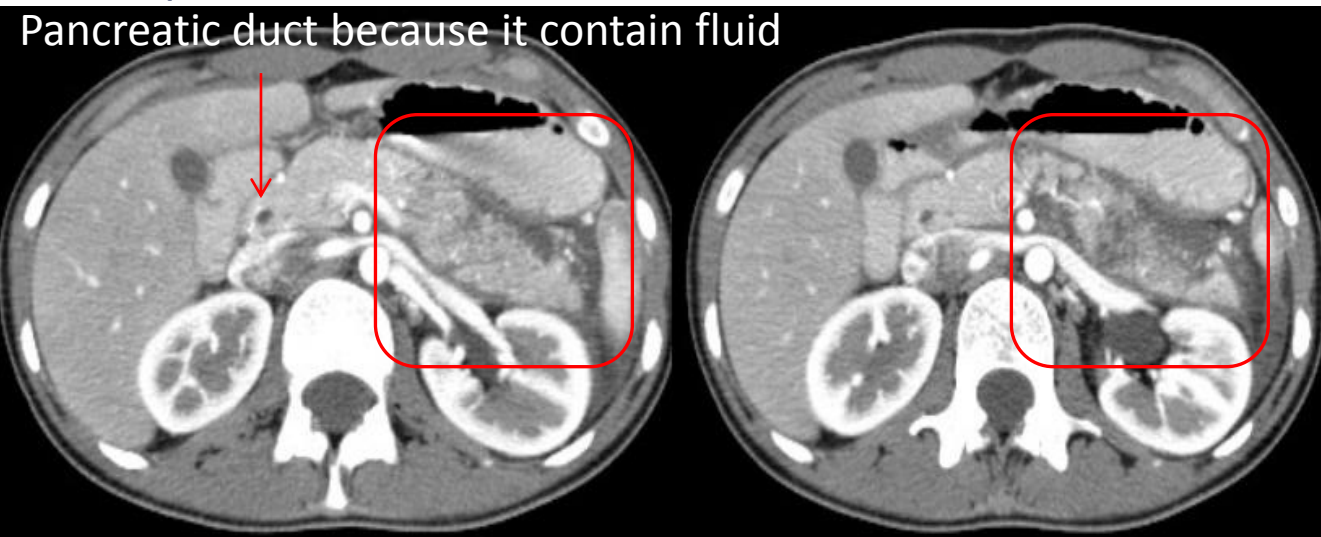
Liver Abscess Sx Abdominal Pain



Cystic area around the liver (hydatid cyst)

Acute pancreatitis Sx acute abdomen

Pancreatic duct because it contain fluid

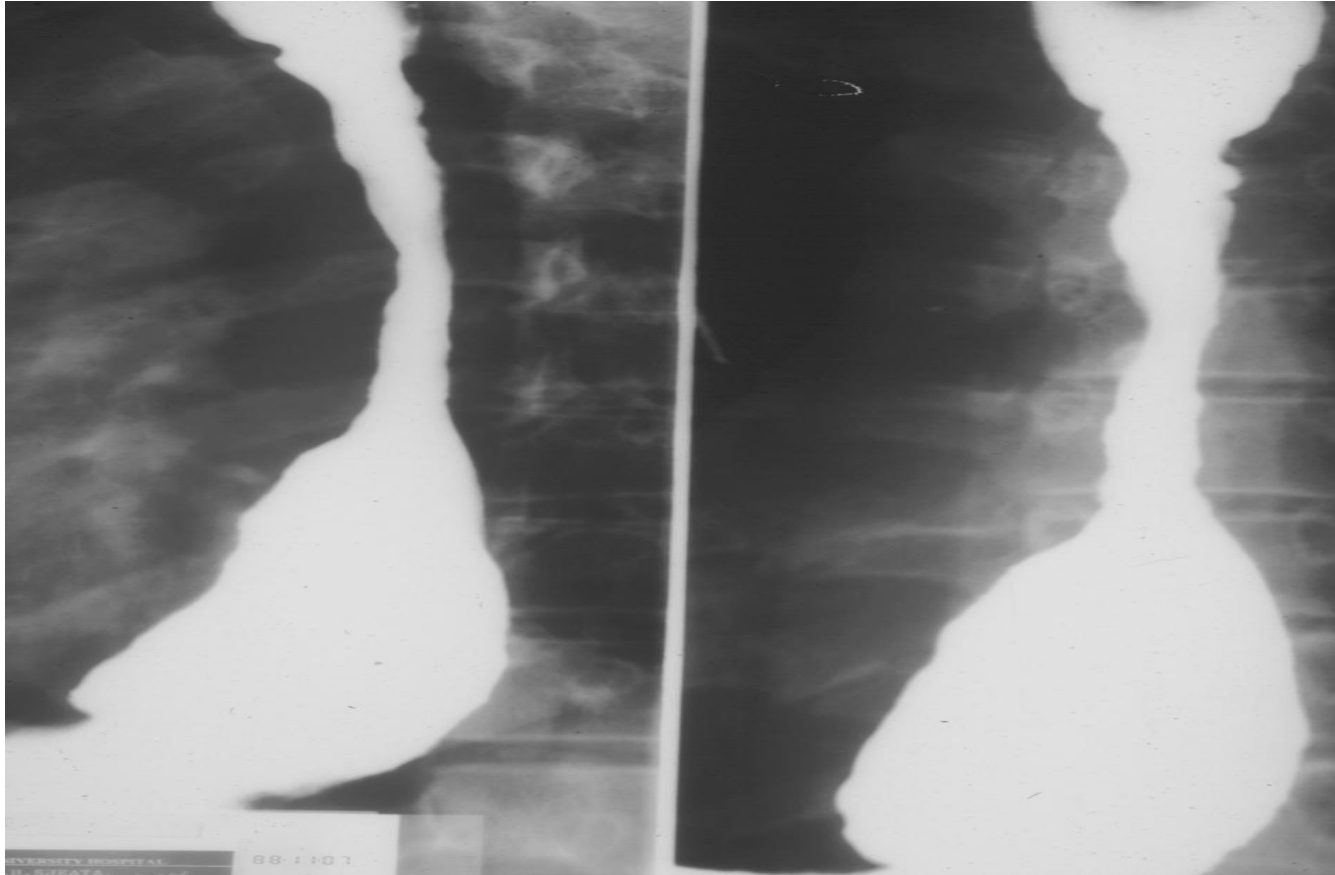


Left side of the pancreas toward the tail ,
the density of the tail of the pancreas is less than
the head of it and the outline is hessiness + thicker
(due to inflammation)

Barium cannot be used when there is any perforation in the peritoneum may cause chemical peritonitis

Case 3

Corrosive Esophageal Stricture



Regular, smooth margins long stricture of the mid portion of esophagus indicate benign structure

A child presenting with dysphagia.

Which of type study your are shown?

- a- Barium enema.
- b- Barium meal.
- c- Barium follow through.
- d- Barium swallow.**

Which of the following abnormalities is seen on this Barium swallow exam?

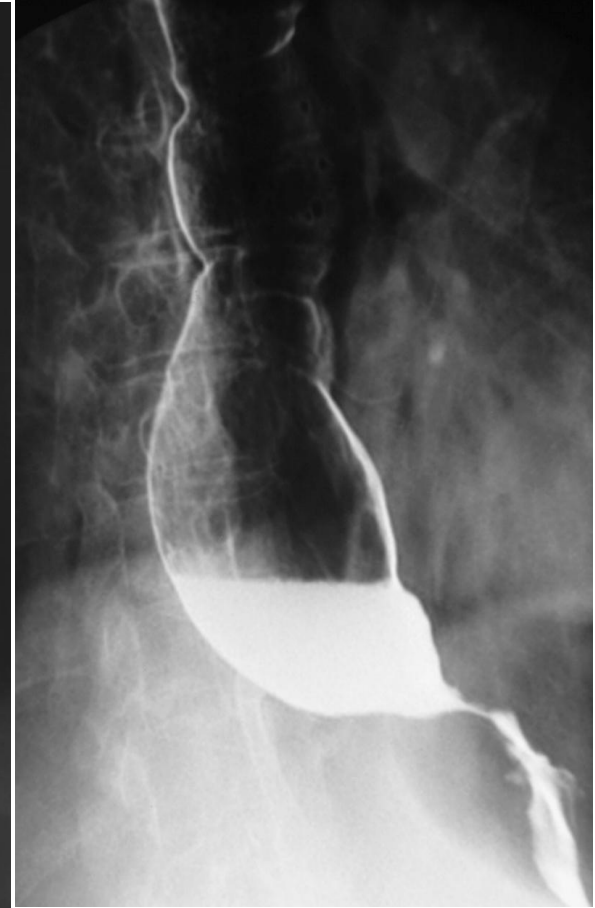
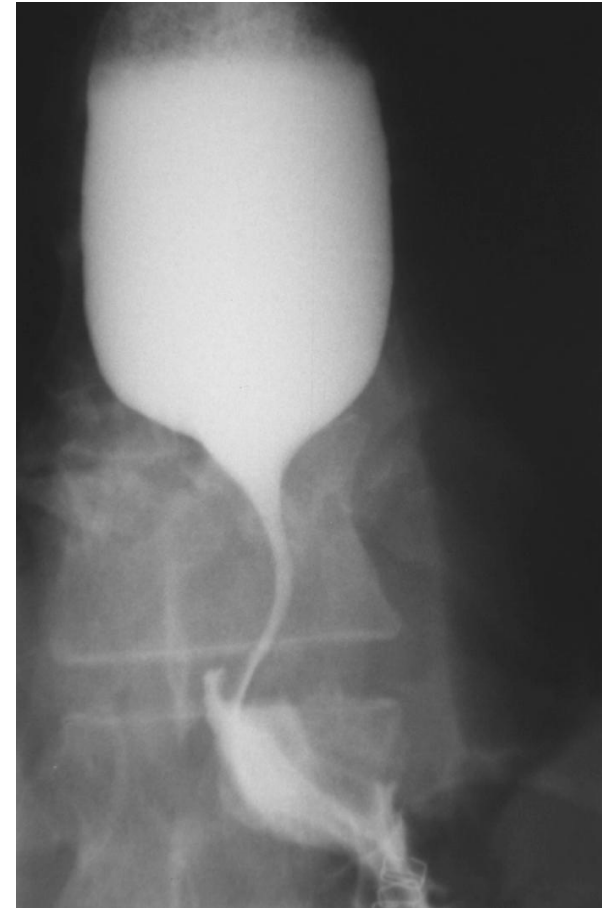
- a- Benign stricture. Because it is sharp and smooth.**
- b- Malignant stricture.
- c- Esophageal leak.
- d- Esophageal perforation.

Malignant Stricture(Esophageal Cancer)



Irregular (apple core appearance) and the contrast is herniated from the margins

Achalasia (Benign Stricture)



Benign Stricture comes with any motility dysfunction and
Primary Achalasia / congenital or acquired
Secondary Achalasia/ Chagas disease

a disease caused by a trypanosome transmitted by blood sucking bugs, endemic in South and Central America and causing damage to the heart and central nervous system.



Barium Swallow Indications:

- Dysphagia
- Pain
- Tracheoesophageal Fistula
- Esophageal perforation
- Pre-operative assessment of bronchial Carcinoma. why? To see if there is fistulation or invasion to the of the oesophagus

FLUROSCOPY – Dynamic Contrast Studies

Added contrast in the body which is normally in the body :

- Air
- Fat
- Barium sulfate
- Iodine (Water Soluble)

Barium is never given IV, why?? Because it is a powder which will stick in the (fluid) blood causing suspension.

Iodine can be given IV because its water soluble.

CASE 4

Adult patient presenting with epigastric abdominal pain

What is the abnormality seen on this chest PA x-ray?

- a- Right upper quadrant mass.
- b- Bilateral basal lung consolidations.
- c- Bilateral pneumothorax.
- d- Air under both diaphragms.

What is the likely cause of the chest x-ray findings?

- a- Pneumoperitoneum. The most important imaging to do is chest X ray (less radiation + upright or erect position)
- b- Pneumothorax.
- c- Ascites.
- d- Pneumonic consolidation.



Pneumoperitoneum:

-Is the presence of free air within the abdomen.

-The best view to detect pneumoperitoneum is erect chest film.

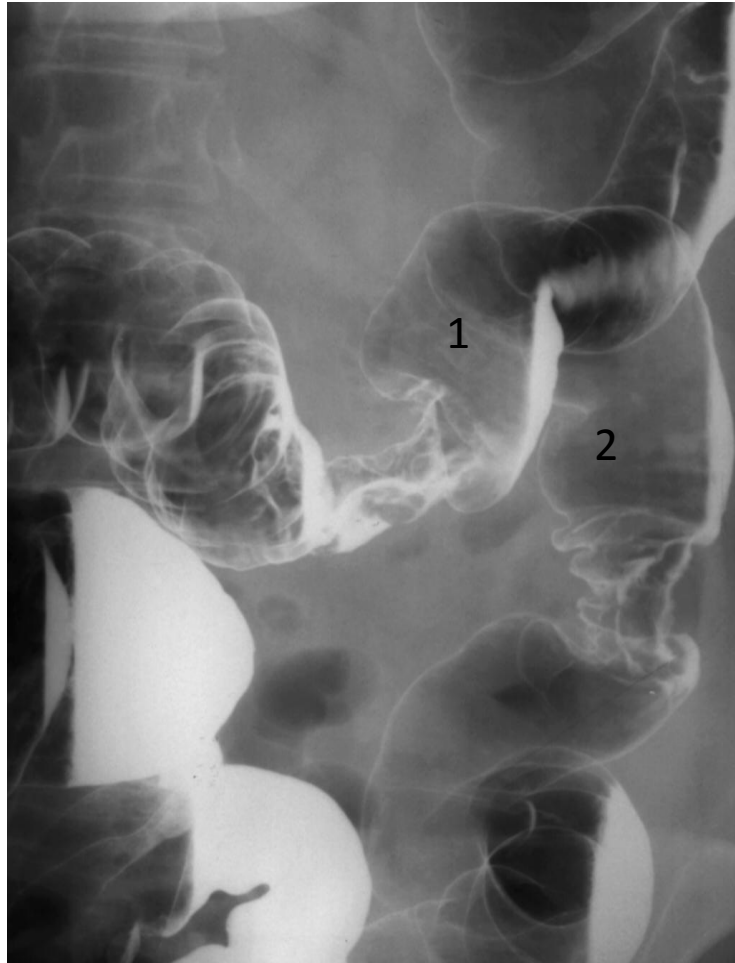
It appears as crescentic area of lucency under diaphragm.

Lateral decubitus can be used for very ill patient.

The most common cause of air in the peritoneum is perforated duodenum, peptic ulcer.

CASE 5

The “apple core” is present at the transverse (1) and descending (2) colon. The “apple core” appearance is indicative of malignancy wherever is found in the GIT e.g. esophagus, colon, etc...
-The type of study is:
double contrast



Adult patient presenting with weight loss and lower GI bleeding

What is the abnormality seen on this double contrast barium enema exam?

a- Colonic polyps(abnormal growth from the wall invaginating into the lumen)filling defect .

b- Colonic diverticula.

c- Colonic strictures.

d- Colonic perforation.

Based on the clinical and the double contrast barium enema exam, which of the

following is the likely cause of the findings?

a- Colonic polyps.

b- Colonic diverticulitis.

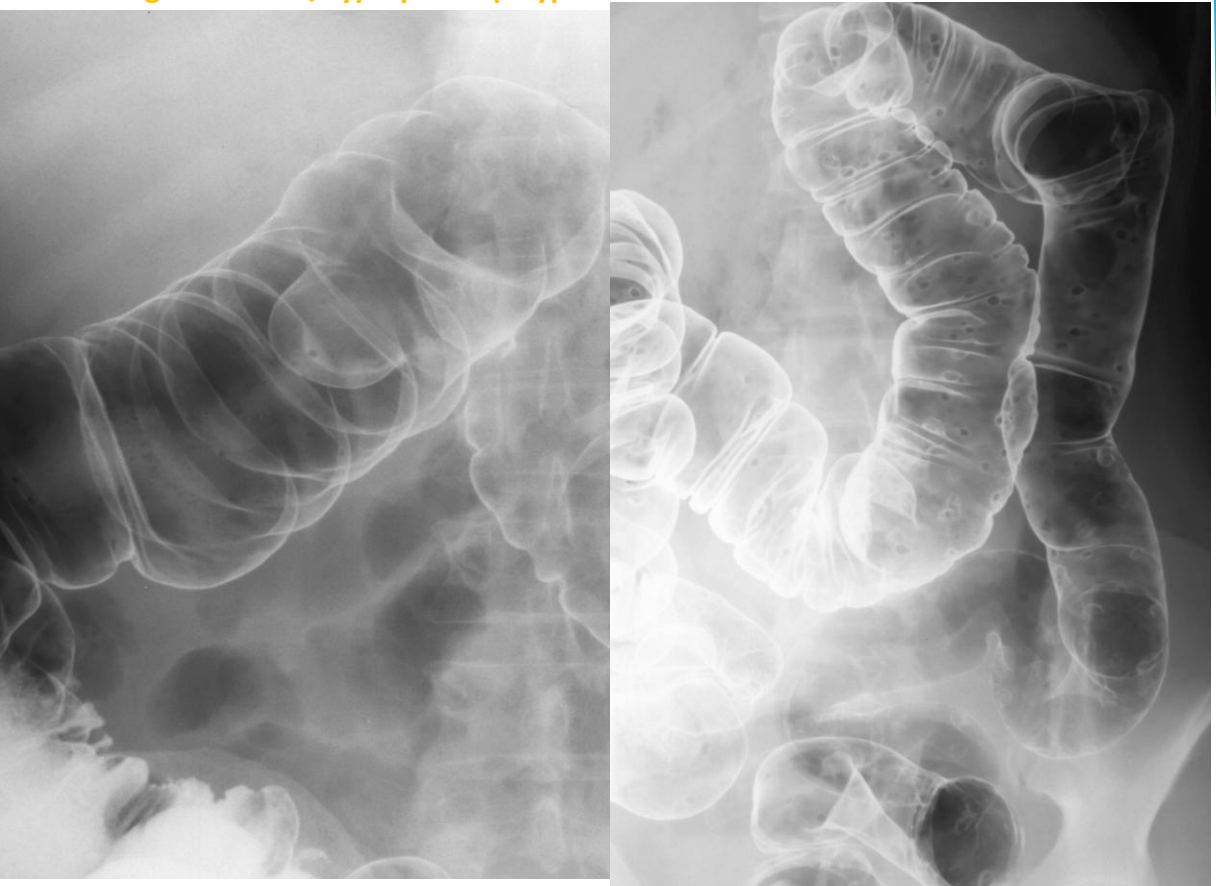
c- Colonic carcinoma.

d- Colonic perforation.

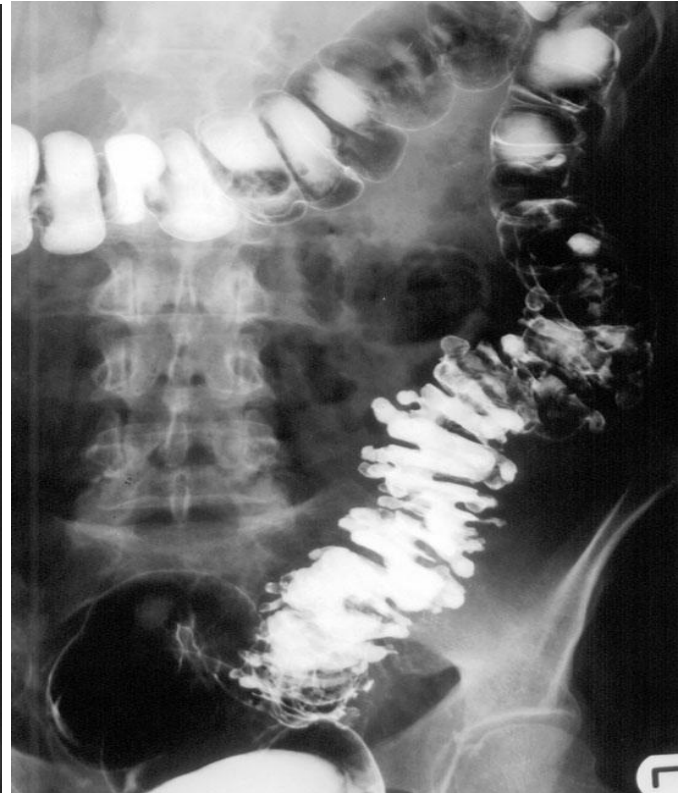
Colonic Polyps(

DDX:

- familial adenomatous polyposis (FAP)
- Hereditary nonpolyposis colorectal cancer (HNPCC)/Lynch syndrome
- Pseudopolyps associated with mucosal inflammation
- Benign adenoma/hyperplastic polyp



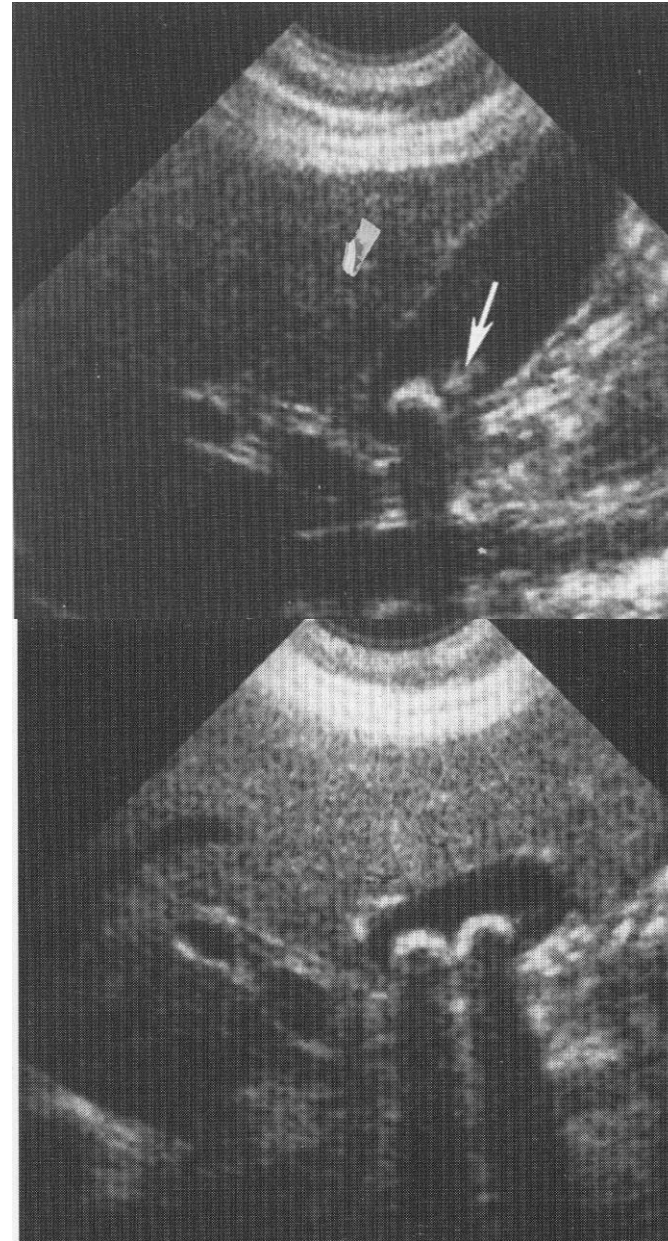
Diverticular Disease Sx: Abdominal Pain & Diarrhea



CASE 6

Adult female patient presenting with right upper quadrant pain. What is the abnormality seen on this upper abdominal ultrasound exam?

- a- Liver abscess.
- b- Gall stones.**
- c- Pneumoperitoneum.
- d- Colonic stricture.



Dx Cholelithiasis ,Sx
Acute abdomen



summary of Barium types and indication

type	<u>barium enema</u>	Barium meal	Barium follow through	Barium swallow
indication	Pain Change in bowel habit Bleeding/ melena Obstruction <u>double contrast (air contrast)</u> Rectal bleeding - gross or occult Polyps or carcinoma Inflammatory bowel disease <u>single contrast barium enema</u> Suspected diverticulitis ,verify or exclude obstruction, volvulus, appendicitis, fistula, etc. Uncooperative, disabled, very old, or very ill patient unable to tolerate or perform the maneuvers required for a double contrast study	problems in the stomach and the first part of the gut (small intestine), known as the duodenum. These problems may include <u>ulcers</u> , small fleshy lumps (polyps), <u>tumours</u>	look for problems in the small intestine (duodenum , jejunum and ileum)	This test aims to look for problems in the gullet (oesophagus). These include a narrowing (stricture), <u>hiatus hernias</u> , <u>tumours</u> , <u>reflux from the stomach</u> , <u>disorders of swallowing</u>
Contra indication	Suspected acute perforation Acute, fulminating colitis Immediately after biopsy			
	<u>Indications for water-soluble contrast enema:</u> Suspected perforation or high risk for intestinal perforation			

Other type is **Small intestine enema**

This test is similar to a barium follow through. However, instead of drinking the barium liquid, a thin tube is passed down your gullet (oesophagus), through the stomach and into the first part of the small intestine. Barium liquid is then poured down the tube. This test is not commonly done but can give some different information about the small intestine to the tests above.

Thank You!

We hope you found this helpful and informative.

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