



Radiology Team

Lecture 10

Radiology of common GI diseases

Done by:

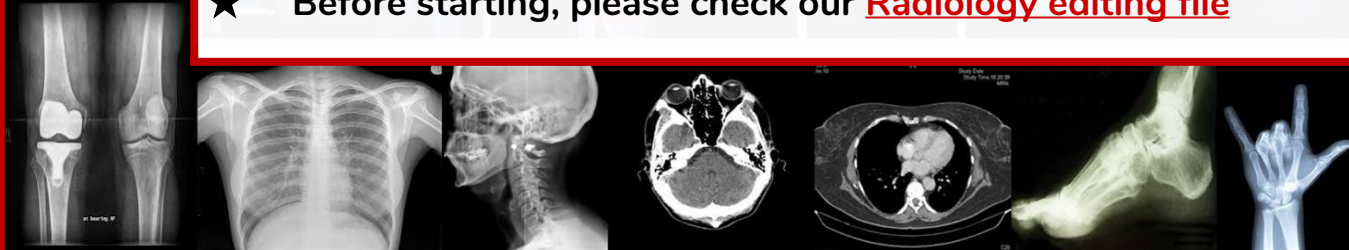
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Color Index:

• **Important** • **Females' notes** • **Males' notes** • Explanations

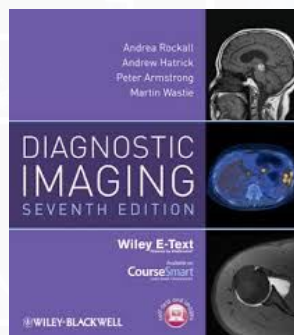
Objectives

- To know the common GIT pathologies presentation.
- To understand step wise approach in requesting GIT radiology investigations.
- To know common radiological pathologies in GIT.

NOTE!

In this lecture we relied on the slides, doctor notes and description and we added some of the important notes from the book.

- You can download chapter 6 from the book by clicking on the book image:



- And also you can check radiopaedia.org:



Esophagus

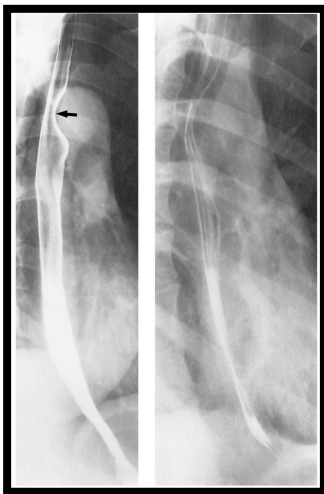
Clinical signs and symptoms:

- Dysphagia.
- Odynophagia.
- Regurgitations.
- Vomiting.
- Age is also important (some diseases are common in specific age)
- Constitution symptoms (fever, sweating and weight loss)

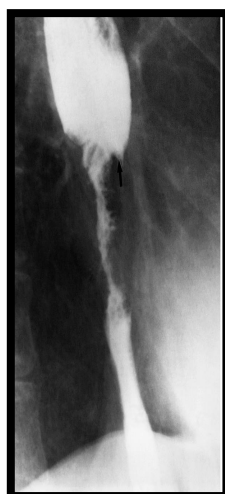
IMAGING MODALITIES:

- **X-RAY.** (We will not see clearly because it is behind the trachea but we might see dilated esophagus)
- **FLUOROSCOPY (CONTRAST STUDY).** (show us the lumen and mucosal lining)
- **ULTRASOUND.** (rarely used)
- **CT.** (not the main study of choice)
- **MRI.** (limited role)
- **NUCLEAR MEDICINE.**
- **ANGIOGRAPHY.**

1st image



2nd image



3rd image



4th image



5th image



1st image :normal esophagus shows full barium with a smooth outline and indentation made by aortic arch

Compare tapered narrowing in the 2nd and 3rd image:

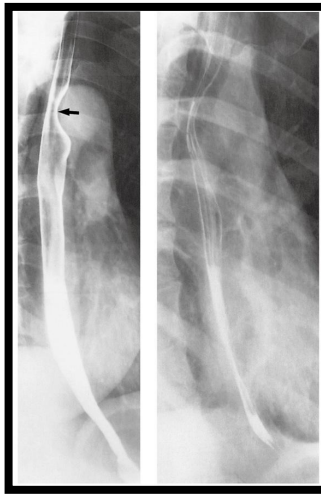
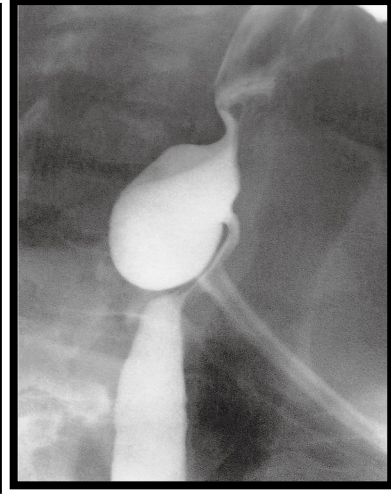
2nd image :Irregular narrowing in the mid of the esophagus with dilated upper esophagus because of this narrowing (there is a mass constricting the lumen which gives shouldering at the upper end)

3rd image :tapered smooth narrowing of the mid esophagus we see it in gastroesophageal reflux disease (peptic stricture in the esophagus) and there is an ulcer within the stricture (arrow) – there is hiatus hernia

4th image :most of the esophagus is dilated (food residual) with smooth narrowing of in lower end

5th image :irregular narrowing in the whole esophagus (corrosive induced stricture along the whole esophagus) ** corrosive is chemicals like acids or bases

*We always don't rely on the imaging (radiology) only we must take the whole picture by full history and examination and radiology investigation and endoscopy to see and to take biopsy

1st image**2nd image****3rd image****4th image**

1st image: normal esophagus shows full barium with a smooth outline and indentation made by aortic arch

2nd image: external compression causes narrowing of the esophagus caused by apparent subclavian artery as it passes behind the esophagus (arrow) - (anomalous right subclavian artery)

3rd image: esophageal web. Shelf-like indentation (arrow) from the anterior wall of the esophagus.

4th image: pharyngeal out pouching filled with contrast with compression of the esophagus - (Zenker's diverticulum)

Stomach

Clinical signs and symptoms:

- Epigastric pain.
- Vomiting
- hematemesis.
- Age is also important (some diseases are common in specific age)
- Constitution symptoms (fever, sweating and weight loss)

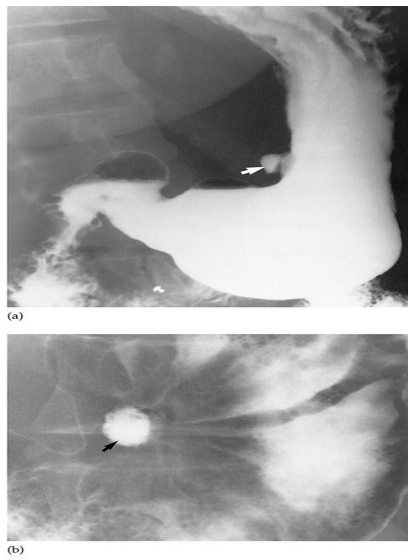
IMAGING MODALITIES:

- X-RAY.
- FLUOROSCOPY (CONTRAST STUDY).
- ULTRASOUND.
- CT.
- MRI.
- NUCLEAR MEDICINE.
- ANGIOGRAPHY.

1st image



2nd image



3rd image



1st image: normal stomach and duodenum on double contrast barium meal

2nd image (upper one): out pouch filled with contrast in the lesser curve of the stomach which indicate benign ulcer (arrow)

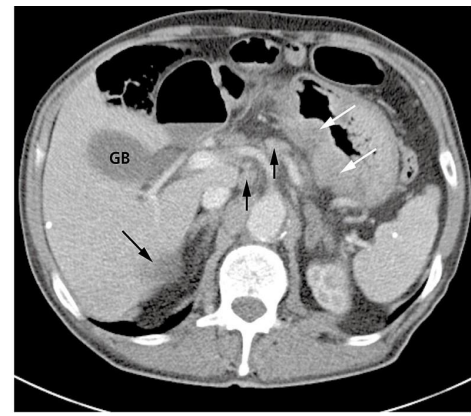
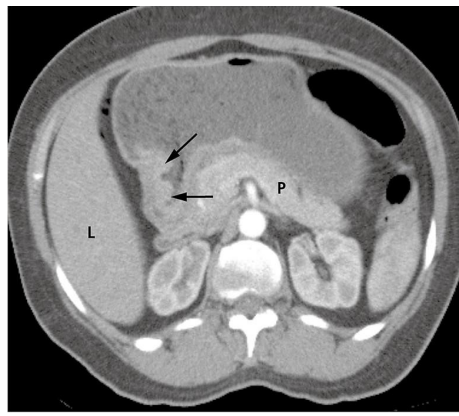
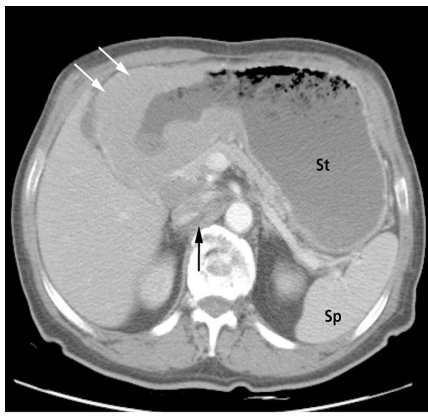
2nd image (lower one) : En face if the same ulcer (arrow) is seen as rounded collection of barium

3rd image: sliding hiatus hernia. The fundus of the stomach and the gastroesophageal junction (arrow) have herniated through the esophageal hiatus and lie above the diaphragm (dotted line)

Black areas is filling defect in the antrum and body of the stomach which indicate mucosal abnormality (infiltrations) - gastric carcinoma

The different between gastric masses and ulcer is that the ulcer will accumulate the contrast in the site of ulcer which will appear as density but the mass will clear the contrast from the mass site which will appear black





- There is thickening of the wall in all of these CT scan images , it is even **primary gastric cancer** or **infiltration of metastasis or lymphoma**
- Significant thick wall and the lumen is narrowed left image

US has very limited role in stomach but may play a roll in **pyloric stenosis** in pediatric age group

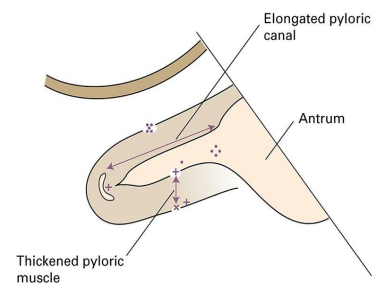
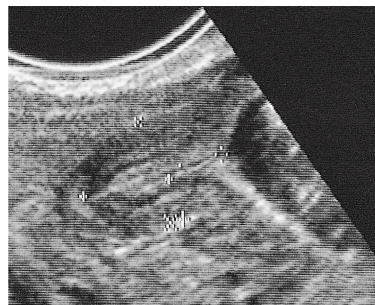


Fig. 6.29 Pyloric stenosis. Ultrasound scan in a neonate showing a thickened, elongated pyloric canal.

Small bowels

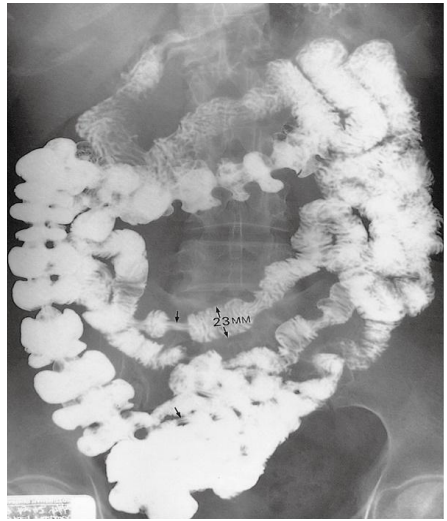
Clinical signs and symptoms:

- Malabsorption.
- Vomiting.
- Diarrhea.
- Age is also important (some diseases are common in specific age)
- Constitution symptoms (fever, sweating and weight loss)

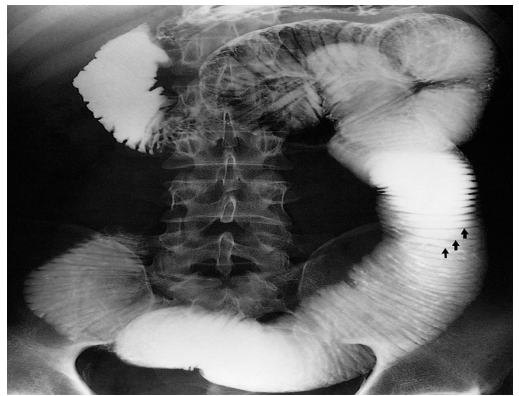
IMAGING MODALITIES:

- X-RAY. (bowel obstruction)
- FLUOROSCOPY (CONTRAST STUDY).
- ULTRASOUND. (No because it filed with gas)
- CT.
- MRI.
- NUCLEAR MEDICINE.
- ANGIOGRAPHY.

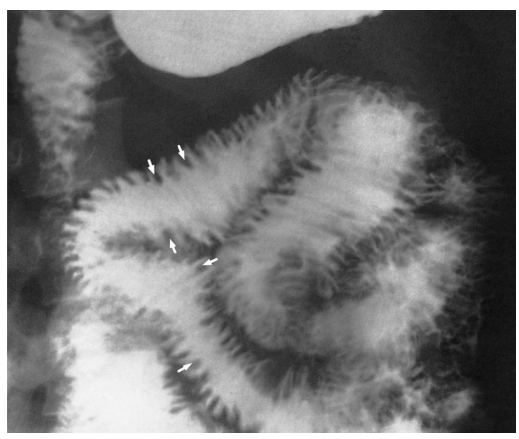
Normal fluoroscopic image of the small intestine



Significant Dilatation of the small bowel (without obstruction due to malabsorption disease)

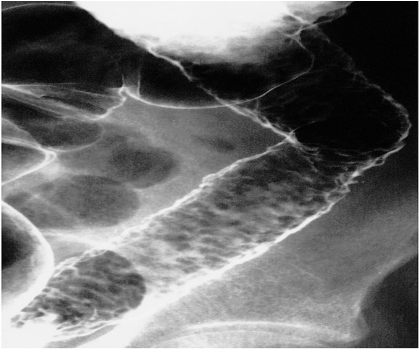


mucosal abnormality with infiltration of the bowel and thickening of the wall in all areas

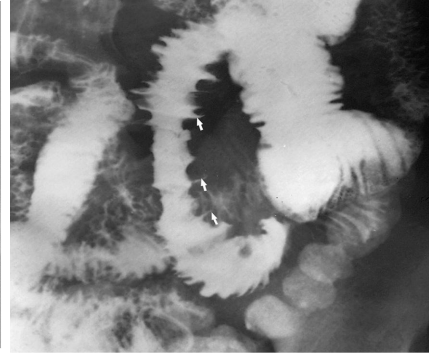


1st image: (mucosa ulceration)
 Small erosion of the mucosal lining (**cobblestone sign**).
2nd image: (Deep ulcer)
 If the erosion extended to the submucosa we will see the contrast filling the submucosa (Thorns rose)
NOTE: these changes are seen in Crohn's disease

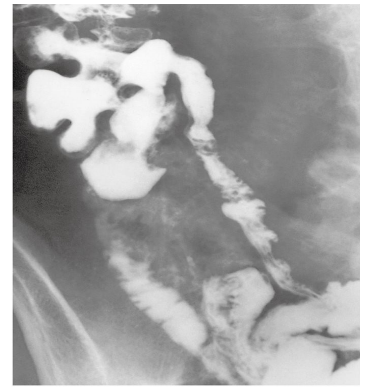
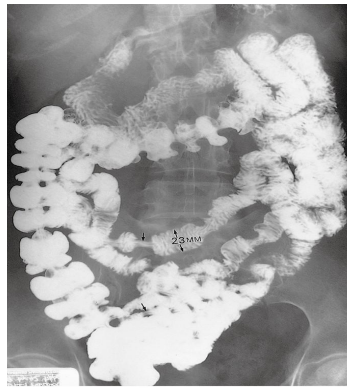
1st image



2nd image



Normal smooth regular ilio-cecal junction



1- Narrowing and ulceration and the contrast extend to the mucosal and submucosal wall.

2- Thickening and dilation of the ilio-cecal junction .

3- dilated bowel loops

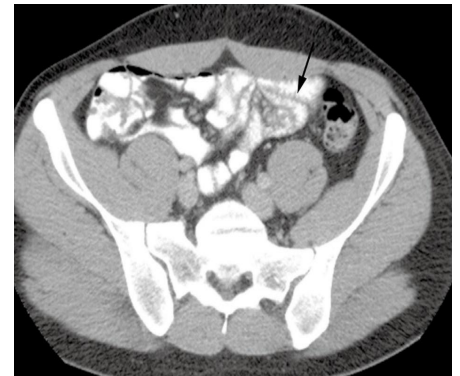
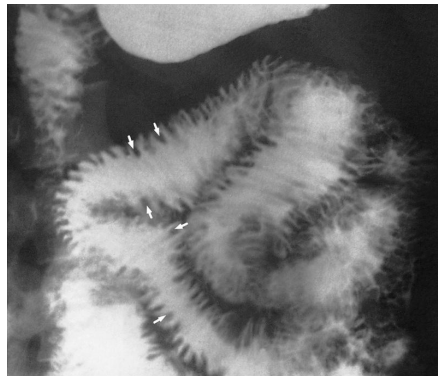
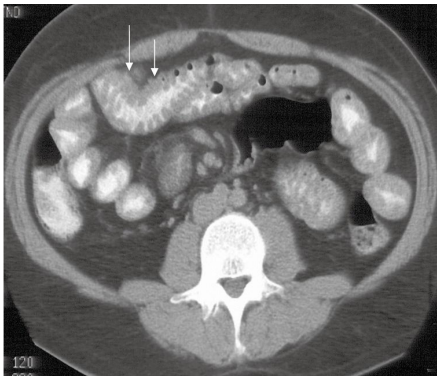
4- (left image) there is long stricture (arrows) in the ileum

NOTE: these changes are seen in Crohn's disease



(a)

(b)

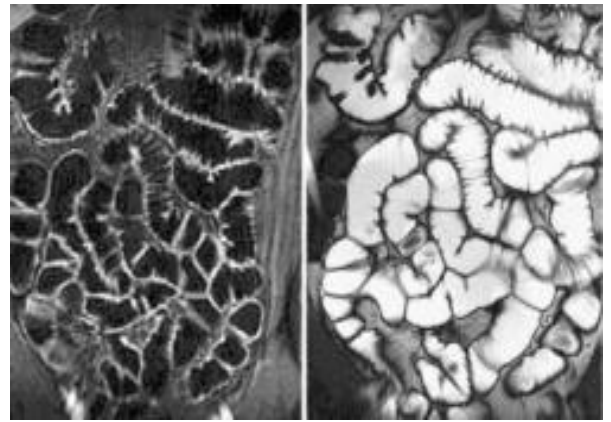


- **(right image)** normal CT scan of the small bowel
- **(middle and left image)** Thickening are seen in the wall due to infiltration of any cells (Malignant cells (lymphoma) ,connective tissue disorder ,storage disease, malabsorption disease)

1st image



2nd image



- Narrowing and thickening in the well of the ileocecal junction are seen by **MRI enterography**
- **1st image:** coronal T2 post contrast image
- **2nd image:** coronal T1 post contrast image
- Both images demonstrate mucosal thickening and **enhancement** involving terminal ileum.
- **NOTE: these changes are seen in Crohn's disease**

Normal MRI enterography

Large bowels

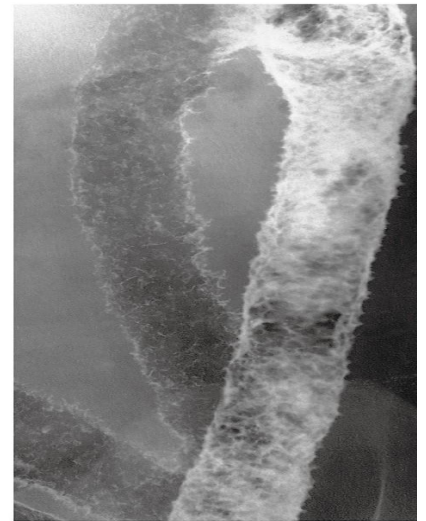
Clinical signs and symptoms:

- Abdominal pain.
- Diarrhea.
- Hematochezia.
- Vomiting.
- Anal pain and discharge.
- Age is also important (some diseases are common in specific age)
- Constitution symptoms (fever, sweating and weight loss)

IMAGING MODALITIES:

- X-RAY.
- FLUOROSCOPY – enema (CONTRAST STUDY).
- ULTRASOUND. (No because it filled with gas)
- CT.
- MRI.
- NUCLEAR MEDICINE.
- ANGIOGRAPHY.

Normal appearance of double contrast in the colon and it has normal mucosal lining and **haustration**



Ulcerative Colitis:

- After multiple episodes of inflammation affecting the mucosa and submucosa we will have this appearance
- Ulcerations of the mucosal and loss of the haustra (lead pipe appearance) and tiny contrast filling .
- **Right image:** double contrast.
- **Middle image:** single contrast.
- **Left image:** we can see clearly the lead pipe appearance. And reflux into the ileum through an incompetent ileocaecal valve has occurred

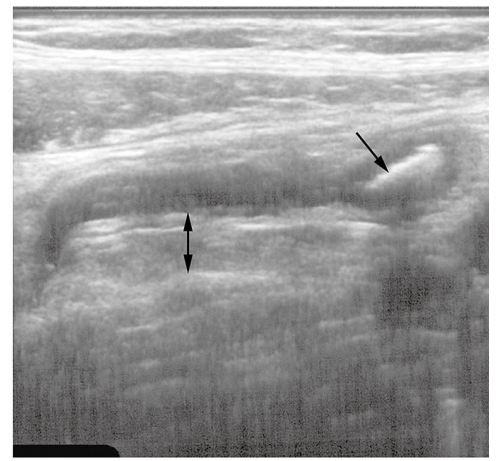
Yong male healthy compiling of right iliac fossa pain with leukocytosis and fever .

What is the Diagnosis? **Appendicitis**

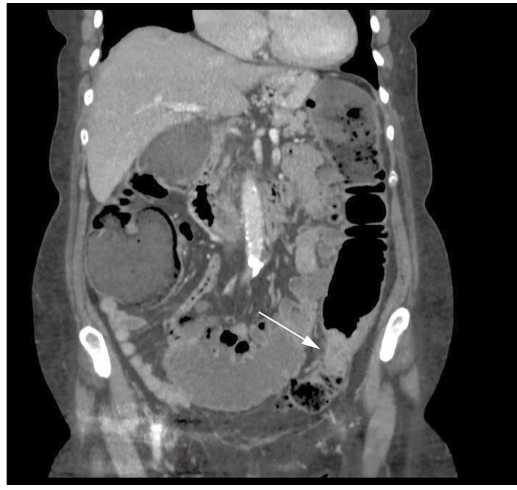
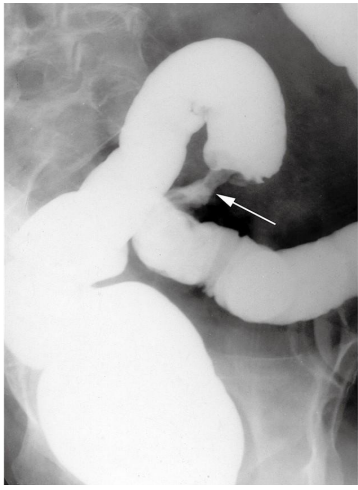
What is the best modalities to diagnose ? **CT Scan** (If it is a pregnant lady or pediatric patient then we do ultrasound)



CT scan showing Normal appendix



- The diameter from the outer wall to outer wall is more than 6mm.
- Appendicolith (white arrow in image A)
- in US (right image) there is thickening of the wall and we can see appendicolith (single headed arrow).
- The complication of acute appendicitis : perforation, abscess formation and mass formation
- Before CT scan invention they give the patient contrast enema and if it fills the lumen of the appendix this means the patient has appendicitis !!!



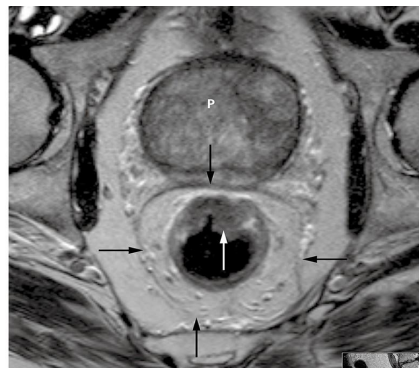
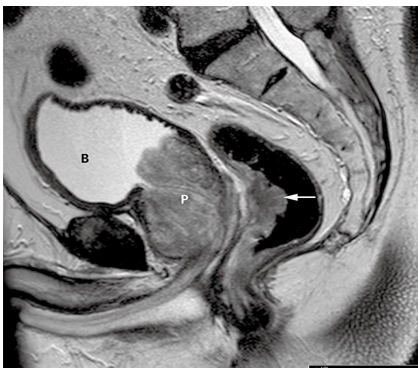
enema and coronal CT showing a short, circumferential narrowing in the sigmoid colon (arrows) from carcinoma

- Barium enema (left image) shows narrowing of the lumen due to presence of soft tissue mass (**Apple core sign**)
- We can't see the mass in the FLUOROSCOPY (only narrowing) BUT we can see it in the CT .

Colon carcinoma standard axial CT acquired on thin sections showing a tumor in the transverse colon.



Rectal carcinoma



- Posterior wall of the rectum is normal and in the lumen there is gas
- The anterior wall there is fungating mass. And because there is fat between the mass and the prostate so the mass is not invading
- Right image is axial image of the same tumor. Black arrow is the mesorectal fascia that encases the mesorectal fat
- **MRI is very good for rectal cancer grading**

Perianal fistula



Perianal fistula in crohn's disease.



Normal perianal area

MRI is the best in perianal disease