

An anatomical illustration of the human digestive system, showing the esophagus, stomach, liver, gallbladder, pancreas, and the small and large intestines. The organs are rendered in realistic colors (pink, red, and brown) and are superimposed on a semi-transparent blue-tinted human torso. The background is a solid dark blue.

Lecture I : Radiology of the abdomen

**Special thanks to Nada Alalmri
Since shes the only one member in this team**

Radiological modalities :

❖ X - Ray

It is ionizing radiation – radiation hazard.
It is useful in assessing the bones, bowel gases and calcification.

❖ Flouroscopy

❖ U/S

❖ CT scan

Ionizing radiation.

- Cross-sectional imaging.
- Better anatomical visualization

❖ MRI

X-ray

Normal gas pattern:

1- **stomach**: Almost always air in stomach

2- **small bowel**: Usually small amount of air in 2 or 3 loops

3- **large bowel**: Almost always air in rectum and sigmoid

* Varying amount of gas in rest of large bowel

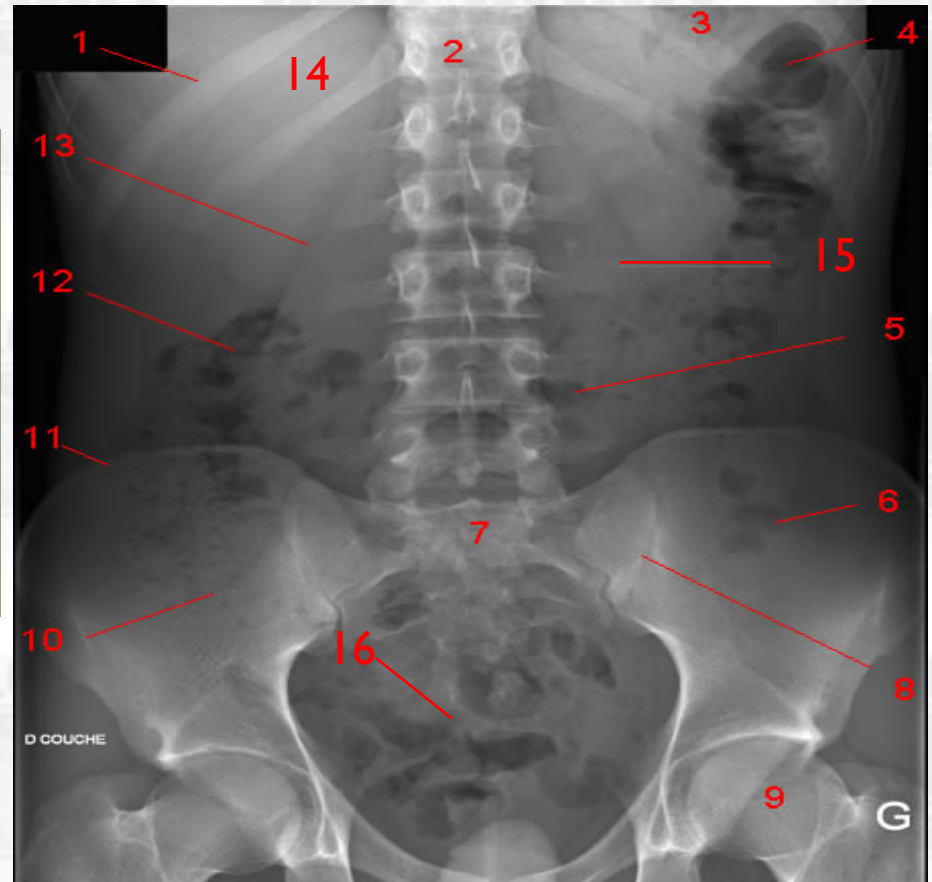
3, 6, 9 RULE :

Maximum Normal Diameter of bowel

Small bowel = 3cm

Large bowel = 6cm

Caecum = 9 cm



Normal

1-11th rib margin

2- T12

3-Gas in stomach

4-splenic flexure

5-transvers colon

6- gas in sigmoid

7- sacrum

8-SI joint

9-femoral head

10-gas in caecum

11-iliac crest

12-hepatic flexure

13-psosa

14-liver

15-left kidney

16-bladder

Mechanical Small Bowel Obstruction (SBO):

❖ Dilated small bowel

❖ Fighting loops

(visible loops, lying transversely, with air-fluid levels at different levels)

❖ Little gas in colon, especially rectum

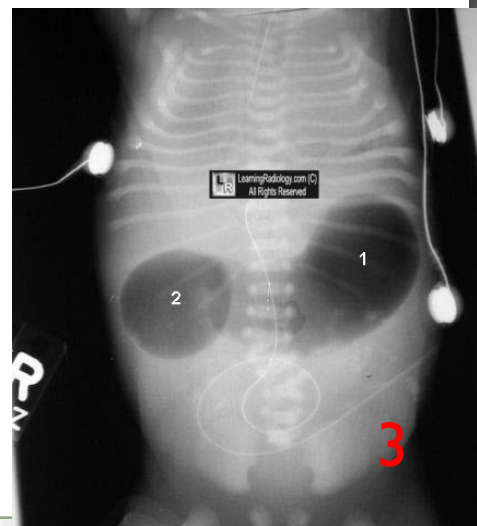
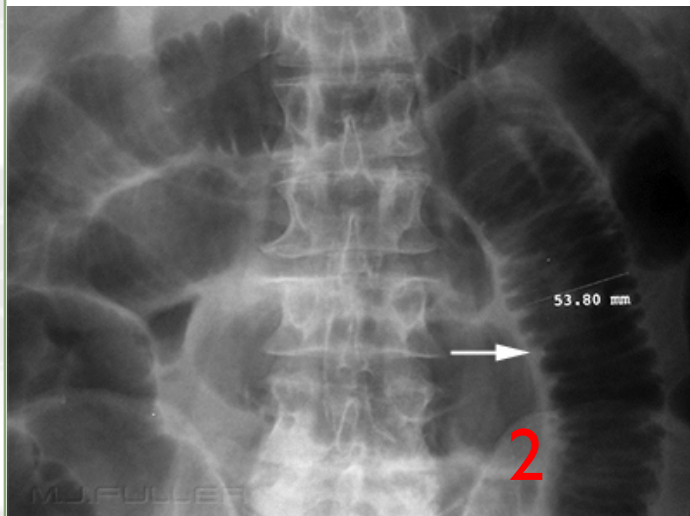
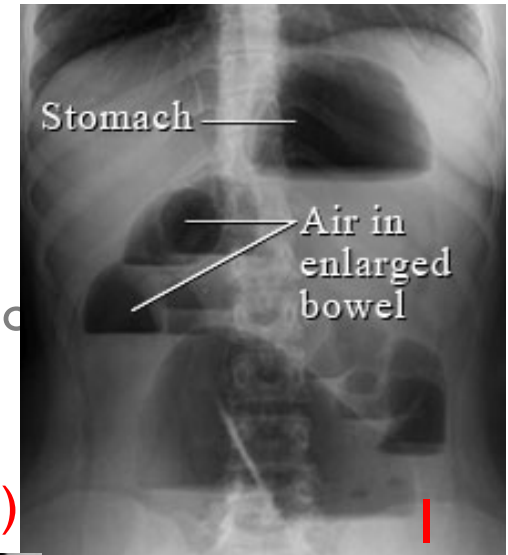
Special radiological signs in SBO :

1- Step ladder appearance:

(Loops arrange themselves from left upper to right lower in SBO)

2 - Coil spring / stack of coins sign

3 - Double Bubble Sign (**Indicate Duodenal Atresia**)



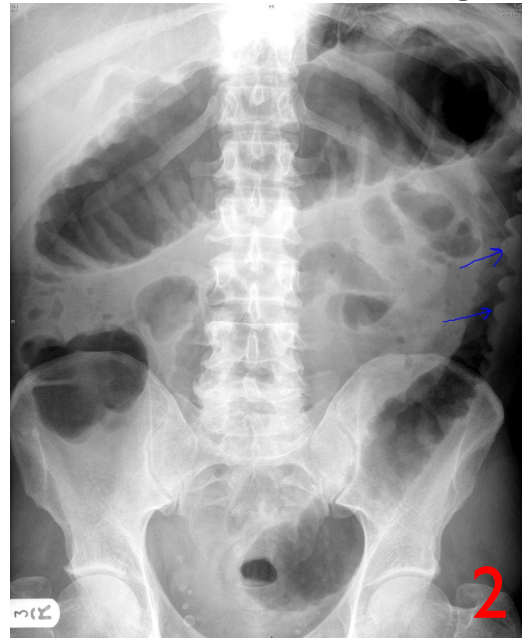
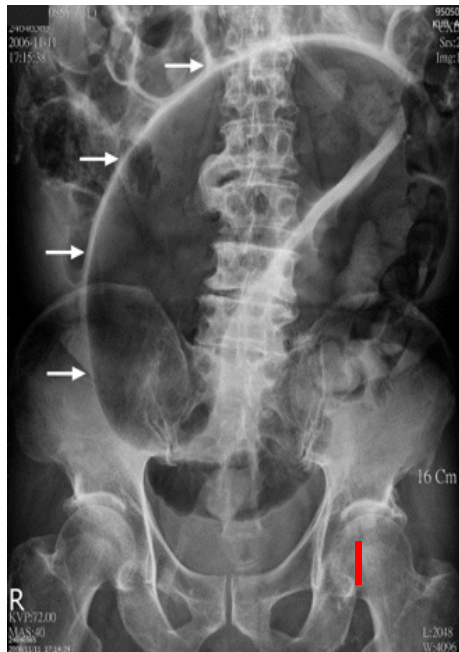
Mechanical Large Bowel Obstruction (LBO):

- ❖ Colon dilates from point of obstruction backwards
- ❖ Little/no air fluid levels (colon reabsorbs water)
- ❖ Little or no air in rectum/sigmoid

Causes : Tumor – Volvulus – Hernia – Diverticulitis – Intussusception

Special radiological signs of LBO:

- 1 - Coffee Bean Sign (**Sigmoid volvulus**) = Massively dilated sigmoid loop
- 2 - Thumbprinting (**The haustral folds are very thick**) = The distance between loops of bowel is increased due to thickening of the bowel wall.



Extra-luminal air : (TYPES)

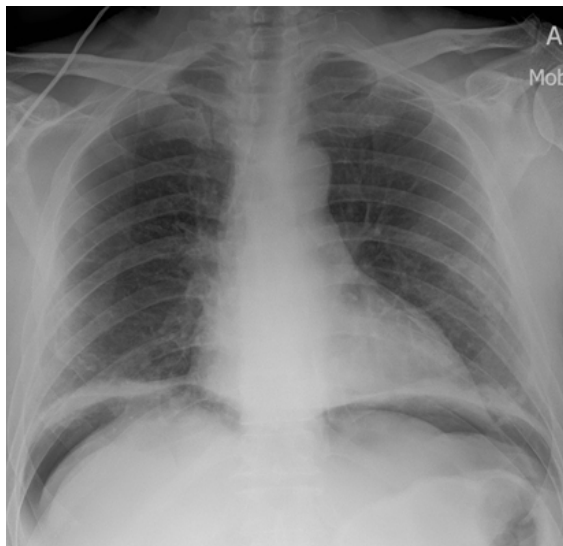
- ❖ Pneumoperitoneum/free air
- ❖ Retroperitoneal air
- ❖ Air in the bowel wall
- ❖ Air in the biliary system

Causes of free air :

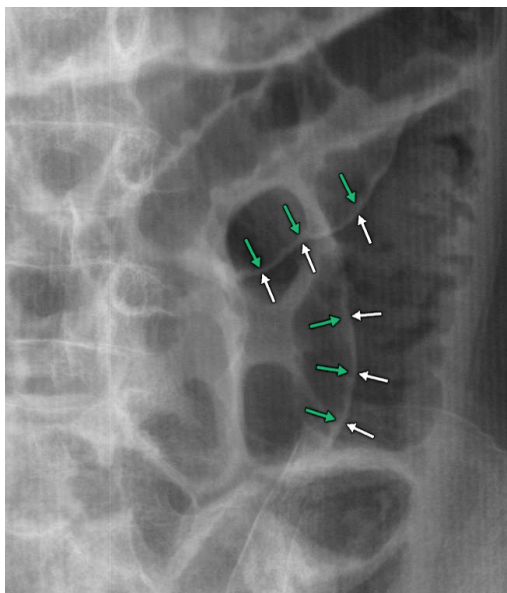
- 1 - Rupture of a hollow viscus
(Perforated peptic ulcer -Trauma
Perforated diverticulitis -Perforated carcinoma)
- 2- Post-OP
5-7 days normal, should get less with successive studies *NOT ruptured appendix

Signs of free air:

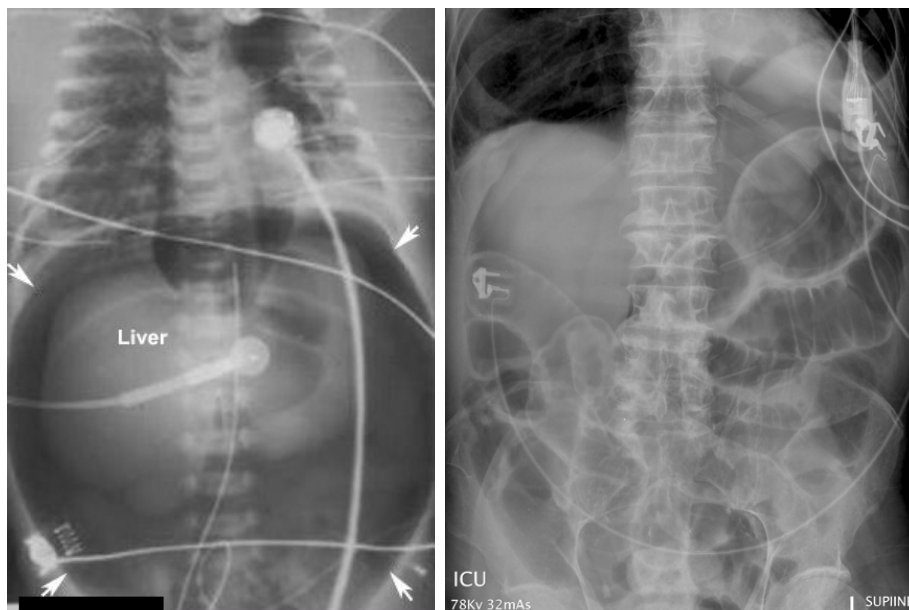
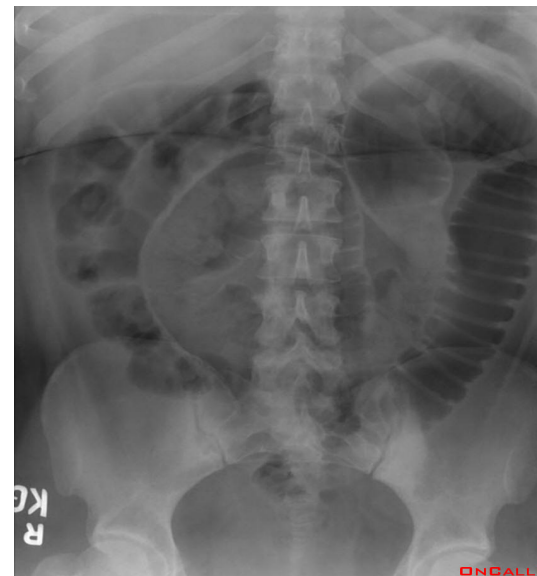
1. Crescent sign = (Free air under the diaphragm , Best demonstrated on upright chest x rays or left lat decub) **Easier to see under right diaphragm**
2. Riglers sign = (Bowel wall visualised on both sides ,Usually large amounts of free air)
3. Football sign= (Seen with massive pneumoperitoneum most often in children with necrotizing enter colitis, In supine position air collects anterior to abdominal viscera)
4. Falciform ligament sign = (Normally invisible ,Supine film, free air rises over anterior surface of liver)



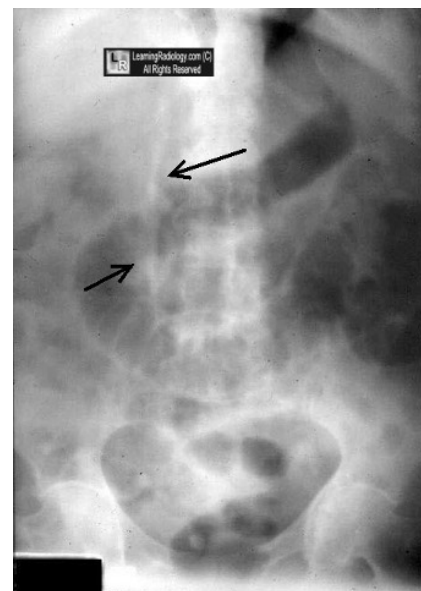
Crescent sign



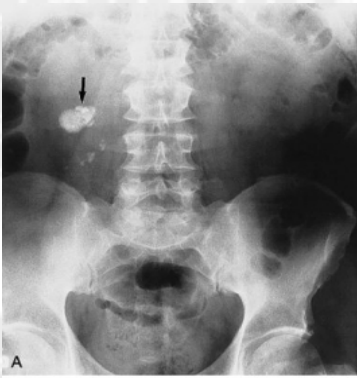
Riglers sign



Football sign



Falciform ligament sign



Calcified enteric lymph nodes



Bladder calculi



Calcified fibroids



Calcified pancreas



Renal calculi



Staghorn Calcification

Renal calculi:

Nephrocalcinosis

- ❖ Uncommonly the renal parenchyma can become calcified.
- ❖ A condition found in disease entities such as medullary sponge kidney or hyperparathyroidism.

Fluoroscopy :

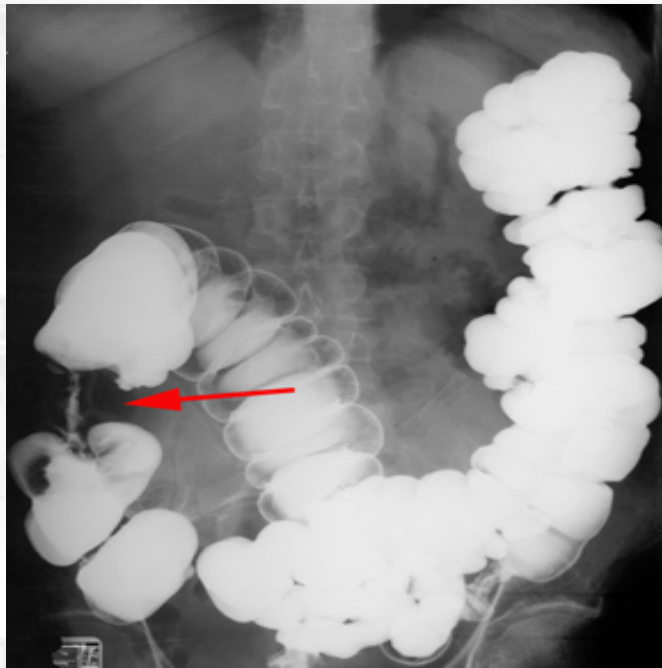
- ❖ use a contrast material for better visualization of hollow organs
- ❖ It is useful to assess the mucosal pathology.
- ❖ We can use either **oral** or **rectal** contrast

If we use rectal contrast; we can use either:

Single contrast barium enema / Double contrast barium enema



Small bowel contrast study (enema)



Colon Cancer (apple core sign)

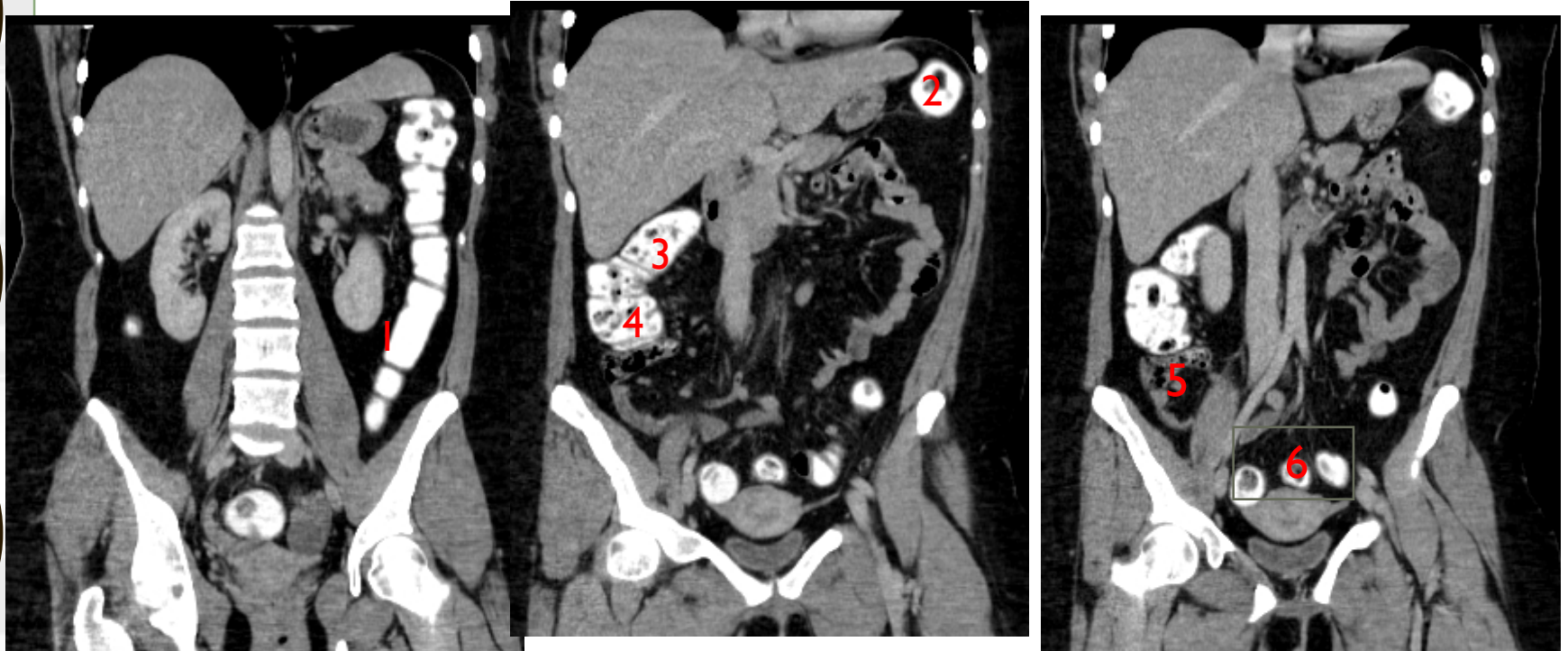


1. Rectum
2. Sigmoid colon
3. Descending colon
4. Splenic flexure
5. Transverse colon
6. Hepatic flexure
7. Ascending colon
8. cecum

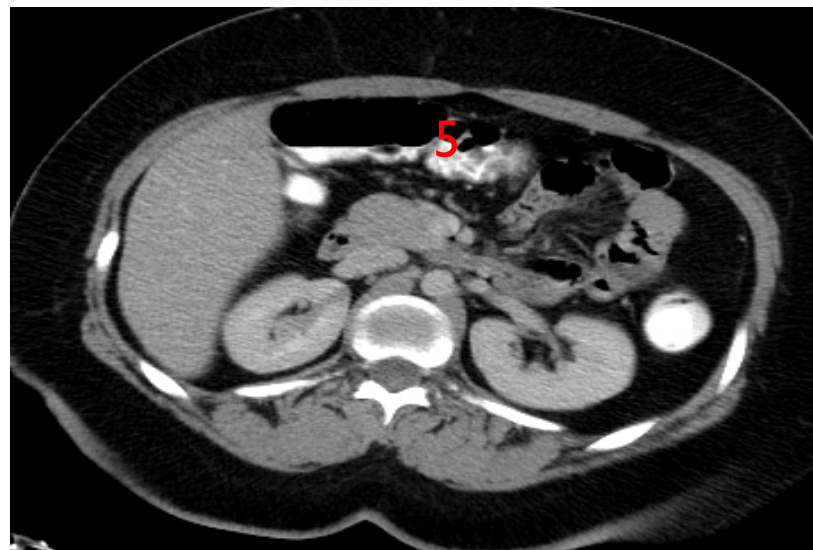
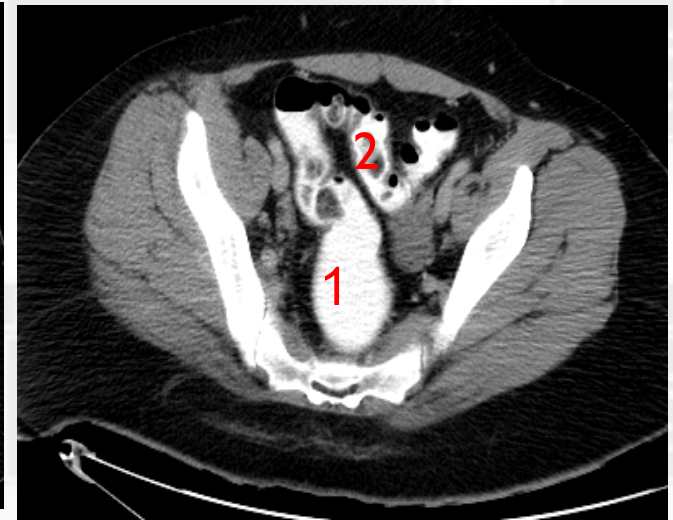
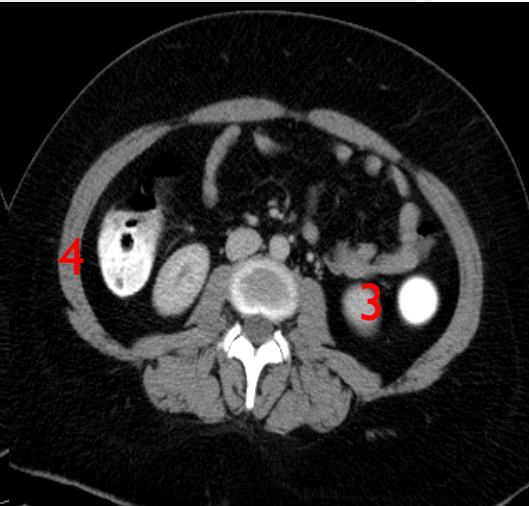
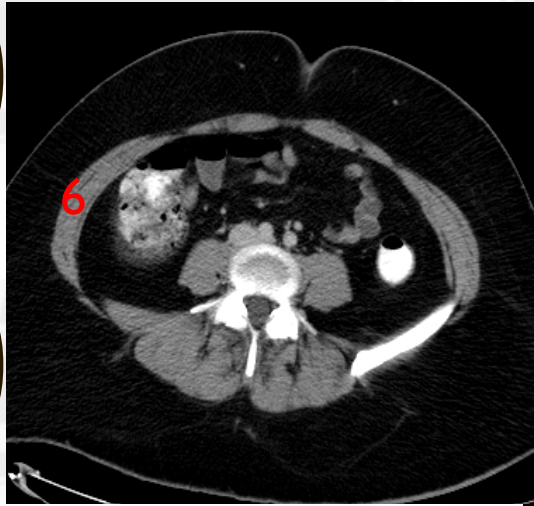
Lead pipe colon

1. Shortening of colon
2. Loss of haustration
3. Ulcerative colitis





1. Descending colon
2. Splenic flexure
3. Hepatic flexure
4. Ascending colon
5. cecum
6. Sigmoid colon



- | | | | |
|--------------------|-----------------|--------------------|-------------|
| 1- Rectum
colon | 2-Sigmoid colon | 3-Descending colon | 4-Ascending |
| 5-Transverse colon | | 6-Cecum | |

Thank you for checking our team

Done by :

❖Nada Alamri

