Rev. 8.17.22

LOWER GI AND INVASIVE PROCEDURES

Reading Hospital School of Health Sciences
Medical Imaging Program
MI 263 Clinical Seminar V

Pathology and Image Critique

1

Pathology

- Crohn's
- Diverticulosis/itis
- Ulcerative colitis
- Cancer
- Intussusception
- Disk herniation

2

Crohn's Disease

Chronic inflammatory disease of the intestines

Cause: idiopathic

Complications: ulcerations, fistulas, bowel necrosis

Primary area: terminal ileum

Pattern: Skip areas

Radiographic Appearance: inflammation and fibrosis with narrowing
- String sign

Technical: Normal technique

Prognosis: No cure, remaining on medicines will help. Dependent on severity.

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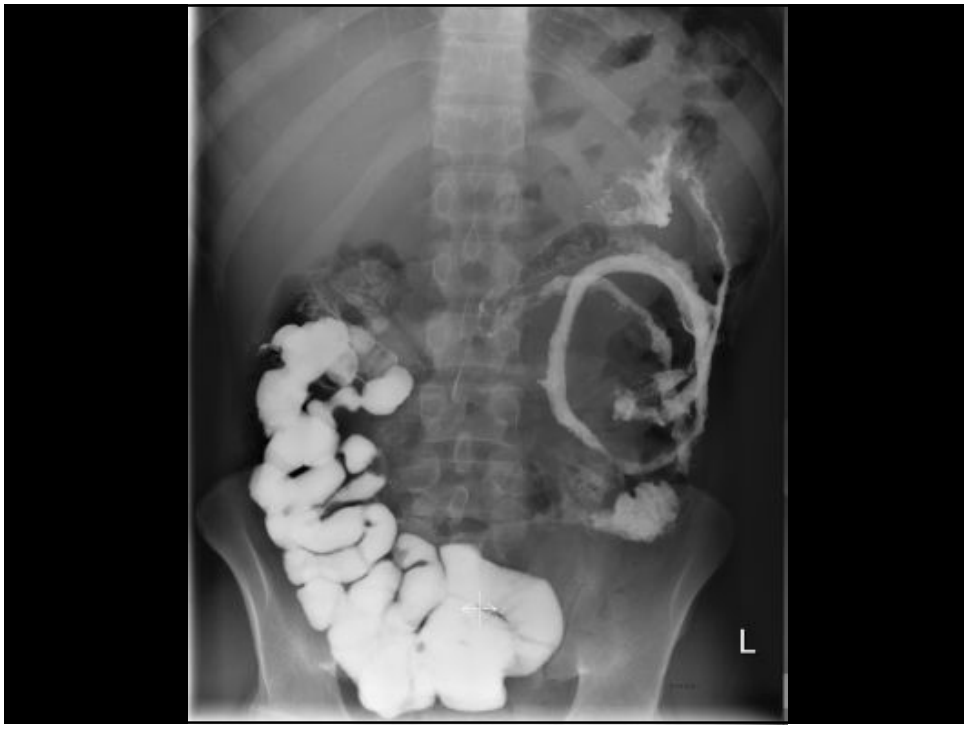

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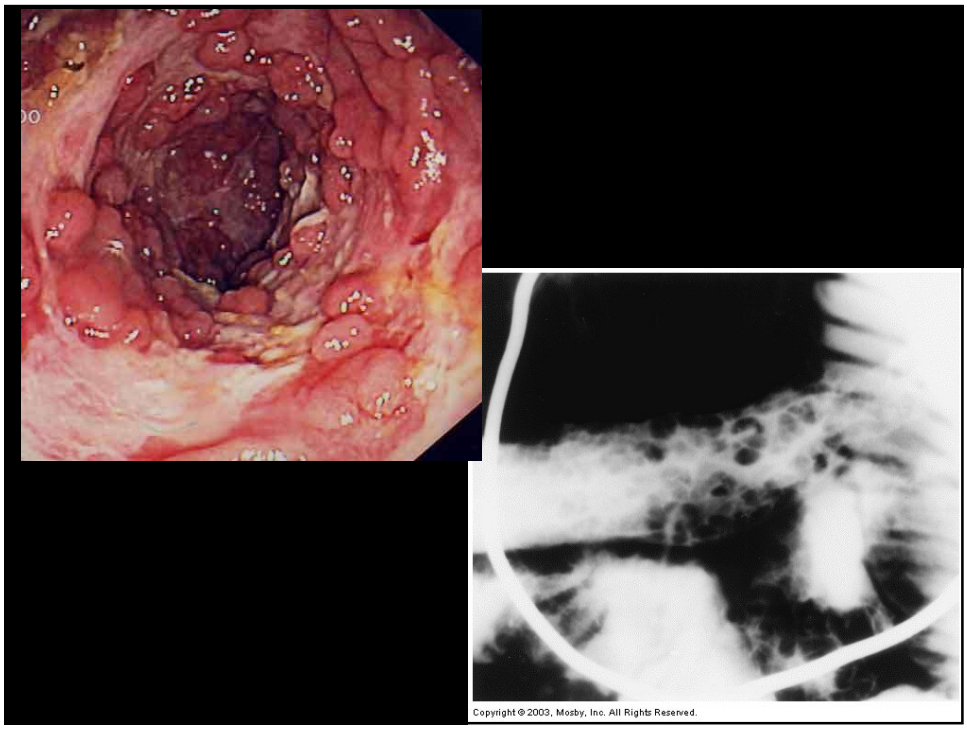

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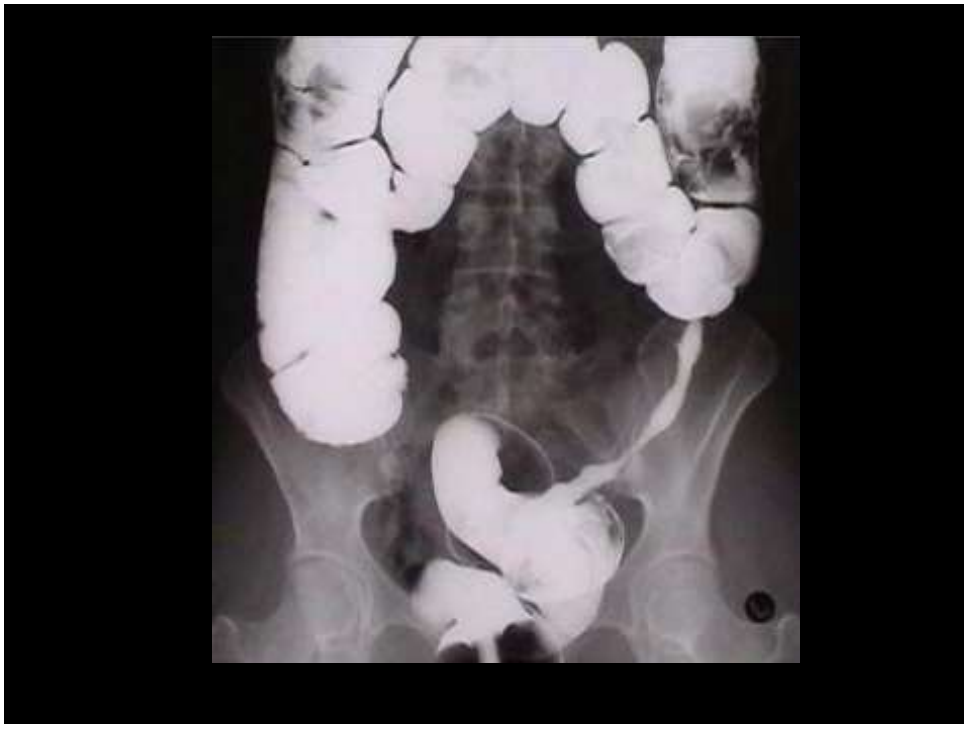

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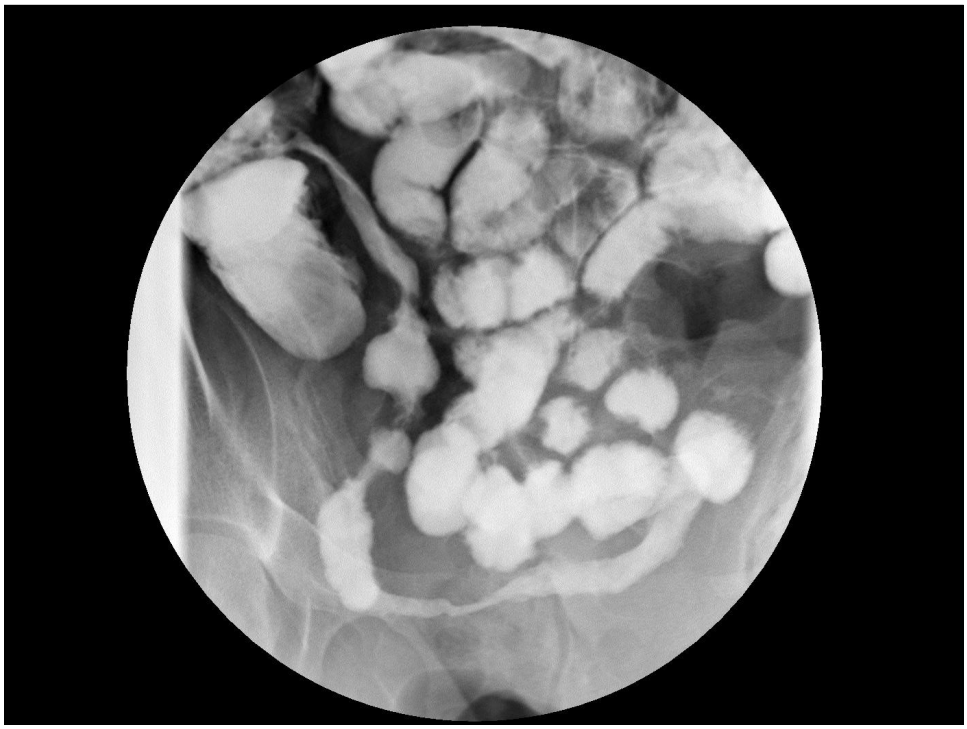

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Diverticulosis/itis

Diverticulosis – outpouching, herniation of mucosa and submucosa through the muscular layers at points of weakness of the bowel wall

Causes: idiopathic

- Examples: straining to pass stool, consuming low fiber diet

Diverticulitis- inflammation of diverticuli

Causes: idiopathic

- Examples: retained fecal material trapped in diverticulum

8

Diverticulosis/itis cont.

Complications: perforation, fistula formation

Radiographic appearance:

- Round or oval outpouchings, tend to be in clusters
- Abscesses
- Extravasation

Technical: Normal technique

Prognosis: full recovery unless further complications

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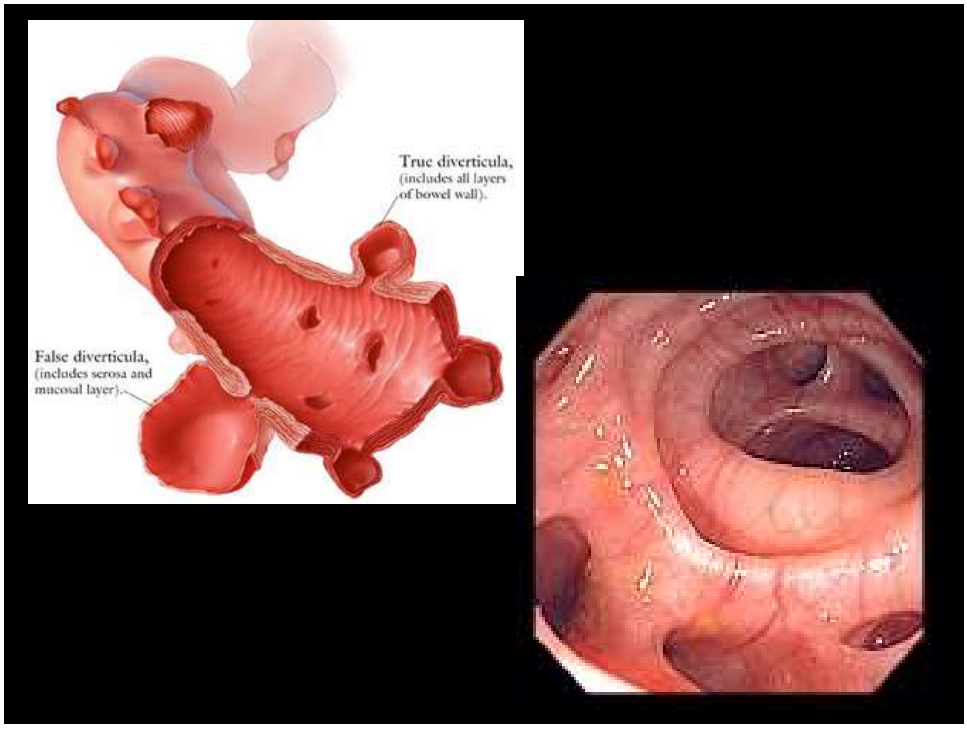

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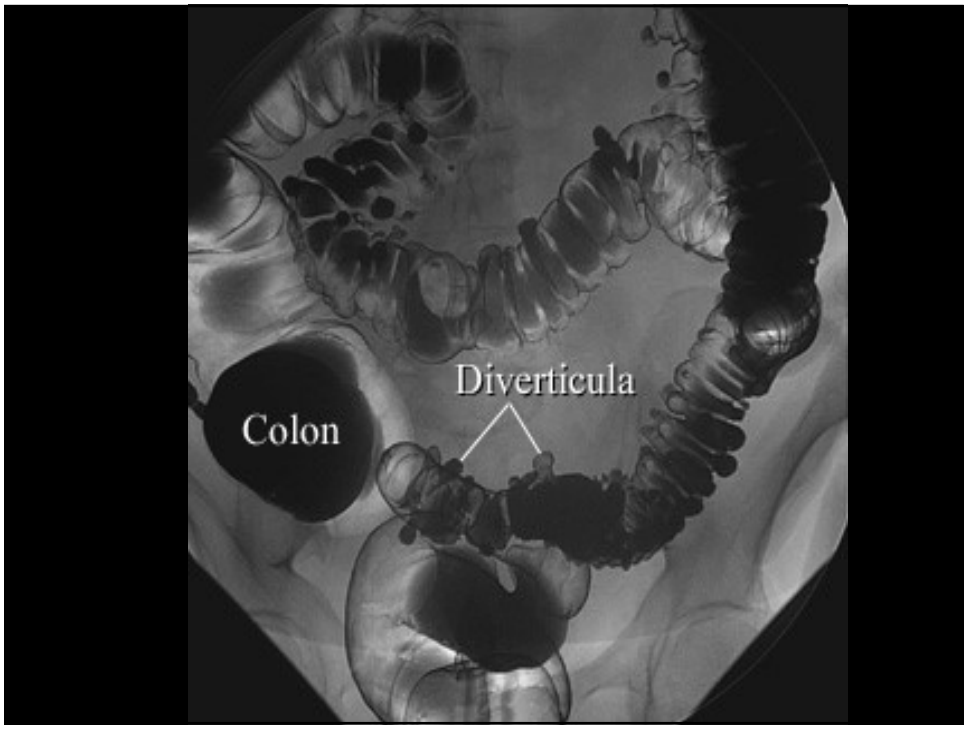

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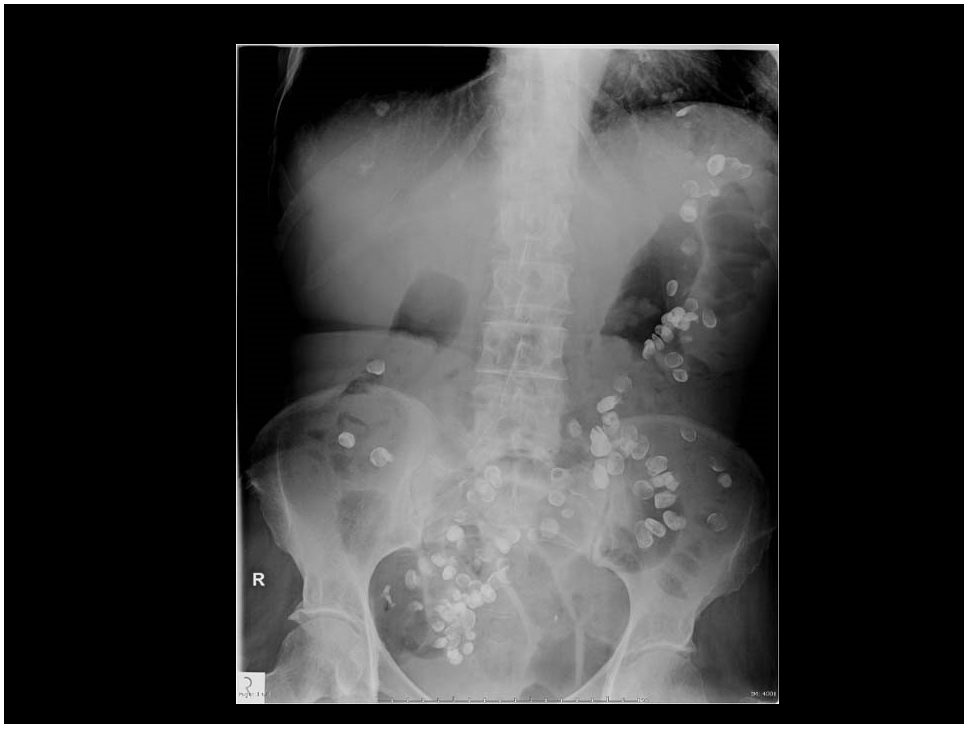

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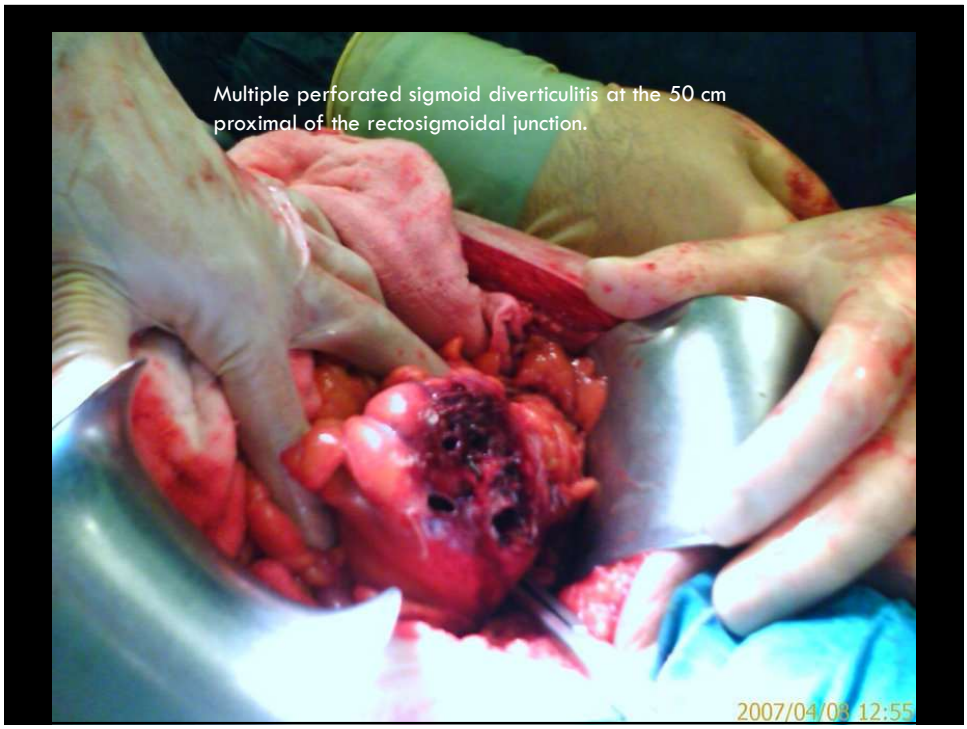
Multiple perforated sigmoid diverticulitis at the 50 cm proximal of the rectosigmoidal junction.
2007/04/03 12:55

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Barium enema showing sigmoid diverticulitis with intra-mural sinus tract.

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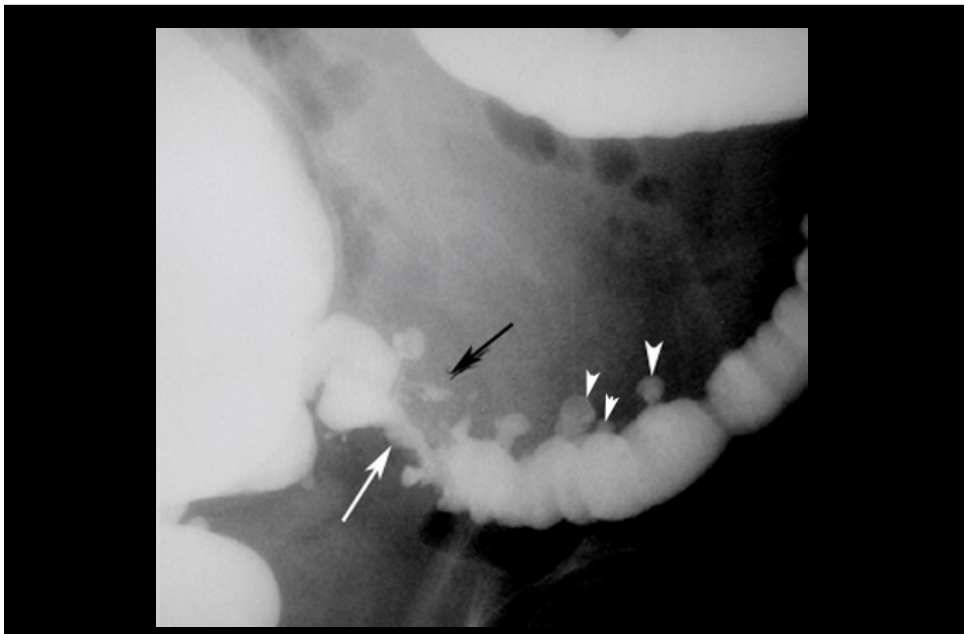


Perforation with intramural abscess

15

Ulcerative Colitis

Inflammatory bowel disease

Cause: idiopathic

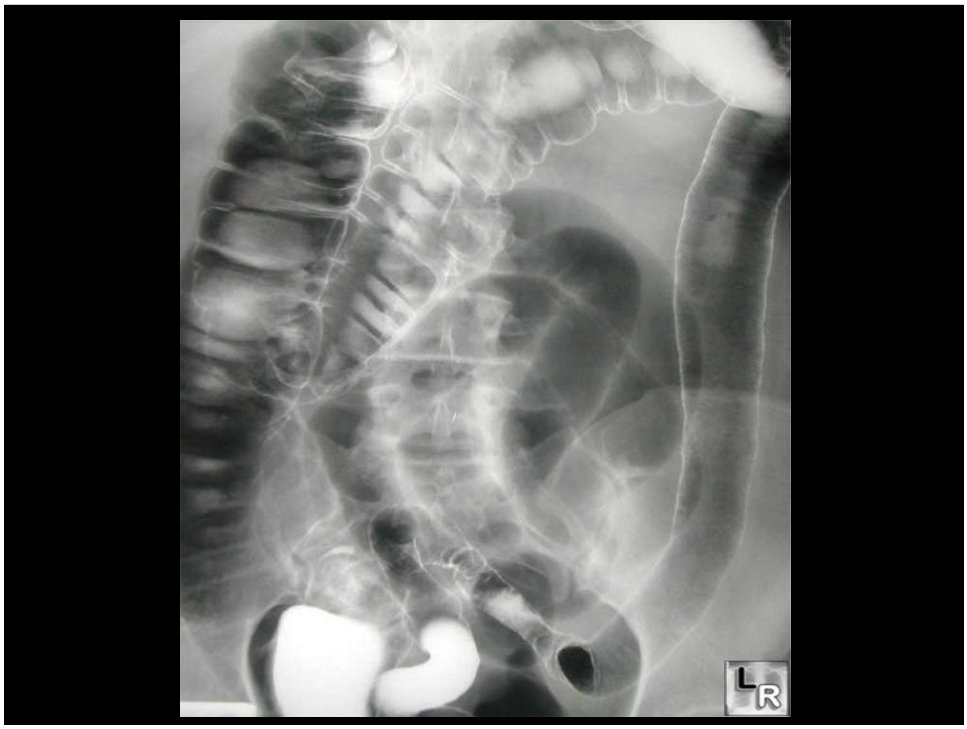
Complications: toxic mega colon, perforation

Radiographic Appearance:
- Earliest detection: fine granularity of the mucosa
- Chronic: haustra pattern absent, tubular looking colon

Technical: Normal technique

Prognosis: depends on the patient and severity, medication will help but other patients may struggle
- To rid oneself of disease the entire lg intestine needs to be removed.

16



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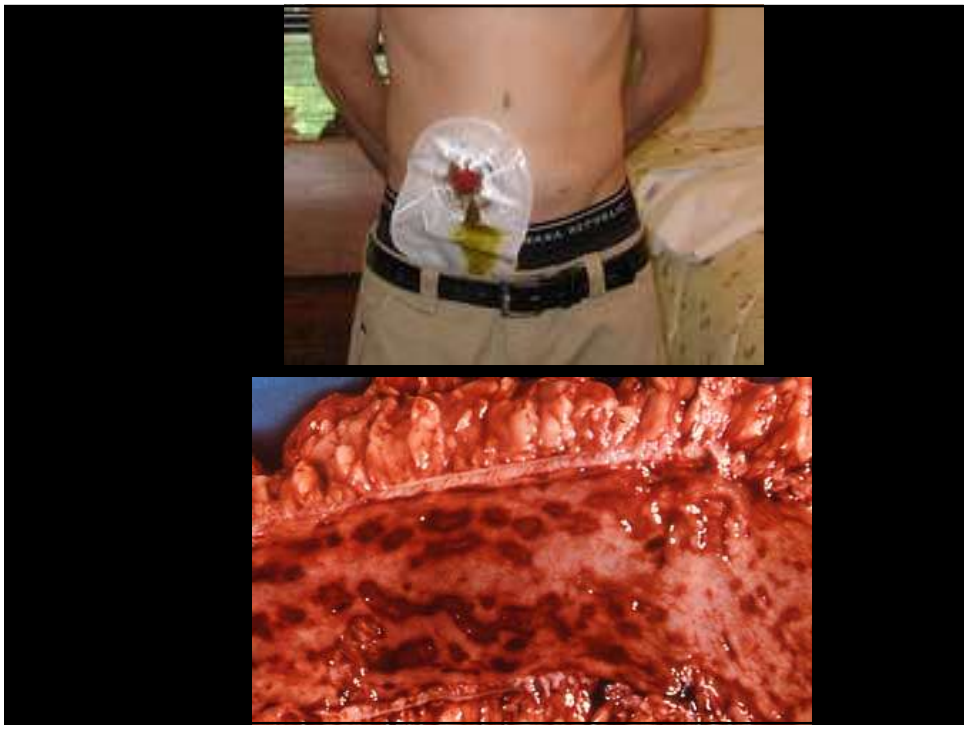

19

Colon Cancer

Cause: idiopathic, ?genetics

Complications: blockage of colon, metastasis

Radiographic Appearance:

- Polyps
- Apple core

Technical: Normal technique

Prognosis: Recovery from colon cancer depends on the extent of your disease before your surgery.

- If your tumor is limited to the inner layers of your colon, you can expect to live 5 years or more.
- If cancer has spread to your lymph nodes adjacent to the colon, the chance of living 5 years is 65%.
- If the cancer has already spread to other organs, the chance of living 5 years drops to 8%.
- If the cancer has reached your liver but no other organs, removing part of your liver may prolong your life.

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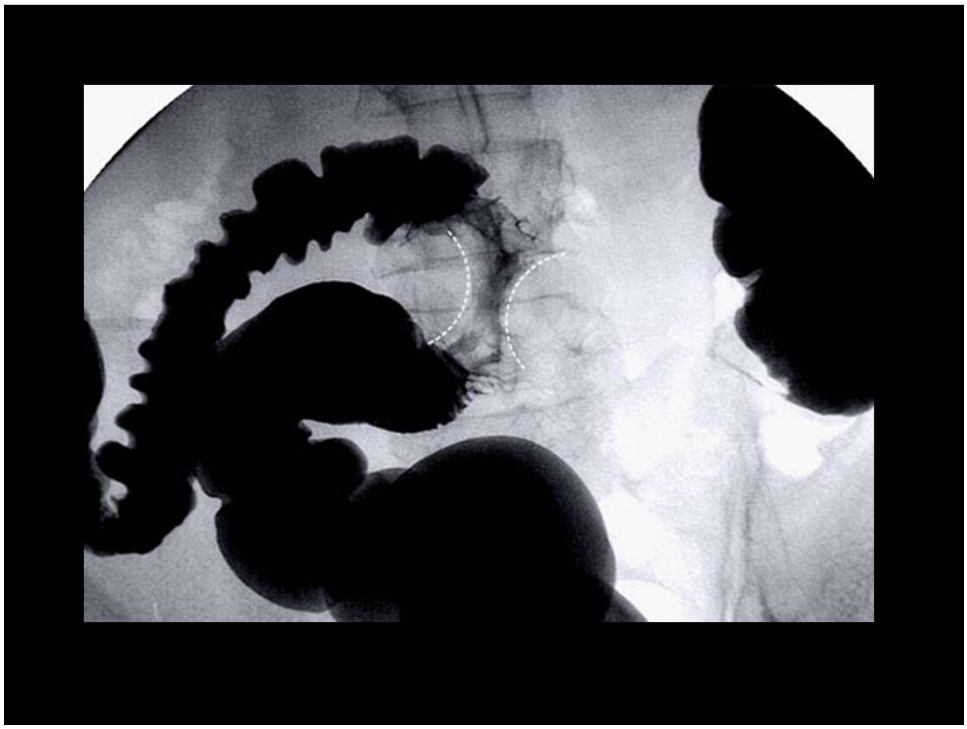

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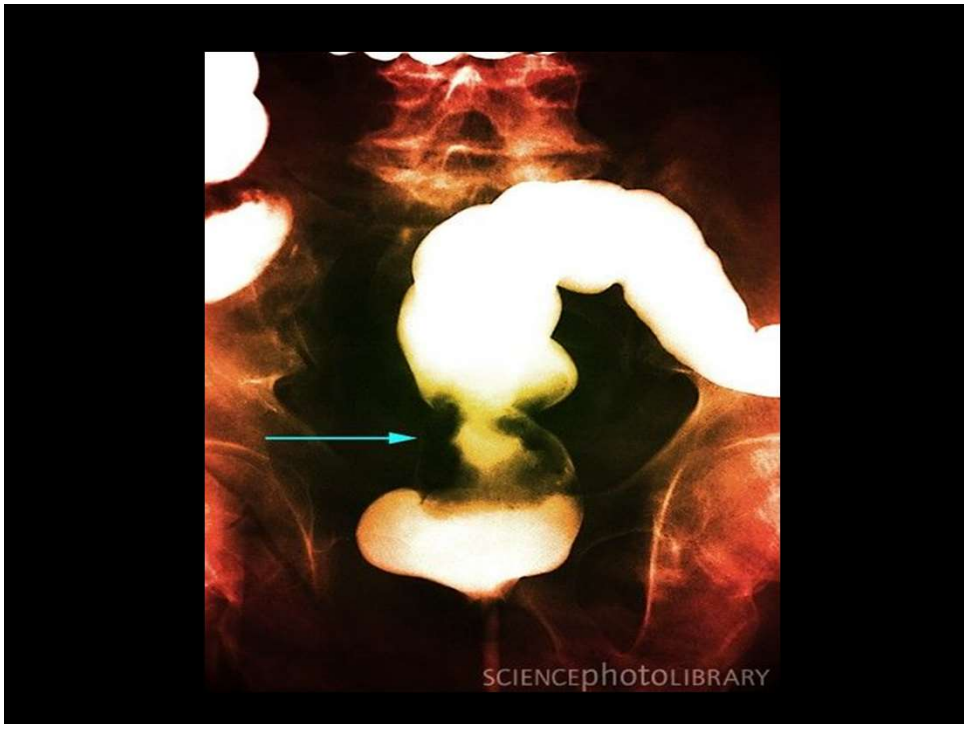

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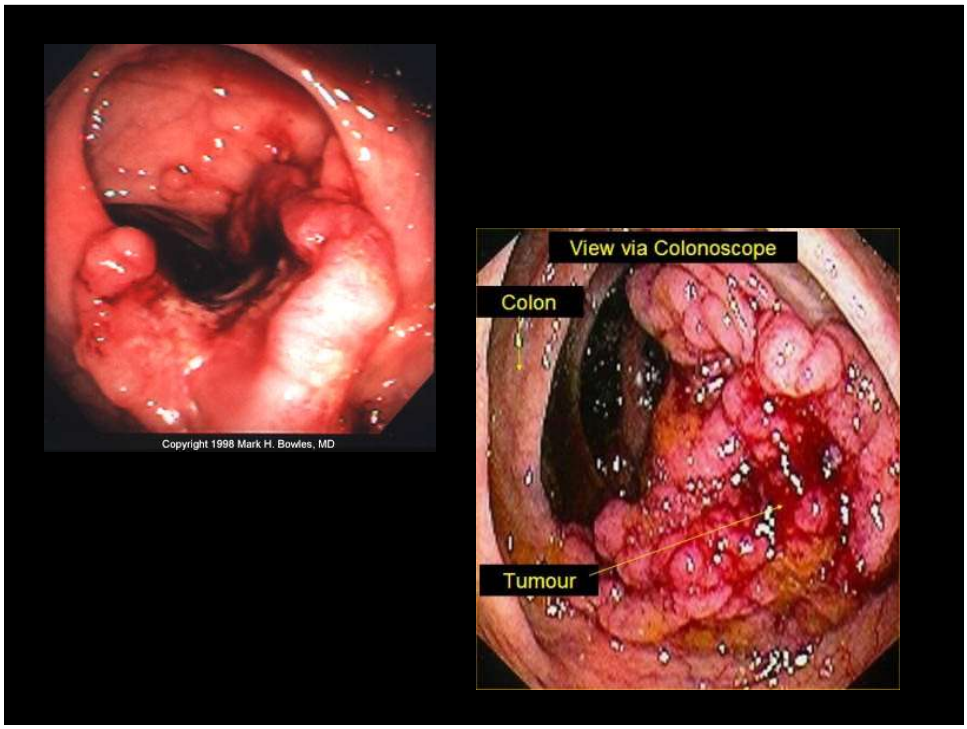
Copyright 1998 Mark H. Bowles, MD
View via Colonoscope
Colon
Tumour

23


A.D.A.M.

24

Intussusception

Telescoping of one part of intestinal tract into another because of peristalsis which forces the proximal segment of bowel to move distally w/in the ensheathing outer portion

Cause: idiopathic

Complications: Constrict blood supply and produce necrosis of bowel

Radiographic Appearance: Coiled – spring

Technical: Normal technique

Prognosis: The outlook for intussusception is usually good with early diagnosis and treatment. Early detection and treatment are paramount.

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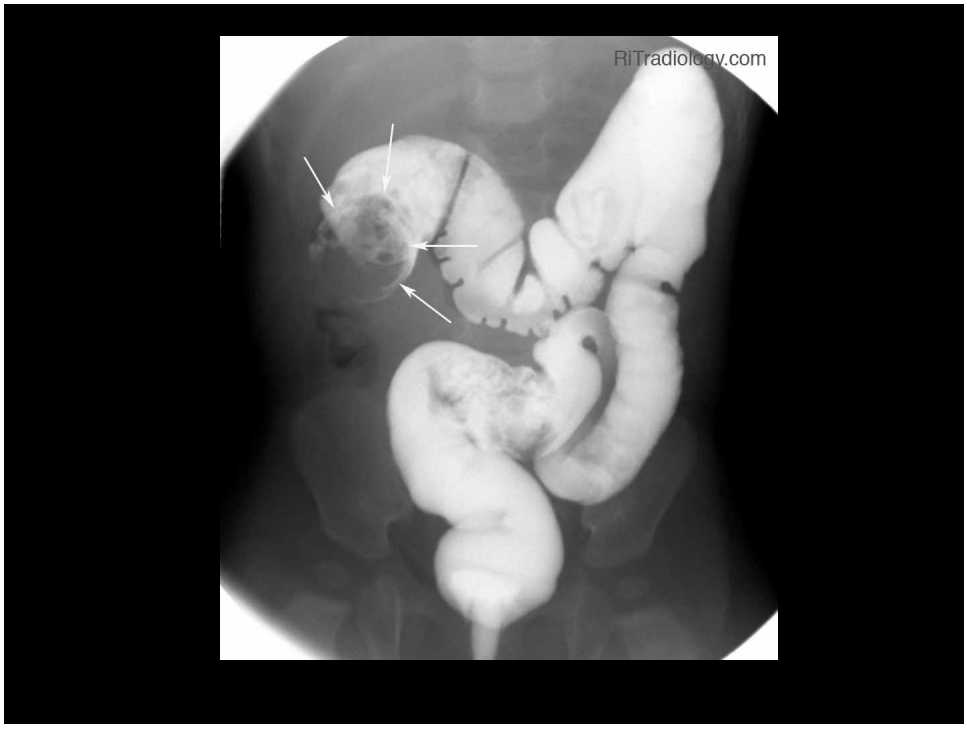

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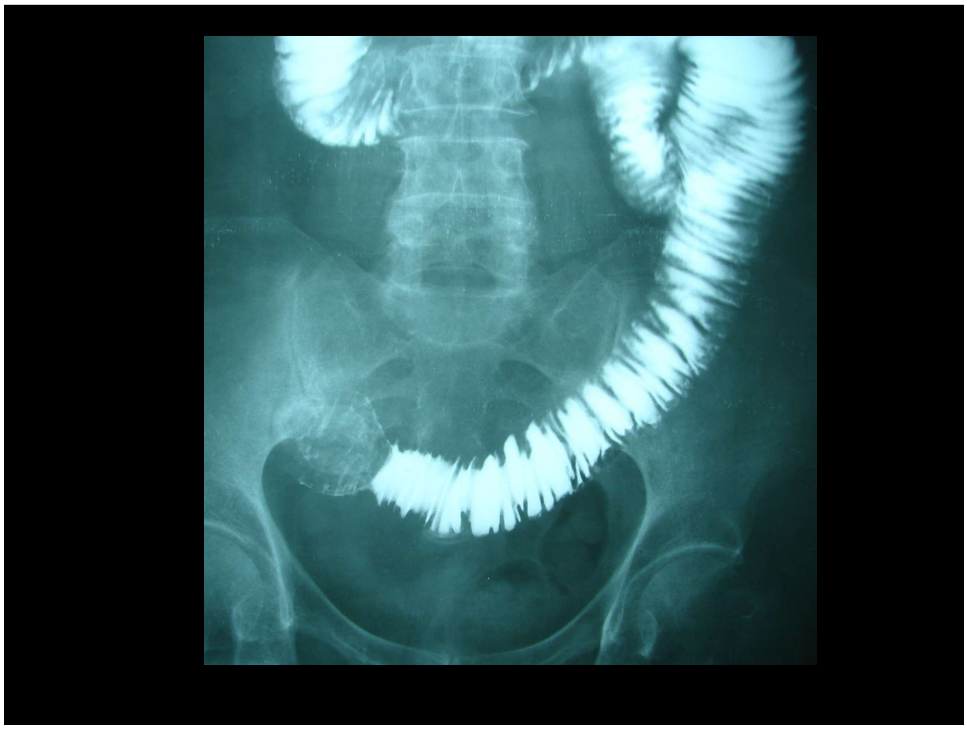

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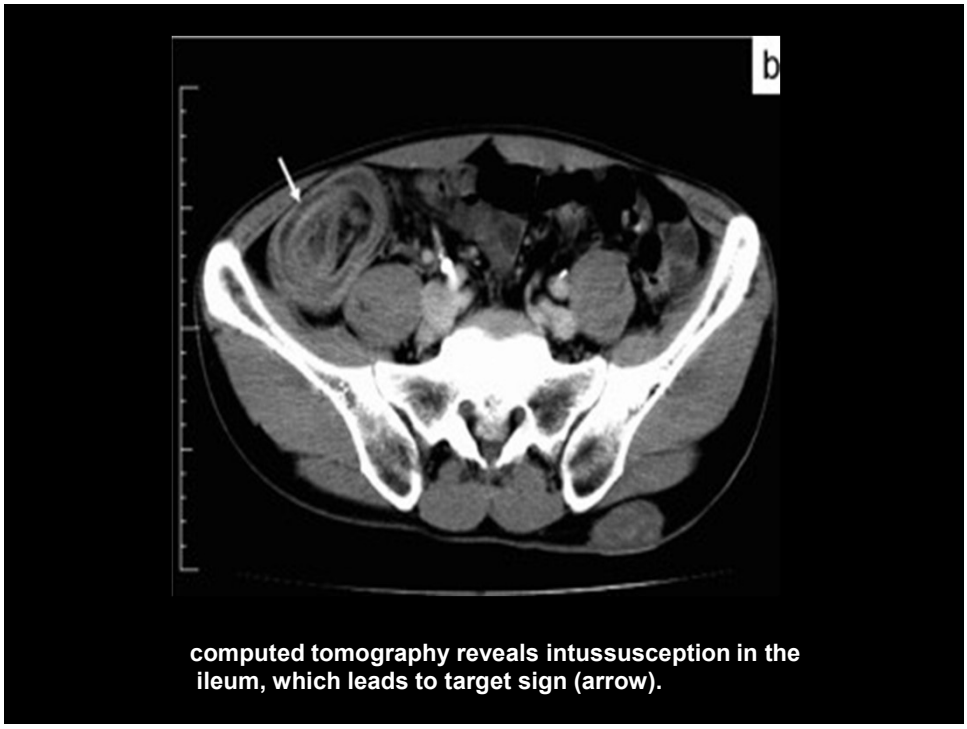

computed tomography reveals intussusception in the ileum, which leads to target sign (arrow).

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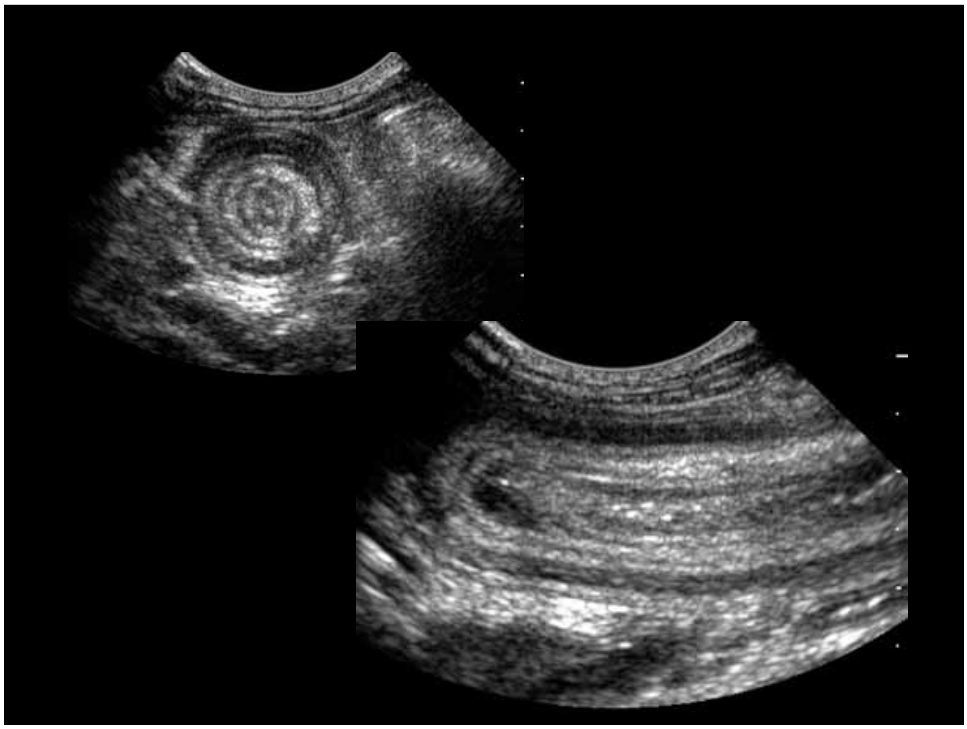

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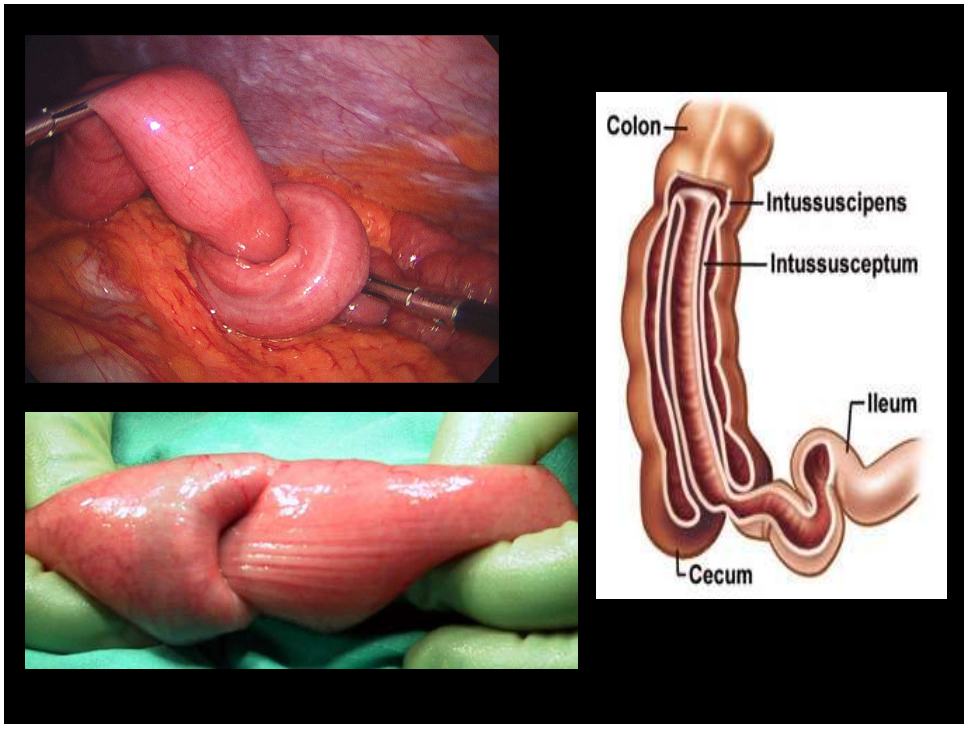

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http://www.nlm.nih.gov/medlineplus/ency/article/000442.htm

Disk Herniation

Protrusion of a intervertebral disk

Major sites: L4-L5, L5-S1, C5-C6, C6-C7, T9-T12

Cause: idiopathic, trauma

Complications:

- Long-term back pain or leg pain
- Loss of movement or feeling in the legs or feet
- Loss of bowel and bladder function
- Permanent spinal cord injury (very rare)

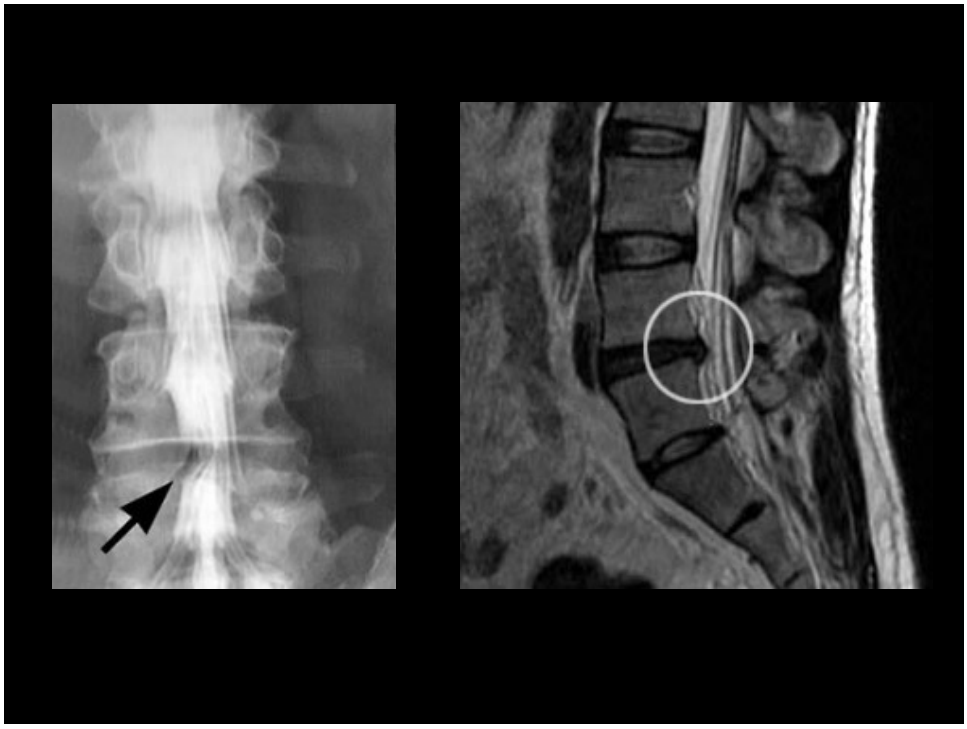
Radiographic Appearance:

- Requires CT, MRI, or myelography to demonstrate impression of the disk on the spinal cord or individual nerve roots

Technical: Normal technique

Prognosis: Most people improve with treatment. But you may have long-term back pain even after treatment

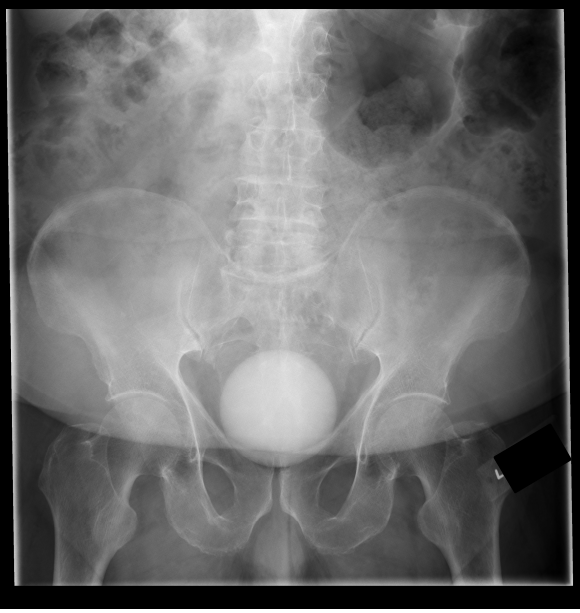
31



32

Interesting Image

FB in Rectum



33

IMAGE CRITIQUE

34

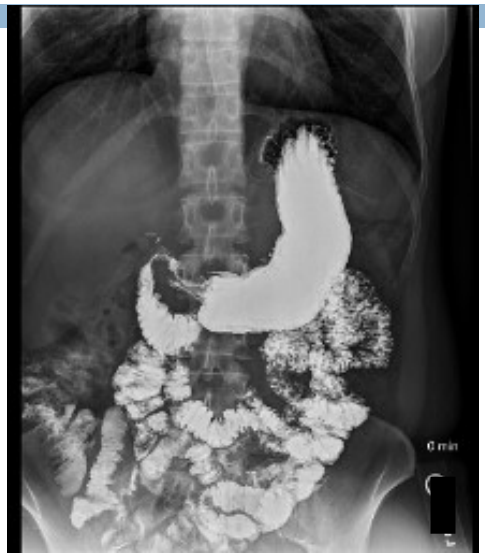
Small Bowel

35

PA Stomach – 0minute

4" above crest slightly off center to left

- Evidence of proper collimation and presence of side marker placed clear of anatomy of interest
- Entire stomach and duodenal loop
- Stomach centered at the level of the pylorus
- No rotation of the patient
- Penetration of the contrast medium
- Surrounding anatomy
- Best to see **body** of stomach; **medial, lateral margins**



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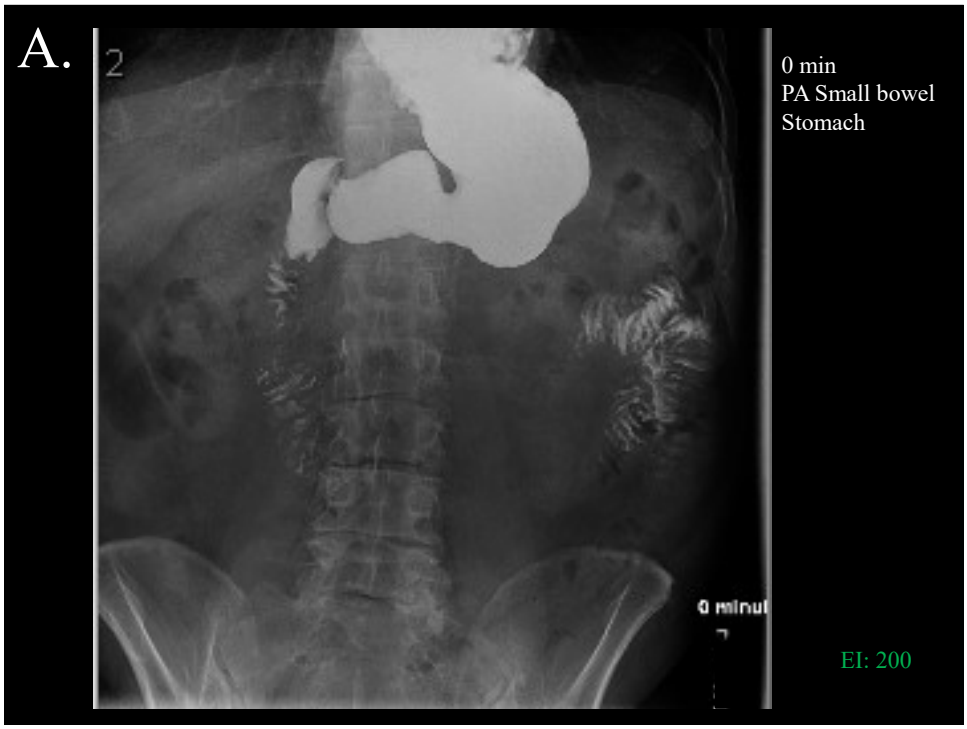
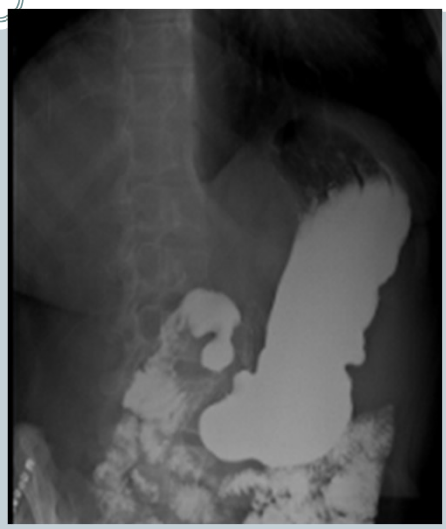


37

RAO Stomach

4" above crest, Bisect spine and lateral border of elevated side, collimate 11x14

- Evidence of proper collimation and presence of side marker placed clear of anatomy of interest
- Entire stomach and duodenal loop
- No superimposition of the pylorus and duodenal bulb
- Duodenal bulb and loop in profile
- Stomach centered at the level of the pylorus
- Penetration of the contrast medium
- Surrounding anatomy
- **Best view to see the duodenal bulb filled with barium. .**



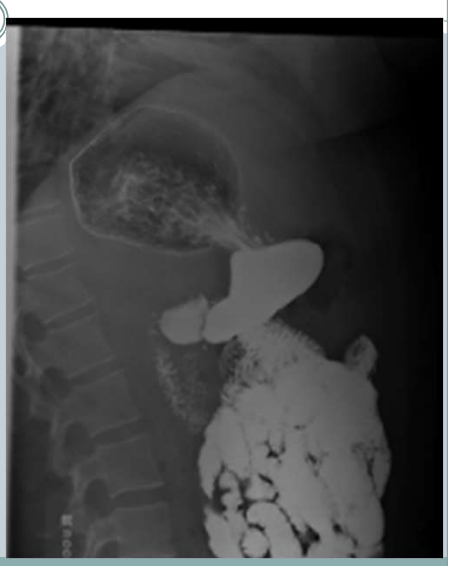
No time marker/ annotation

38

Right Lateral Stomach

4" above crest, Bisect axillary line & anterior abdomen, collimate 11x14

- Evidence of proper collimation and presence of side marker placed clear of anatomy of interest
- Entire stomach and duodenal loop
- No rotation of the patient, as shown by the vertebrae
- Stomach centered at the level of the pylorus
- Penetration of the contrast medium
- Surrounding anatomy
- Best to see the **retrogastric area and loop in profile; anterior, posterior margins.**

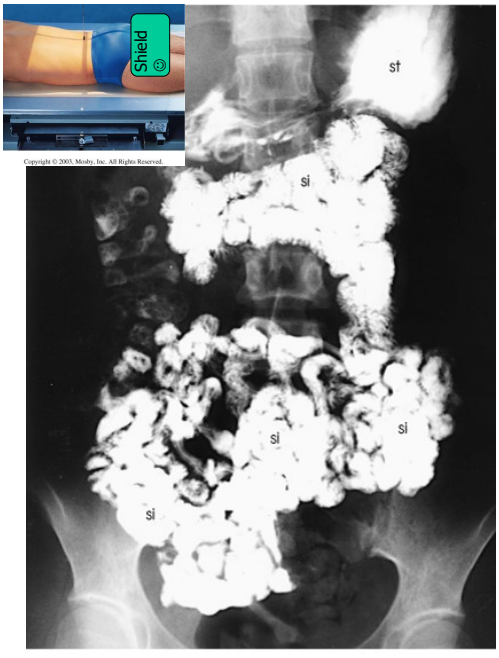


No time marker/ annotation

39

PA/AP (follow through)

- Evidence of proper collimation and presence of side marker placed clear of anatomy of interest
- Entire small intestine on each image
- Stomach on initial image
- Time marker
- Vertebral column centered on the image
- No rotation of the patient
- Penetration of contrast medium
- Complete examination when barium reaches the cecum



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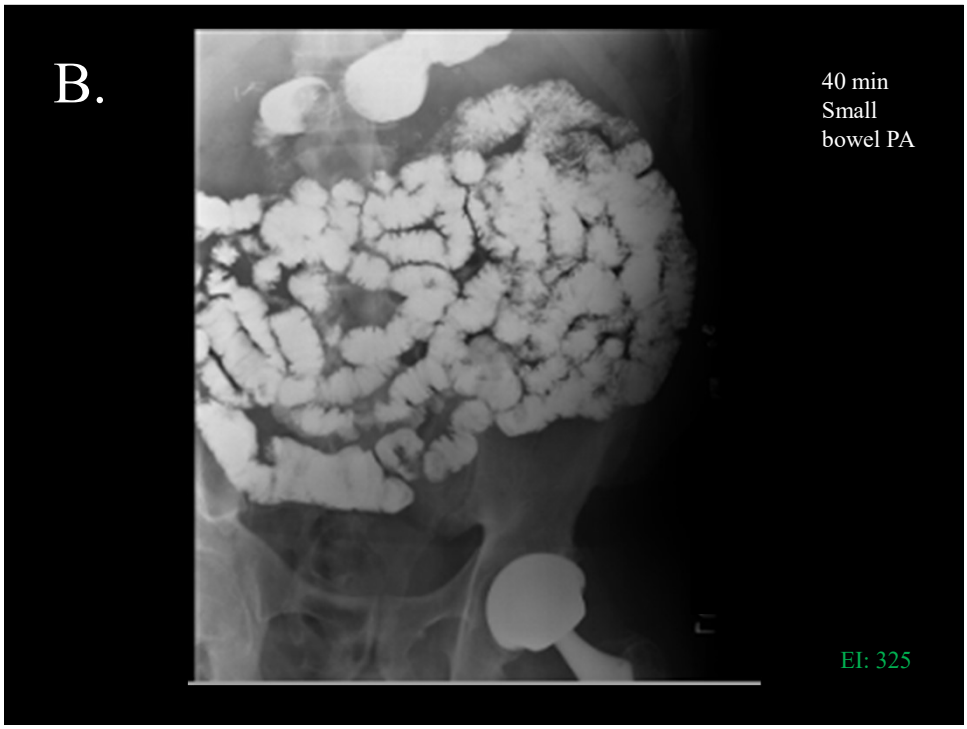

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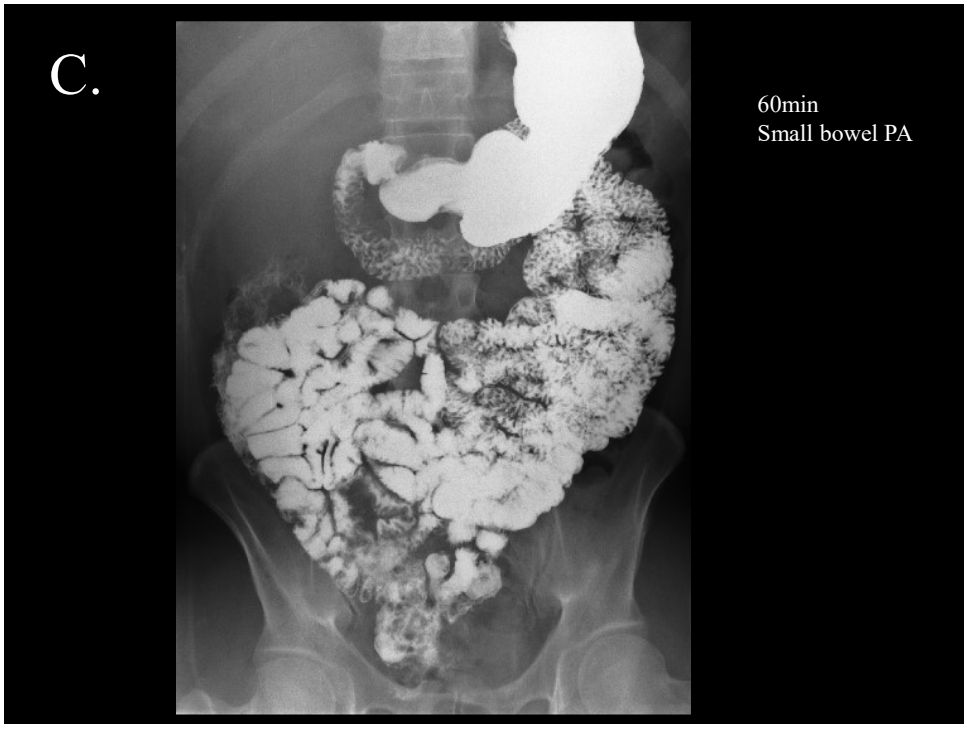

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Single BE

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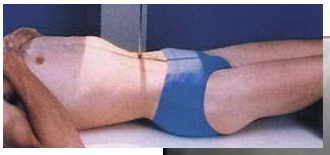
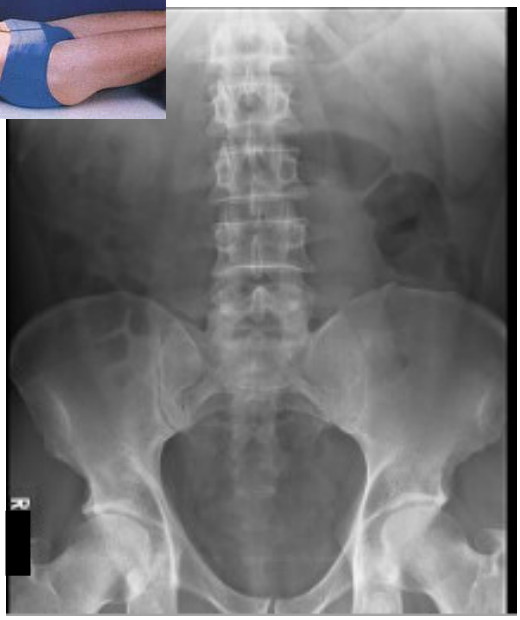
Scout





- Symphysis needs to be included
- No rotation

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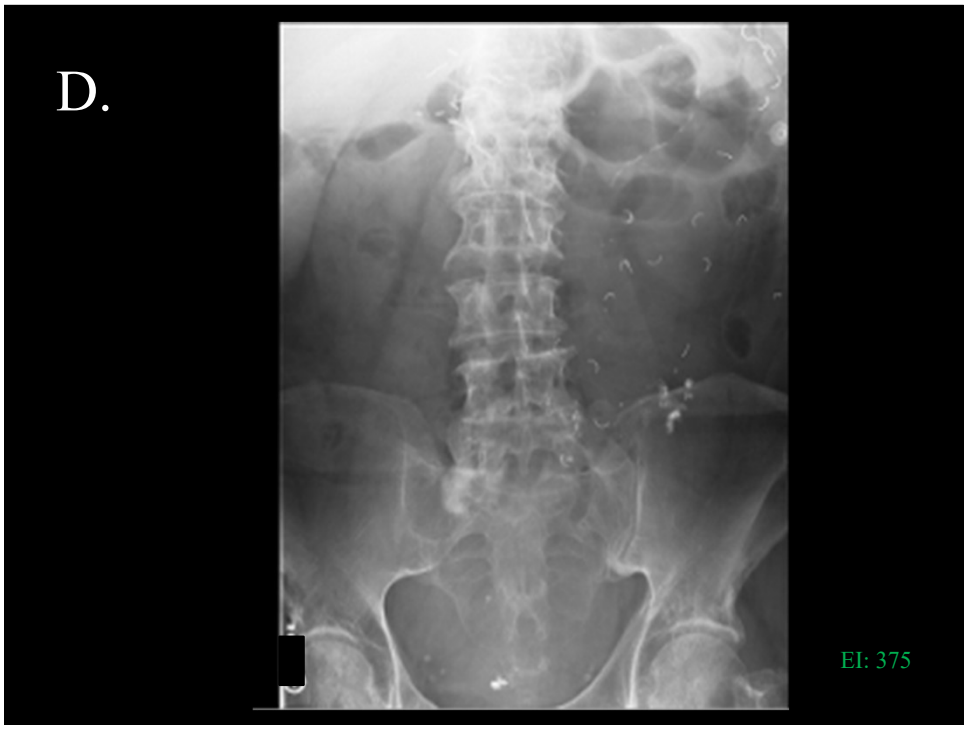

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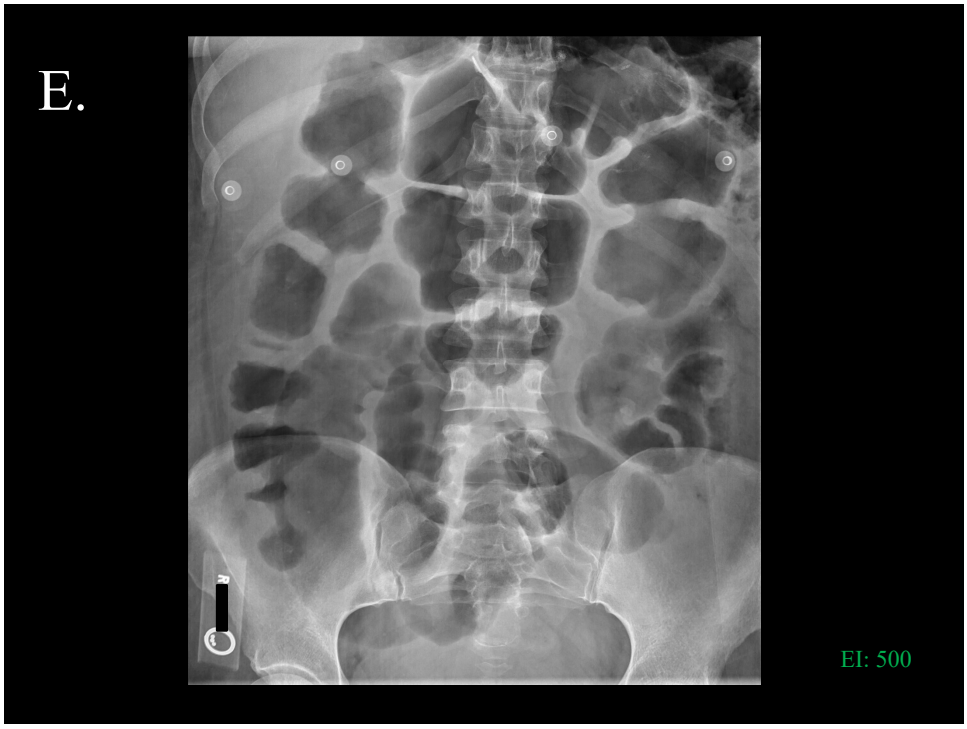

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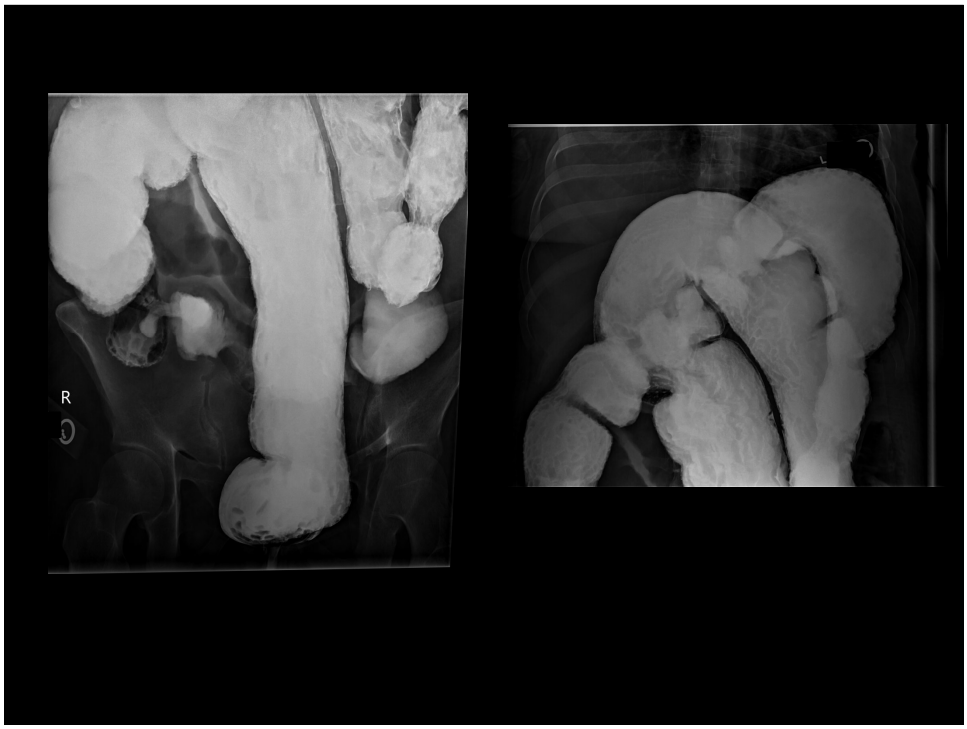

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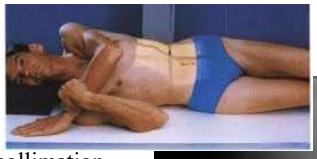
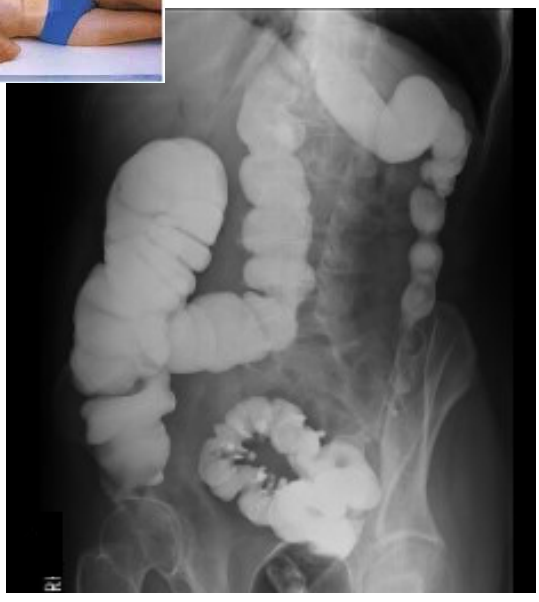


RPO

- Evidence of proper collimation and presence o side marker placed clear of anatomy of interest
- Entire colon
- Left colic flexure and descending colon
- Penetration of the contrast medium

Helpful Hints:

1. RPO
   a) left pelvic wing on end, right pelvic wing flattened. Lumbar pedicle mid vertebral body.
2. LEFT (splenic) flexure less superimposed than on PA view.
3. Mark Right side down.



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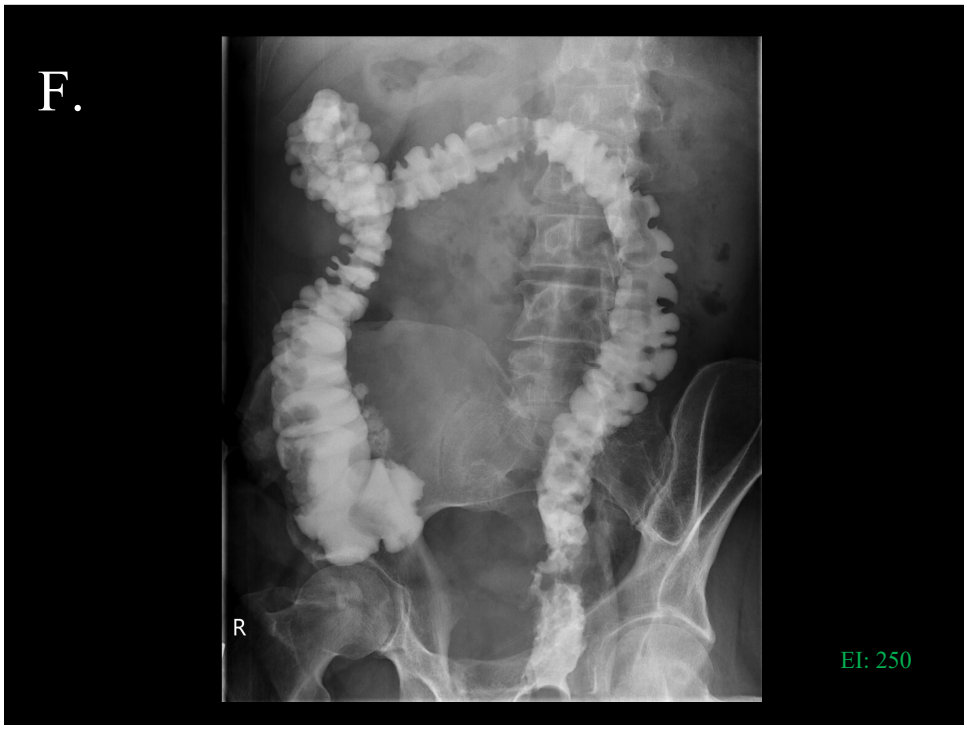

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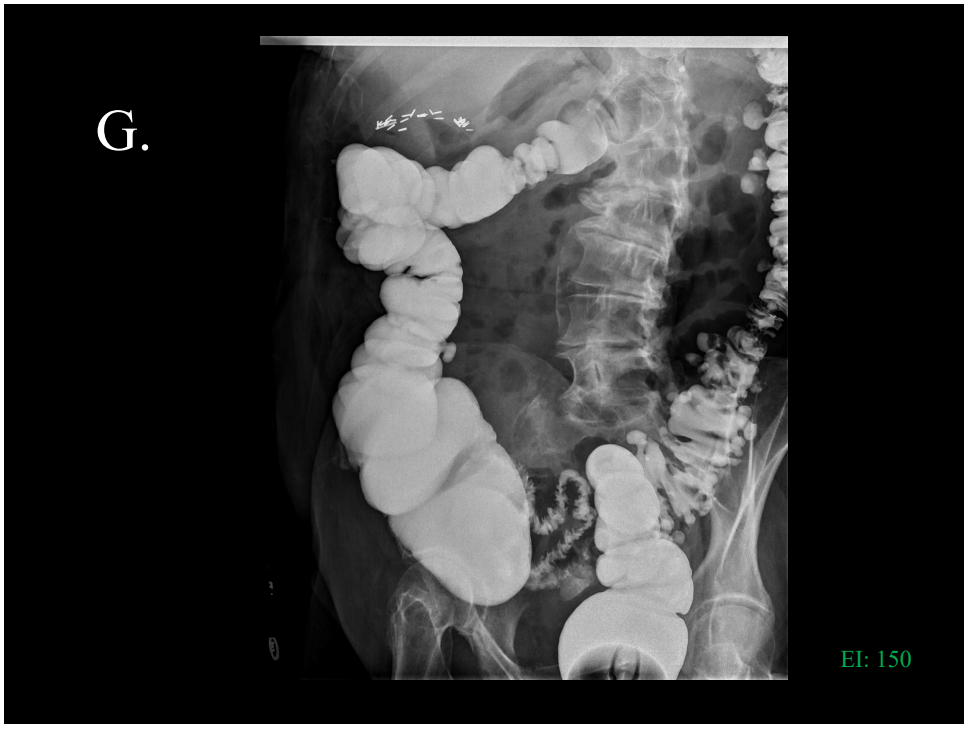

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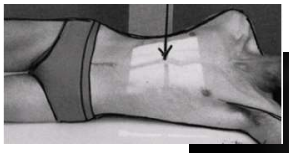
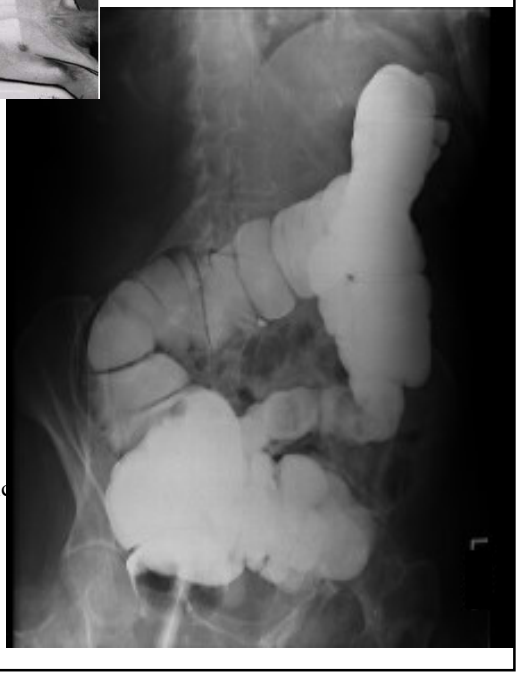


LPO

- Evidence of proper collimation and presence o side marker placed clear of anatomy of interest
- Entire colon
- Right colic flexure less superimposed or open compared with the AP projection
- Ascending colon, cecum, and sigmoid colon
- Penetration of the contrast medium

Helpful Hints:

1. LPO
   a) right pelvic wing on end, left pelvic wing flattened. Lumbar pedicle mid vertebral body.
2. RIGHT(hepatic) flexure less superimposed than on PA view.
3. Mark left side down.



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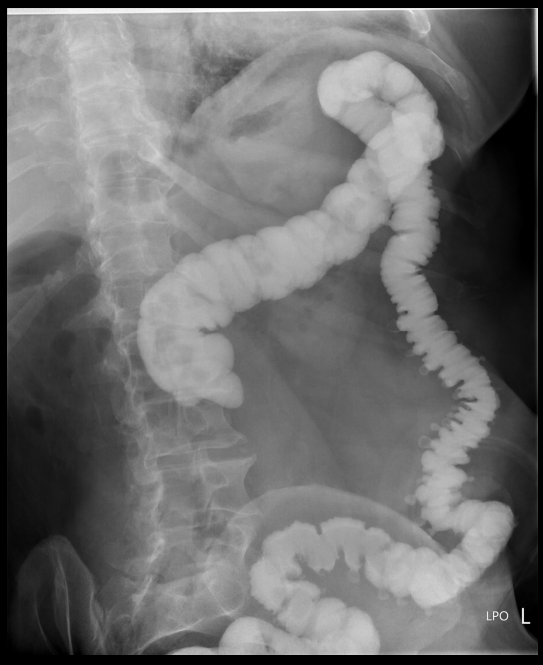
H.



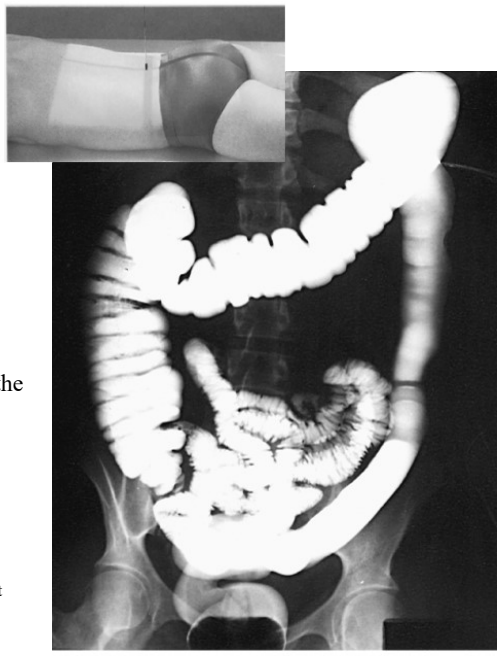
52

PA

- Evidence of proper collimation and presence o side marker placed clear of anatomy of interest
- Entire colon including the flexure and rectum (two image receptors may be necessary for hypersthenic patients)
- Vertebral column centered so that ascending and descending portions of the colon are included
- Penetration of the contrast medium

Helpful Hints:

- Entire **large intestine** is included.
- Symphysis included (rectum is on image)
- RH: Can also see the enema tip. This indicates that you have everything you need included at the bottom if symphysis is not on).



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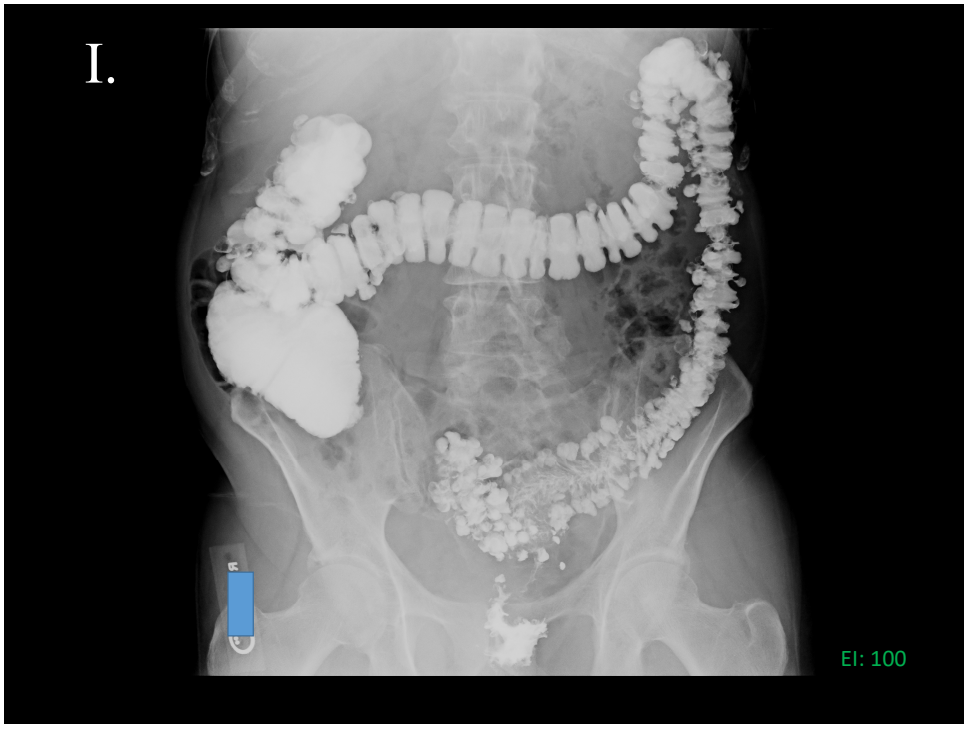

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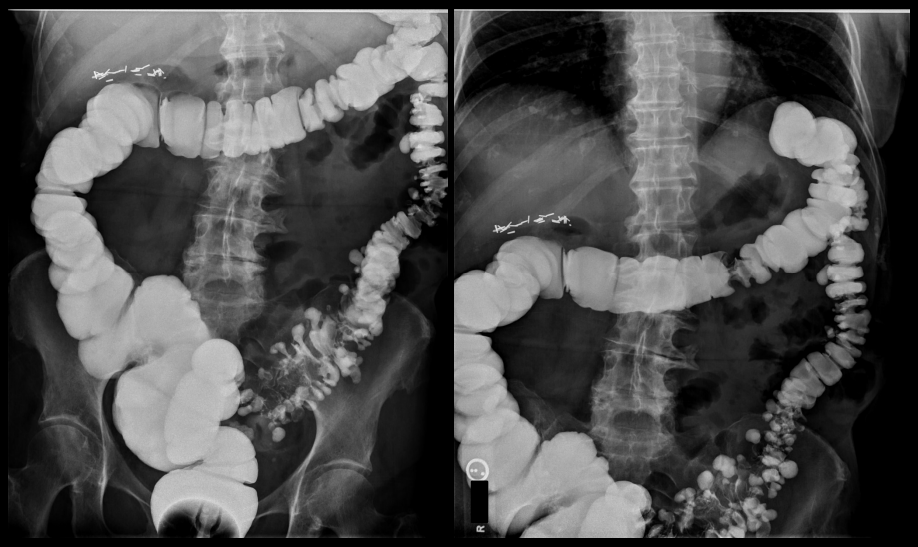
Image is taken AP due to the patient unable to lie prone



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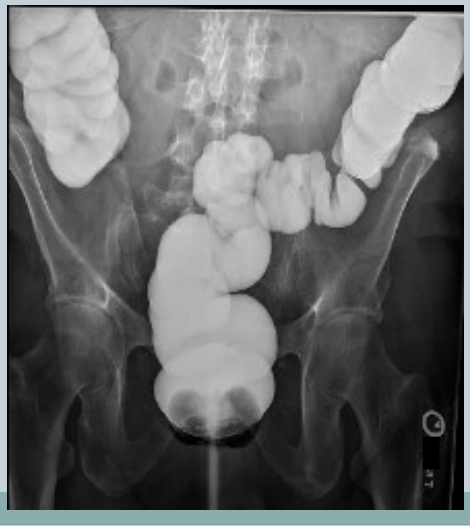
PA Axial (Sigmoid)

- Evidence of proper collimation and presence o side marker placed clear of anatomy of interest
- Rectosigmoid area with less superimposition than in PA projection because of angulation of central ray
- Transverse colon and both flexures not always included
- Penetration of the contrast medium

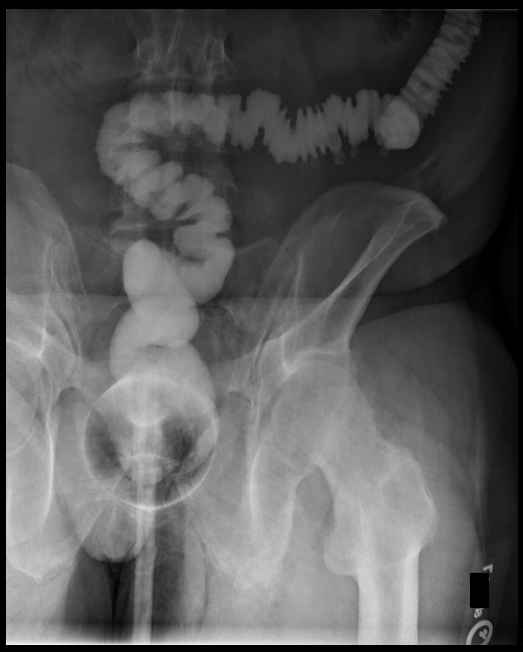
Helpful Hints:

- All of sigmoid colon and rectum included.
- Can see the end of the descending colon.
- No rotation; pelvic wings equal.



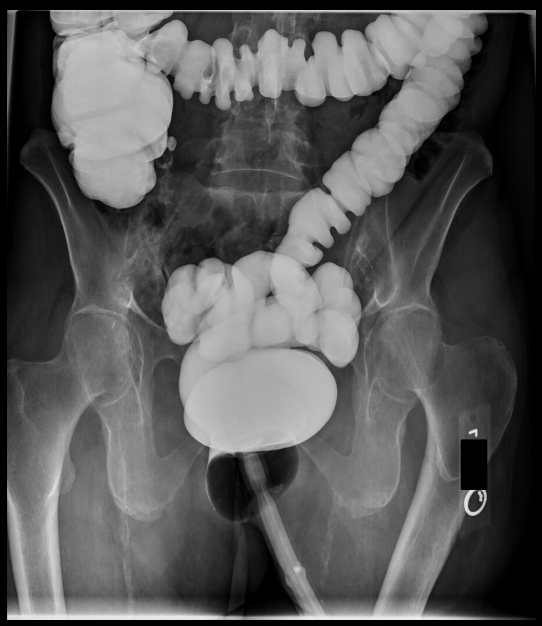
56

J.



57

K.



58

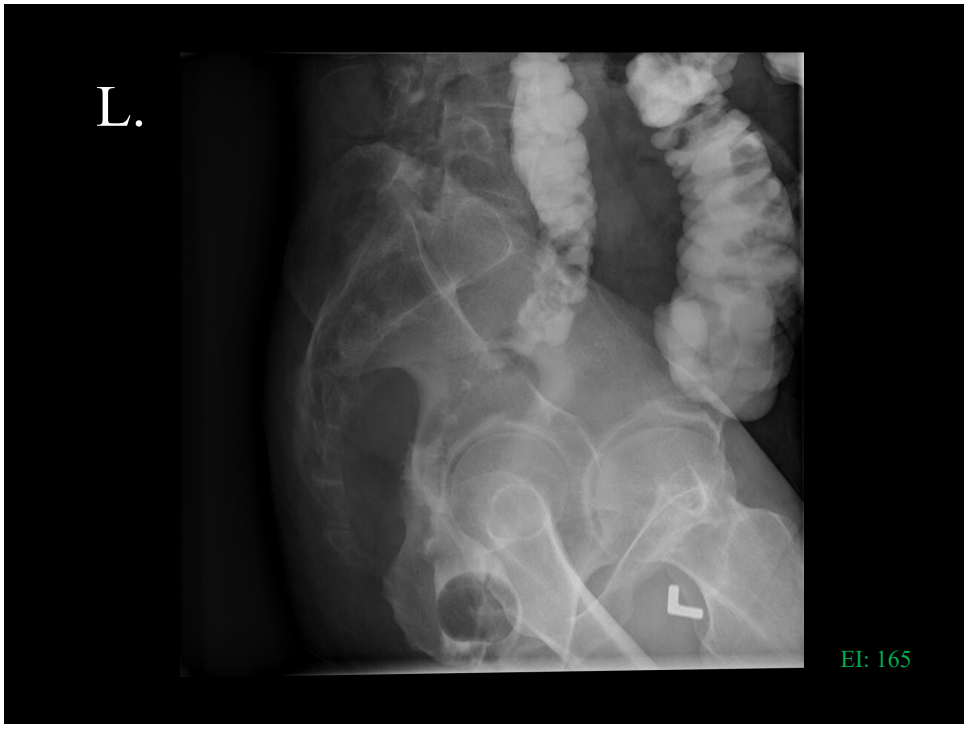
Left Lateral Rectum

(Balloon down)

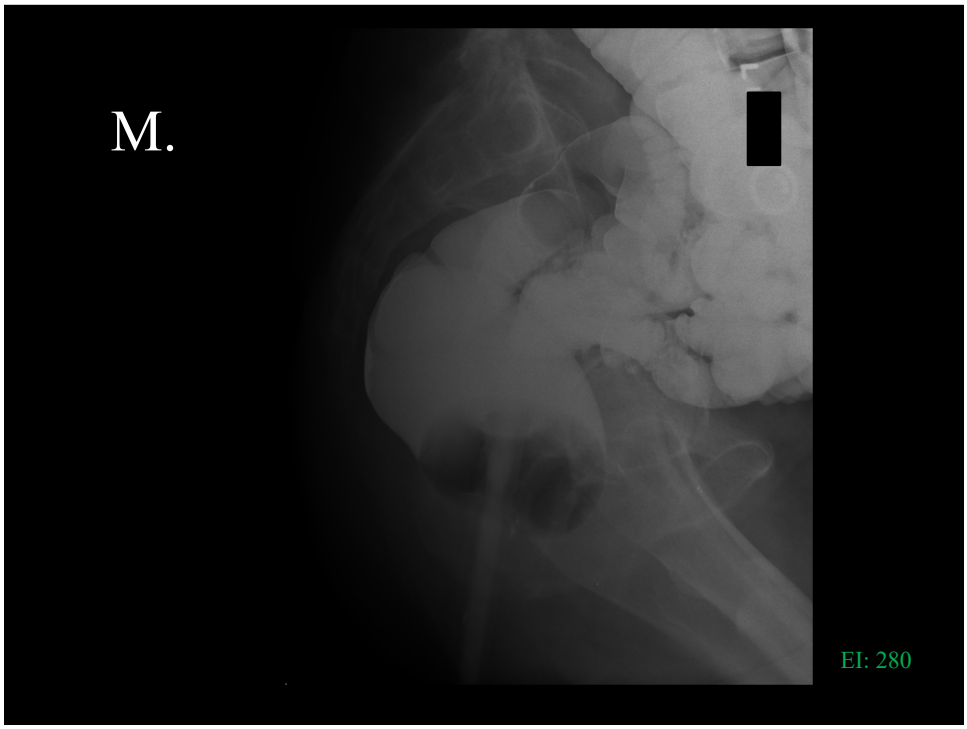
- Evidence of proper collimation and presence o side marker placed clear of anatomy of interest
- Rectosigmoid area in the center of the image
- No rotation of the patient
- Superimposed hips and femora
- Superior portion of colon not included when the rectosigmoid region is area of interest
- Penetration of the contrast medium

RH: deflate balloon prior to exposure

59



60



61

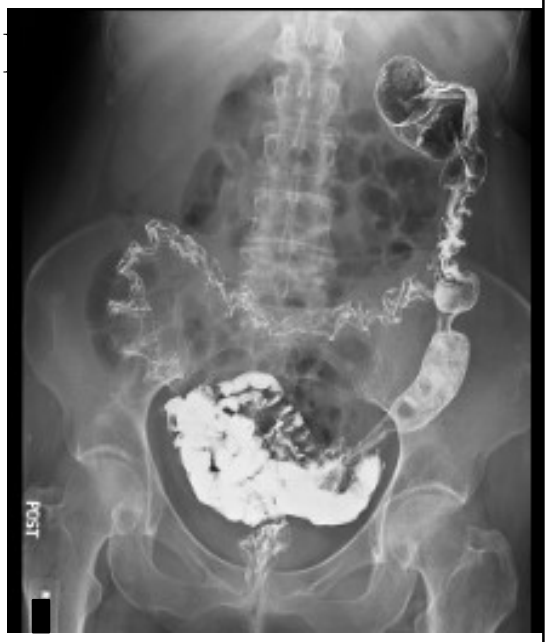
Post Evacuation

*can be taken AP if patient unable to lay prone

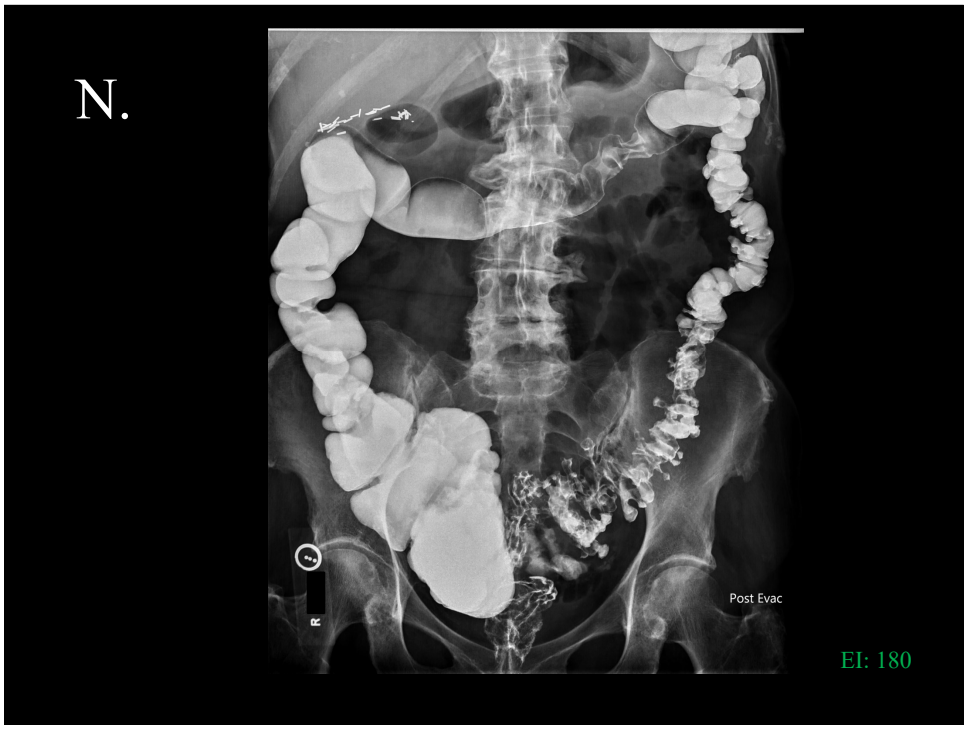
- Same as PA

Helpful Hints:

- Entire **large intestine** is included.
- Symphysis included (rectum is on image)
- No or minimal rotation (look at ribs, spine and pelvis).
- POST marker/annotation
- Residual barium in bowel



62



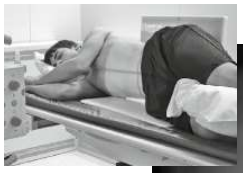
63

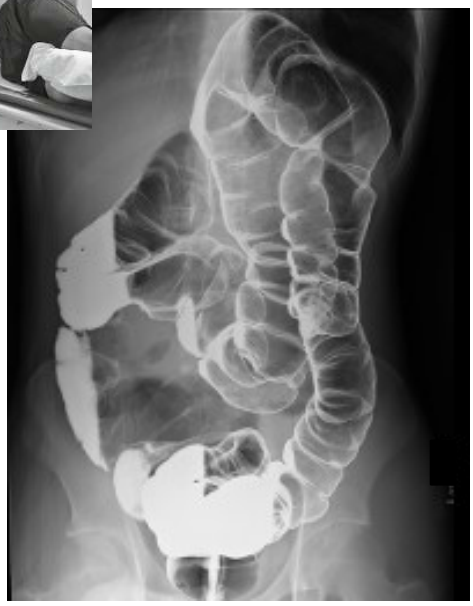
Double BE

64

RLD

Right lateral Decubitus
Measure Patient AP to set technique





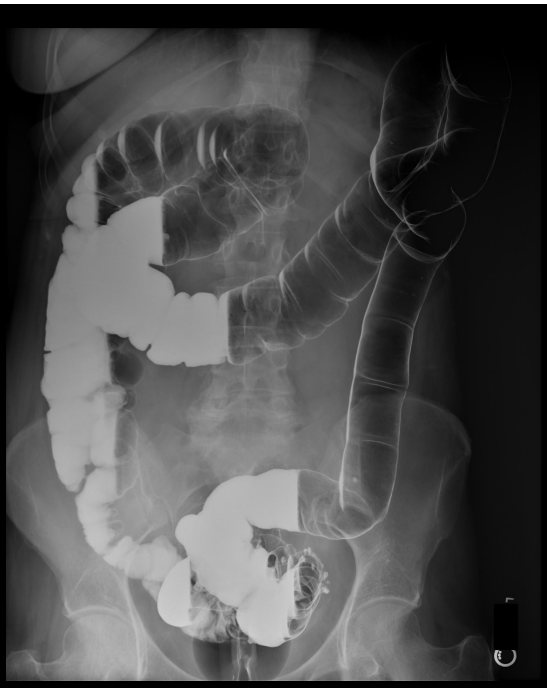
- Evidence of proper collimation and presence of side marker placed clear of anatomy of interest
- Area from the left colic flexure to the rectum
- No rotation of patient, as demonstrated by symmetry of the ribs and pelvis
- The air inflated portion of the colon is of primary importance and should not be over penetrated

Helpful Hint:

•Mark up side (Left)

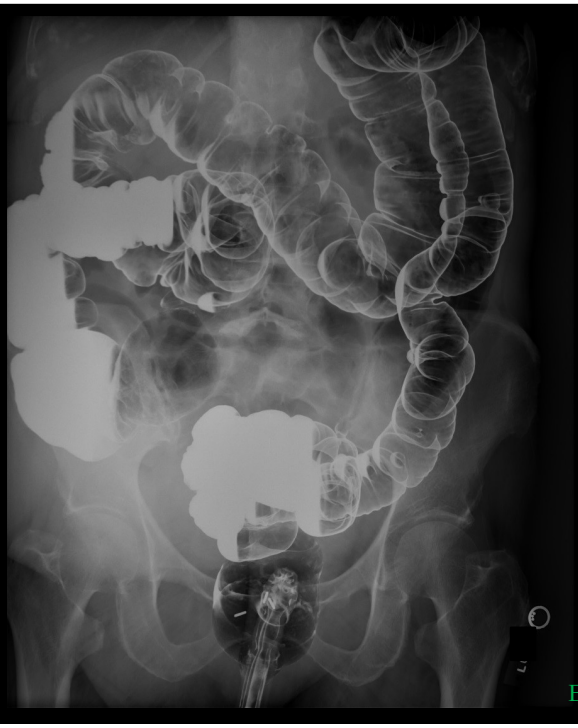
65

O.



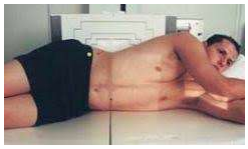
66

P.



67

LLD



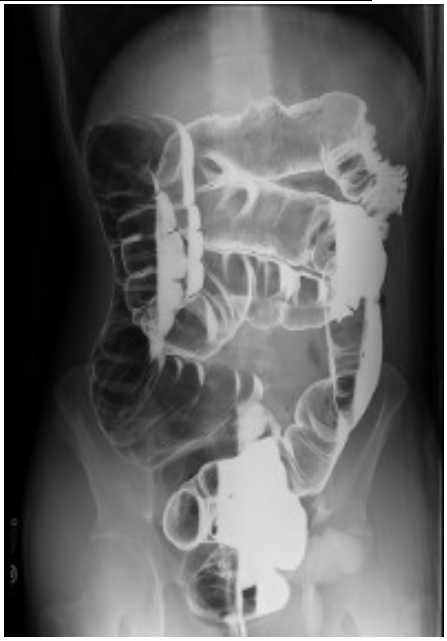
Measure Patient AP to set technique

- Evidence of proper collimation and presence of side marker placed clear of anatomy of interest
- Area from the left colic flexure to the rectum
- No rotation of patient, as demonstrated by symmetry of the ribs and pelvis
- The air inflated portion of the colon is of primary importance and should not be over penetrated

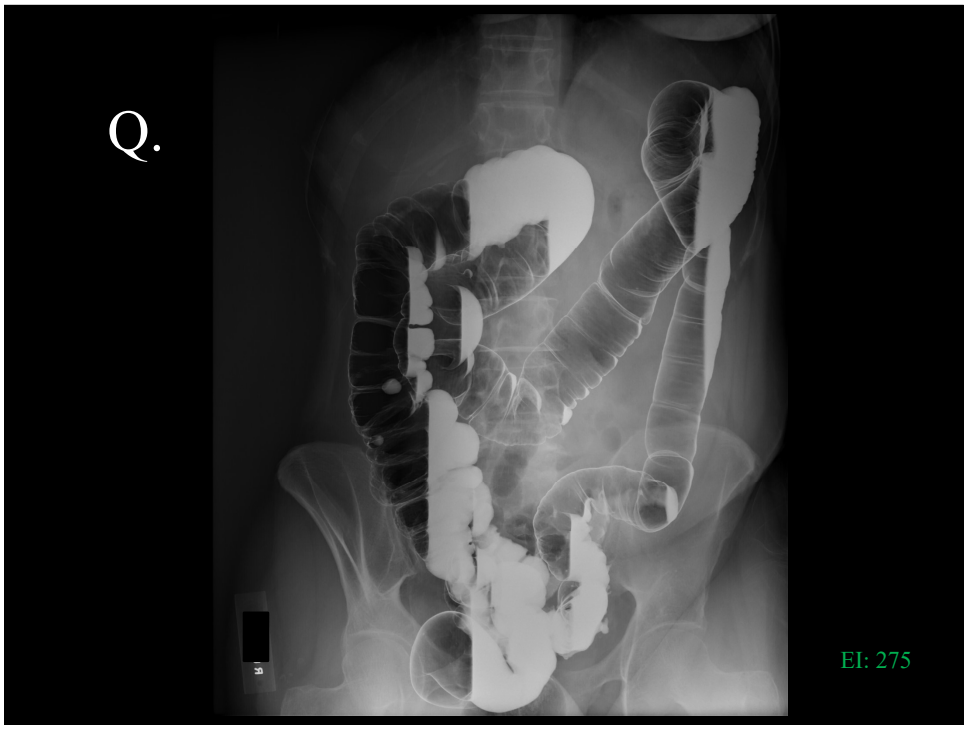
Helpful Hint:

•Mark up side (Right)

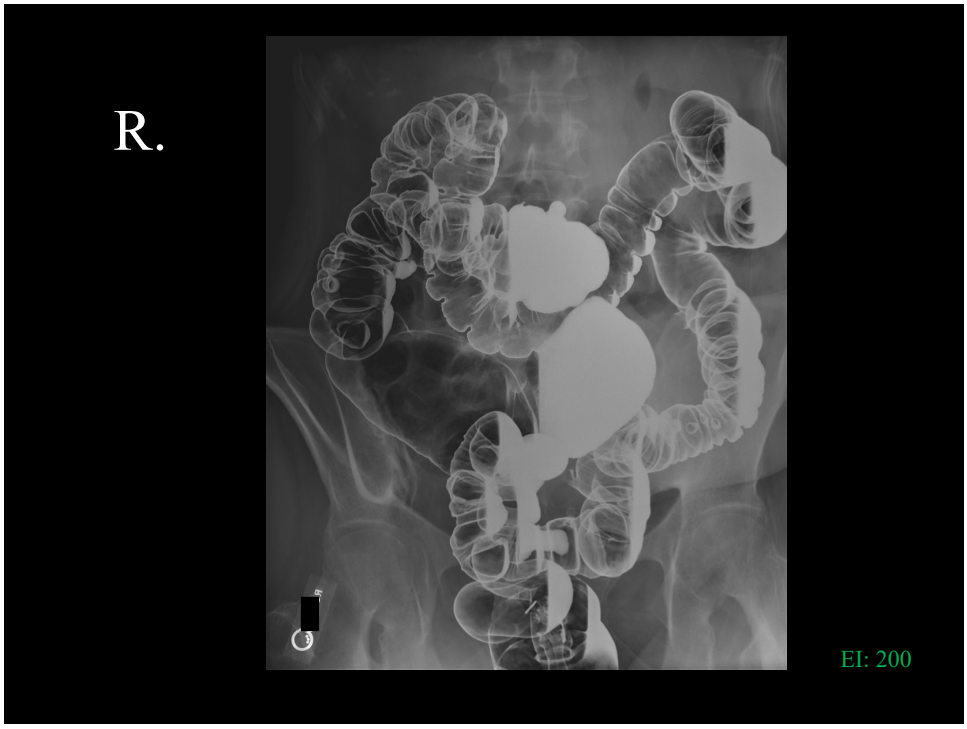
RH: patient faces image receptor



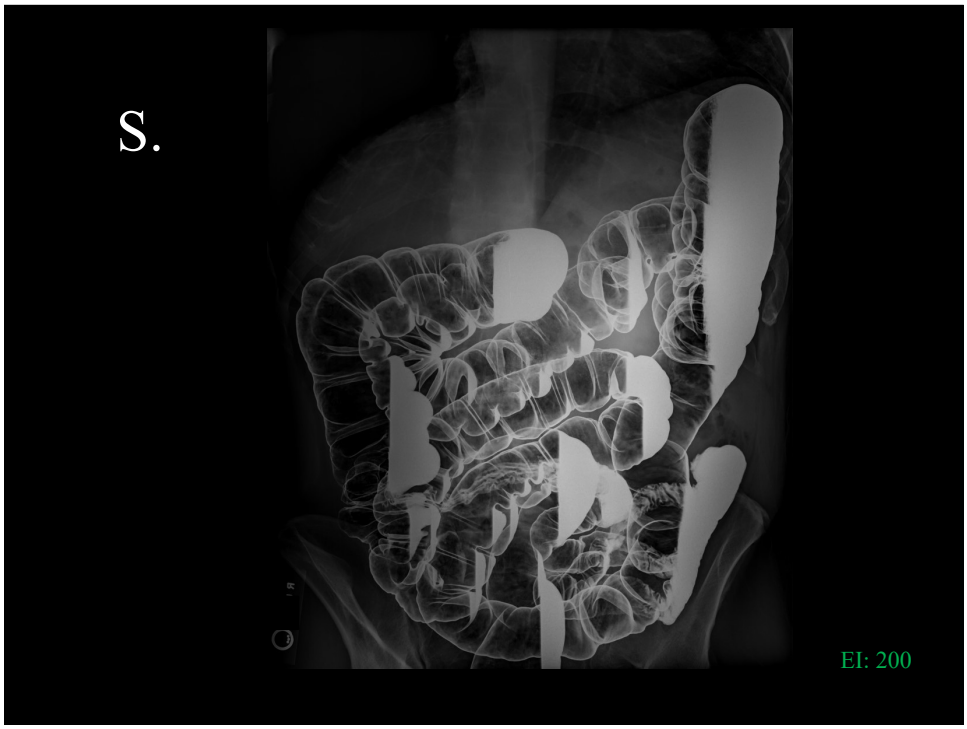
68



69



70



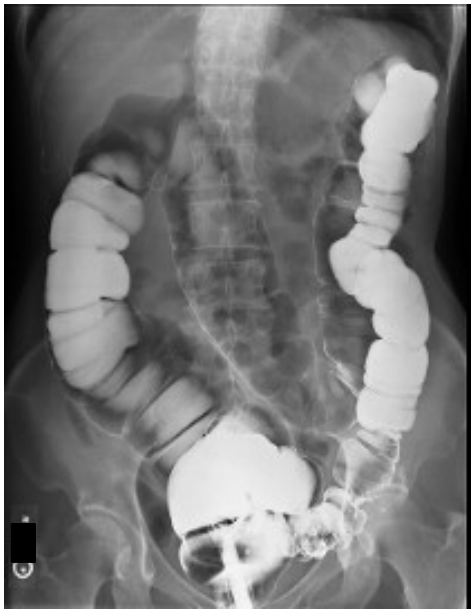
71

AP

- Evidence of proper collimation and presence o side marker placed clear of anatomy of interest
- Entire colon including the flexure and rectum (two image receptors may be necessary for hypersthenic patients)
- Vertebral column centered so that ascending and descending portions of the colon are included
- Penetration of the contrast medium

Helpful Hint:

•Air seen in transverse colon



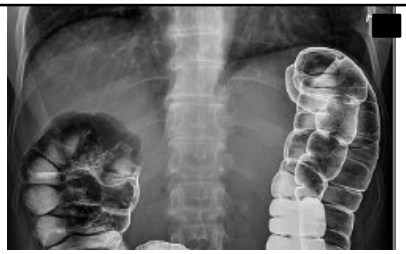
72

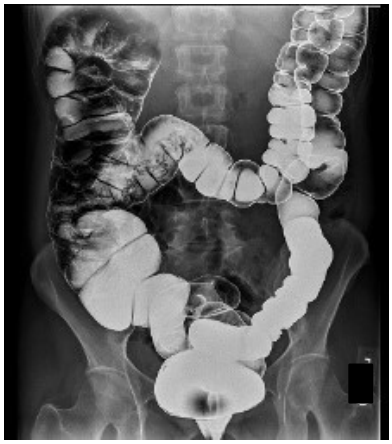
PA

- Evidence of proper collimation and presence o side marker placed clear of anatomy of interest
- Entire colon including the flexure and rectum (two image receptors may be necessary for hypersthenic patients)
- Vertebral column centered so that ascending and descending portions of the colon are included
- Penetration of the contrast medium

Helpful Hint:

•Barium seen in transverse colon

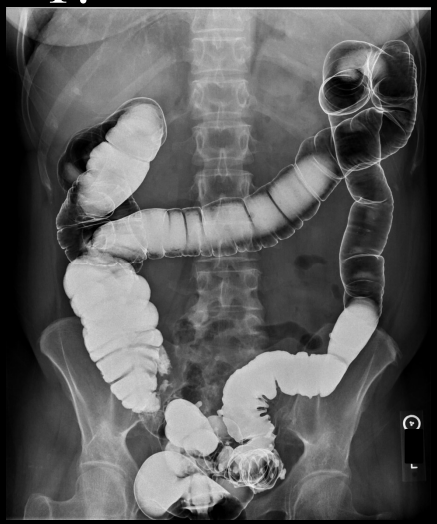




73

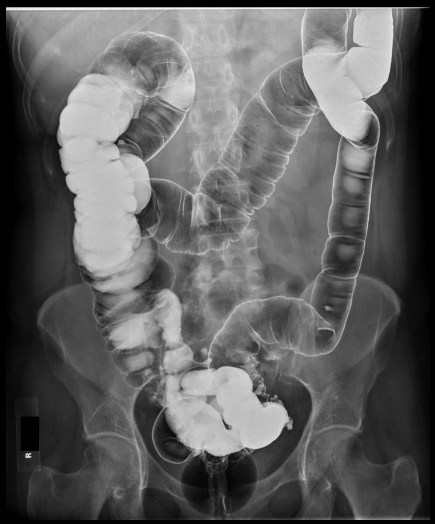
Which is AP vs PA?

T.



EI: 280

U.



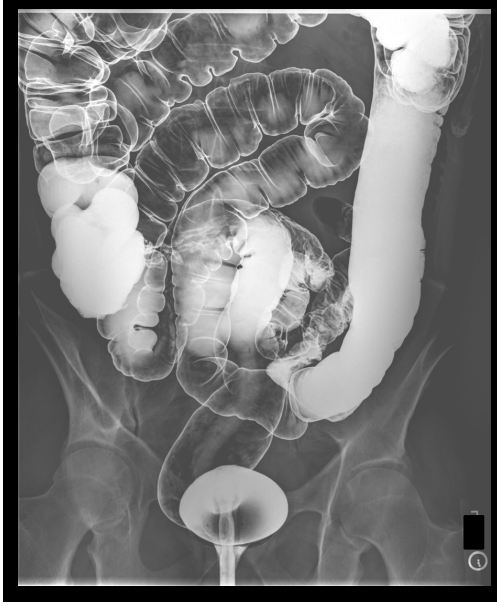
EI: 260

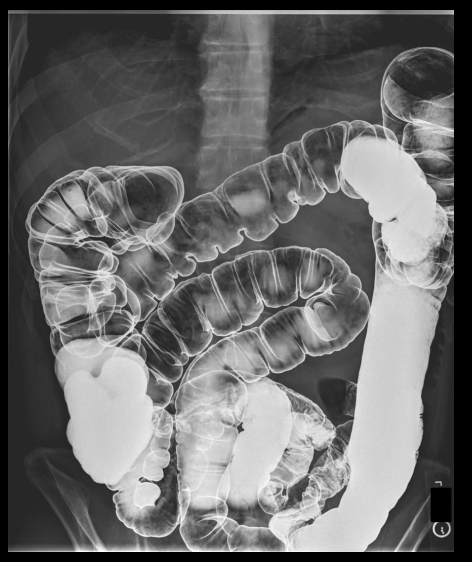
74

V.

EI: 275

EI: 190





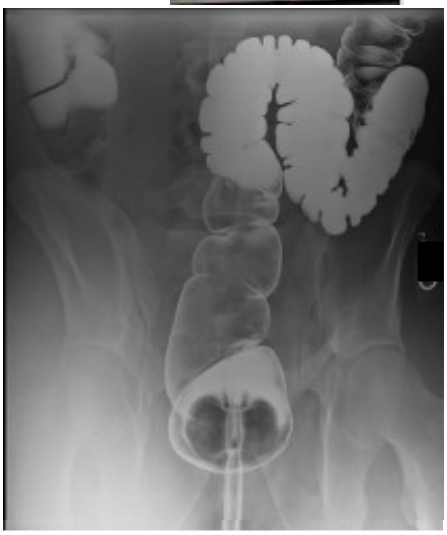
75

PA Axial (Sigmoid)

- Evidence of proper collimation and presence o side marker placed clear of anatomy of interest
- Rectosigmoid area with less superimposition than in PA projection because of angulation of central ray
- Transverse colon and both flexures not always included
- Penetration of the contrast medium

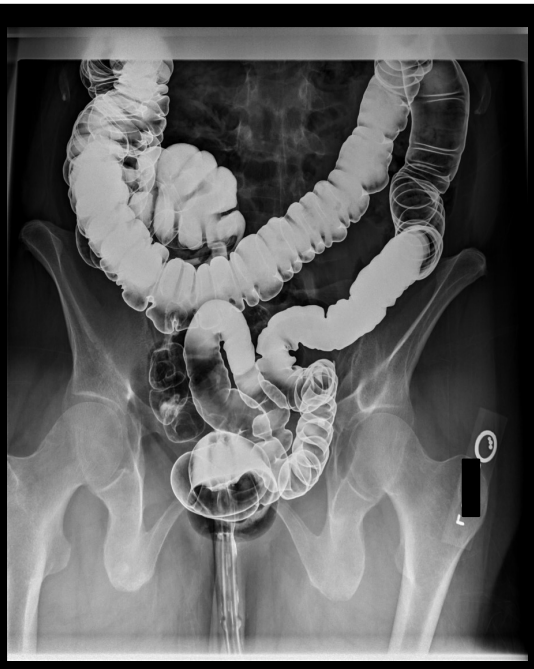
Helpful Hints:

- All of sigmoid colon and rectum included.
- Can see the end of the descending colon.
- No rotation; pelvic wings equal.



76

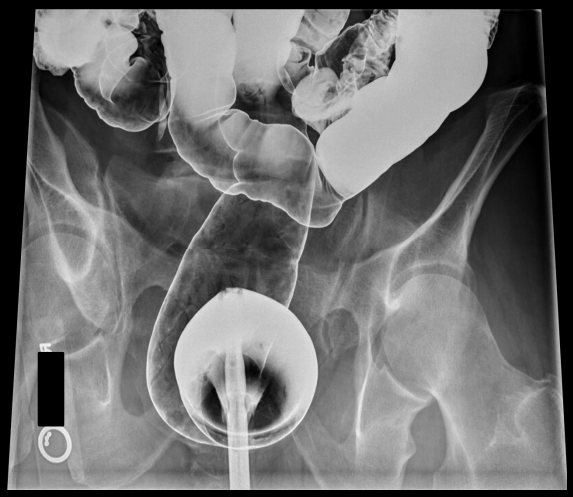
W.



EI: 289

77

X.



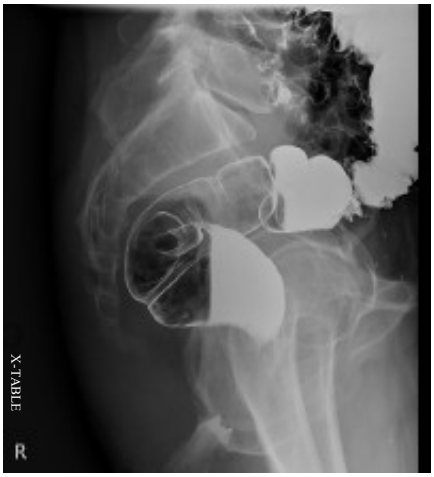
EI: 175

78

Right Lateral X-table Rectum

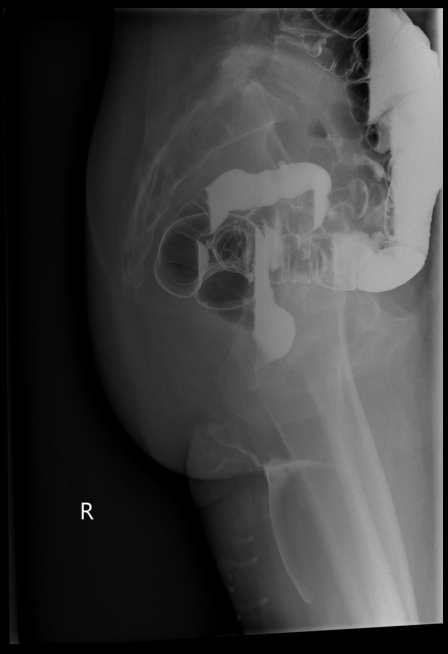
Measure Patient Laterally to set technique

- Evidence of proper collimation and presence o side marker placed clear of anatomy of interest
- Rectosigmoid area visualized and centered
- No rotation of the patient
- Air-fluid level demonstrated
- Enema tip removed for an unobstructed image of the rectum



79

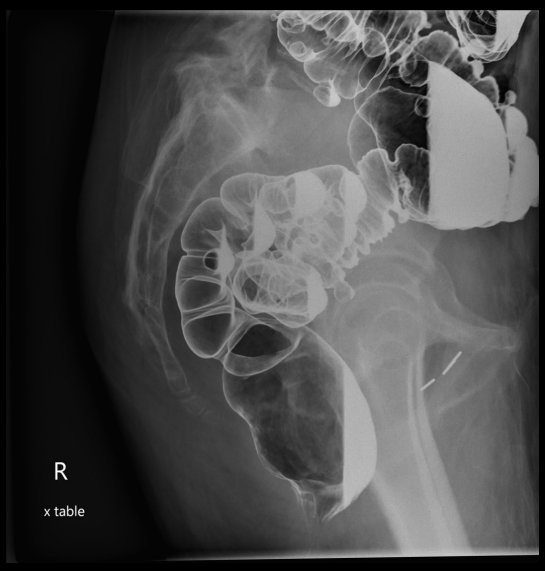
Y.



EI: 160

80

Z.



EI: 240

81