UCSD BOOT CAMP ESOPHAGRAM, UGI, AND PLAIN FILMS

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READ THIS ARTICLE

Gastroesophageal Reflux Disease: Integrating the Barium Esophagram before and after Antireflux Surgery

Mark E. Baker, David M. Einstein, et al

Radiology: Volume 243: Number 2—May 2007

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CONTRAST AGENTS

- Use water-soluble contast agents when there is concern for a leak. Usually post-op
- Otherwise, use barium. Superior coating and opacity
- High density or thick barium – for double contrast/air contrast portions
- Low density or thin barium – for single contrast portions

MOST FREQUENT EXAMS

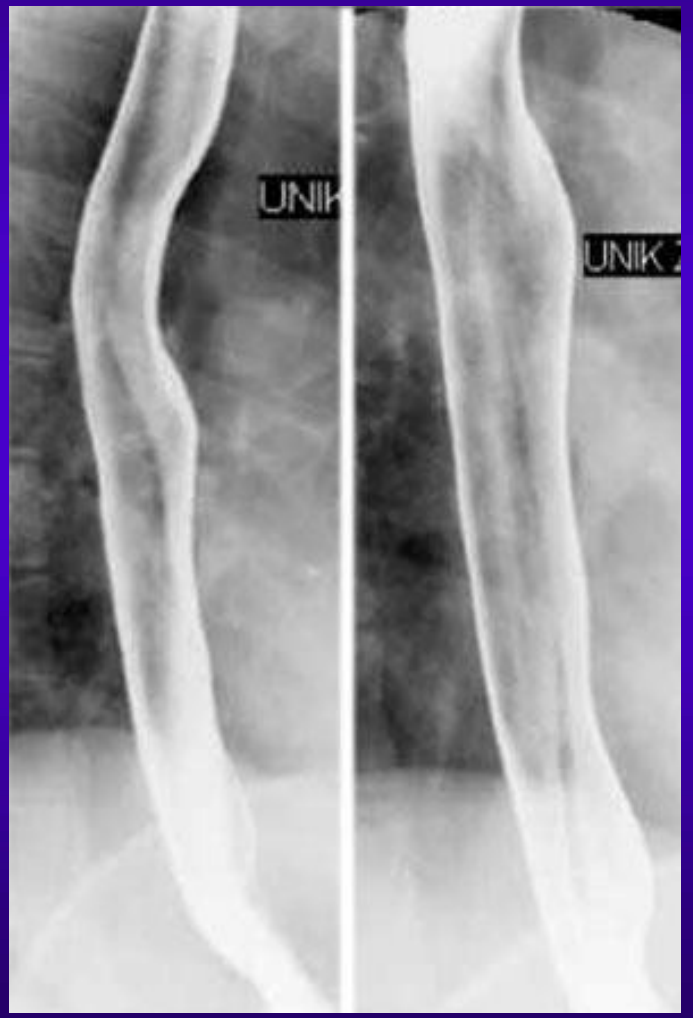
- Esophagram
- UGI – largely replaced by endoscopy
- Small bowel – largely replaced by CT enterography
- Barium enema – largely replaced by colonoscopy and CT colonography
- Post-op exams to exclude leak

BARIUM ESOPHAGRAM TECHNIQUE

- Double contrast esophagram – upright
  - Non reducible hernia
  - Mucosal assessment has limited relevance in pre-op patient
- Double contrast fundus/cardia
- Motility – prone oblique
- Single contrast esophagram – prone oblique
  - Reducible hernia, stricture, ring
- Assess reflux
- Barium tablet

DOUBLE CONTRAST

- First, administer effervescent granules
- Rapidly drink large swallows of barium
- Take 3 or 4 images, especially of distal esophagus



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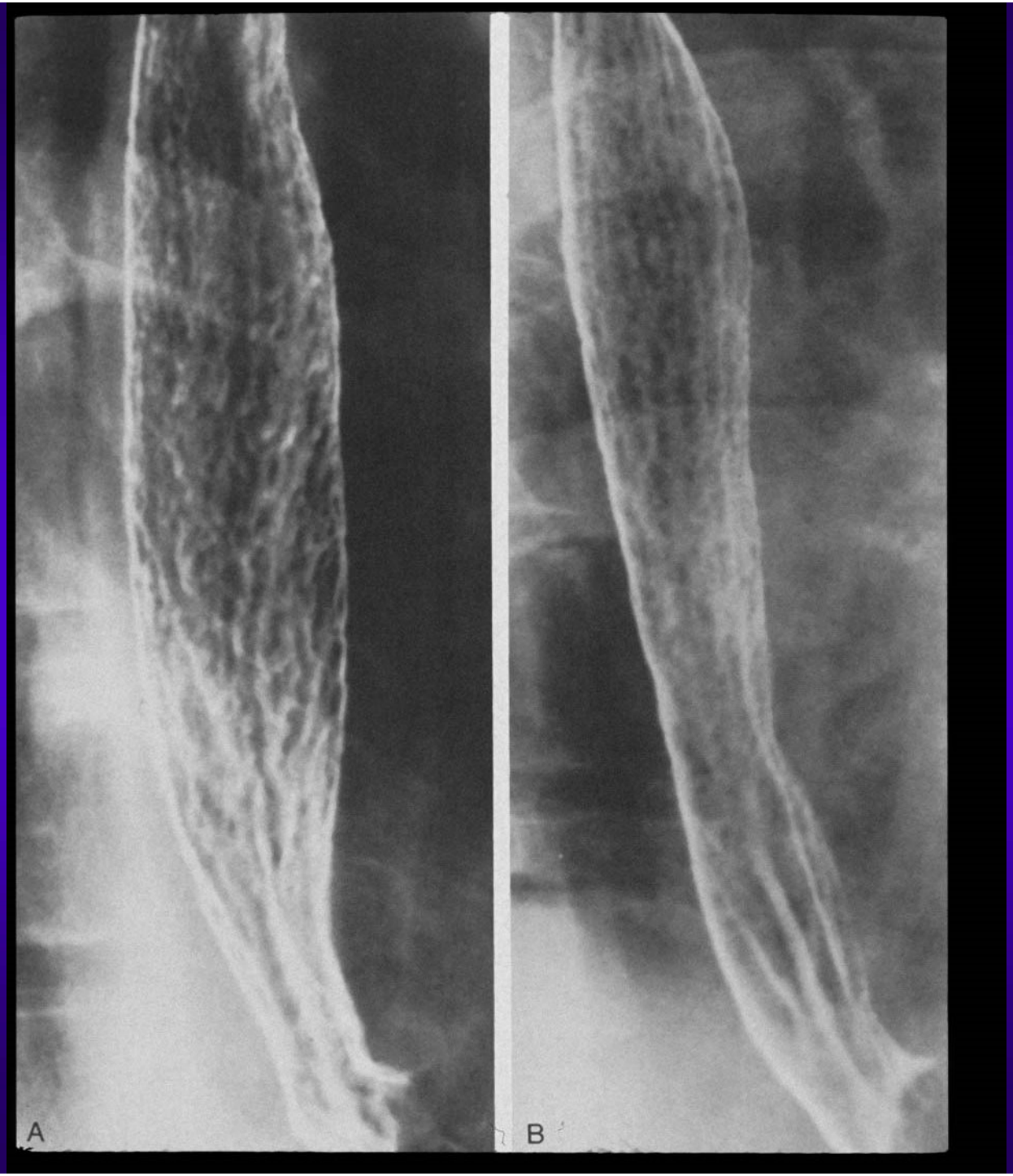
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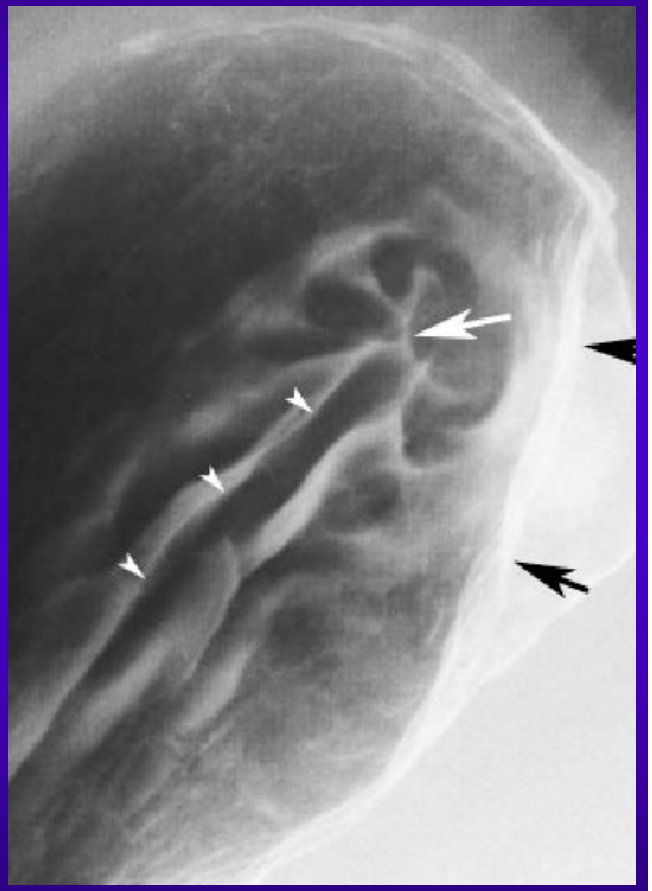
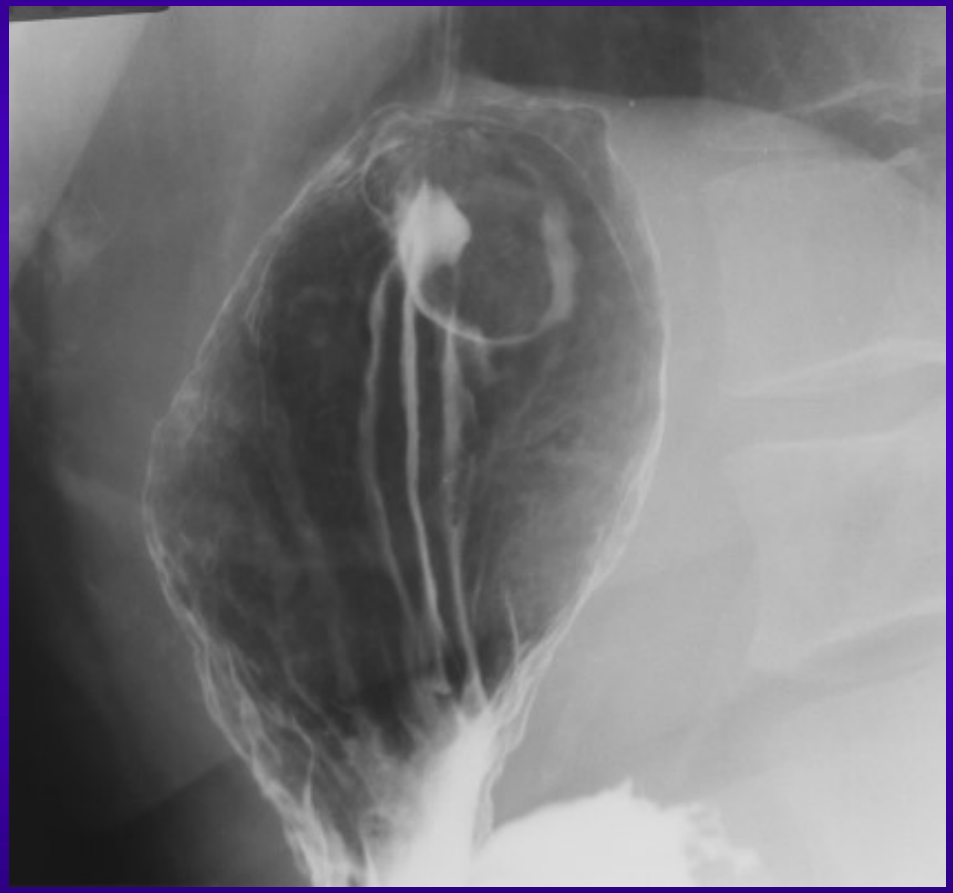
DOUBLE CONTRAST CARDIA

- Rotate the patient once or twice
- End up with right side down
- The cardia is where the esophagus enters the stomach
- RARELY, a gastric lesion here causes dysphagia



GASTRIC CARDIA GIST



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MOTILITY

- Patient in RAO – prone oblique
- Perform five separate small swallows of thin barium – 10 to 20 cc
- Vital to only swallow ONCE
- Follow inverted V distally from pharynx to stomach
- Wait 20-30 seconds between each swallow
- Dysmotility = 2 of 5 abnormal

MOTILITY: WHY IT'S IMPORTANT

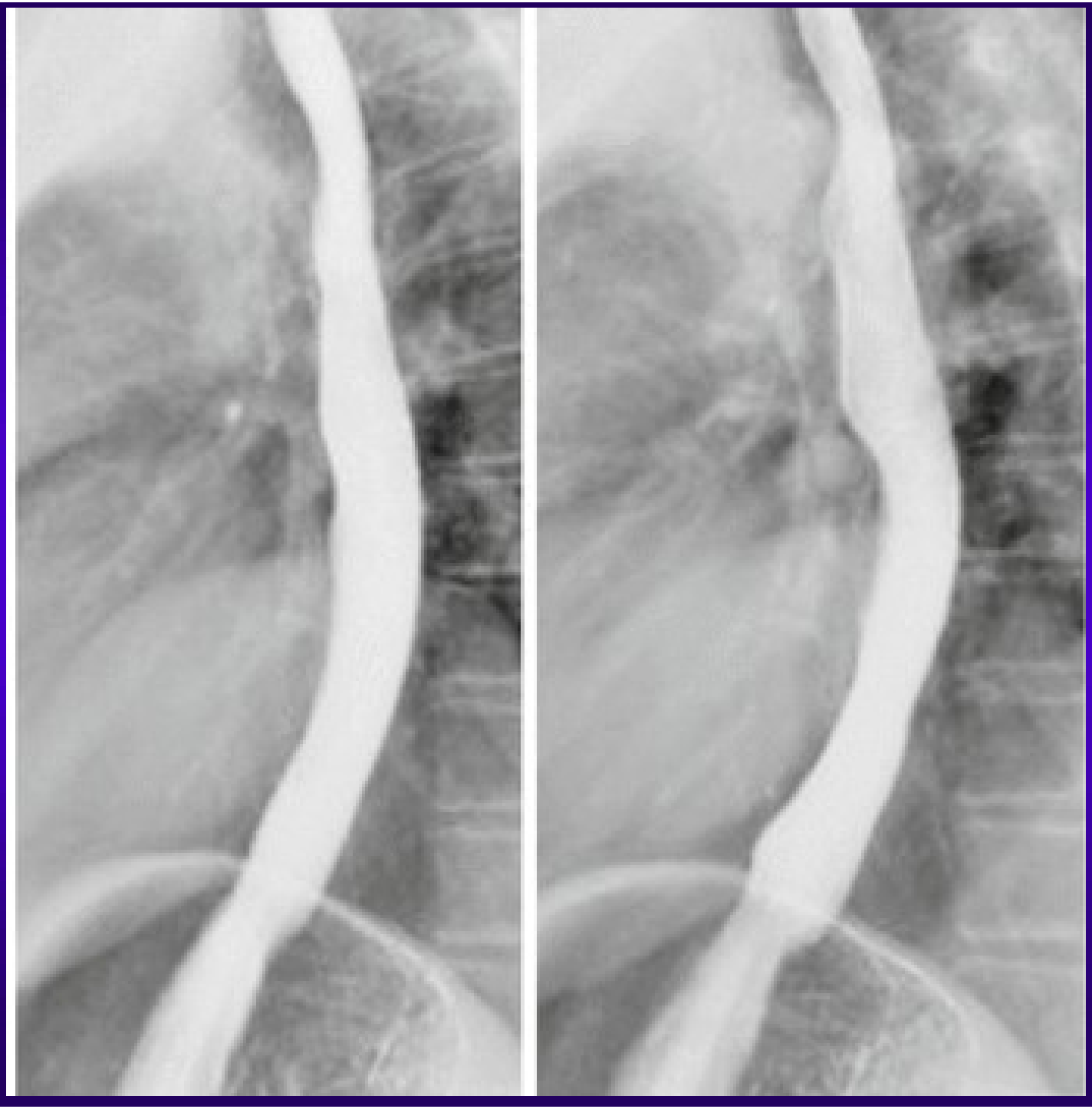
- Many patients with GERD have dysmotility
- Manometry may not be part of surgeon's pre-op workup
- Vital in surgical planning
  - Normal motility → Nissen - 360°
  - Abnormal motility → Toupet - 270°
- If not considered → post-op dysphagia

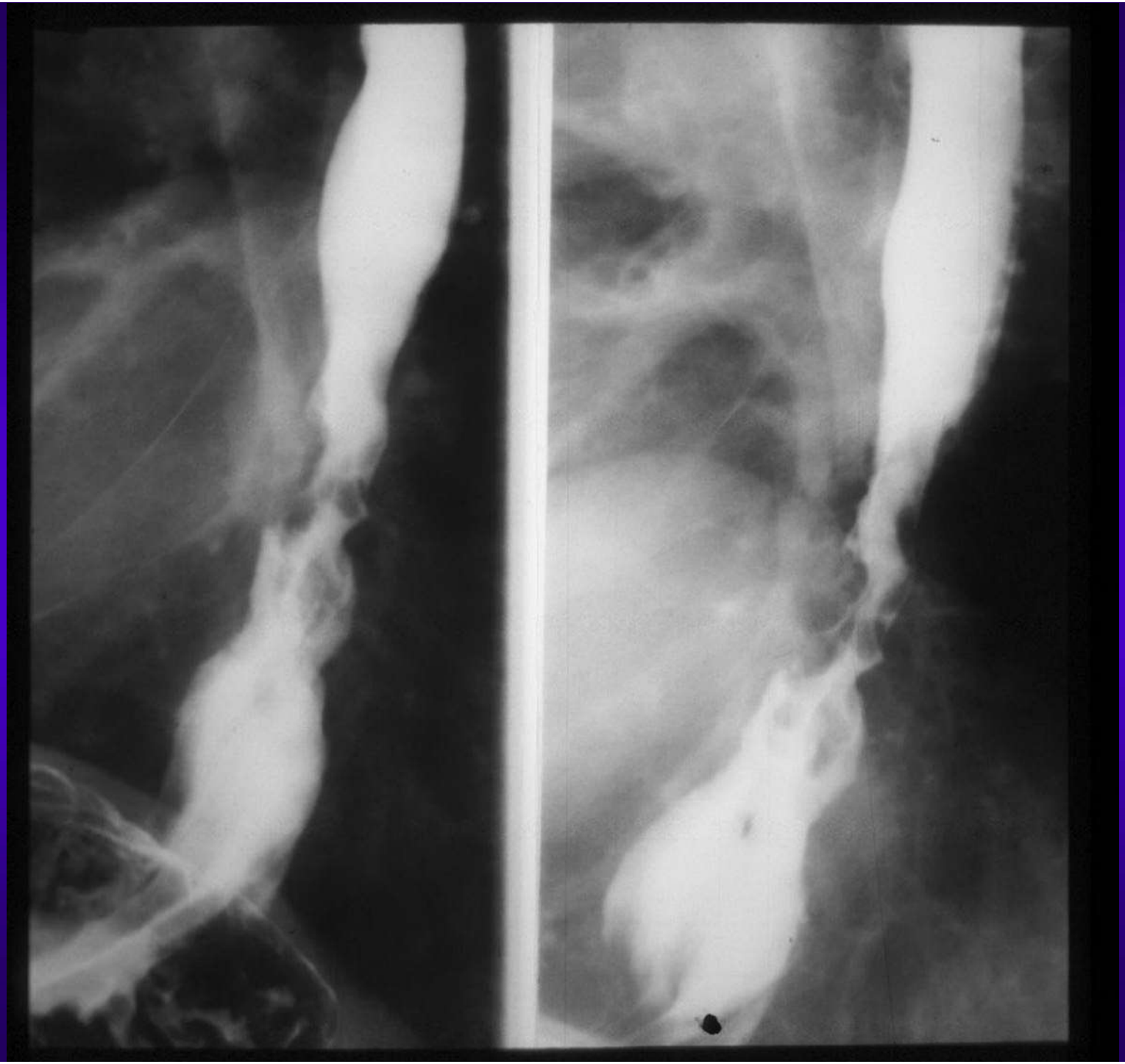
MOTILITY

- Normal – inverted V passes continuously through esophagus to the stomach
- Aperistalsis – no propagation of the wave– Achalasia
- Proximal escape/low amplitude peristalsis is a non-specific but often clinically significant dysmotility, seen in older patients and those with GERD

SINGLE CONTRAST

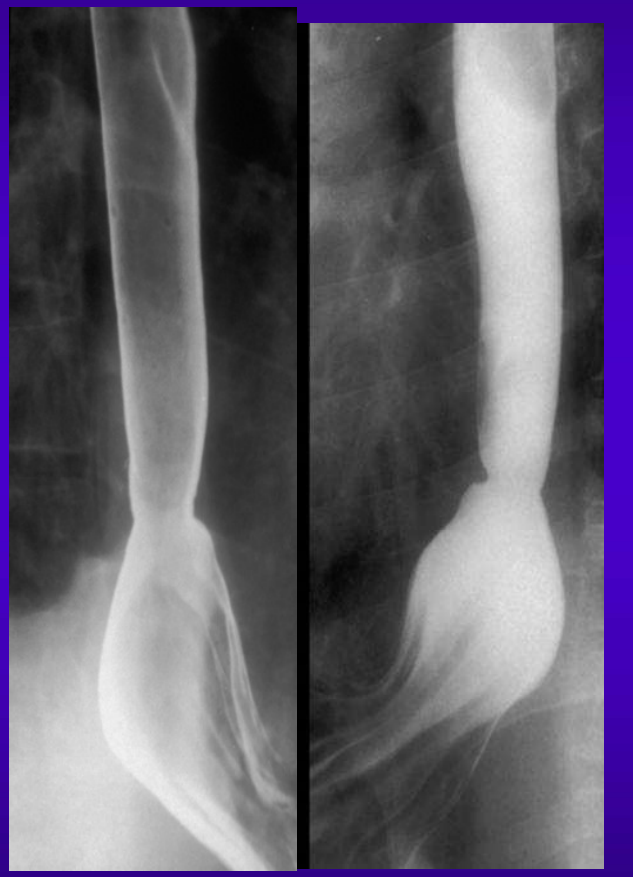
- Keep patient in prone RAO position
- Continuous rapid drinking thin barium
- Take several images of the entire esophagus, concentrating on the distal esophagus
- Continuous, distended column of barium
- Observe the distal esophagus/GE junction fluoroscopically for several seconds
- Best view for rings, strictures, hiatal hernias





FORESHORTENED ESOPHAGUS

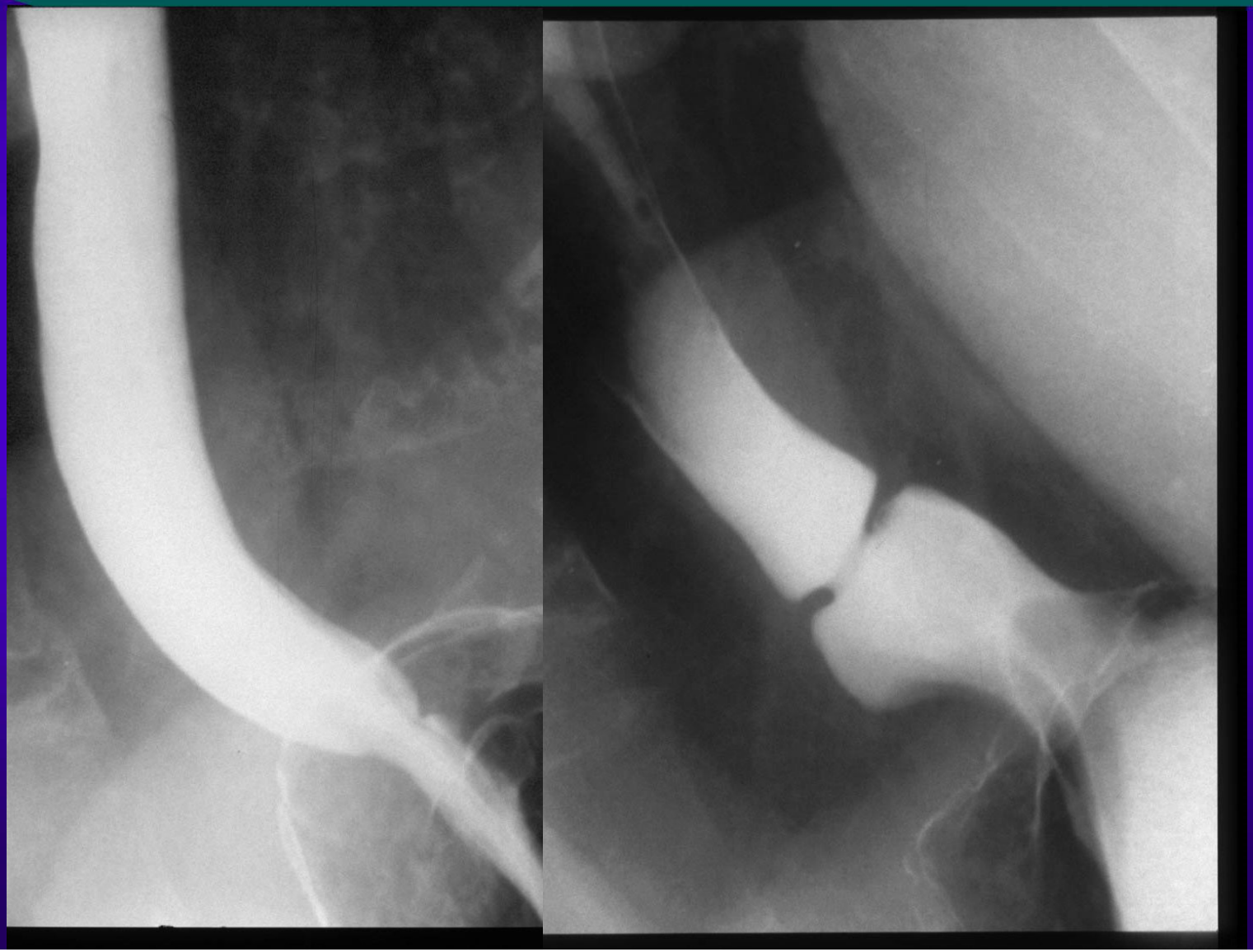
- Most hiatal hernias are reducible, especially when small. Not seen in upright images
- Non-reducible hernia, persists in upright position
- Almost always present with larger hernias (>5 cm)
- Almost always present with Type III hernias



FORESHORTENED ESOPHAGUS: WHY IT'S IMPORTANT

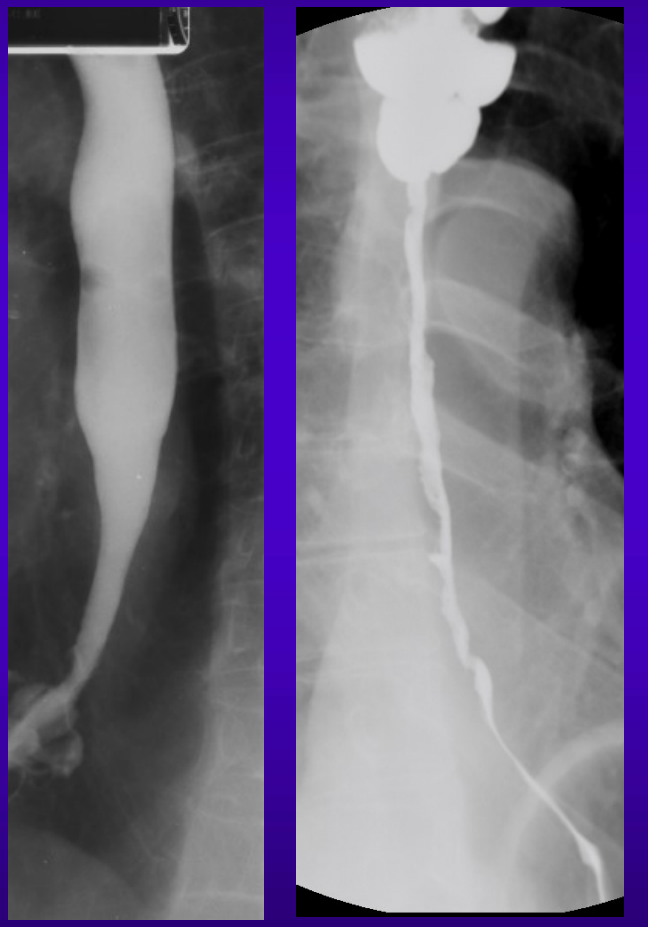
- May result in inadequate esophageal mobilization
- Hernia then reduced under tension
- Leads to postop retraction of the fundoplication into the chest or slipped onto stomach→ failed surgery
- Most surgeons would perform Collis gastroplasty in addition to fundoplication if present

HH & RING ONLY IN SC VIEW



STRICTURES

- 5 mm - 4 cm in height
- Located at GE junction, above hiatal hernia
- Although Barrett's stricture is "classically" in mid esophagus, most common at EGJ
- Best seen in full distended SC view
- Smooth and gradually tapering

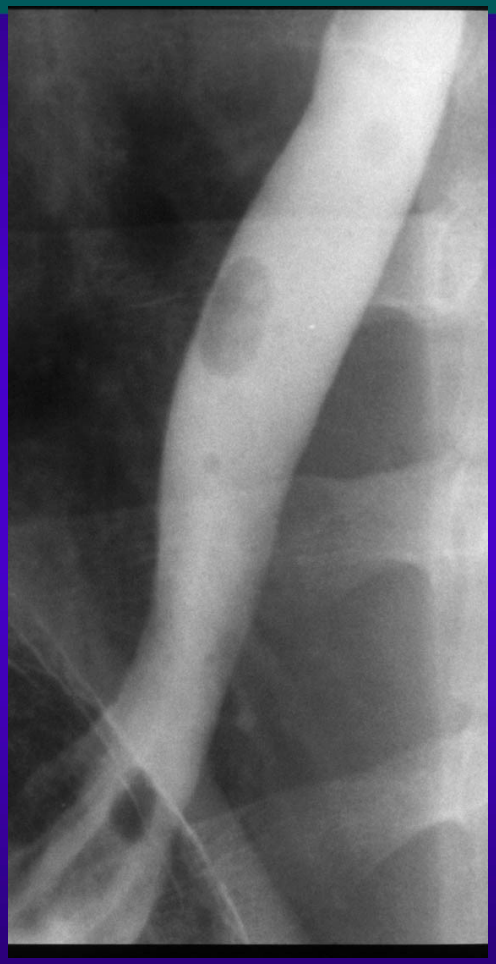


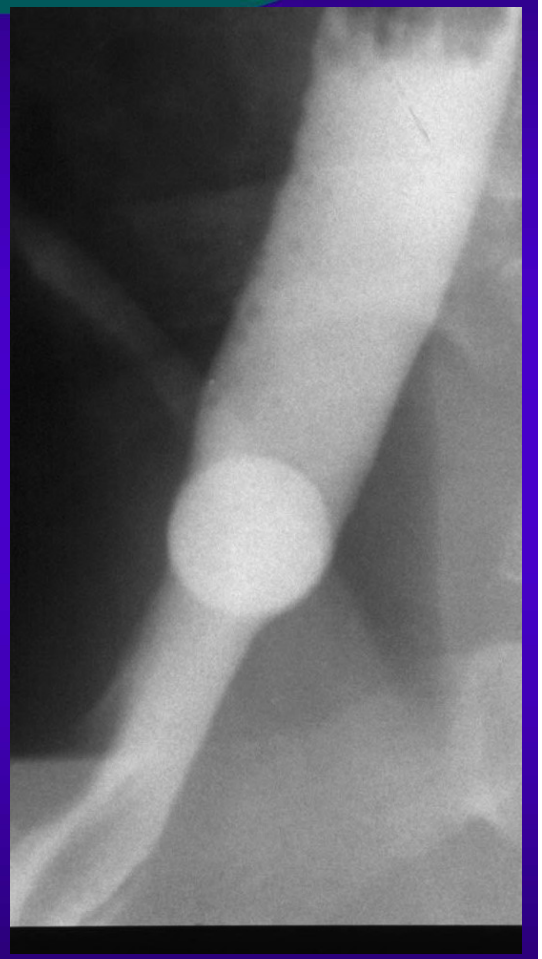
REFLUX EVALUATION

- Not as sensitive/specific as 24 hr. pH probe
- Spontaneous
- Roll patient from side to side
- Valsalva
- Leg lift
- Water siphon test – drink water from straw while recumbent
- If reflux present from any maneuver, no need for others
- Report cause, height, < or > 30 seconds to clear

BARIUM TABLET

- 13 mm – size at which ring or stricture is always symptomatic
- May reveal a subtle stricture





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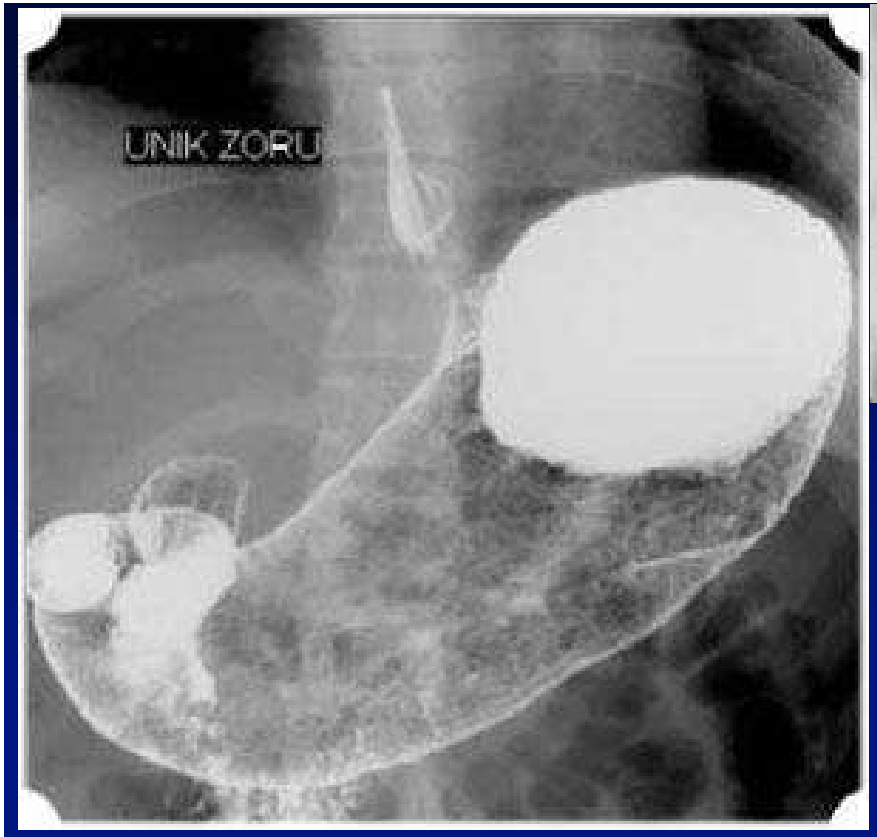
UPPER GI SERIES TECHNIQUE

- Double contrast esophagram
- Rotate patient twice, double contrast stomach - AP and LPO
- Double contrast duodenal bulb - LPO
- Double contrast fundus/cardia - right lateral
- Single contrast esophagram – prone oblique
  - Reducible hernia, stricture, ring
- Single contrast duodenal bulb and sweep - right lateral
- Assess reflux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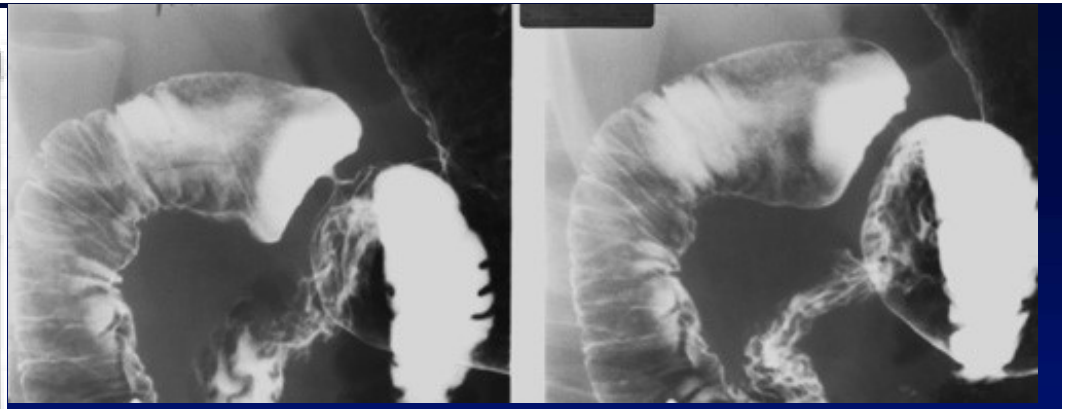
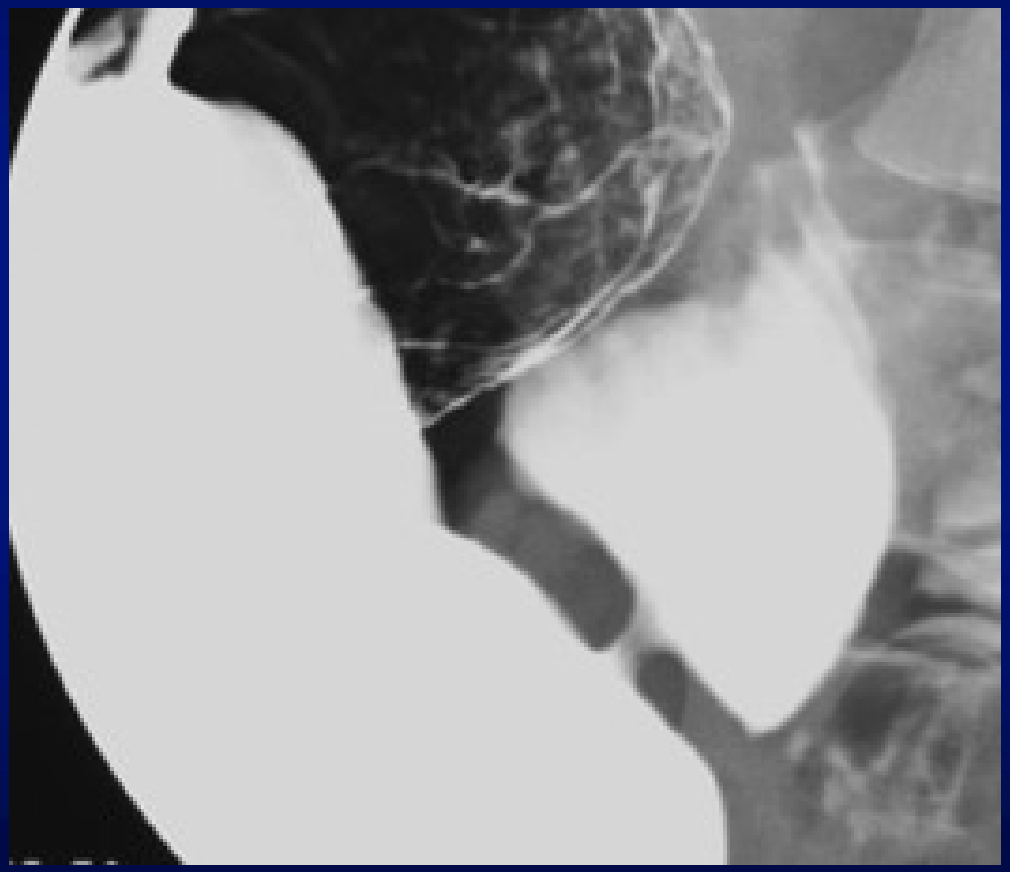
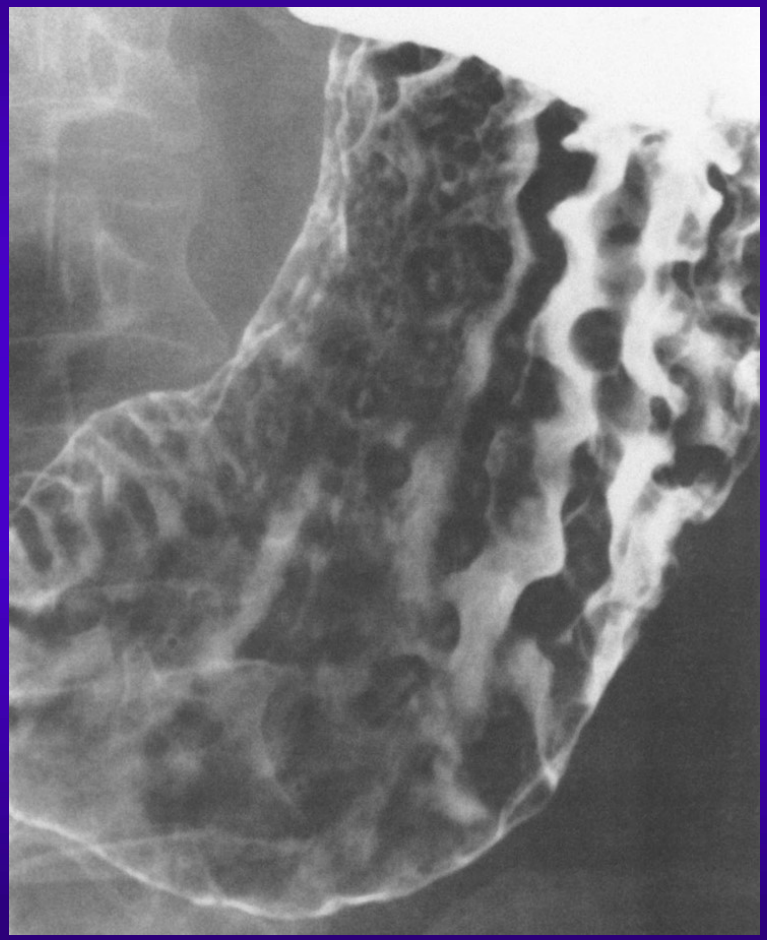




EROSIONS



- Superficial
- Most frequently seen in patients taking ASA/NSAIDs

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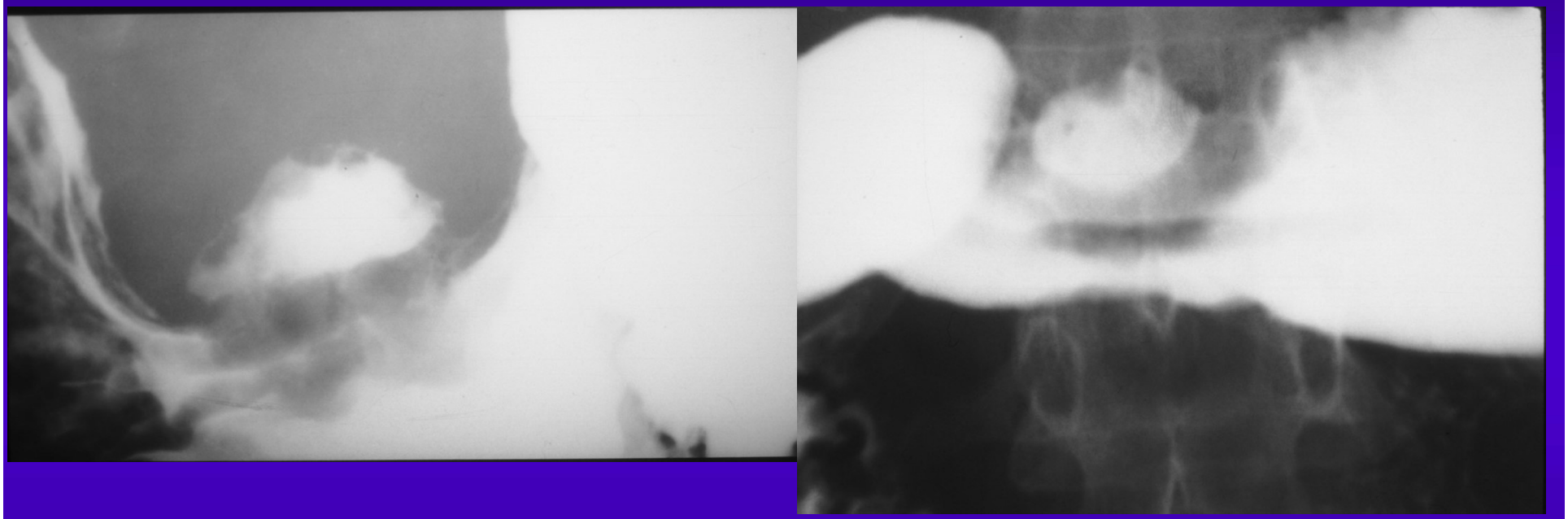
GASTRIC ULCER



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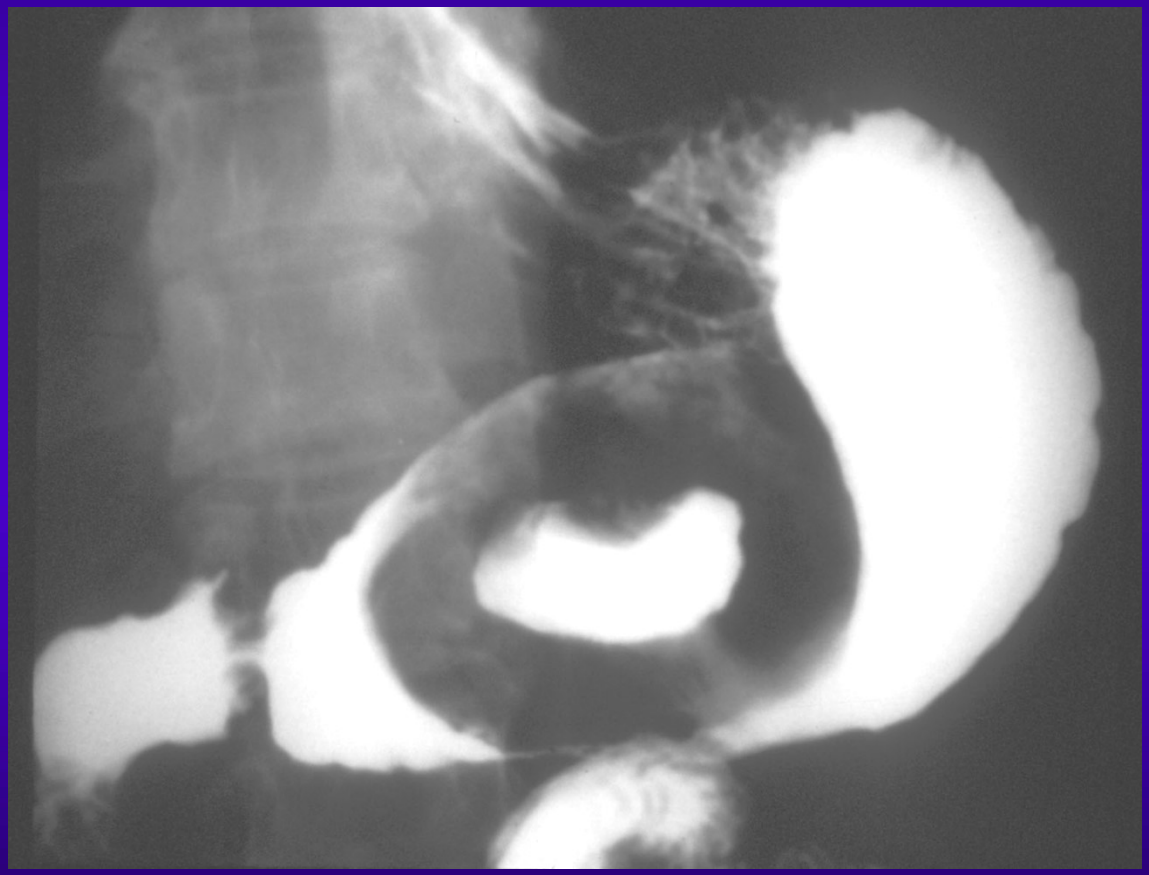
ULCERATED SUBMUCOSAL MASS



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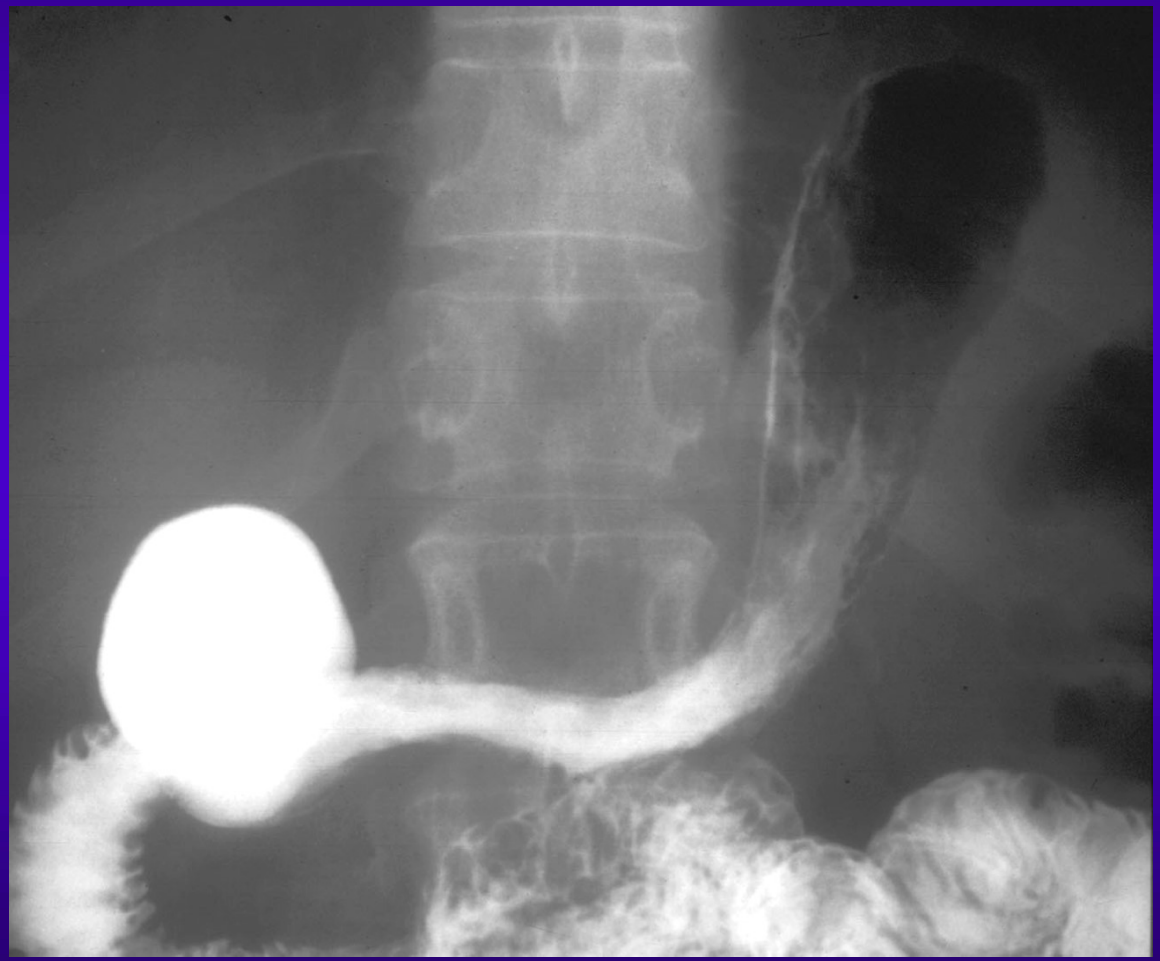

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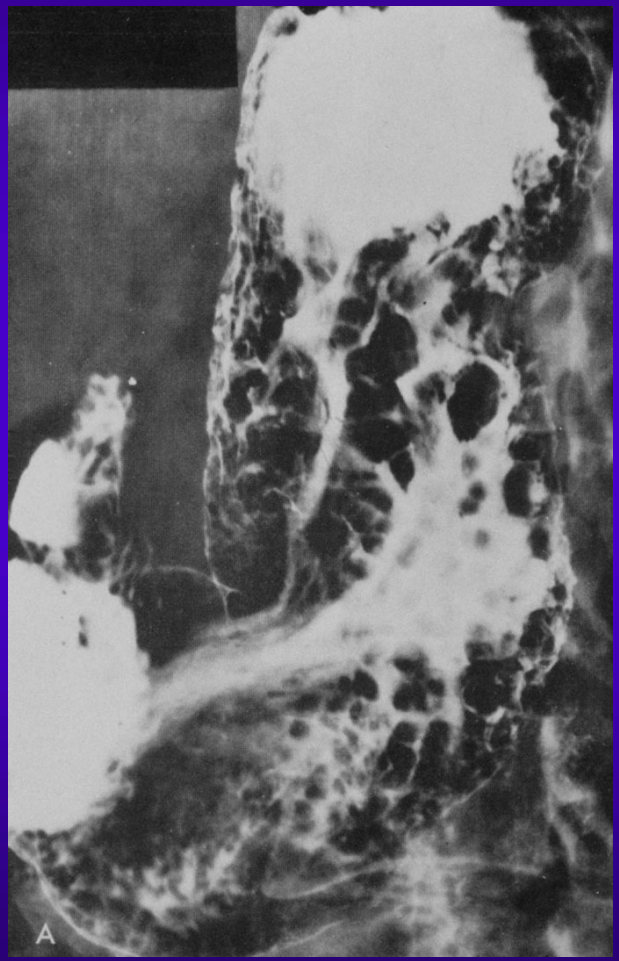
THICK GASTRIC FOLDS



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ABDOMINAL PLAIN FILMS

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- Low Tech
- Inexpensive
- Easily obtained, even portably
- Still of use for several indications

- It's an art – or at least old guys like me would like to think so

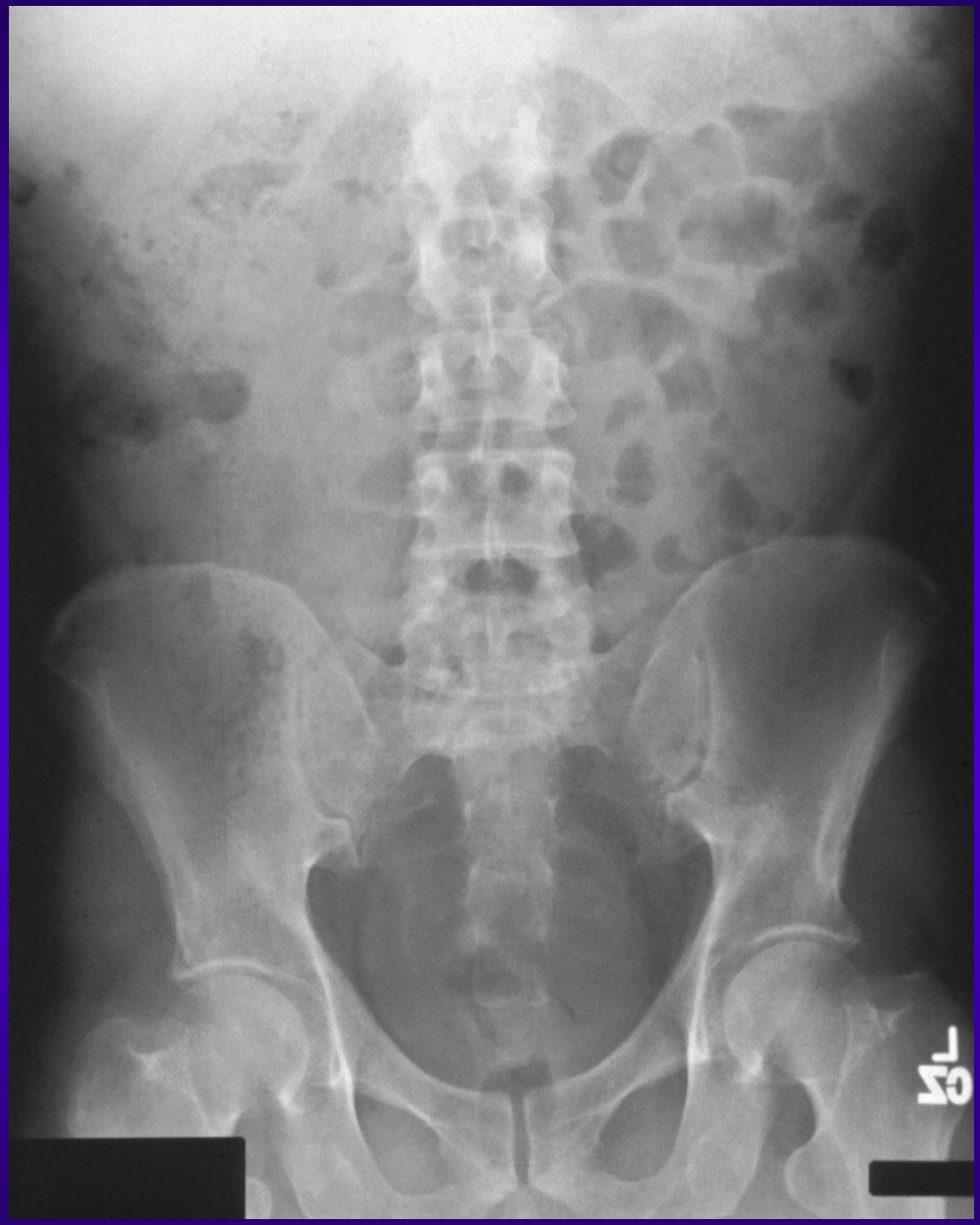
SYSTEMATIC EVALUATION

- Bowel gas
- Soft tissues
- Calcifications
- Skeleton
- Extraluminal gas

SB vs. COLON

- Location
- Fold thickness
- Fold pattern

- Maximum normal diameter
  - SB = 3 cm
  - Colon = 6 cm



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DICTATION POINTERS

- NEVER say non-specific bowel gas pattern. I don't even like non-obstructive bowel gas pattern
- Better to be descriptive
- Gas is scattered throughout normal caliber large and small bowel
- Or better yet – Normal bowel gas pattern

DICTATION POINTERS

- Dilated small bowel loops out of proportion to the amount of colonic gas = SBO
- Gas throughout dilated small and large bowel = ileus
- Any dilated bowel in the first few days post-op = Likely ileus. Very rare to get SBO this soon post -op

DICTATION POINTERS

- No colonic gas – check Epic to make sure patient has a colon!
- Gasless abdomen
  - Prolonged NG suction
  - Vomiting
  - NPO
  - Obstructed fluid filled small bowel
  - Normal

FREE INTRAPERITONEAL AIR

BEST SEEN ON UPRIGHT OR LEFT LATERAL DECUBITUS IMAGE

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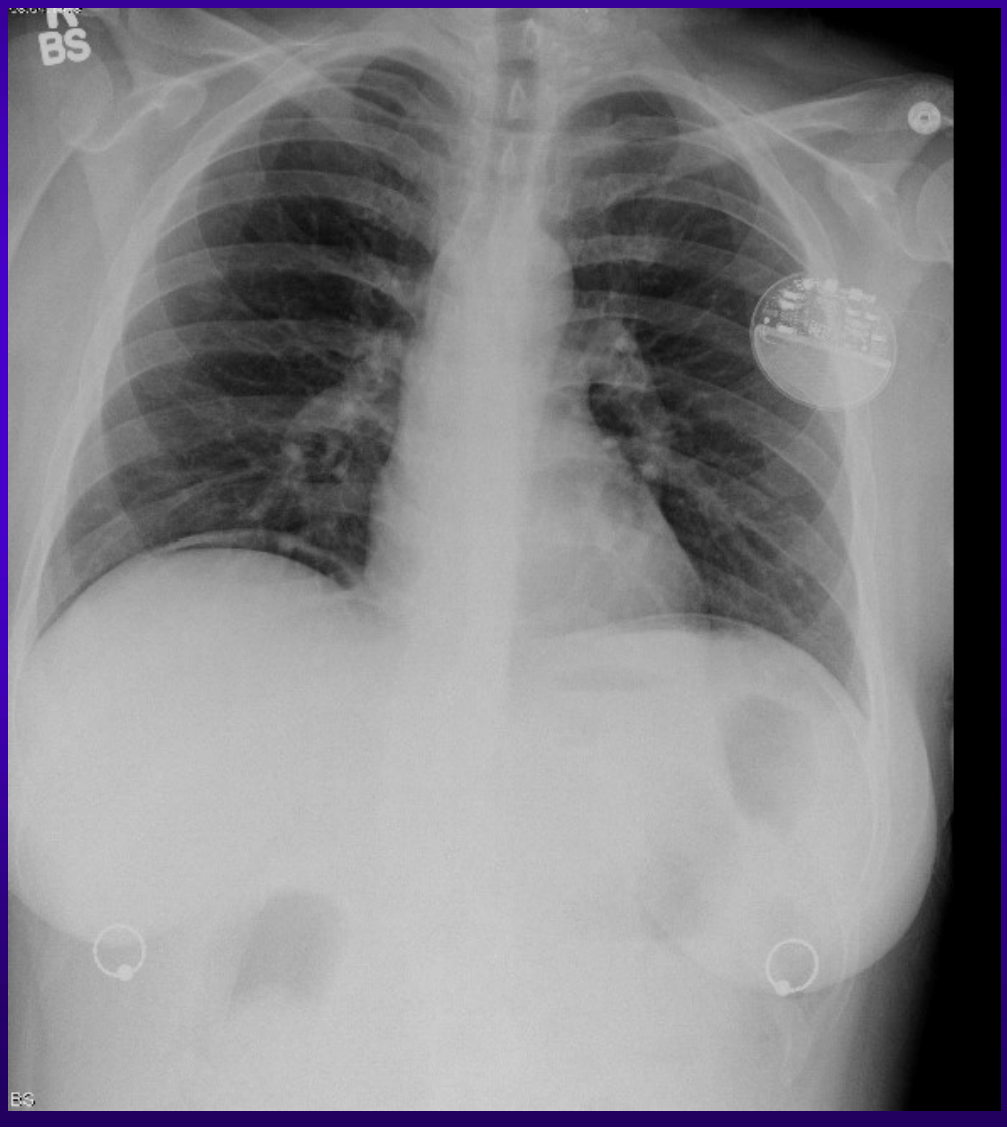
BEST FILM FOR FREE GAS IS OFTEN A CXR

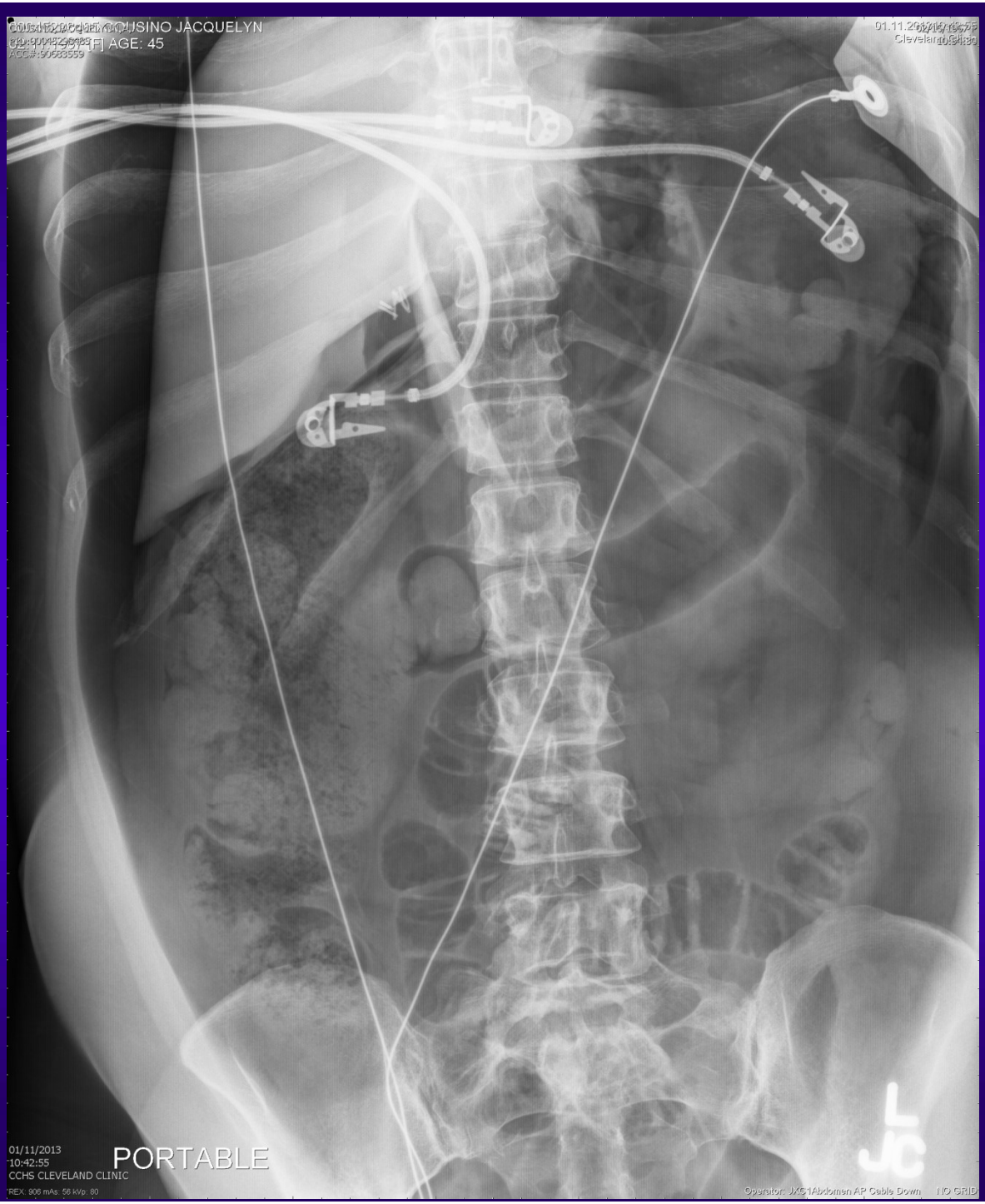


CAUSES OF FREE AIR

- Post operative – most common cause
  - Usually persists 3-7 days
  - Persistence beyond 10-14 days, or increase in amount, is suspicious
- Perforated GI tract
- Penetrating trauma

FREE GAS ON SUPINE FILM

- Rigler's sign – visualization of bowel wall
  - PseudoRigler's – CT contrast, obesity
- Lucent liver
- Triangles of gas between bowel loops
- Visualization of falciform ligament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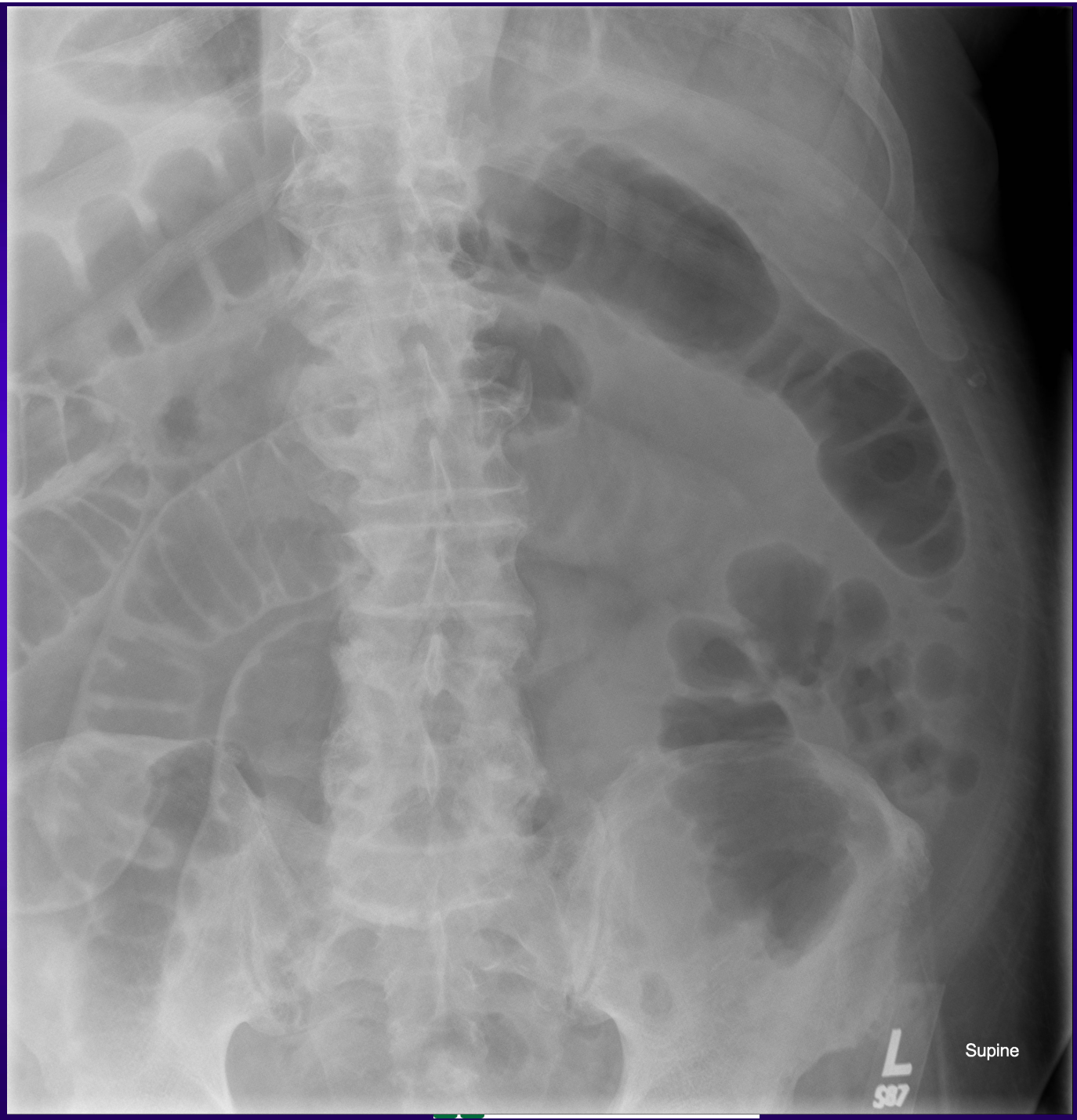
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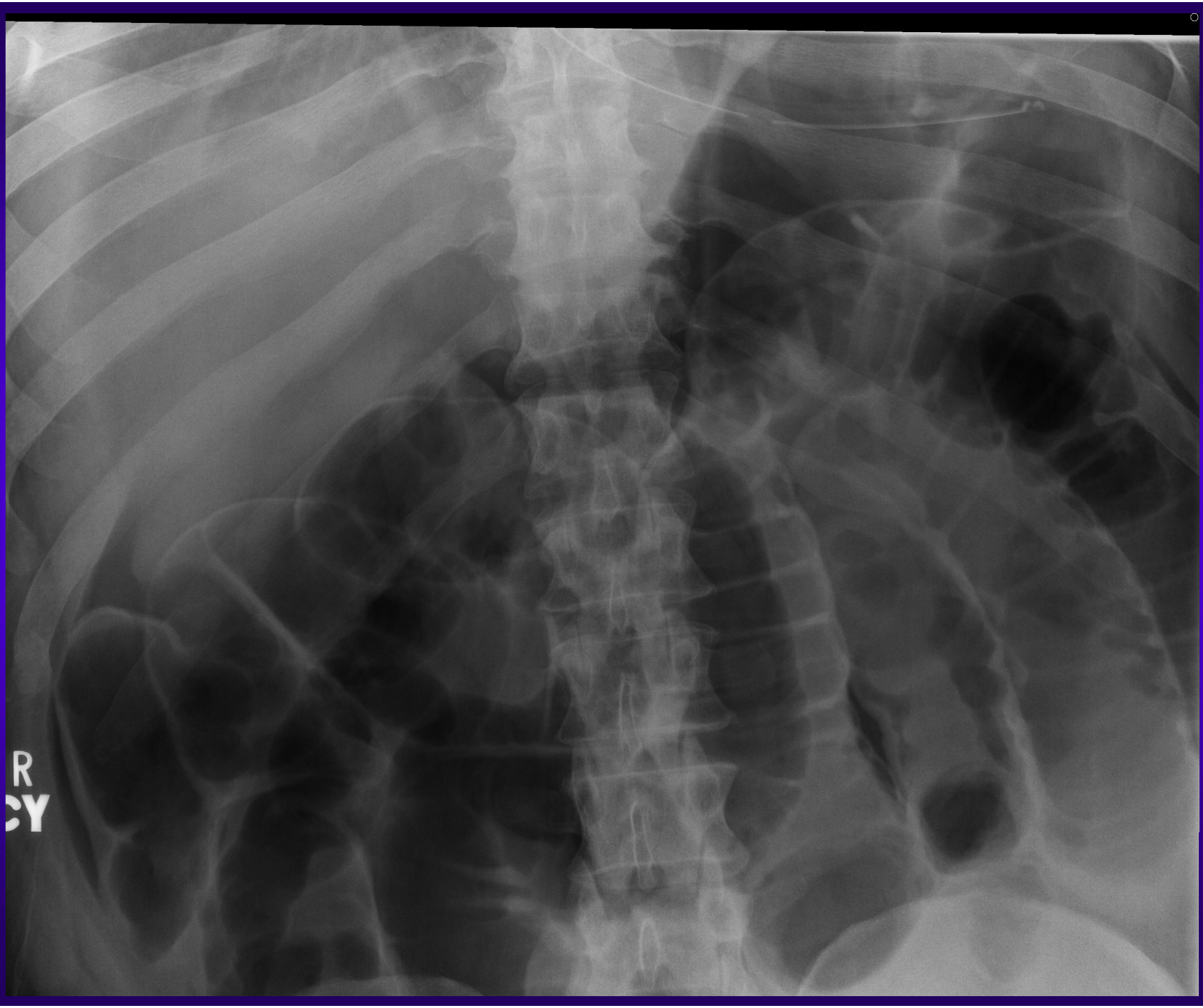
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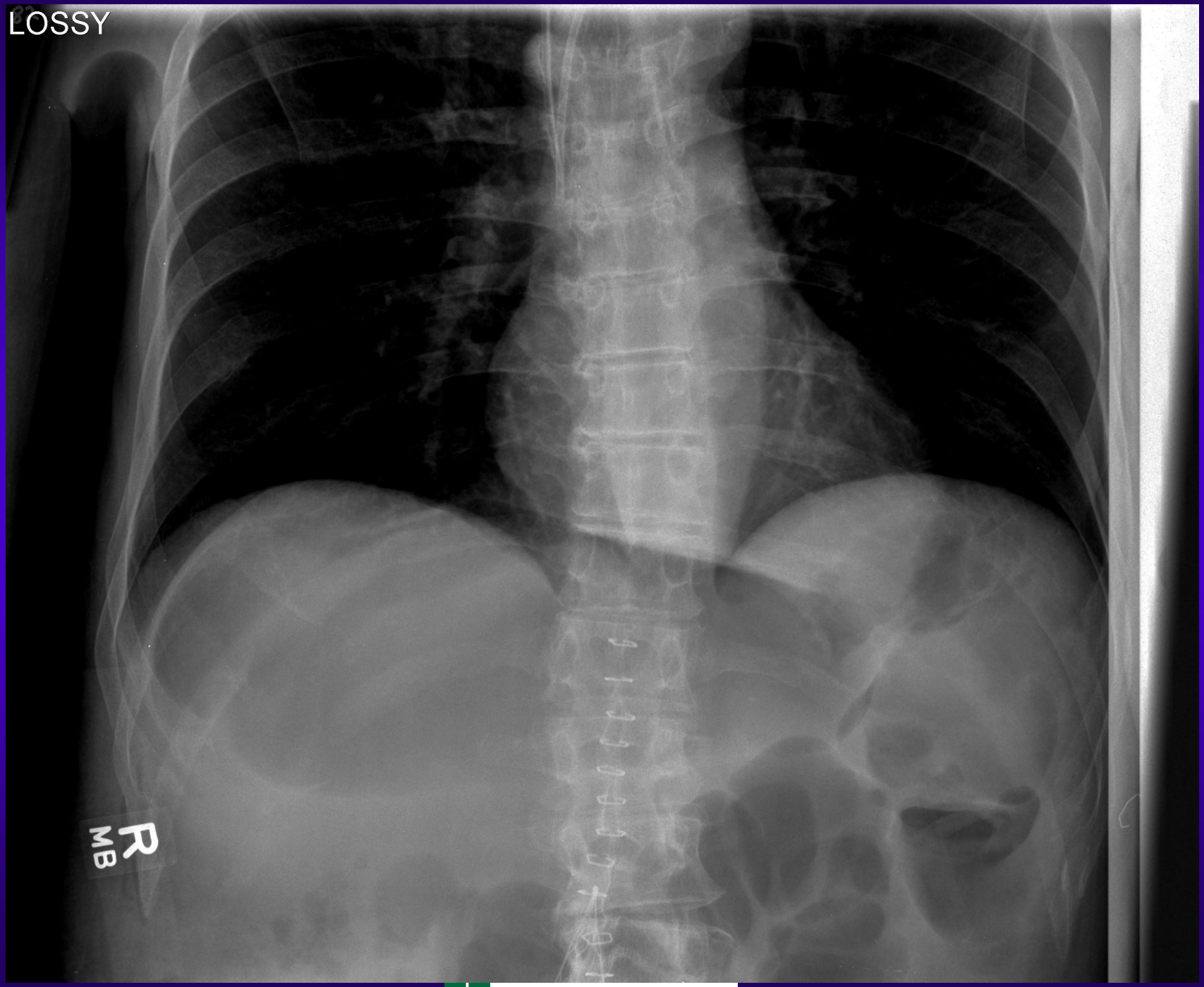
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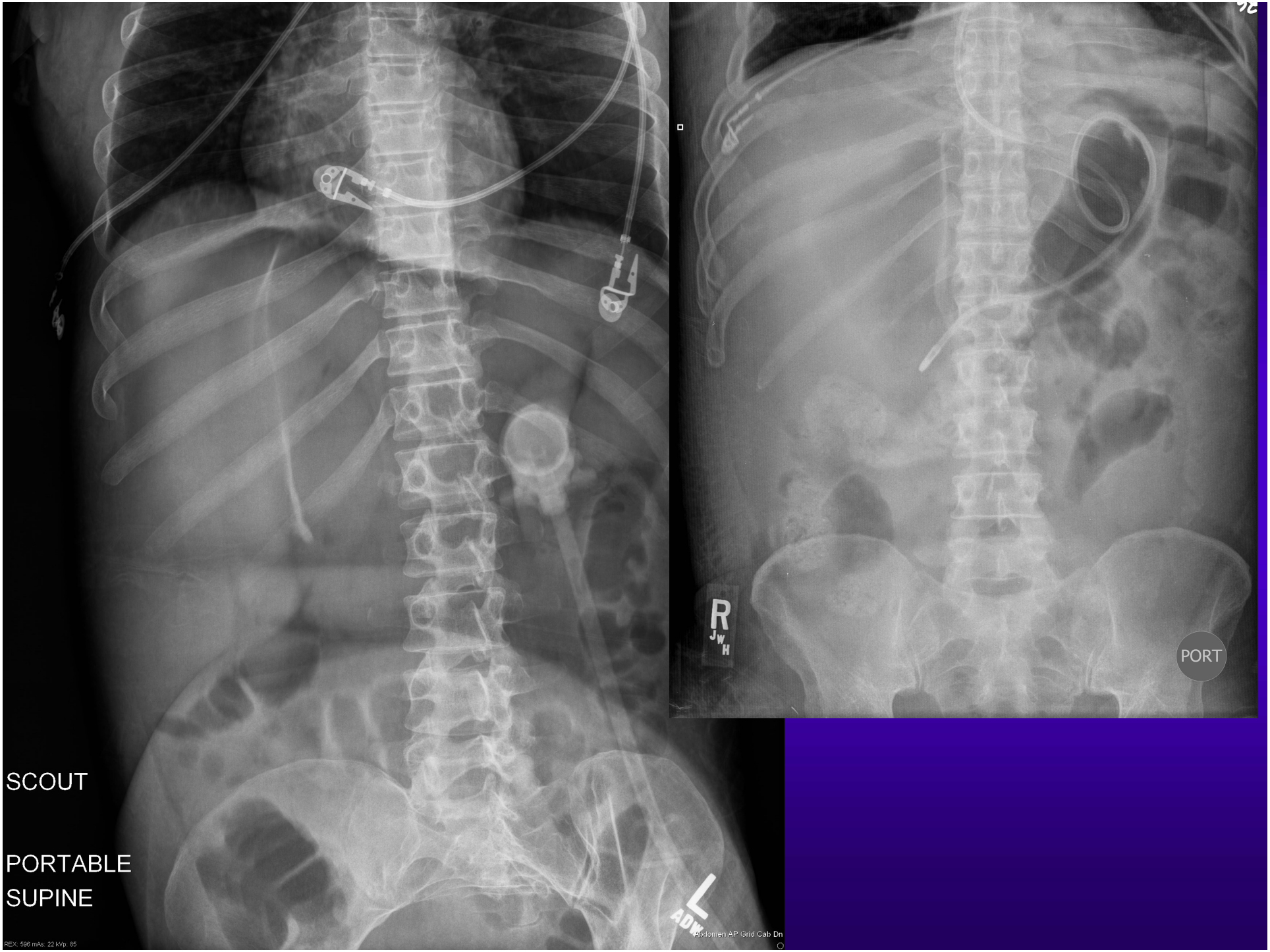
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REX: 596 mAs: 22 kVp: 85
Abdomen AP Grid Cab Dn

BOWEL OBSTRUCTION

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ADYNAMIC ILEUS vs. SBO

- Dilated stomach, small bowel, and colon

- Dilated small bowel
- Collapsed distal small bowel/colon

•Normal small bowel diameter = 3 cm

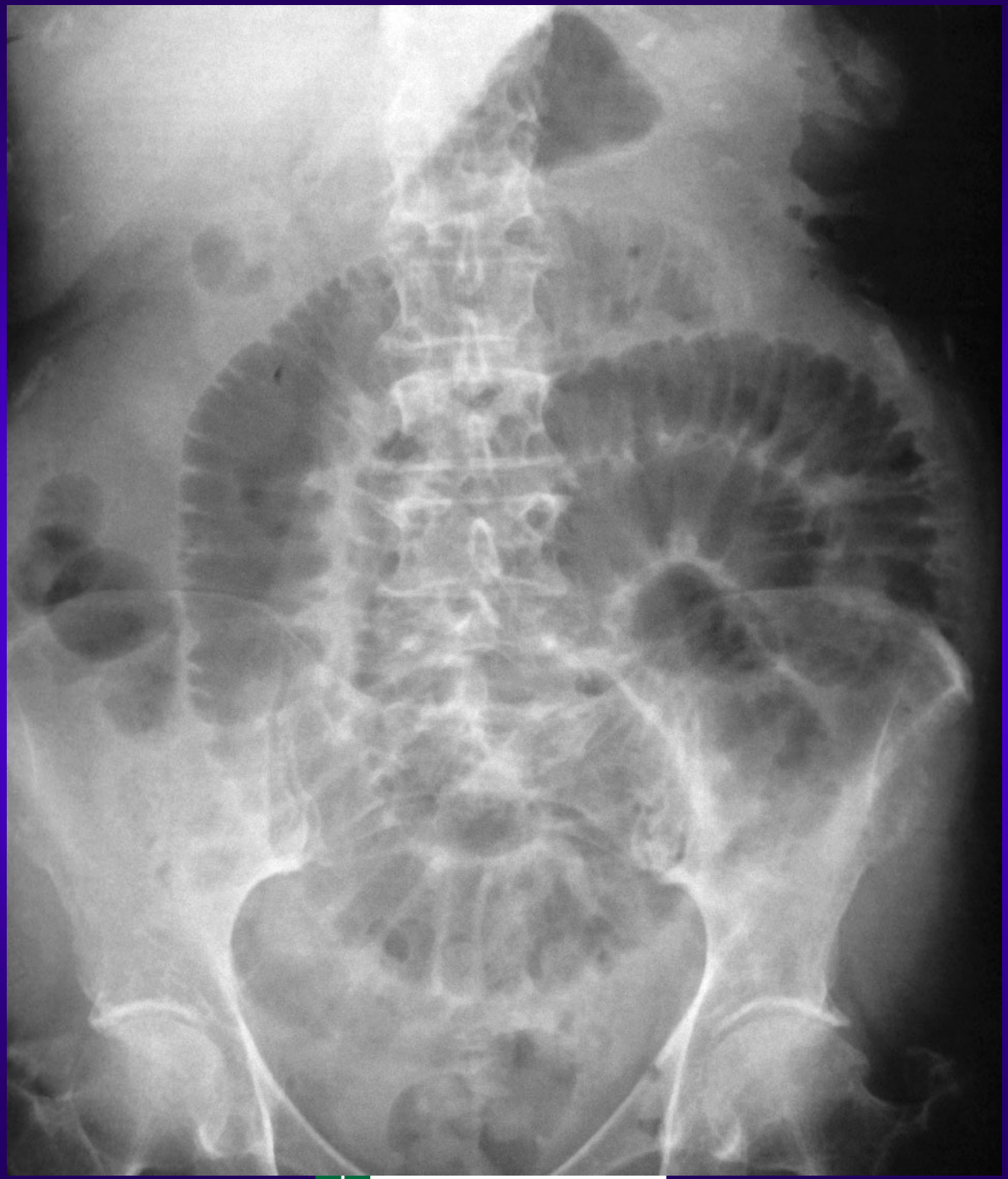
•Normal colon diameter = 6 cm

•Make sure the patient has a colon

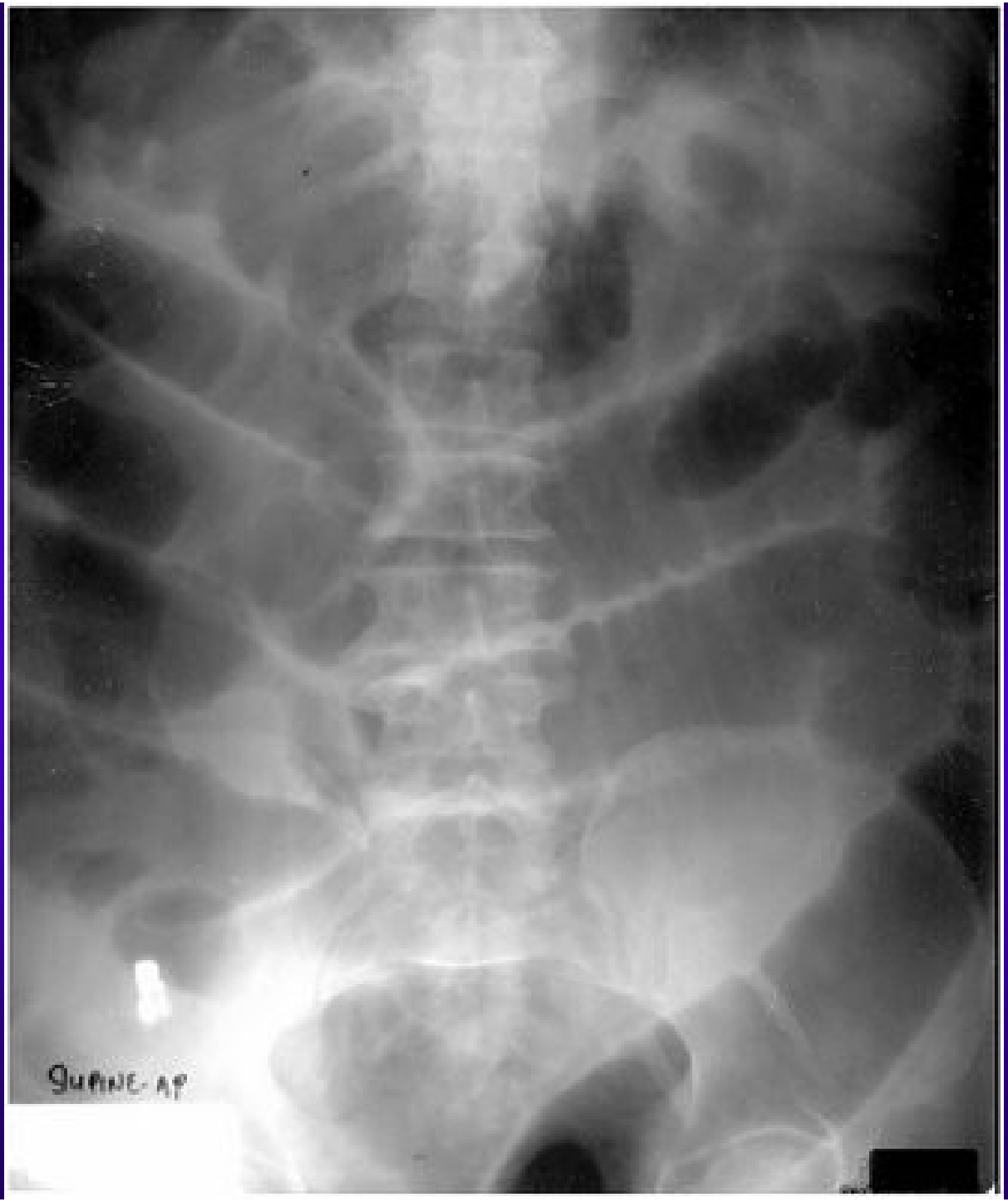
•Difficult to differentiate in the immediate post-op period

PLAIN FILM FINDINGS OF SBO

- Key sign is proximal dilation with distal collapse.
- Disparity in caliber of small bowel and colon.
- Findings vary depending on site of obstruction, severity, duration, and varying amounts of luminal fluid and air.
- Proximal obstructions may be quite subtle.



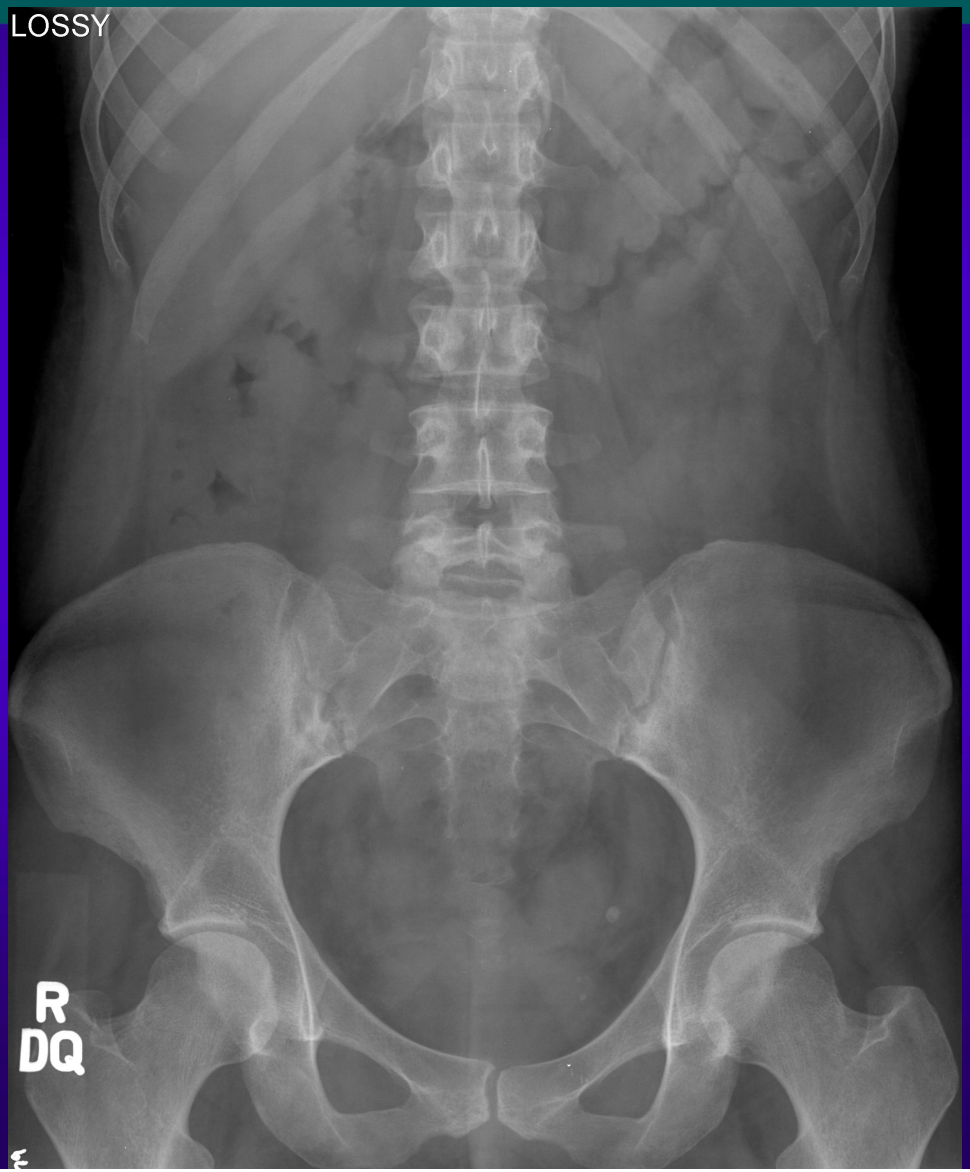
ADYNAMIC ILEUS

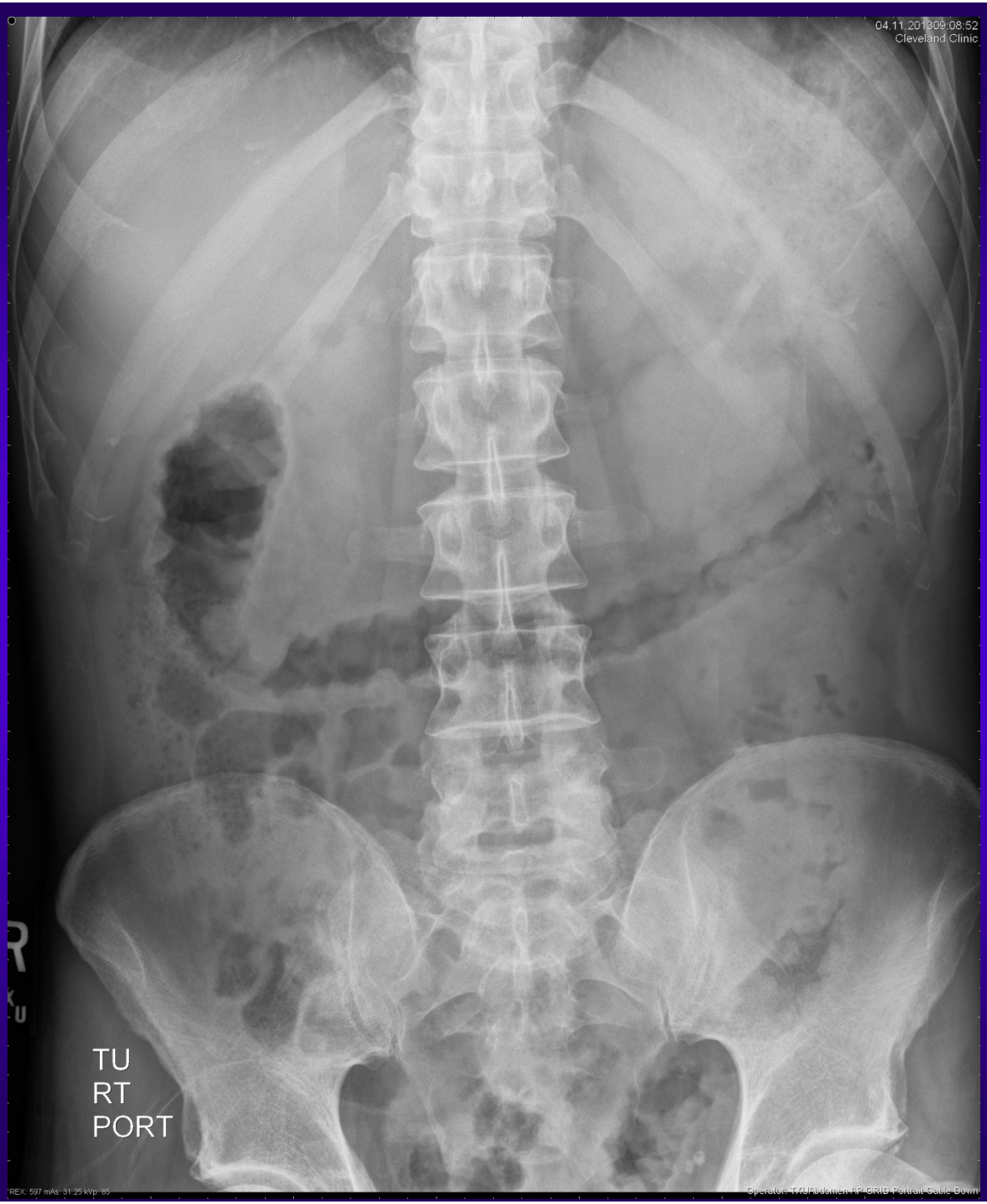


ACUTE COLITIS

- UC
- Crohn's
- Pseudomembranous
- Other infectious
- Ischemic
- With or without megacolon
- XXXX *Toxic* megacolon

ULCERATIVE COLITIS

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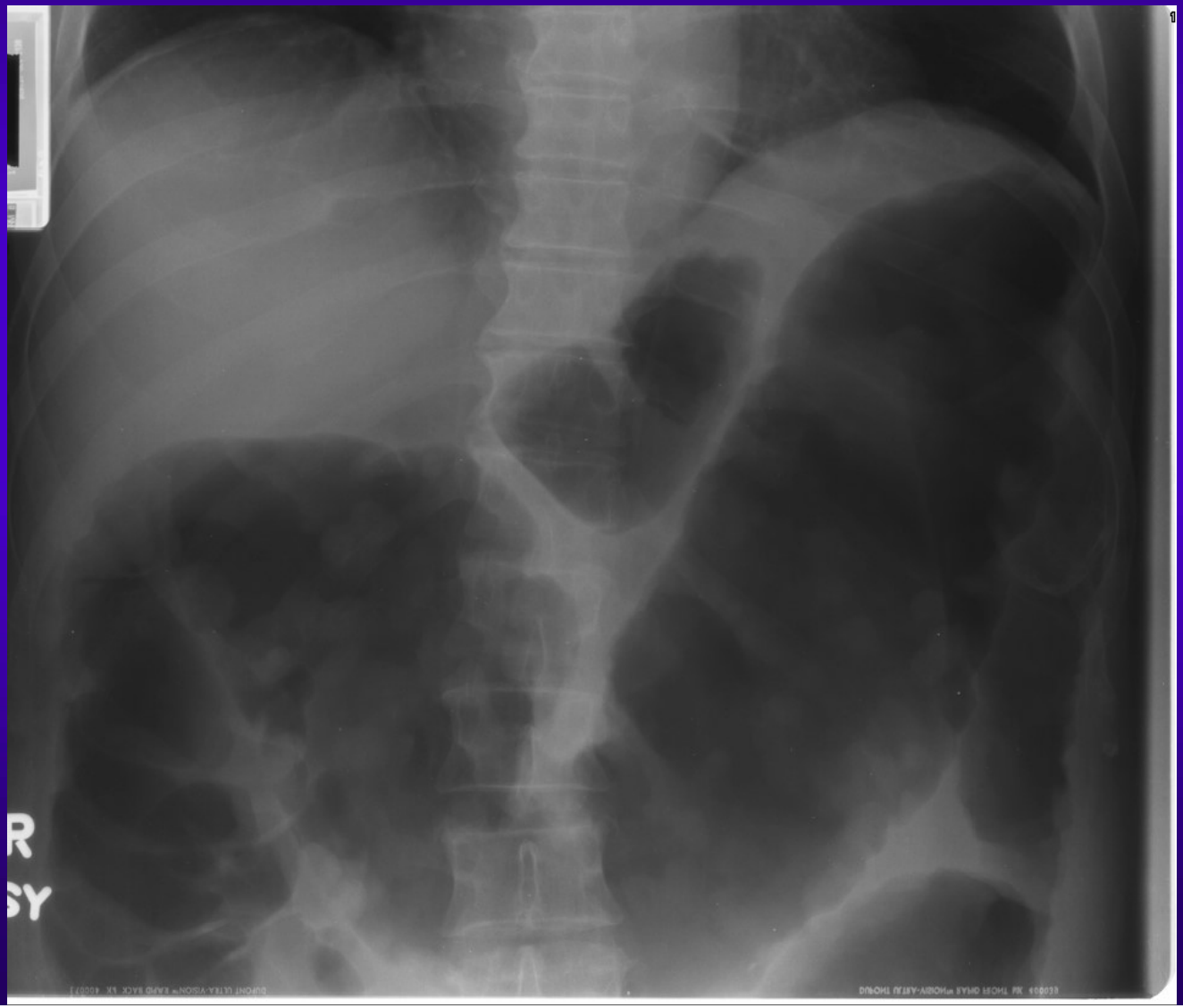
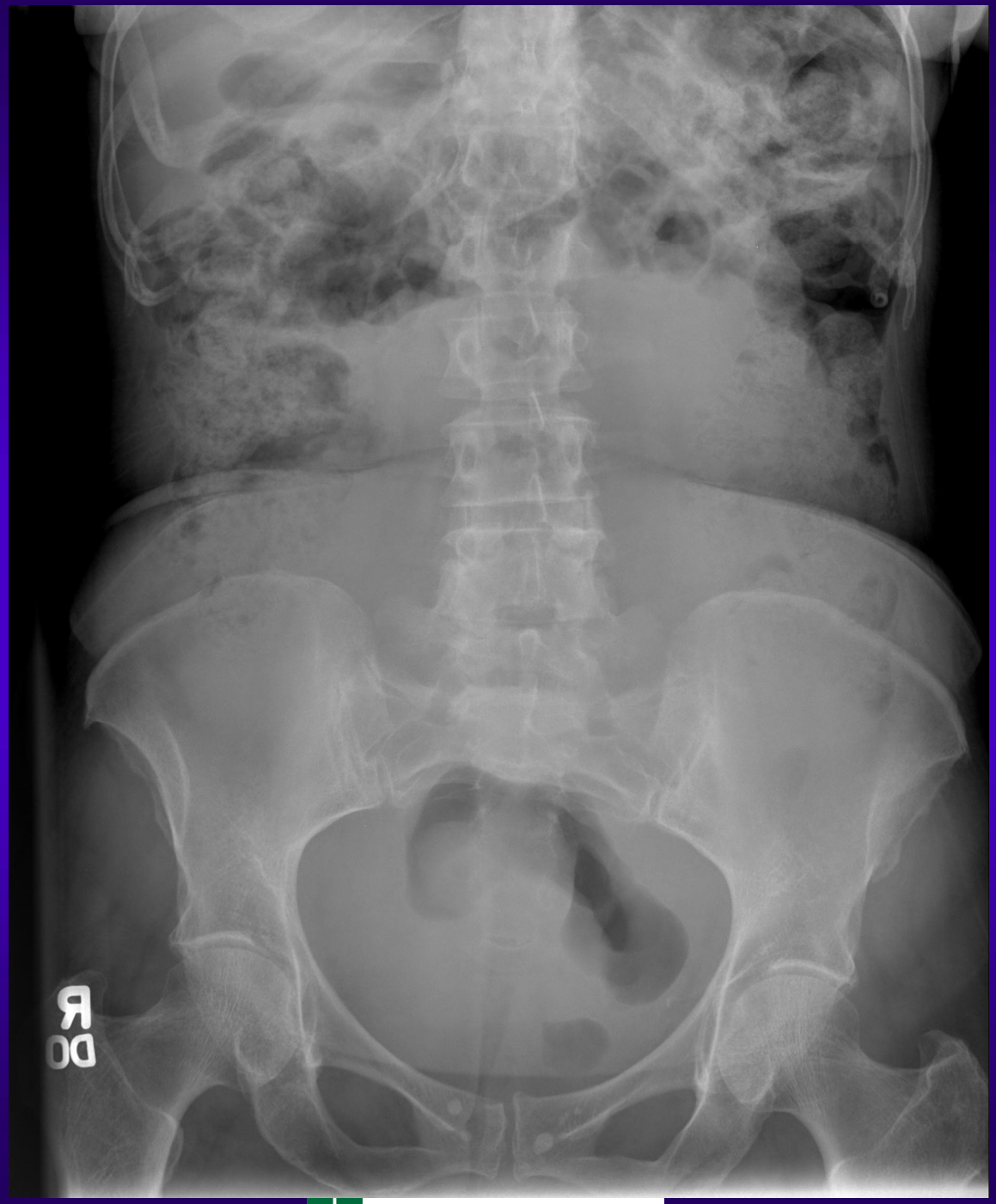
MEGACOLON

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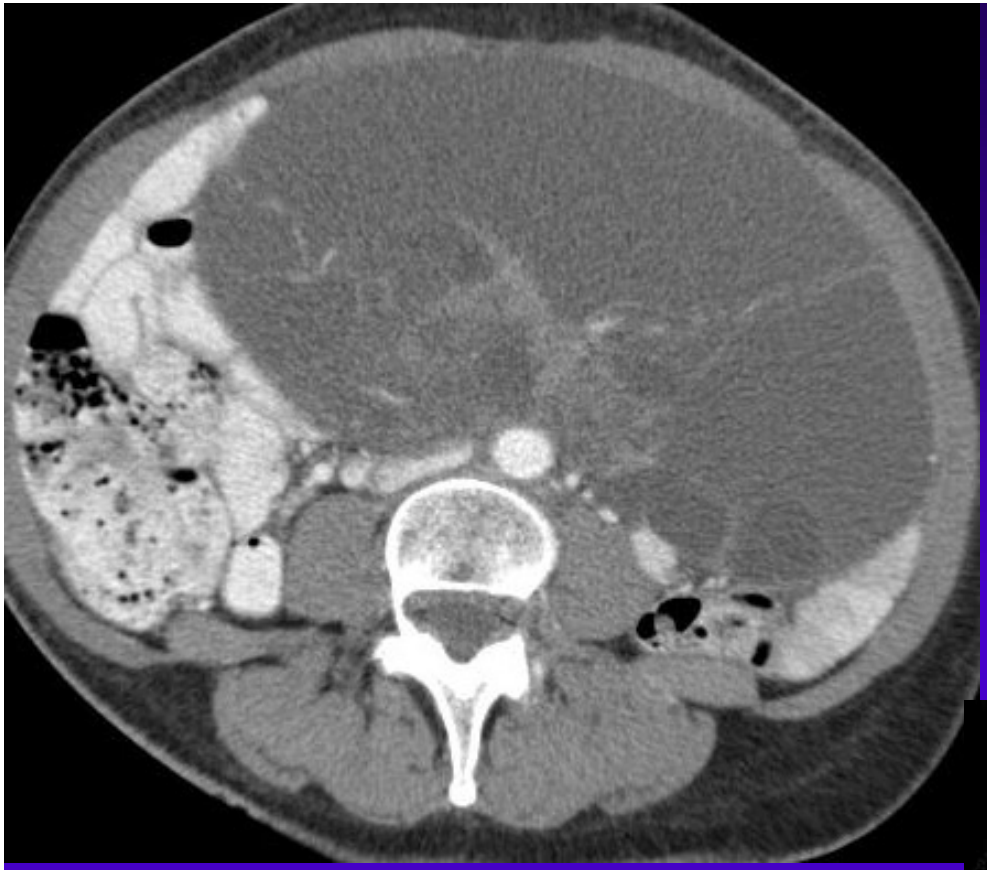
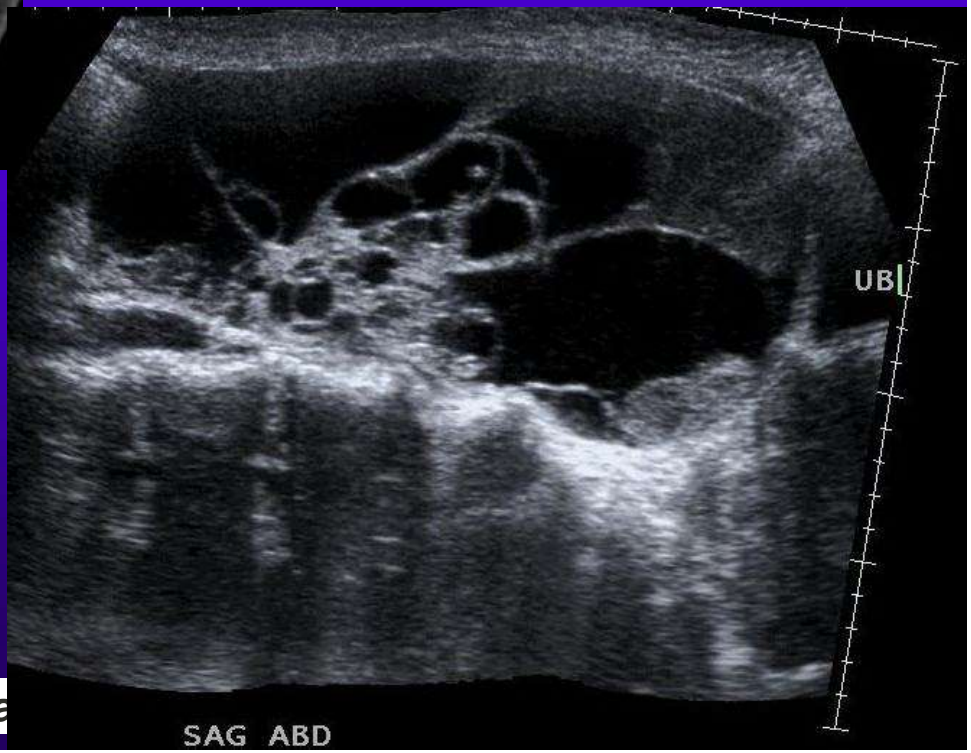
OVARIAN CANCER





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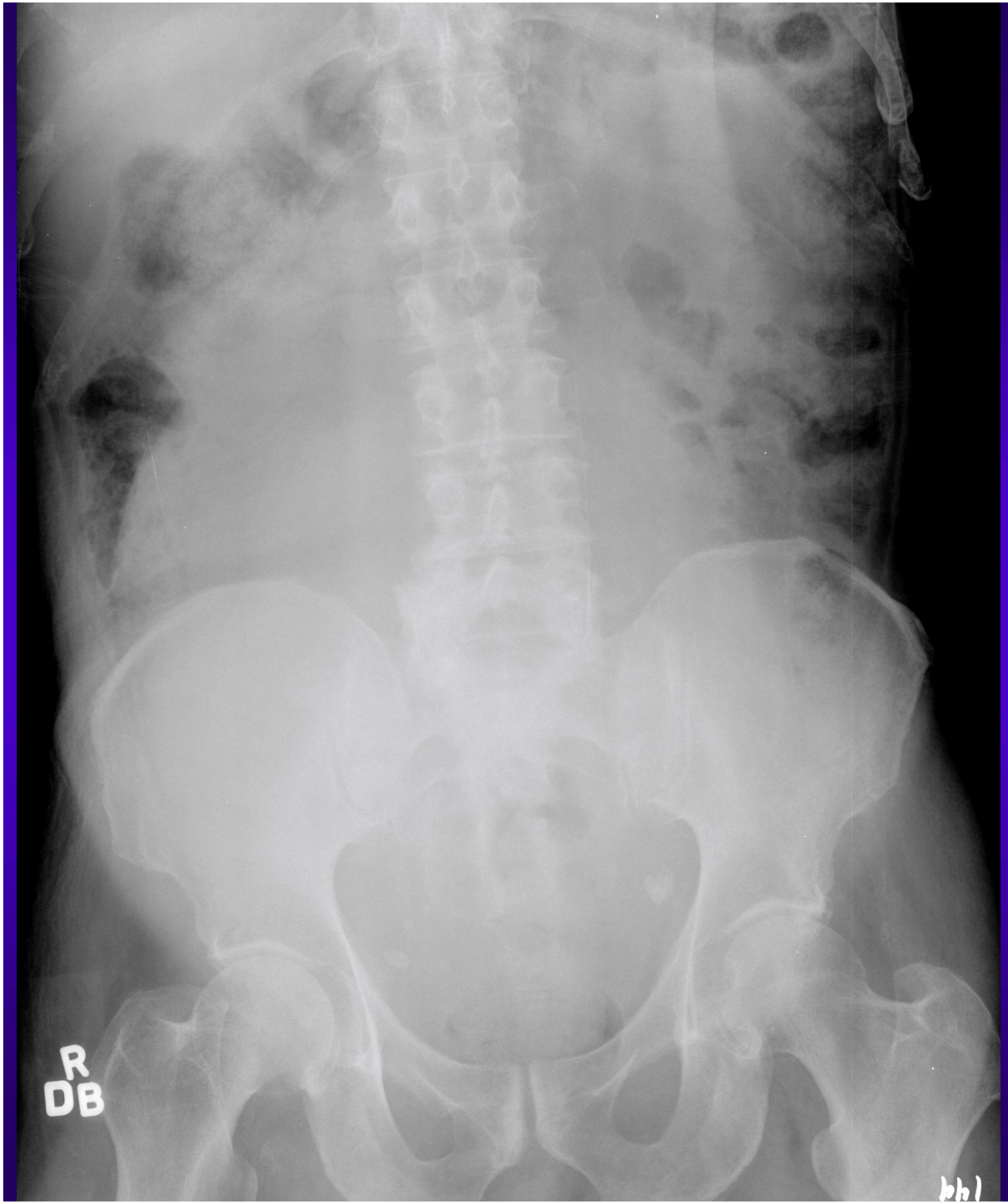
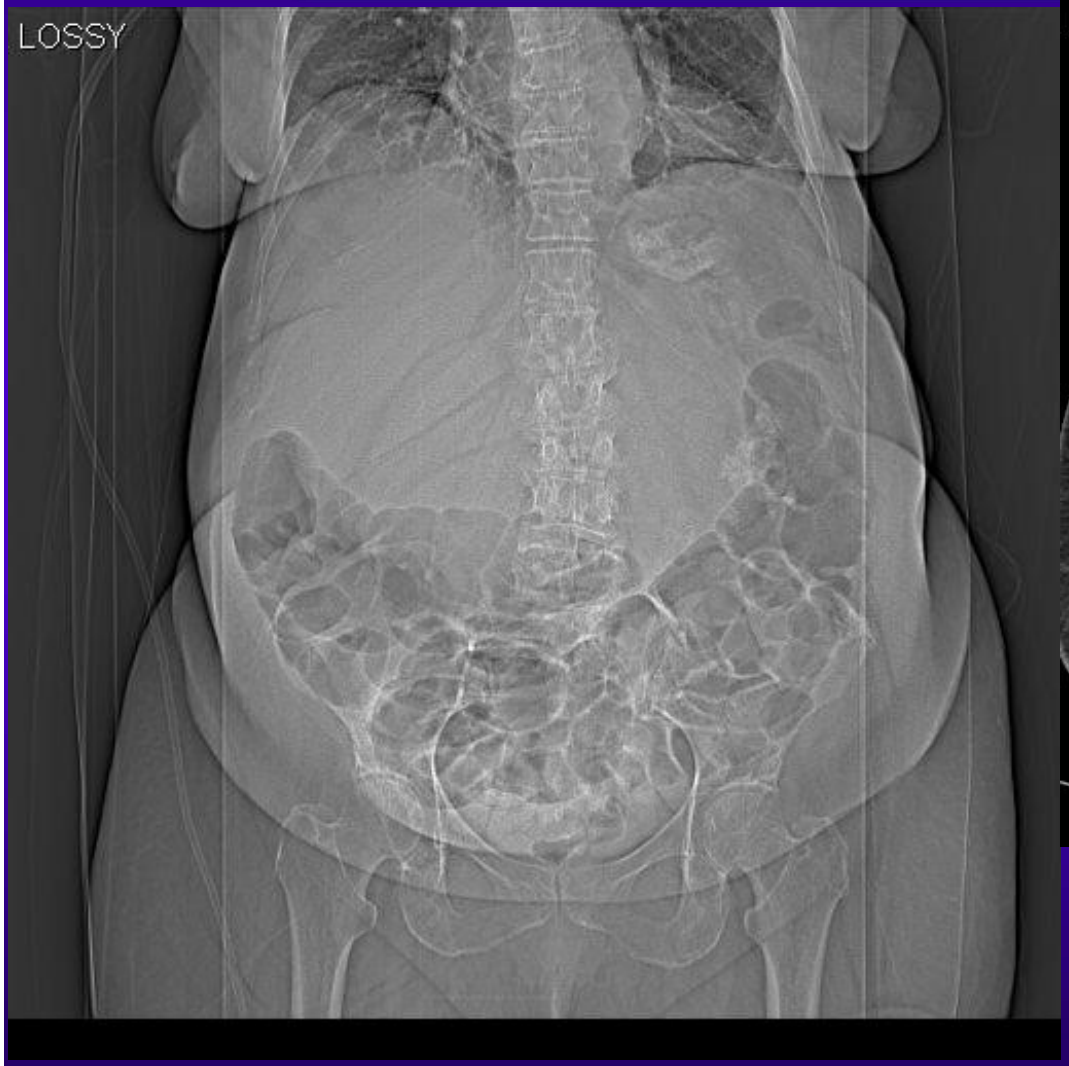
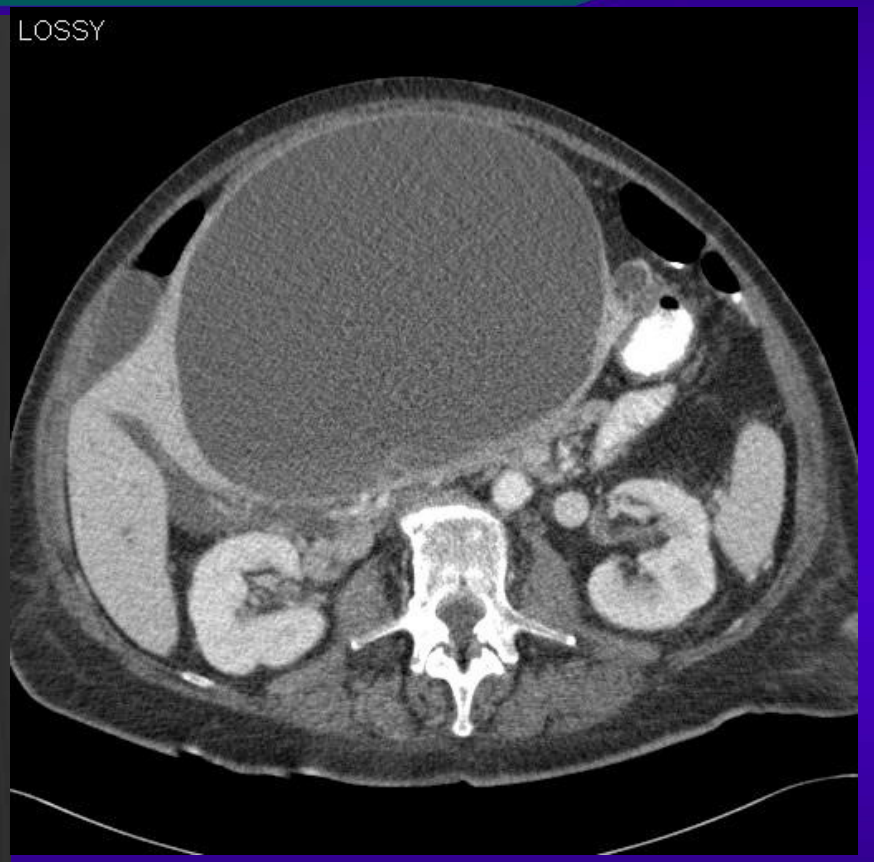


SIMILAR APPEARANCE BUT IN A MALE PATIENT = DISTENDED URINARY BLADDER

PSEUDOCYST





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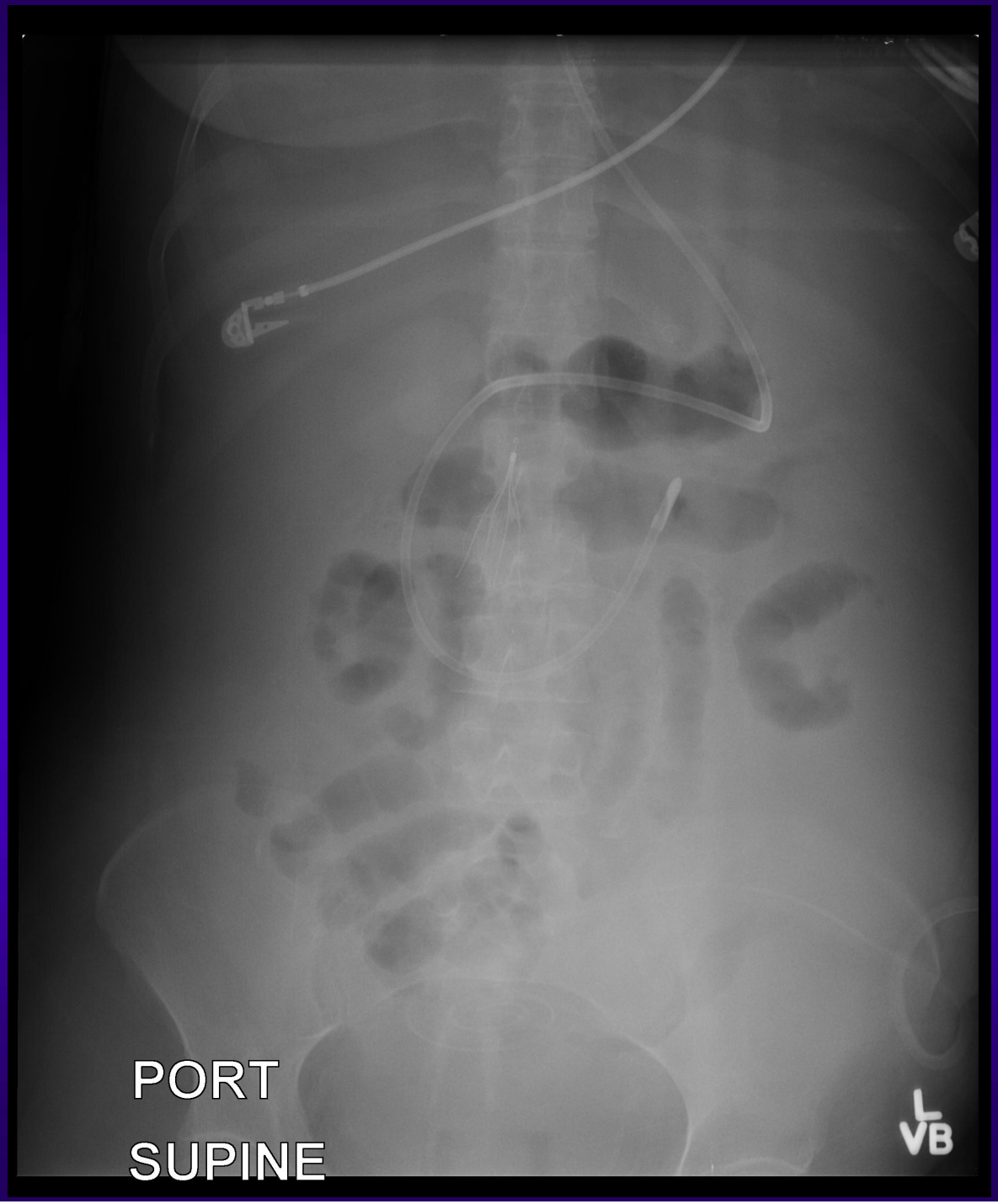
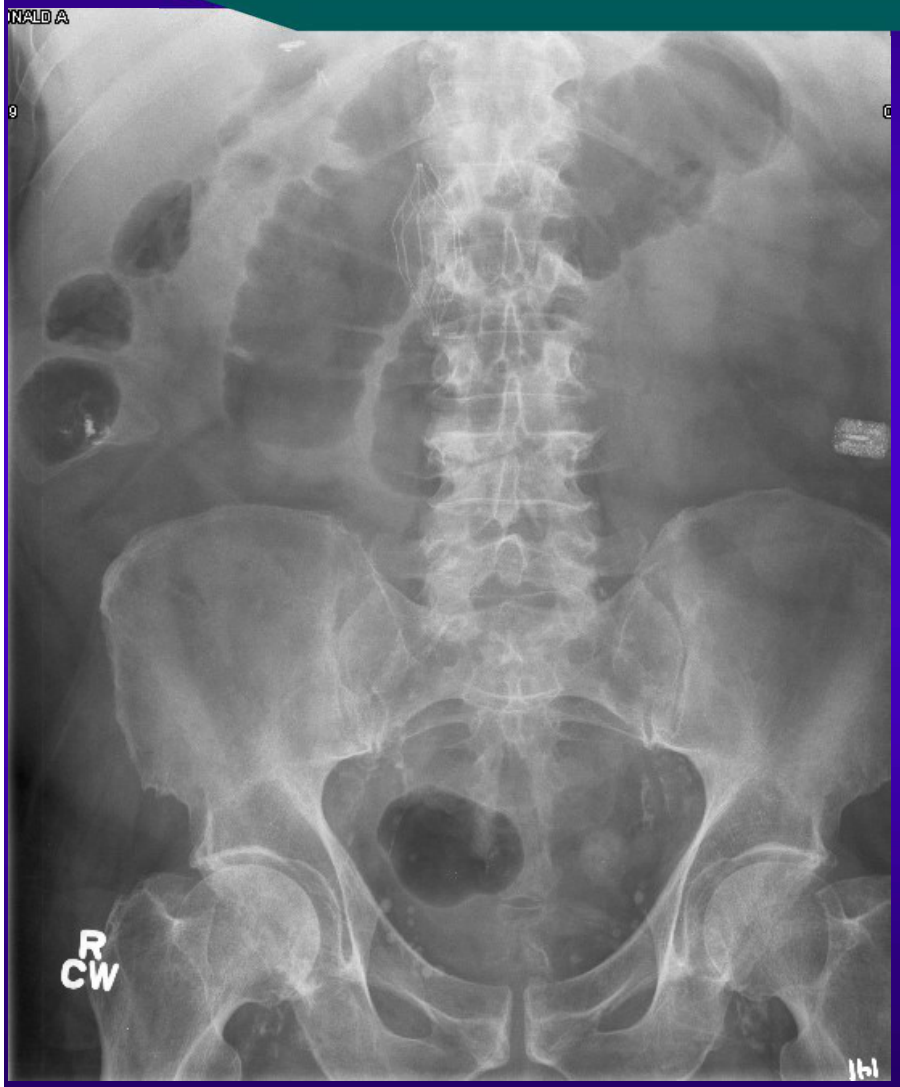
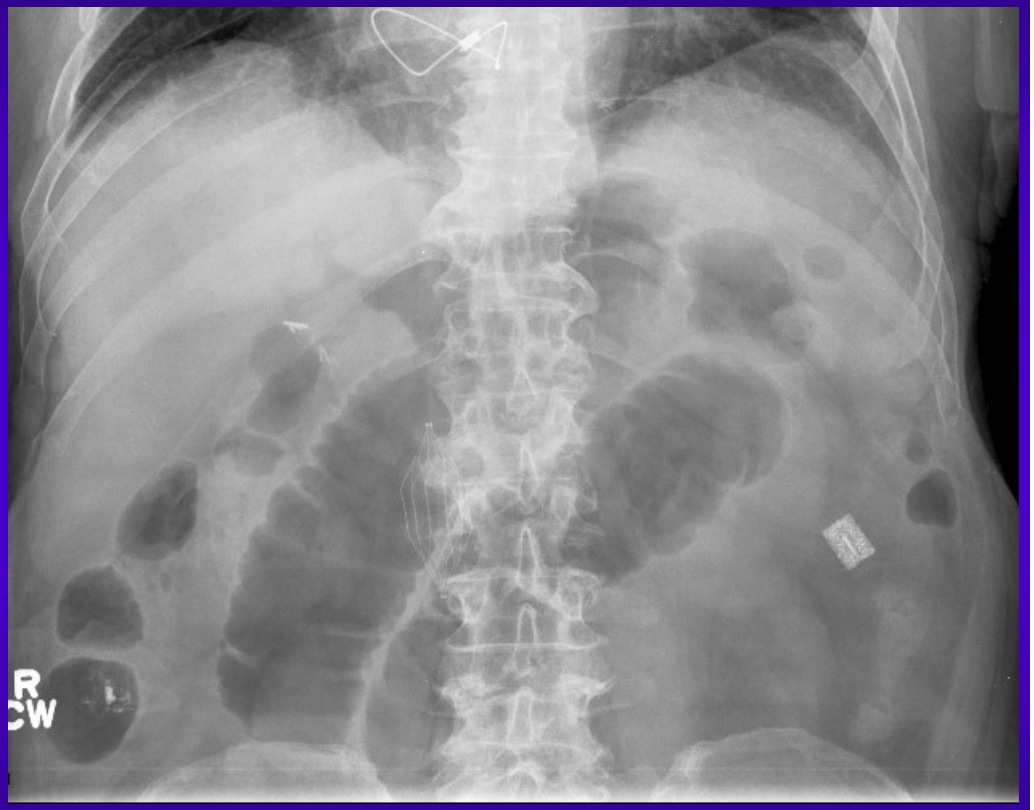
ASCITES



OBSTRUCTED PATENCY CAPSULE





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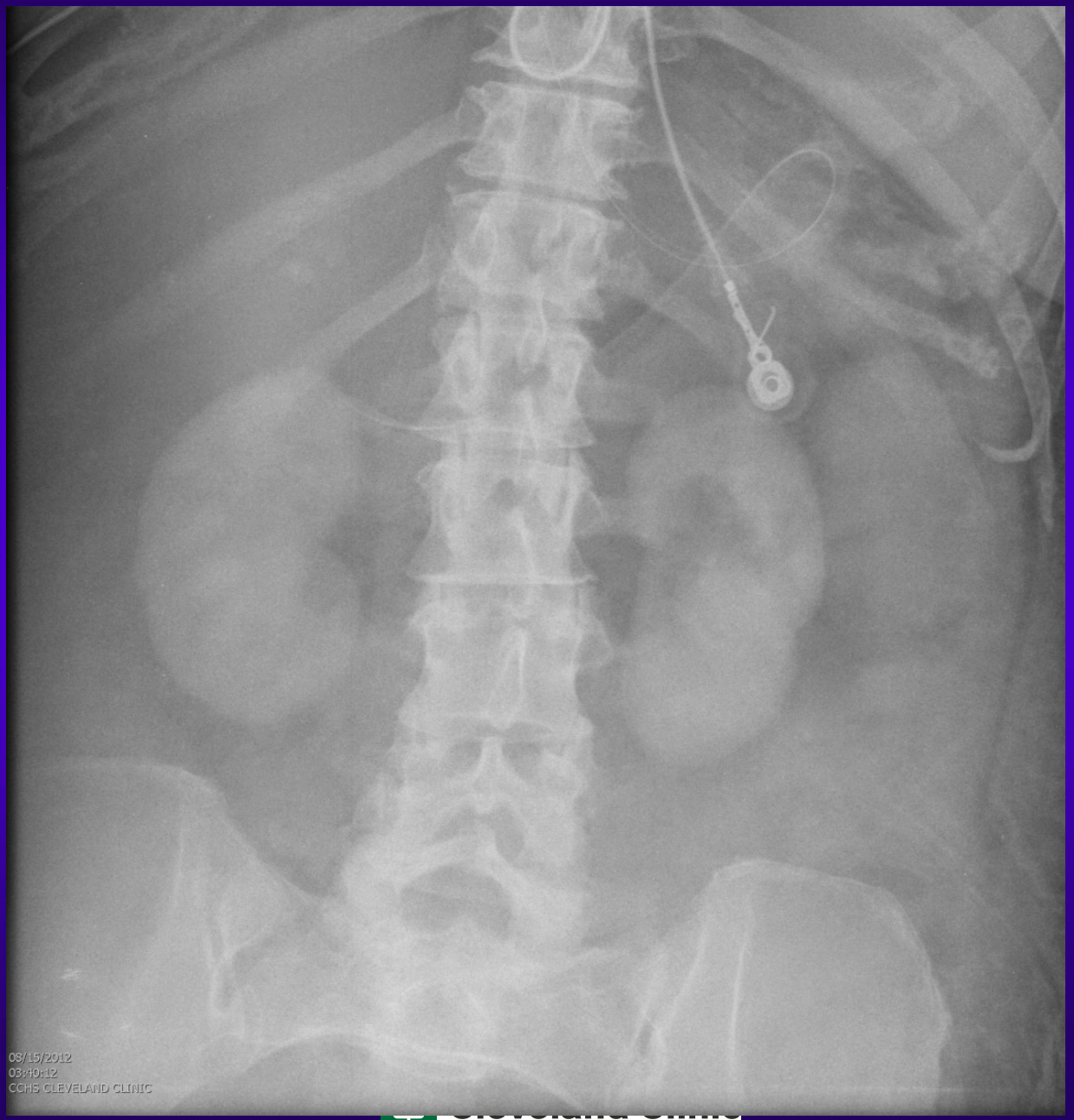
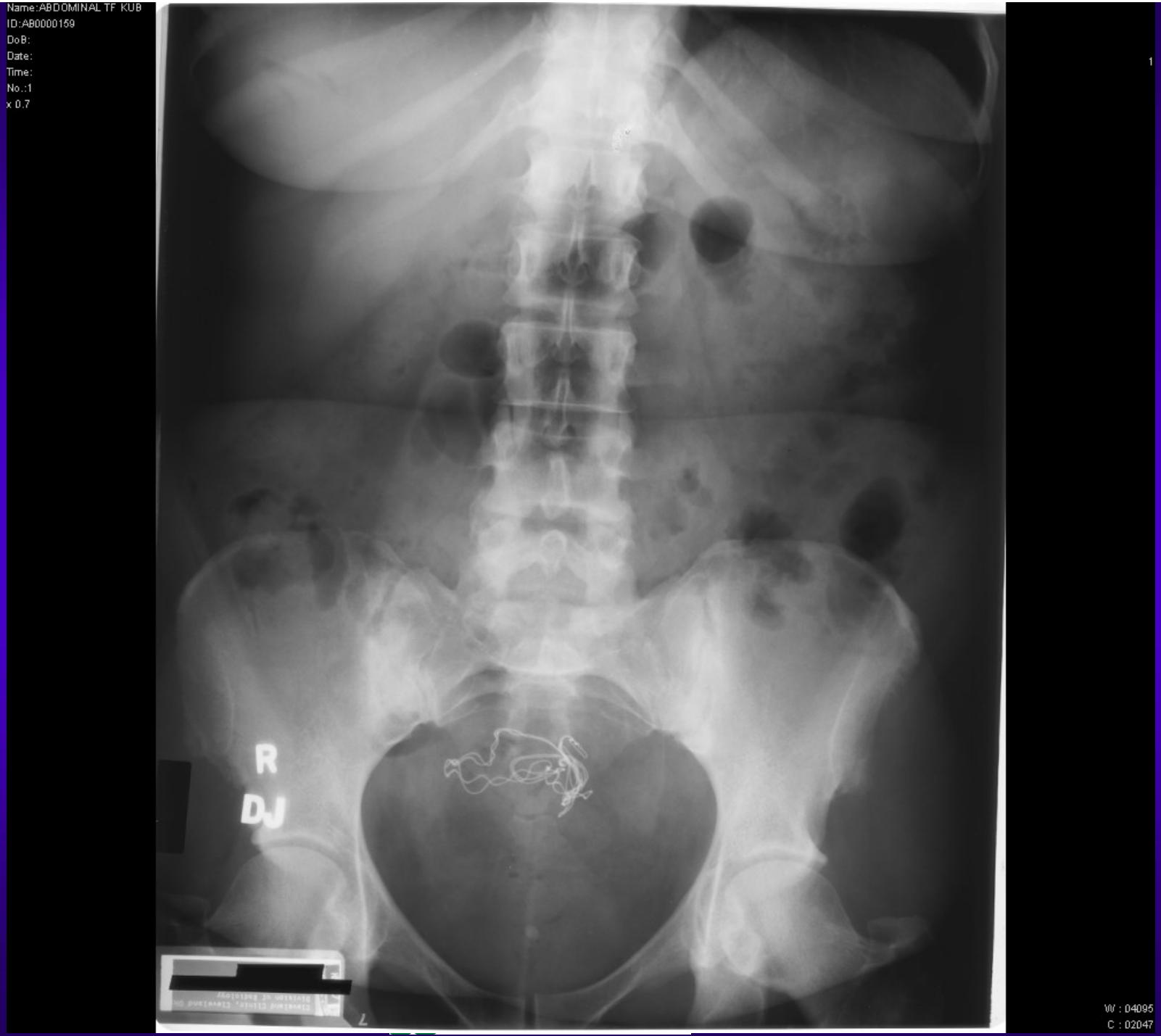
INCREASED RENAL DENSITY – AKI 3 DAYS FOLLOWING CTA

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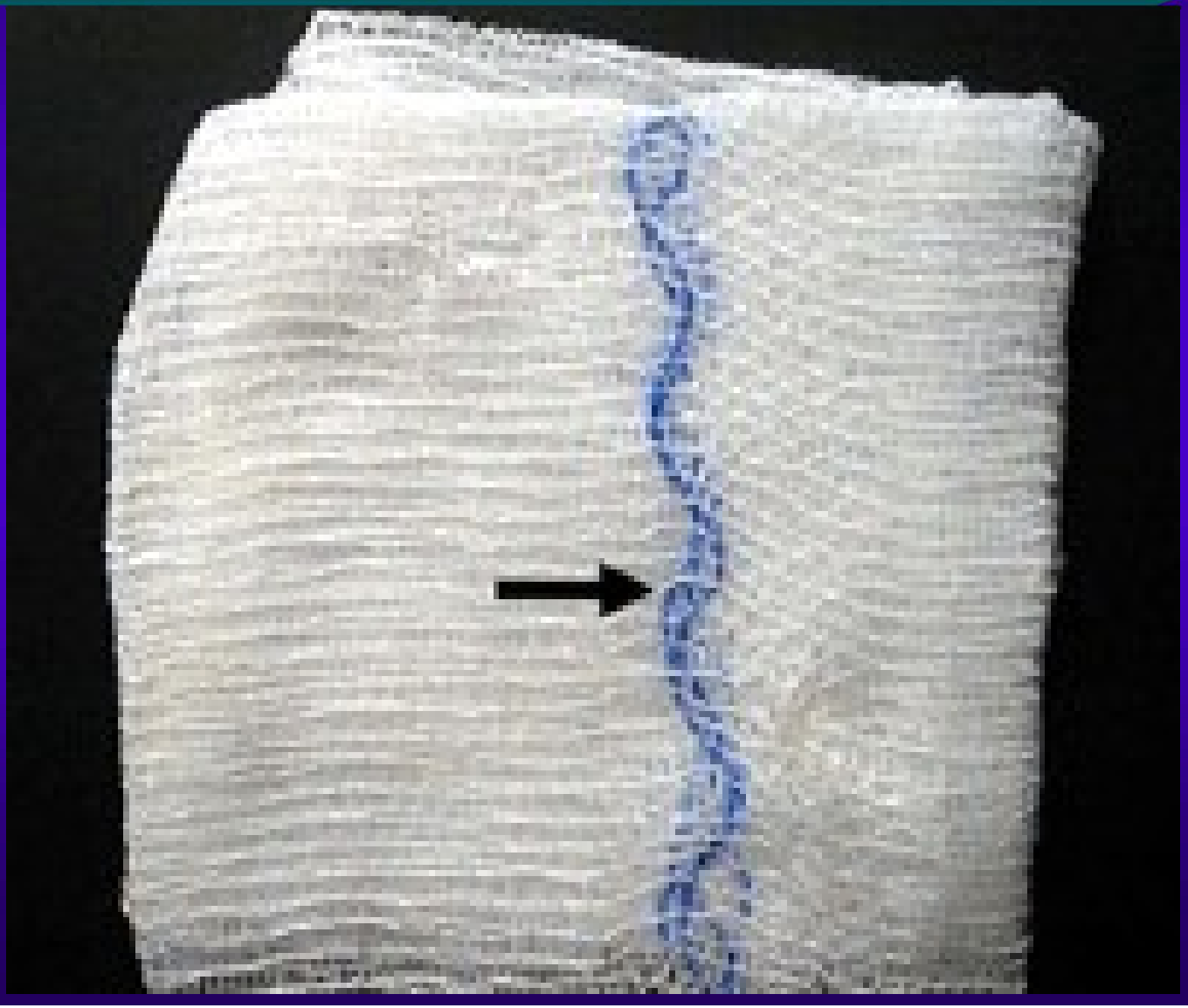
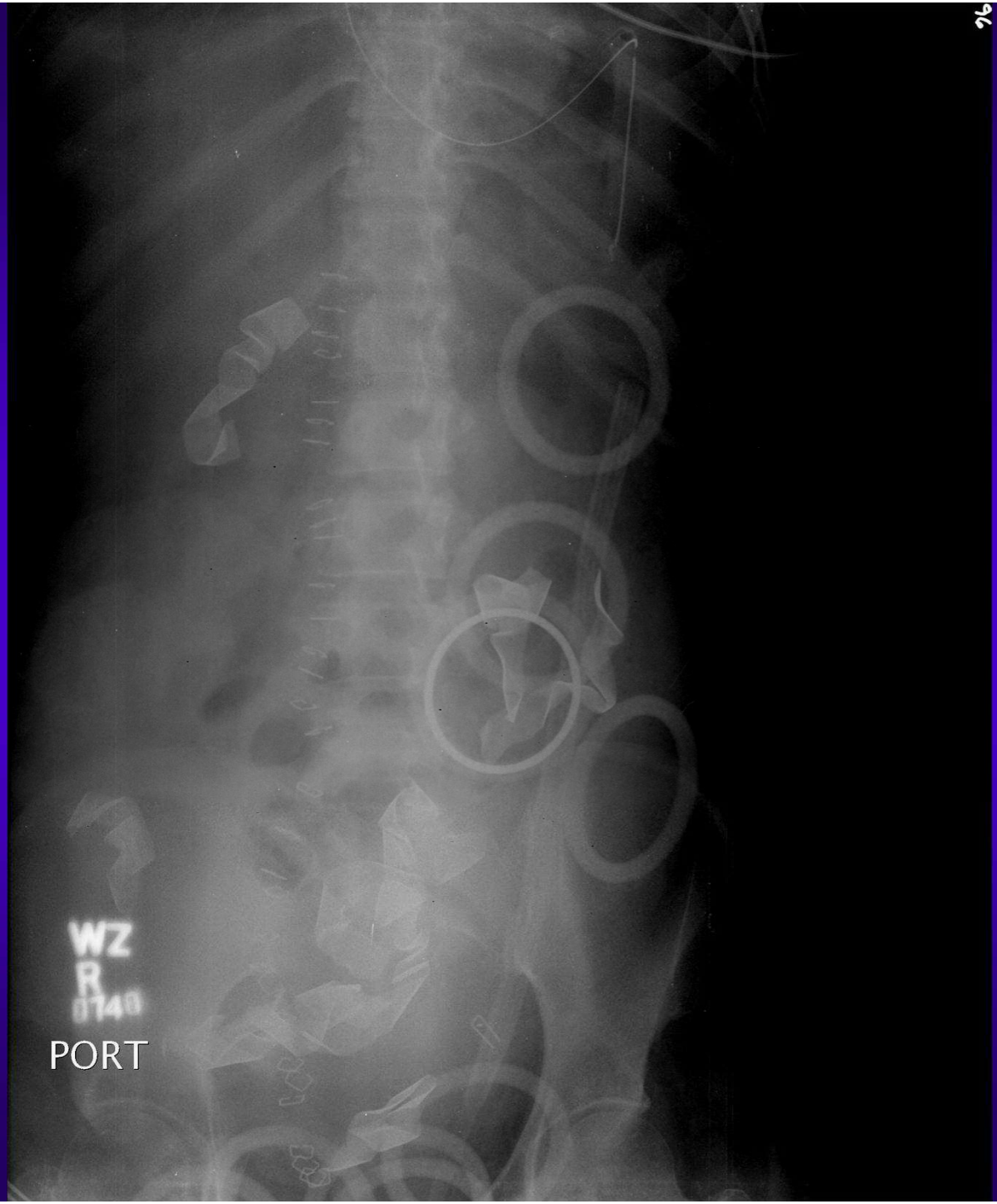
SURGICAL SPONGE

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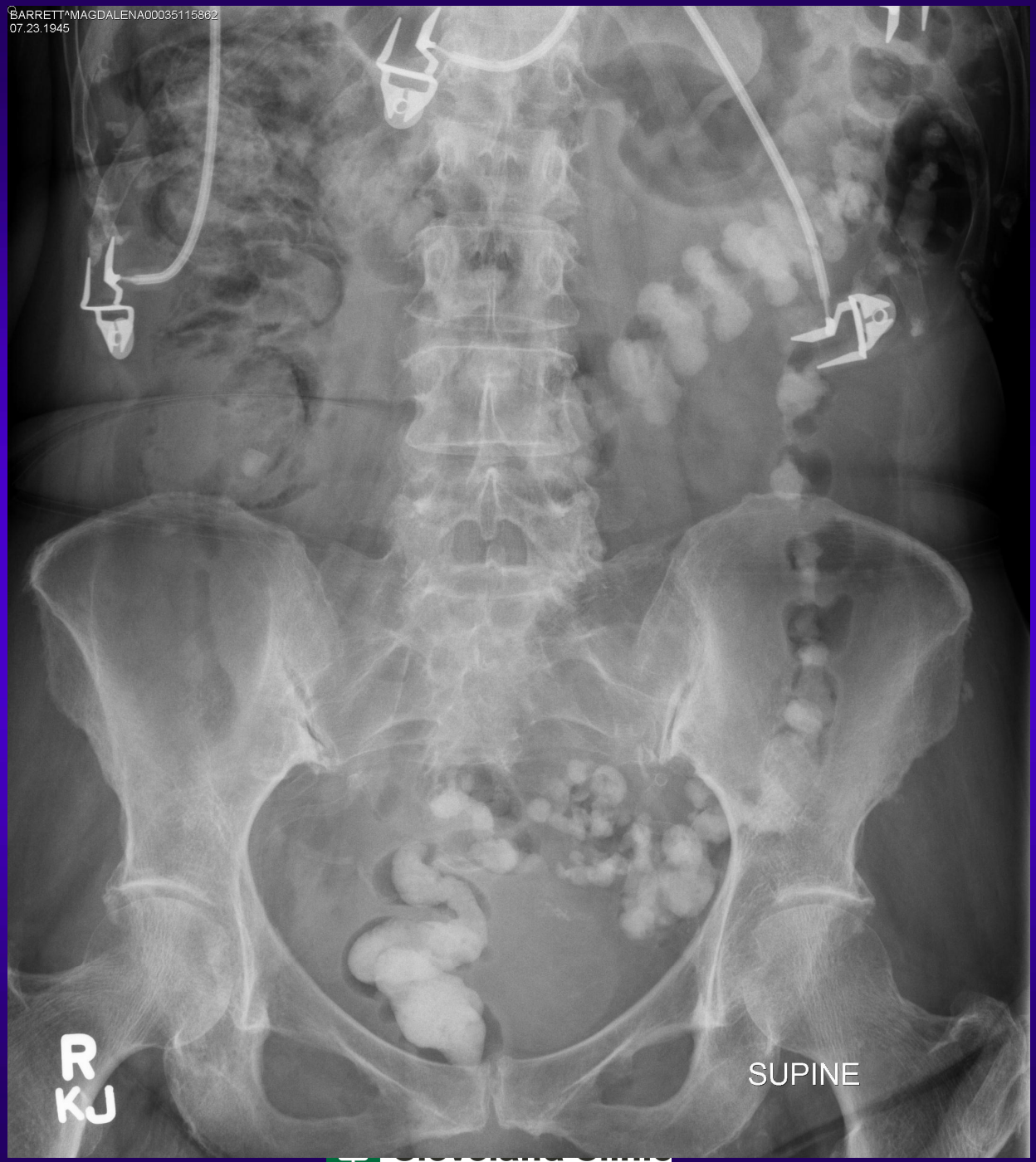
PORT

SURGICAL TOWEL/LAP PAD

Cleveland Clinic

PNEUMATOSIS


BARRETT^MAGDALENA00035115862
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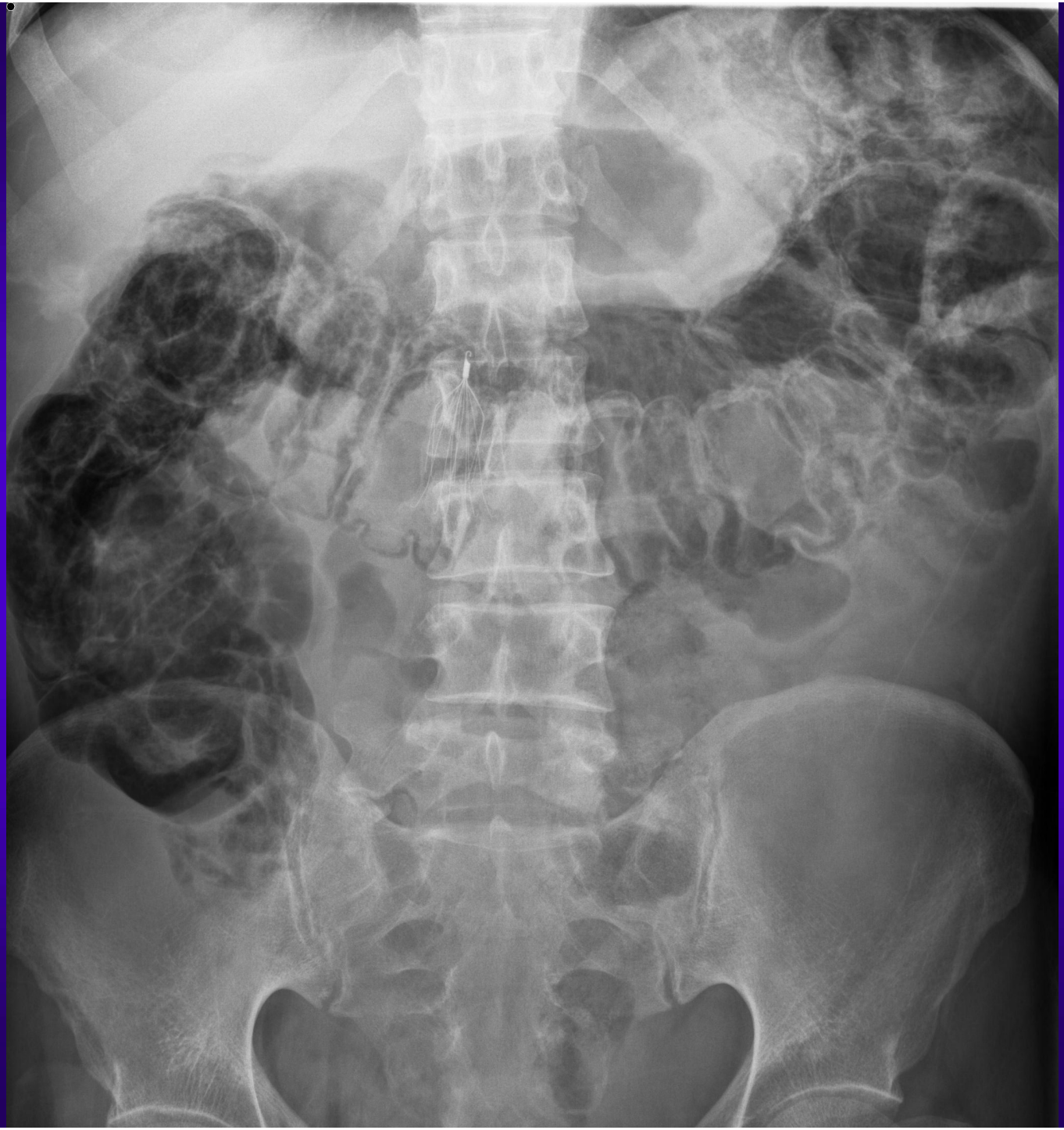
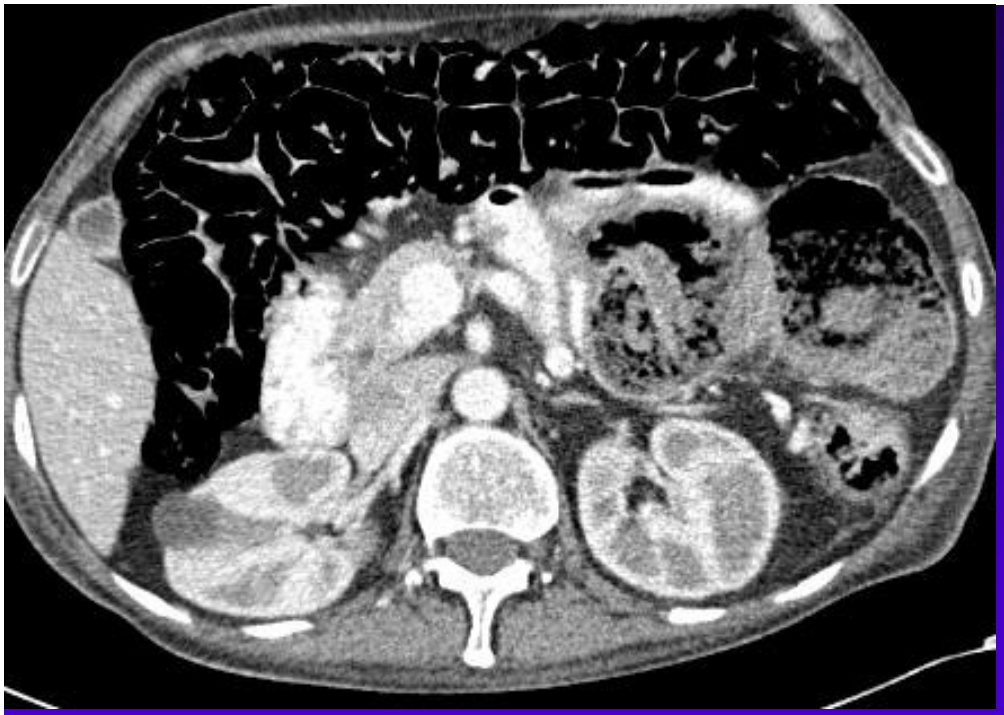
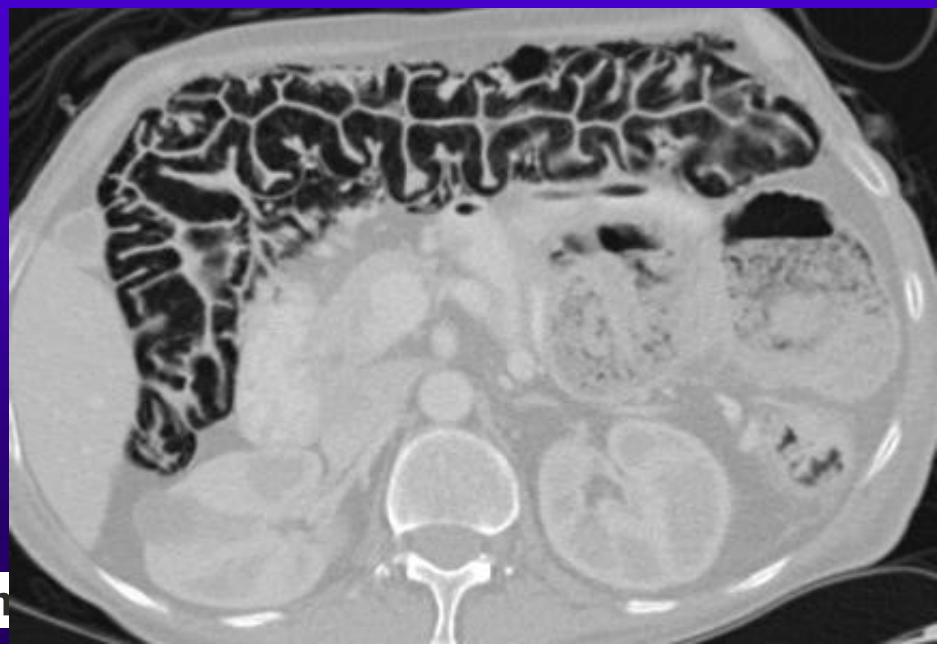
SUPINE

PNEUMATOSIS - CAUSES

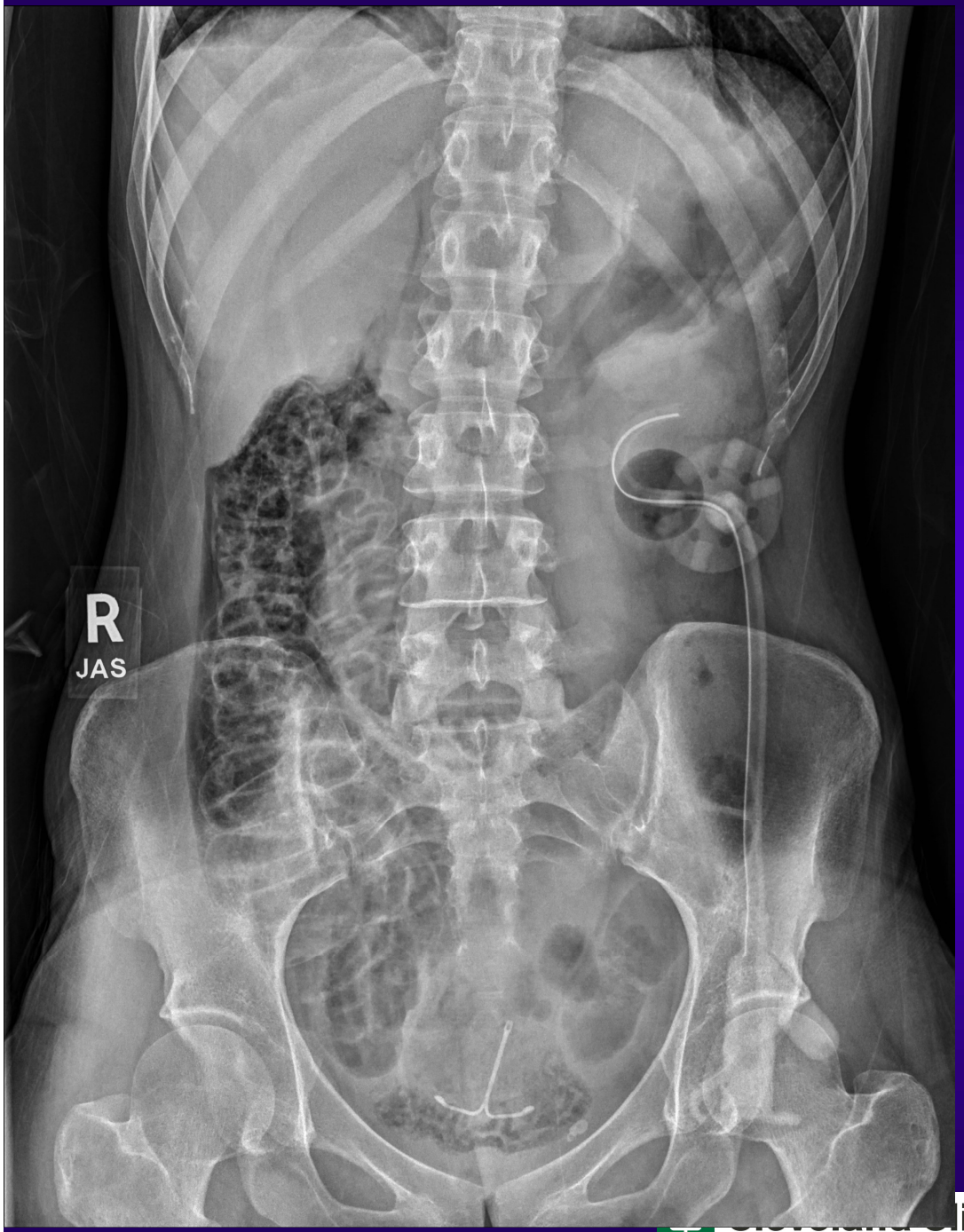
- Immunosuppressive therapy – lung Tx
- Disruption of mucosal integrity
  - Ischemia
  - Post-op
  - Inflammatory
- Increased intraluminal pressure
  - BE, endoscopy, proximal to obstruction
- Miscellaneous
  - Steroids
  - Scleroderma
  - Abnormal thoracic air







Clevelan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