UNIVERSITAS TRISAKTI

HERMINA

EMERGENCY SERIES PART 1. ABDOMEN

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CONVENTIONAL RADIOGRAPHY

- Imaging of the abdomen is now largely perfomed with US, CT or MRI.
- However for many patients, **“plain films”** of the abdomen are obtained as a first step before other imaging studies are ordered.

BOX 14-1 RECOGNIZING THE NORMAL ABDOMEN: WHAT TO LOOK FOR

The gas pattern

Extraluminal air

Calcifications

Soft tissues masses

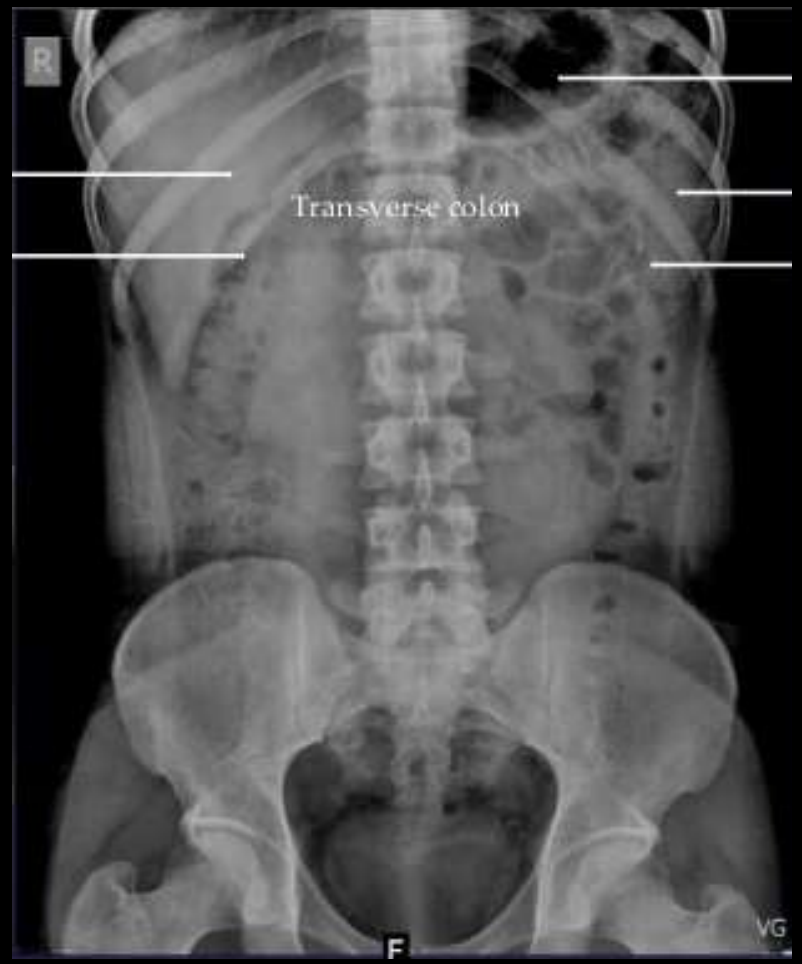
NORMAL BOWEL **GAS PATTERN**

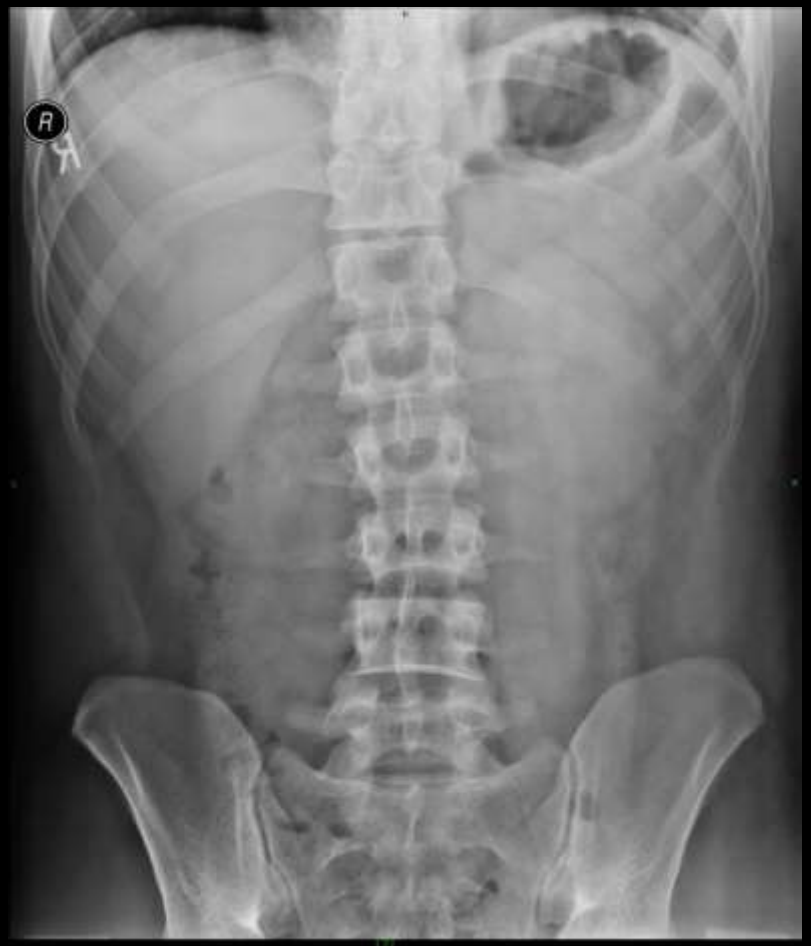
- All gas in the bowel comes from swallowed air. Only a fraction comes from the bacterial fermentation of food.

TABLE 14-1 NORMAL DISTRIBUTION OF GAS AND FLUID IN THE ABDOMEN

Organ	Normally Contains Gas	Normally Has Air–Fluid Levels
Stomach	Yes	Yes
Small bowel	Yes, 2-3 loops	Yes
Large bowel	Yes, especially rectosigmoid colon	No

BNO





30/01/2024 BNO posisi supine

PEMBACAAN/EXPERTISE BNO

1. Pre Peritoneal Fat (Peritoneal fat line) →

Jelas atau tidak (terpotong atau tidak)

2. Kontour dan axis ginjal

3 PSOAS line → Jelas atau tidak

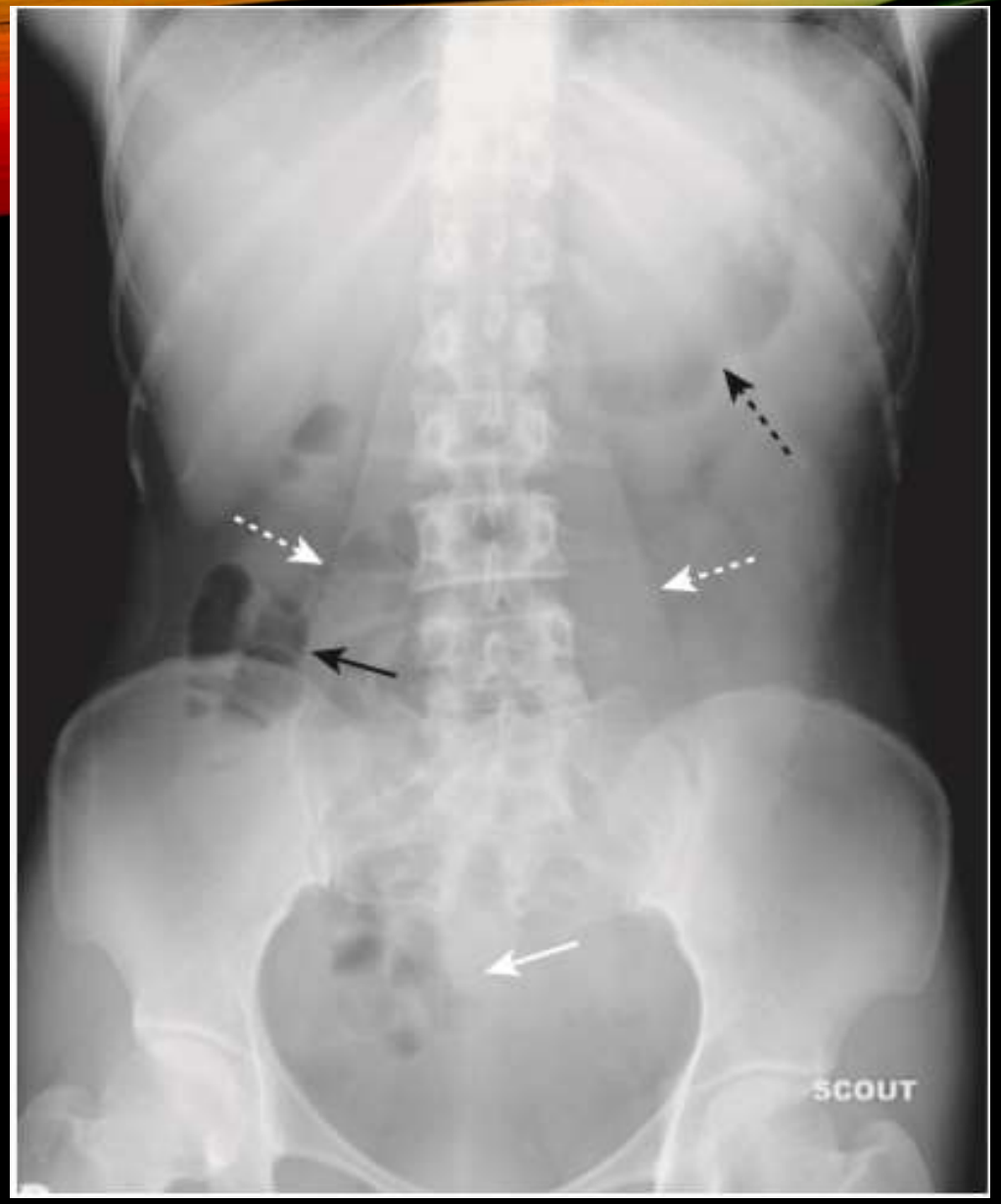
4 Distribusi udara normal atau tidak

5 Jumlah udara di di usus halus dan usus besar.

6 Kalsifikasi atau bayangan opak (massa, batu)

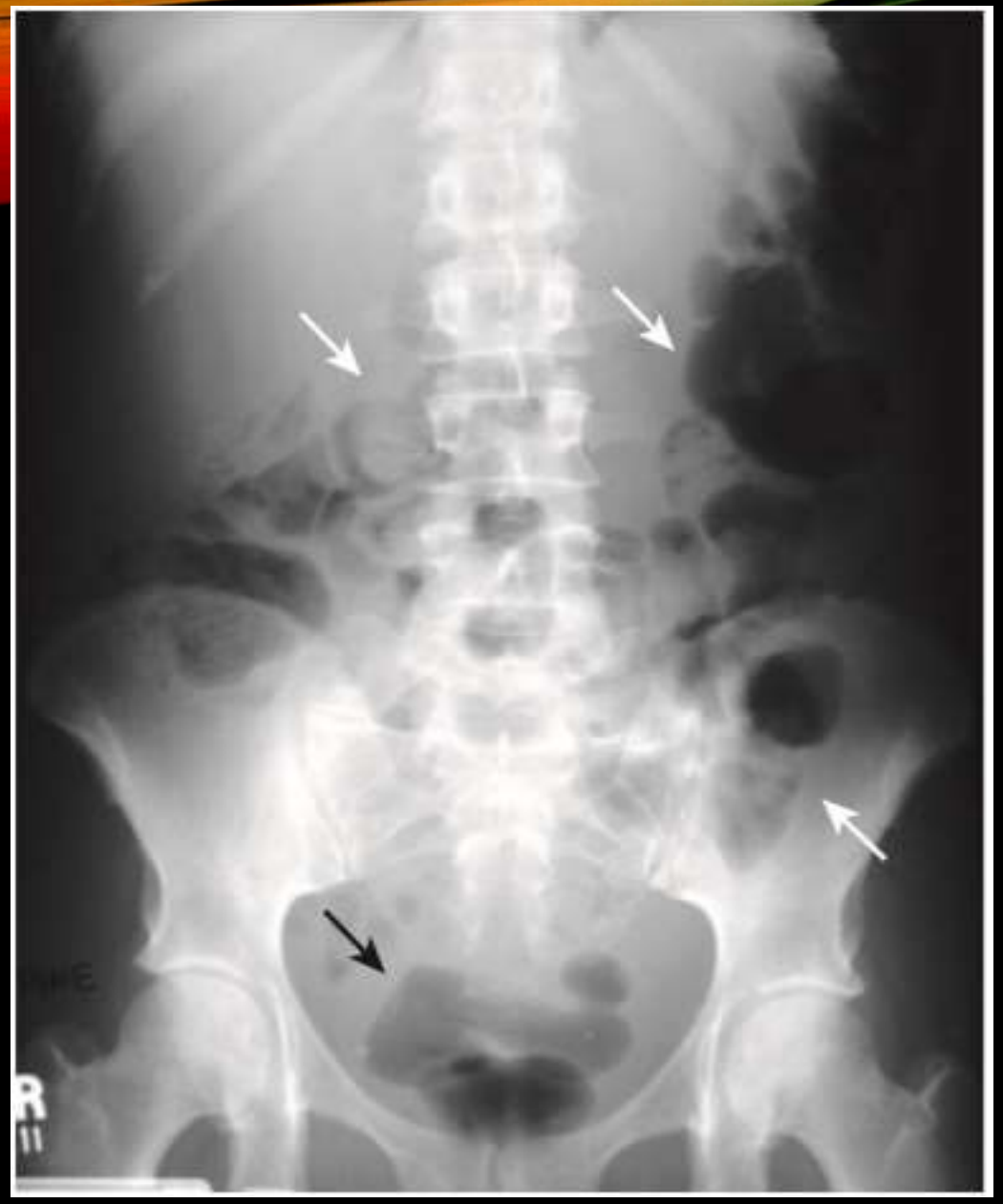
7 Pada posisi LLD atau erect (1/2 duduk) →

Adakah Air fluid level, free air (udara bebas) sub diafragma



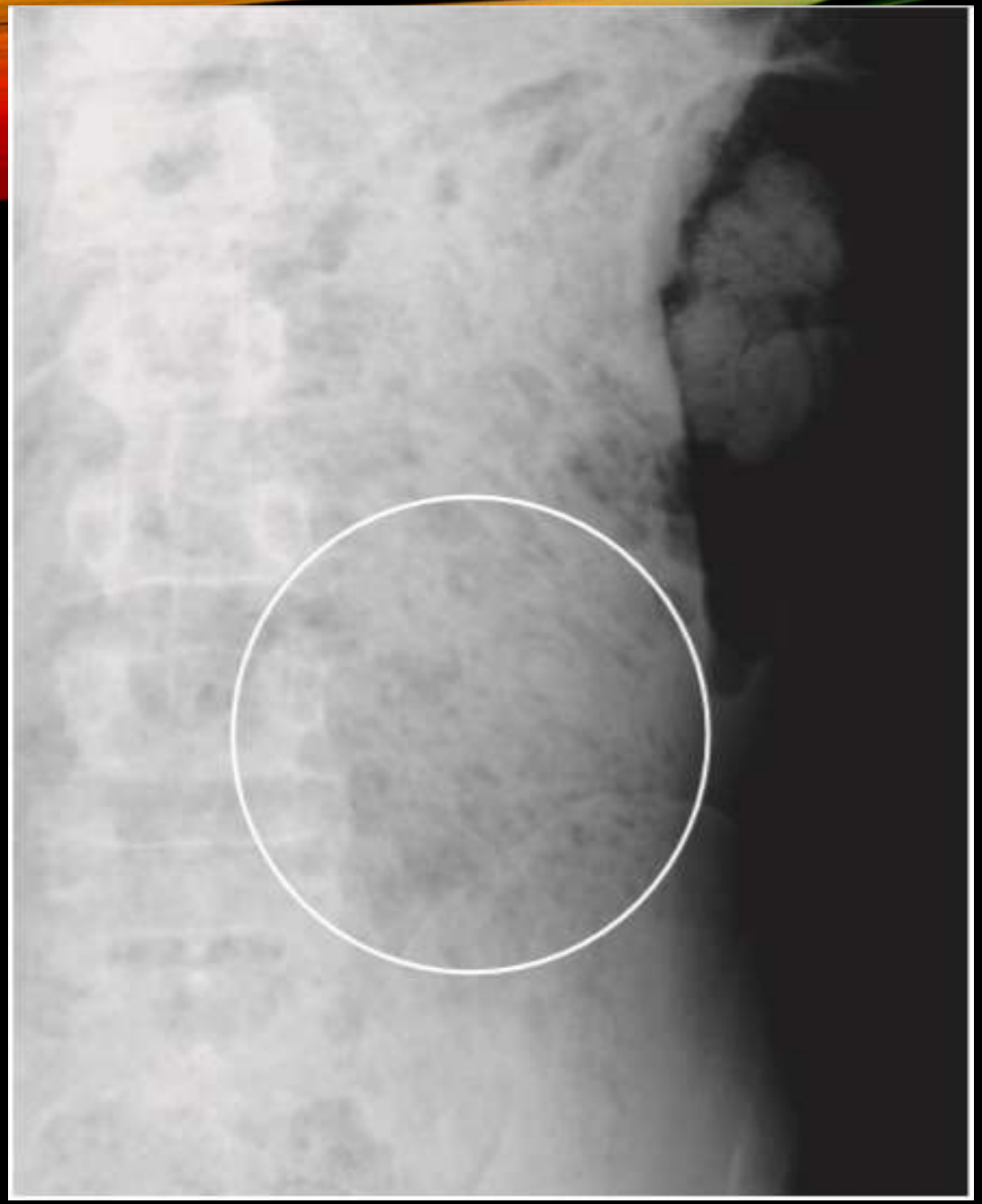
Normal supine abdomen

- *Solid black arrow* → 2-3 loops of air in small bowel
- *Dotted black arrow* → air in the stomach
- *Solid white arrow* → air in the rectosigmoid colon
- *Dotted white arrow* → psoas muscles



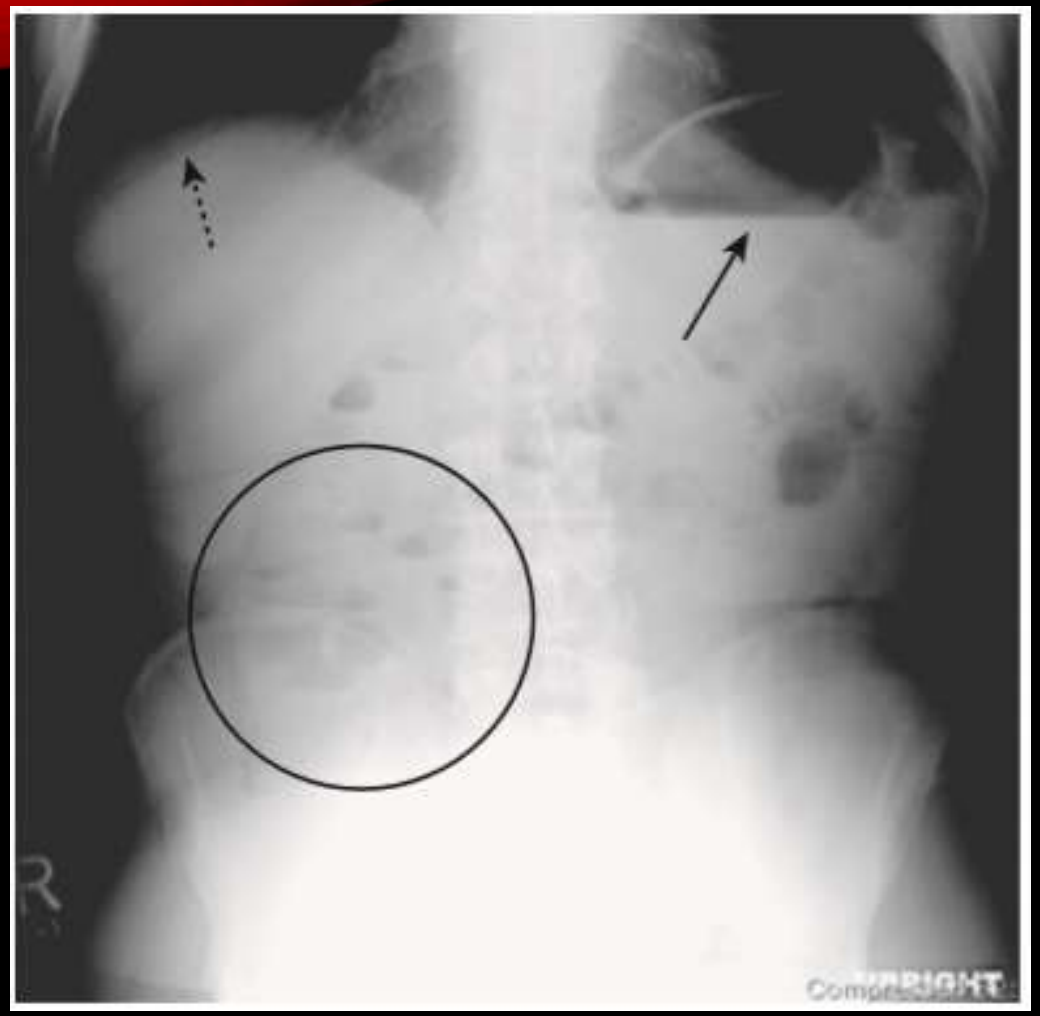
Normal prone abdomen

- The ascending and descending colon, rectosigmoid colon, all of which are posterior structures, are the highest parts of the large bowel → most likely to fill with air.
- *Black arrow* → S-shaped rectosigmoid colon
- *White arrows* → air can be seen throughout the remainder of the colon



Appearance of stool

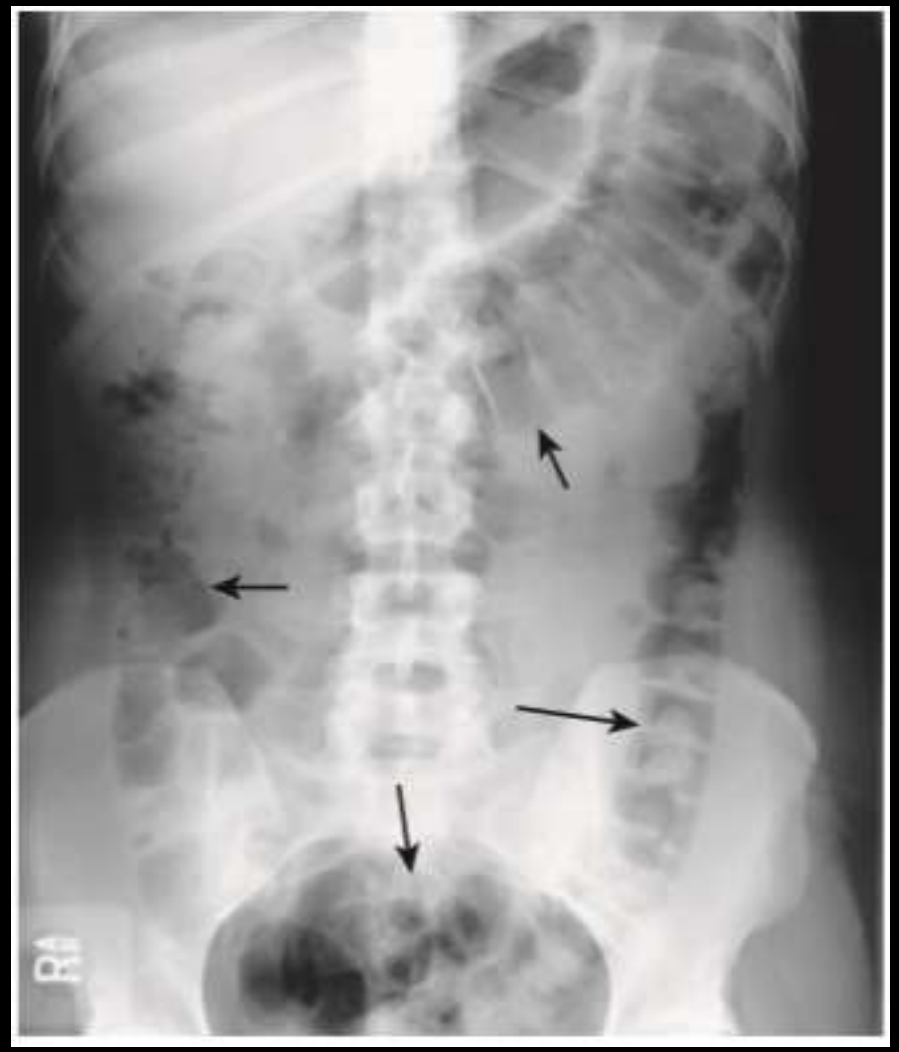
- *White circle* → Stool is recognizable by the multiple, small bubbles of gas present within a semisolid-appearing soft tissue density.
- This patient has a markedly dilated sigmoid colon due to chronic constipation



Normal upright abdomen

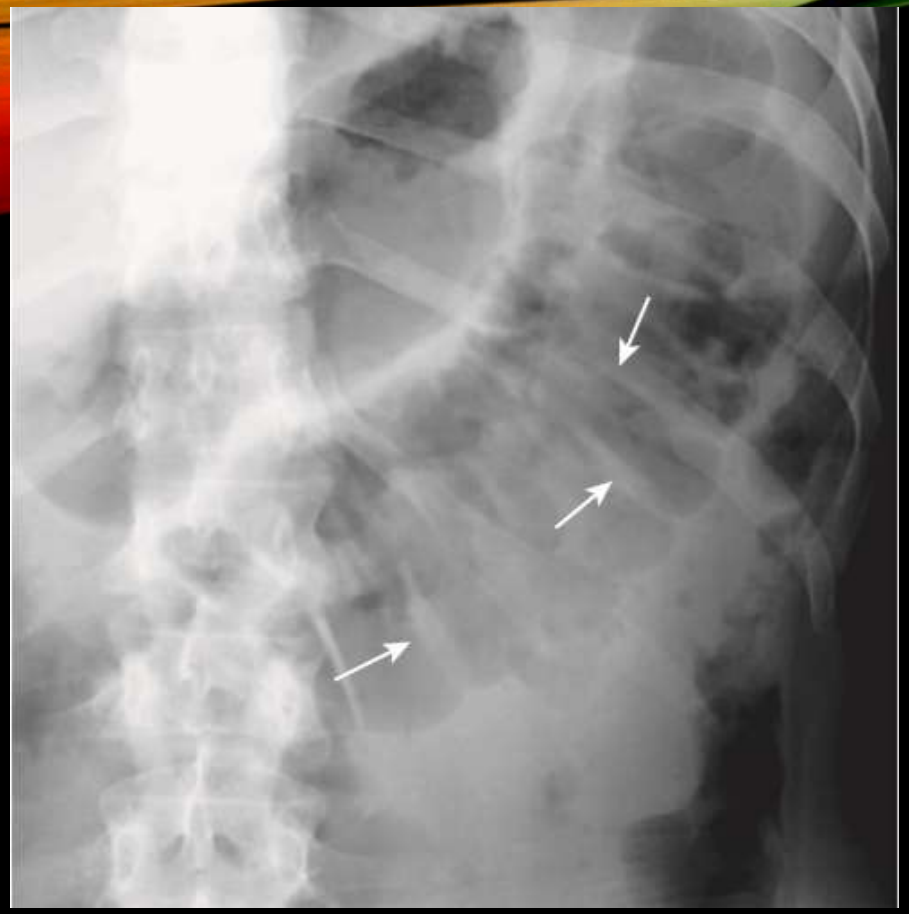
- *Solid black arrow* → normal air-fluid level in the stomach.
- *Black circle* → short air-fluid levels in a few nondilated loops of small bowel.
- *Dotted black arrow* → air-fluid level in the colon just below the hemidiaphragm

DIFFERENTIATING LARGE FROM SMALL BOWEL



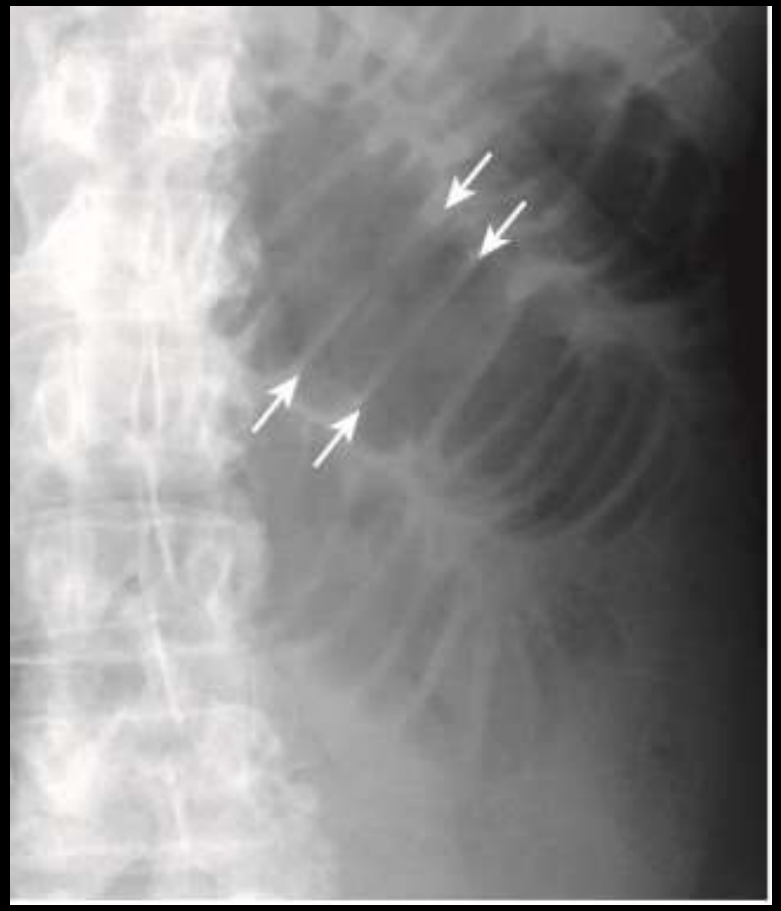
Location of large bowel

- *Black arrows* → large bowel usually occupies the periphery of the abdomen.
- Small bowel is located more centrally.



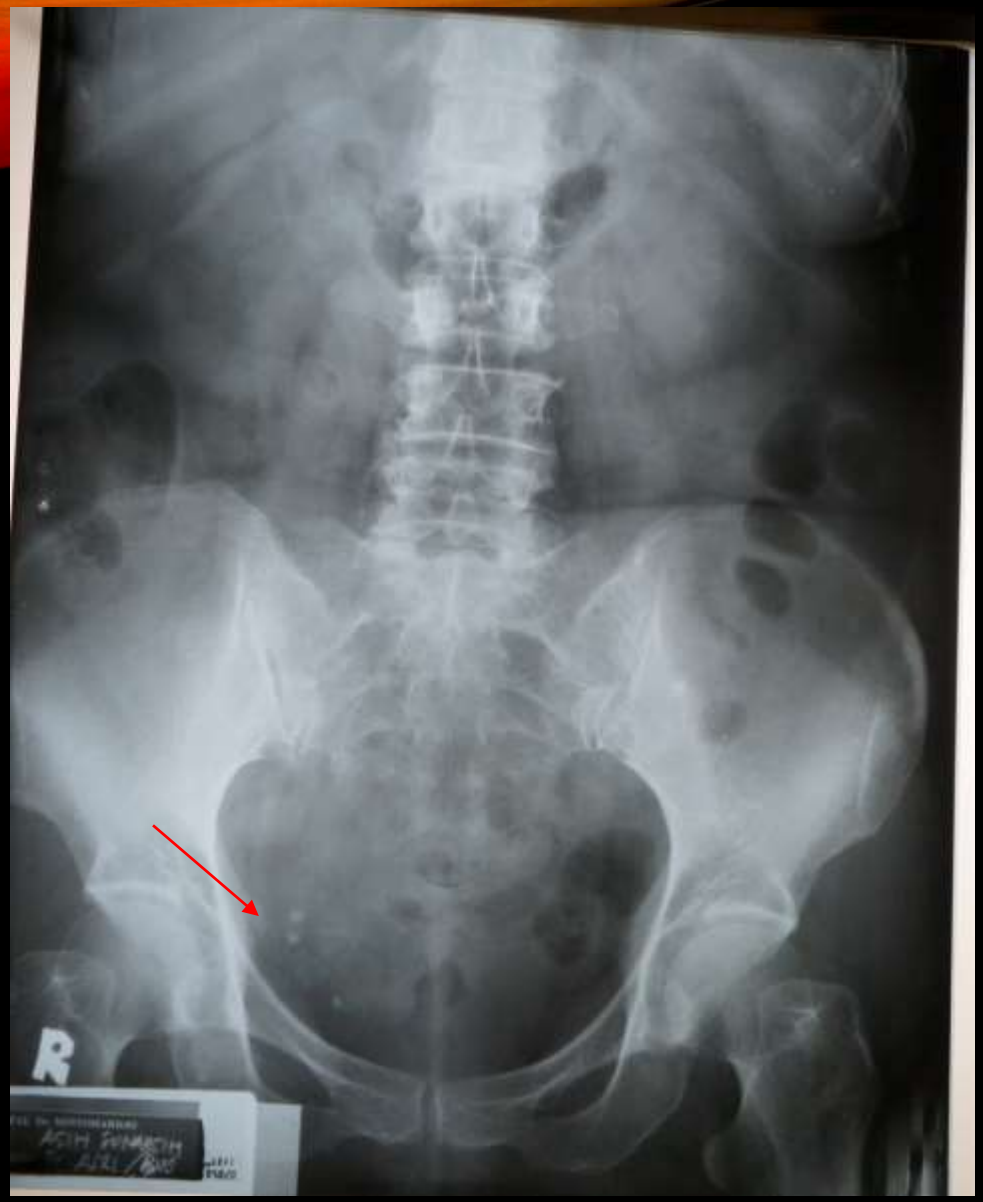
Normal large bowel haustral markings

- *White arrows* → most haustrals markings in the colon do not transverse the entire lumen to extend from one wall to the opposite wall.



Normal small bowel valvulae

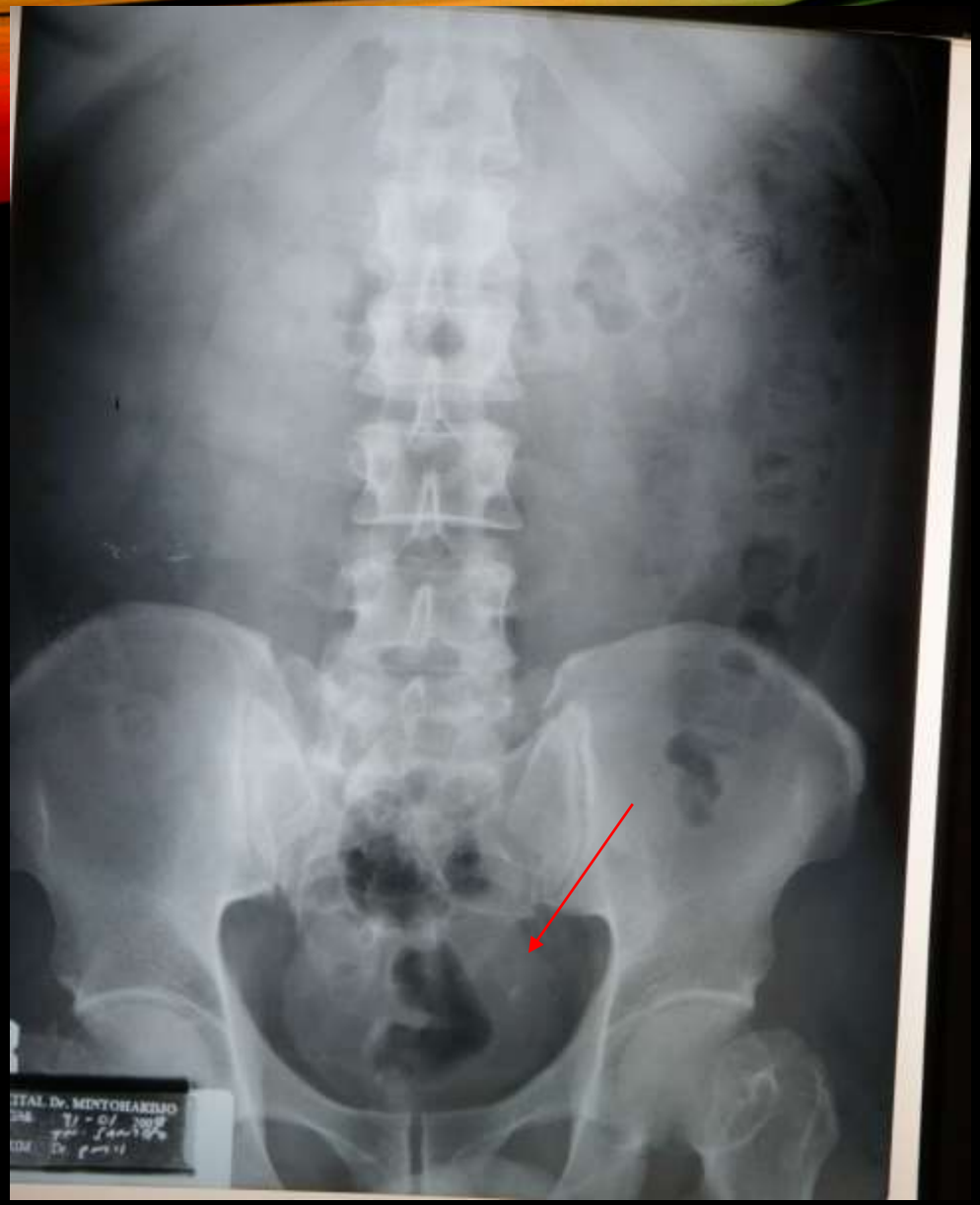
- *White arrows* → two valvulae that transverse the entire lumen in this dilated small bowel.



- Deskripsi/Expertise :
- PSOAS line jelas
- Distribusi udara di usus halus dan usus besar normal
- Jumlah udara normal
- Tampak kalsifikasi di rongga pelvis

Kesan :

- Kalsifikasi di rongga pelvis (phlebolith)



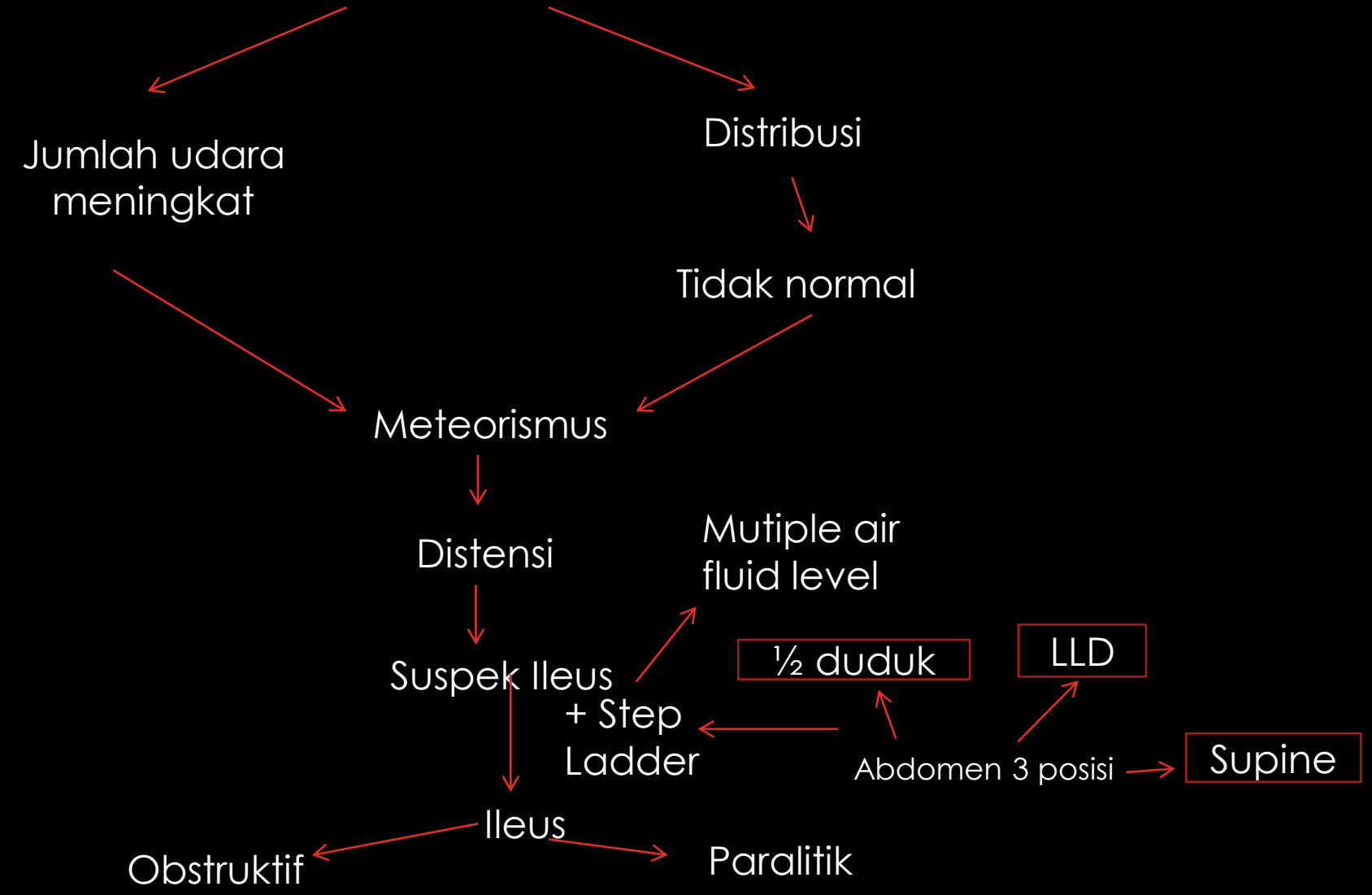
Deskripsi/Expertise :

- PSOAS line jelas
- Distribusi udara di usus halus dan usus besar normal
- Jumlah udara normal
- Tampak kalsifikasi di rongga pelvis

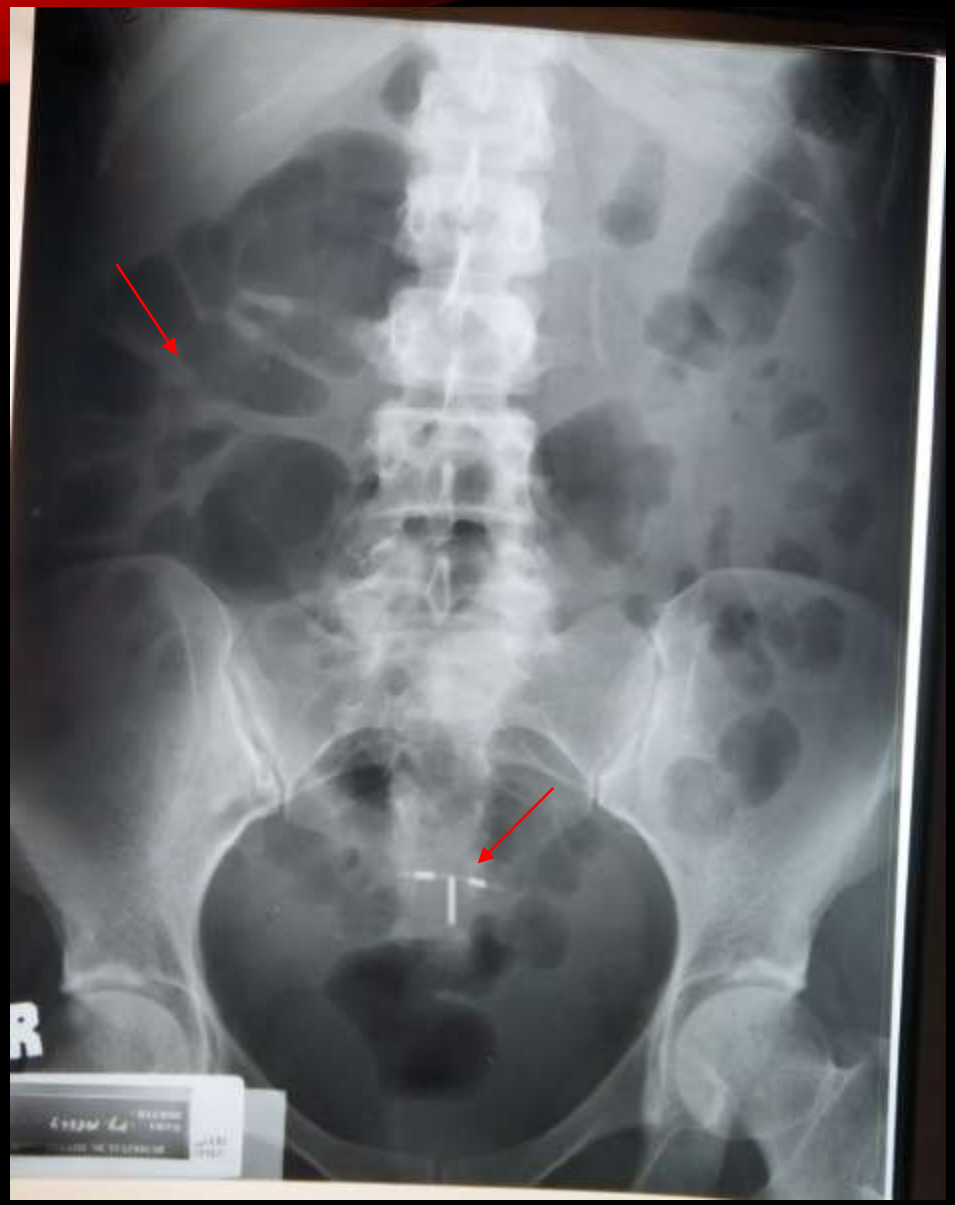
Kesan :

- Kalsifikasi di rongga pelvis (phlebolith)

Udara Usus


Jumlah udara meningkat
Distribusi
Tidak normal
Meteorismus
Distensi
Mutiple air fluid level
Suspek Ileus
+ Step Ladder
½ duduk
LLD
Abdomen 3 posisi
Supine
Ileus
Obstruktif
Paralitik

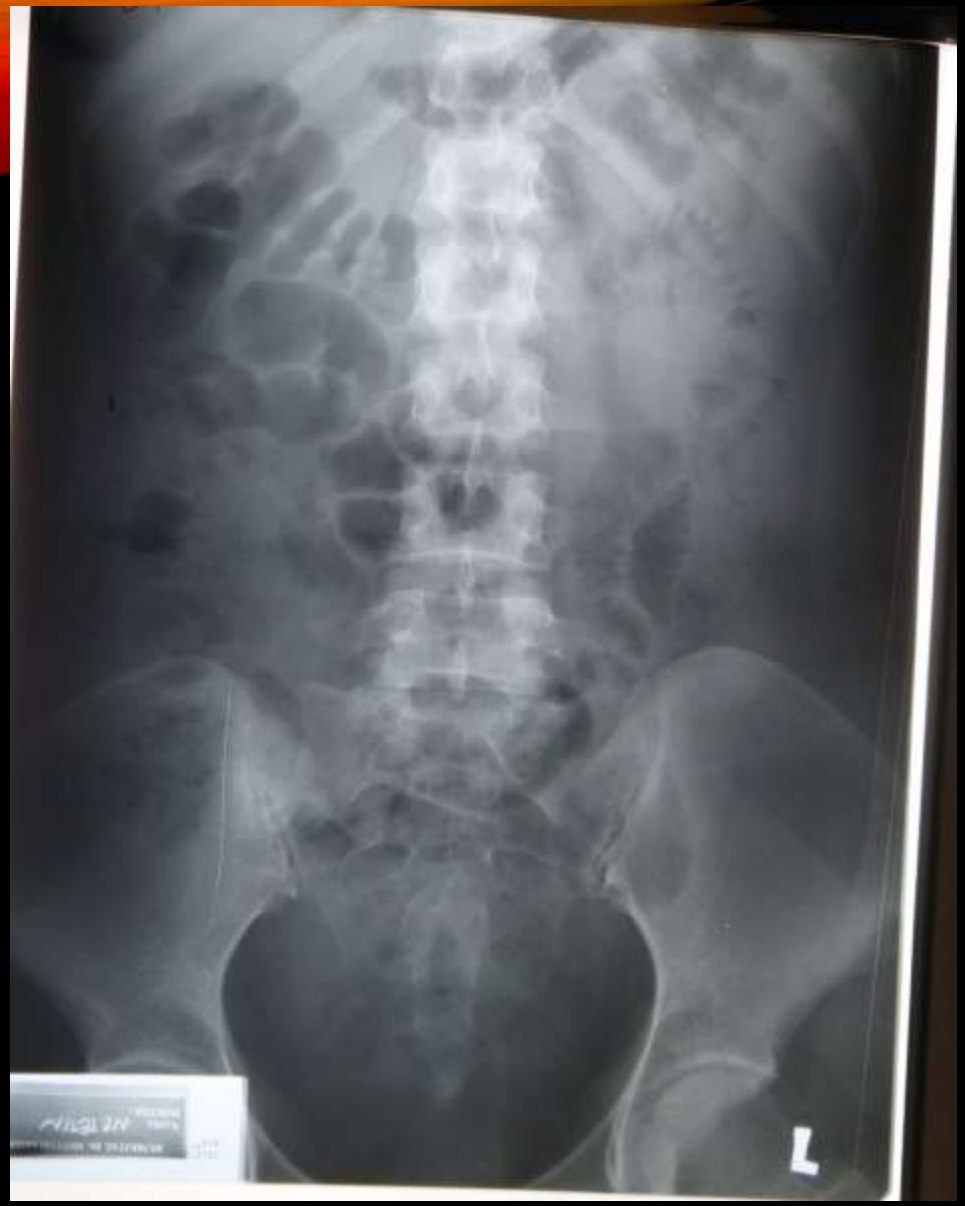
BNO, JUMLAH UDARA



- Deskripsi/Expertise :
- PSOAS line jelas
- Distribusi udara normal dan jumlah udara dalam colon dan usus halus meningkat
- Tampak bayangan opak di rongga pelvis (IUD)

Kesan : Meteorismus

IUD di rongga pelvis



BNO, JUMLAH UDARA ↑

Deskripsi/Expertise :

- PSOAS line jelas
- Distribusi udara normal
- Jumlah udara dalam colon dan usus halus meningkat
- Tidak tampak kalsifikasi

Kesan : Meteorismus

ACUTE ABDOMINAL SERIES

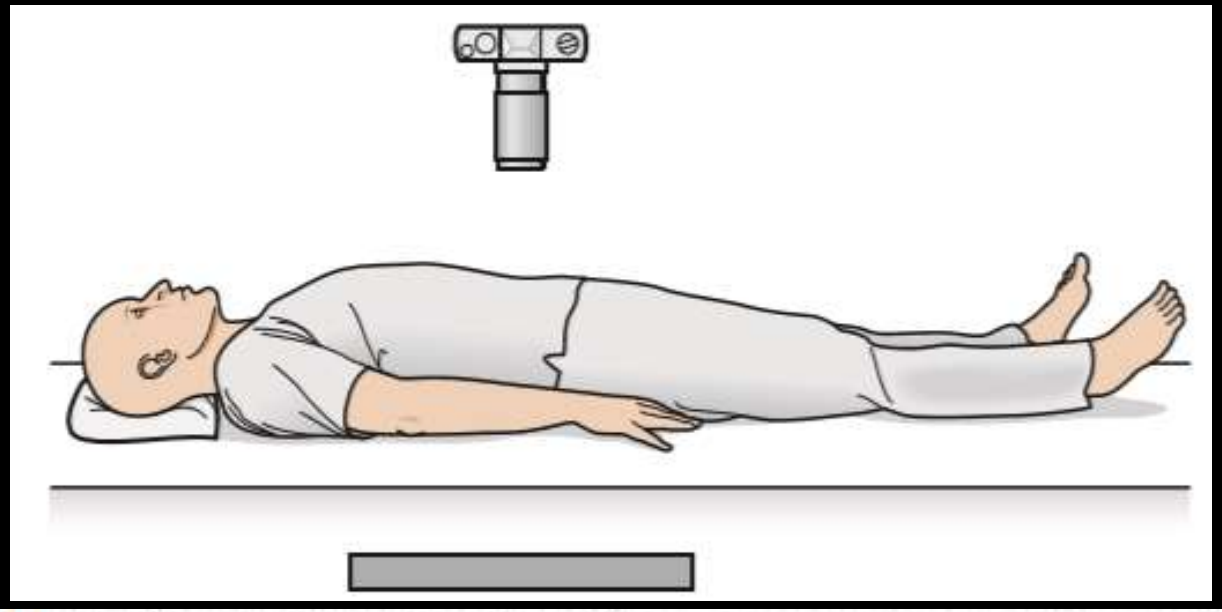
ACUTE ABDOMINAL SERIES → ABDOMEN 3 POSISI

- Almost every Department of Radiology has a series of radiographic images (a protocol) that are routinely obtained in patients who have **acute abdominal pain**.

TABLE 14-2 ACUTE ABDOMINAL SERIES: THE VIEWS AND WHAT TO LOOK FOR

View	Look For
Supine abdomen	Overall bowel gas pattern, calcifications, masses
Prone abdomen	Gas in the rectosigmoid colon
Upright abdomen	Free air, air–fluid levels in the bowel
Upright chest	Free air, pneumonia, pleural effusions

1.



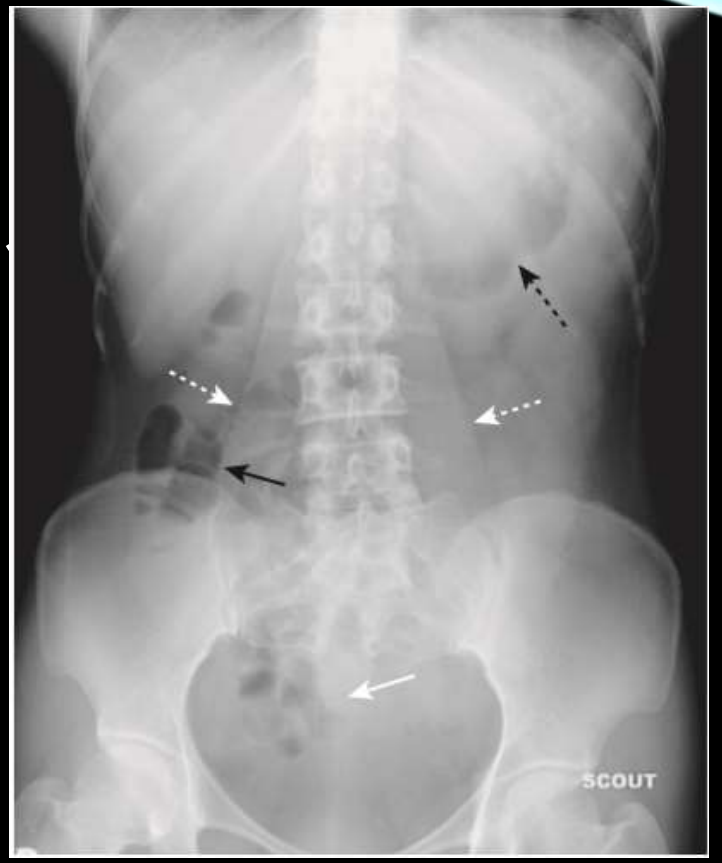
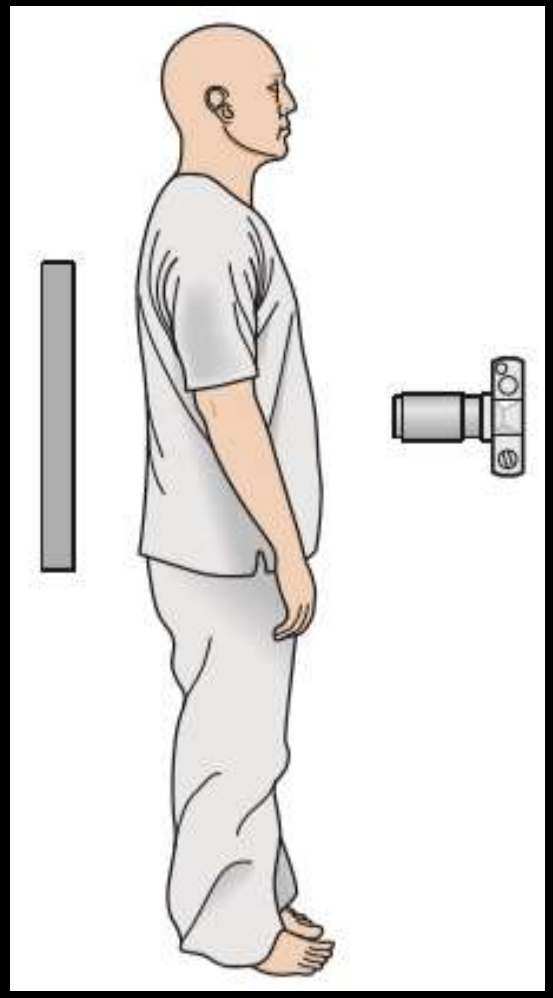


FIGURE 14-10 Positioning for supine view of the abdomen. The patient lies on his or her back on the x-ray table or stretcher, and the x-ray beam is directed vertically downward. The camera icon represents the x-ray tube, which would actually be positioned about 40 inches above the cassette, represented by the thick bar under the table.

Supine abdomen	Overall bowel gas pattern, calcifications, masses

UPRIGHT VIEW OF THE ABDOMEN



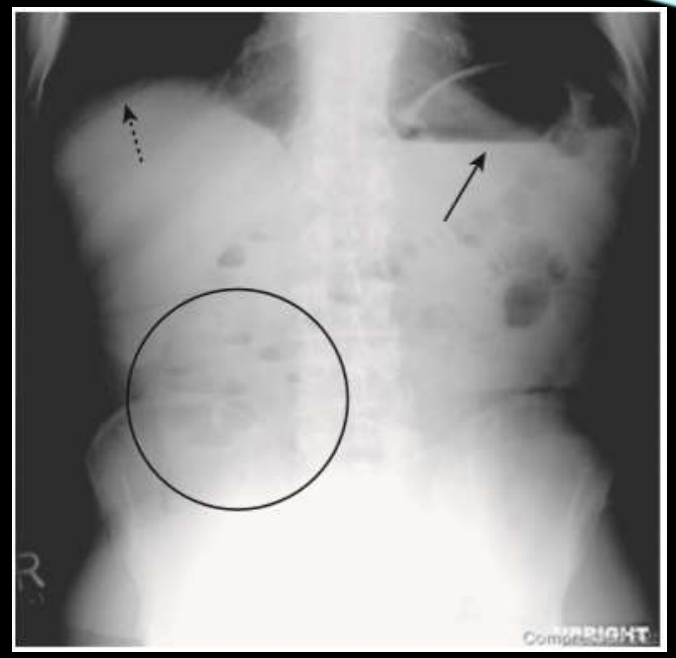


FIGURE 14-14 Positioning of patient for an upright view of the abdomen. The patient stands or sits up, and the x-ray beam is directed horizontally, parallel to the plane of the floor. The camera icon represents the x-ray tube, which would actually be positioned about 40 inches from the cassette, represented by the thick bar behind the patient.

Upright abdomen	Free air, air–fluid levels in the bowel

LEFT LATERAL DECUBITUS VIEW OF THE ABDOMEN

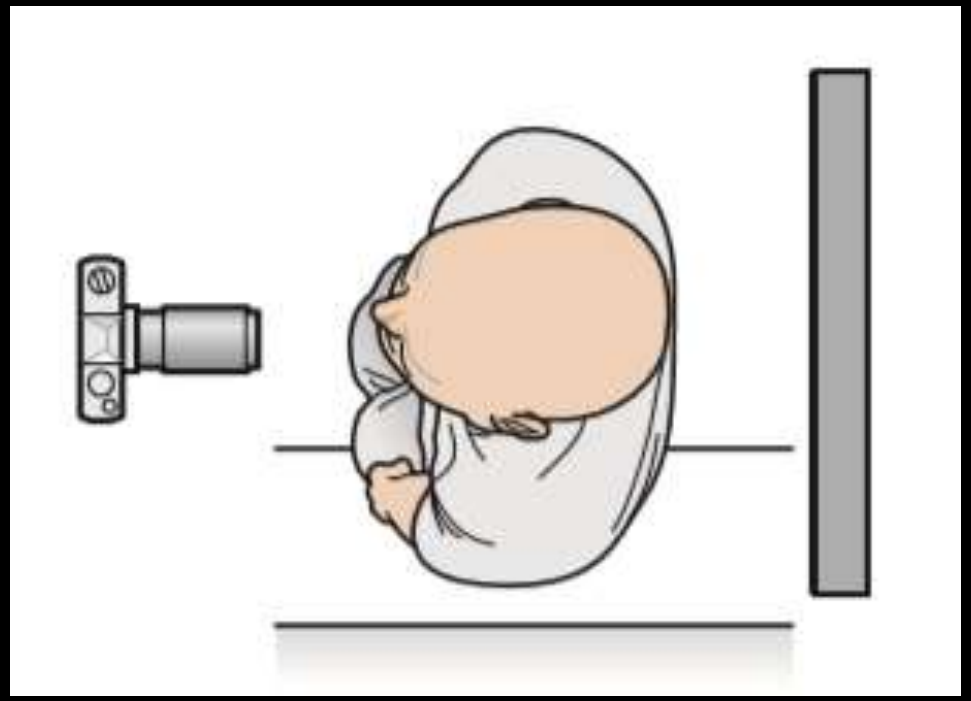
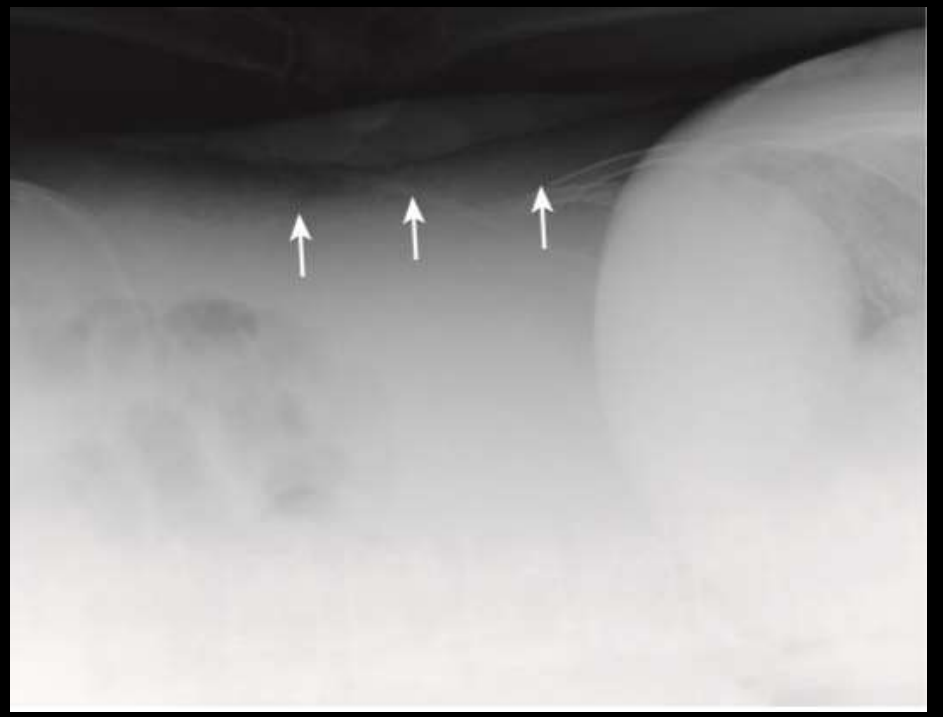


FIGURE 14-15 Positioning of the patient for a left lateral decubitus view of the abdomen. In patients who cannot tolerate an upright view of their abdomen, a left lateral decubitus view is usually used as a substitute. The patient lies on his or her left side on the examining table; the x-ray tube is usually positioned anteriorly *(camera icon)*; and the cassette *(thick bar)* is placed in back of the patient. The x-ray beam is directed horizontally, parallel to the floor, at a distance of about 40 inches from the patient.



- "Free air" will distribute itself at the highest part of the abdominal cavity, which will be the patient's right side
- *White arrow* → black crescent over the outside edge of the liver

Abnormal Gas Patterns

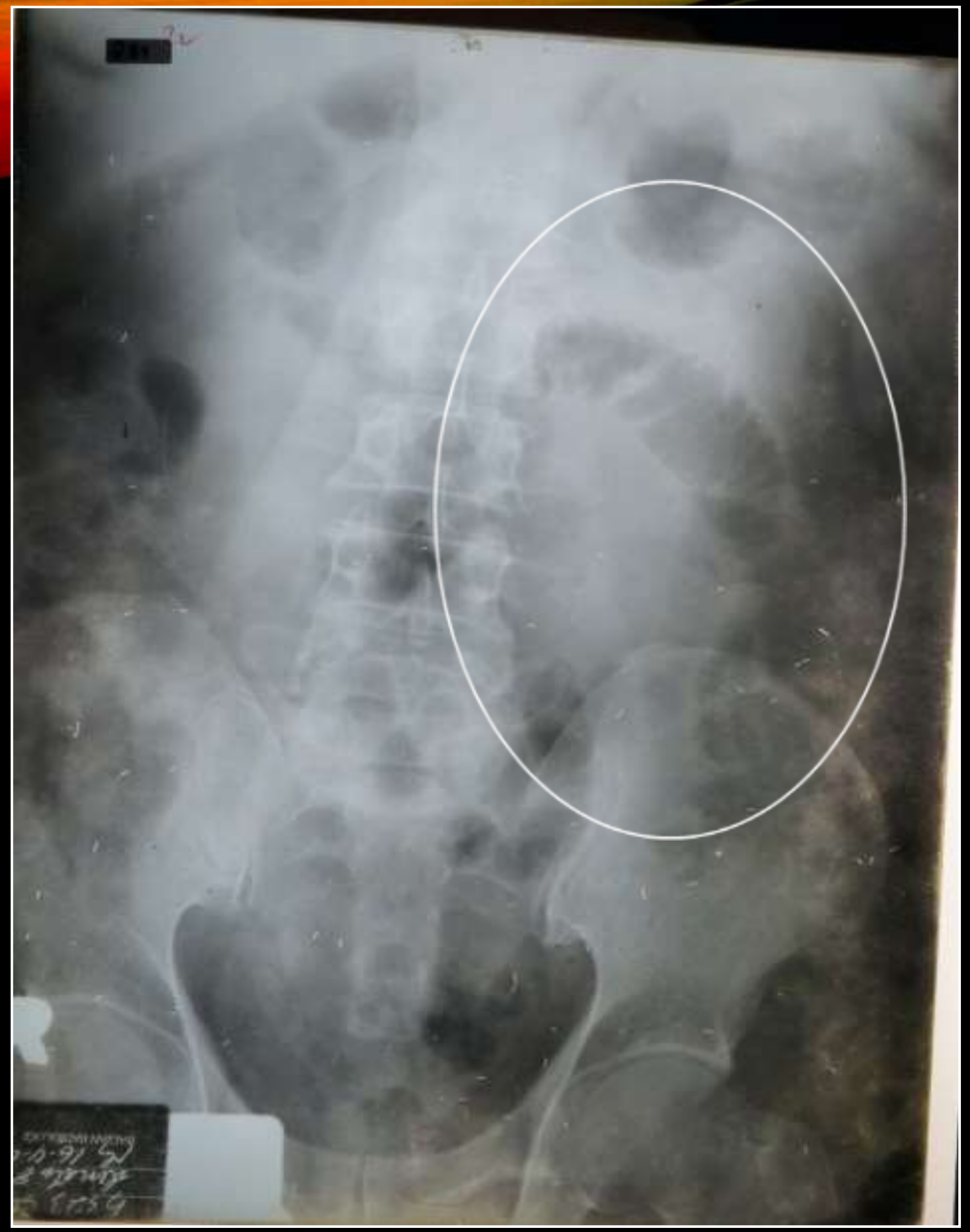
- Functional Ileus
  - Localized (Sentinel Loops)
  - Generalized adynamic ileus
- Mechanical Obstruction
  - SBO
  - LBO

Summary of Abnormal Bowel Gas Patterns

	Air in Rectum or sigmoid	Air in Small Bowel	Air in Large Bowel
Localized Ileus	Yes	2-3 distended loops	Air in rectum or sigmoid
Generalized Ileus	Yes	Multiple distended loops	Yes-Distended
SBO	No	Multiple dilated loops	No
LBO	No	None-unless ileocecal valve incompetent	Yes-Dilated

SENTINEL LOOPS

= localized ileus
= focal ileus
= segmental ileus



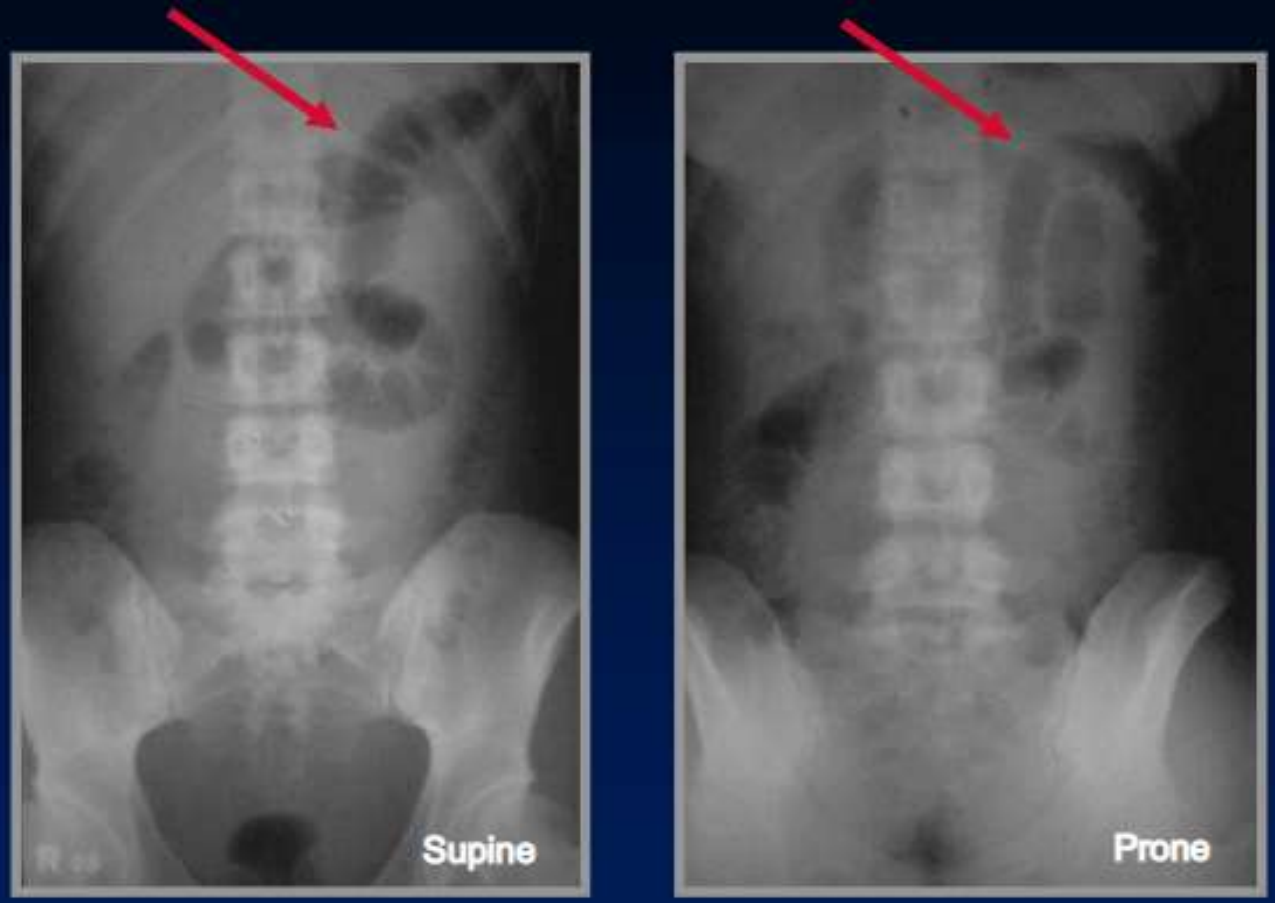
SENTINEL LOOP

Deskripsi/Expertise:

- PSOAS line jelas
- Distribusi normal dan jumlah udara meningkat dalam usus halus
- Tampak distensi fokal usus halus di hemiabdomen kiri atas
- Tidak tampak kalsifikasi

Kesan : Sentinel loop

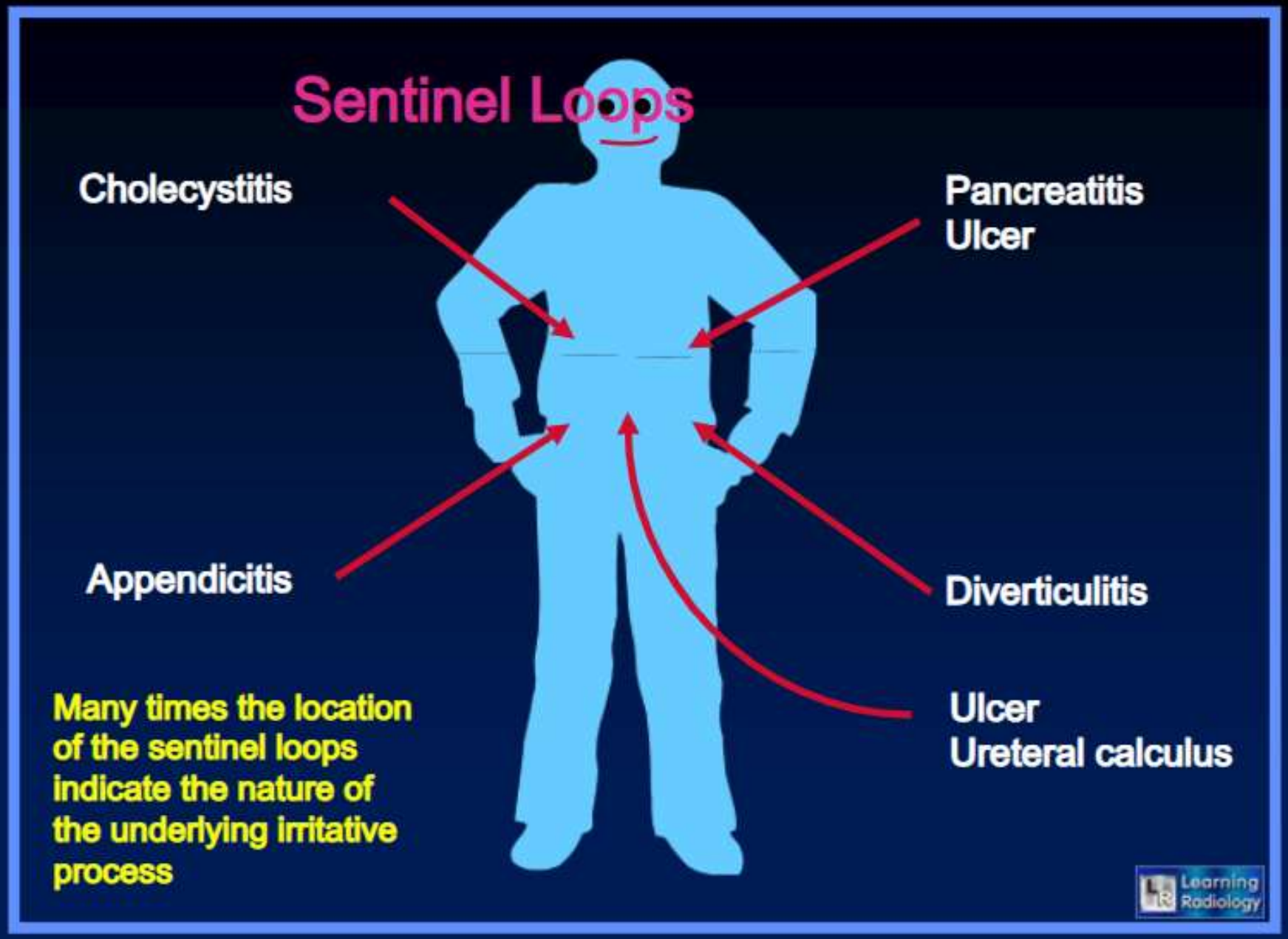
Localized Ileus = Sentinel Loops



Sentinel Loops

Learning Radiology

Sentinel Loops



ADYNAMIC ILEUS
= ILEUS PARALITIK

ILEUS PARALITIK

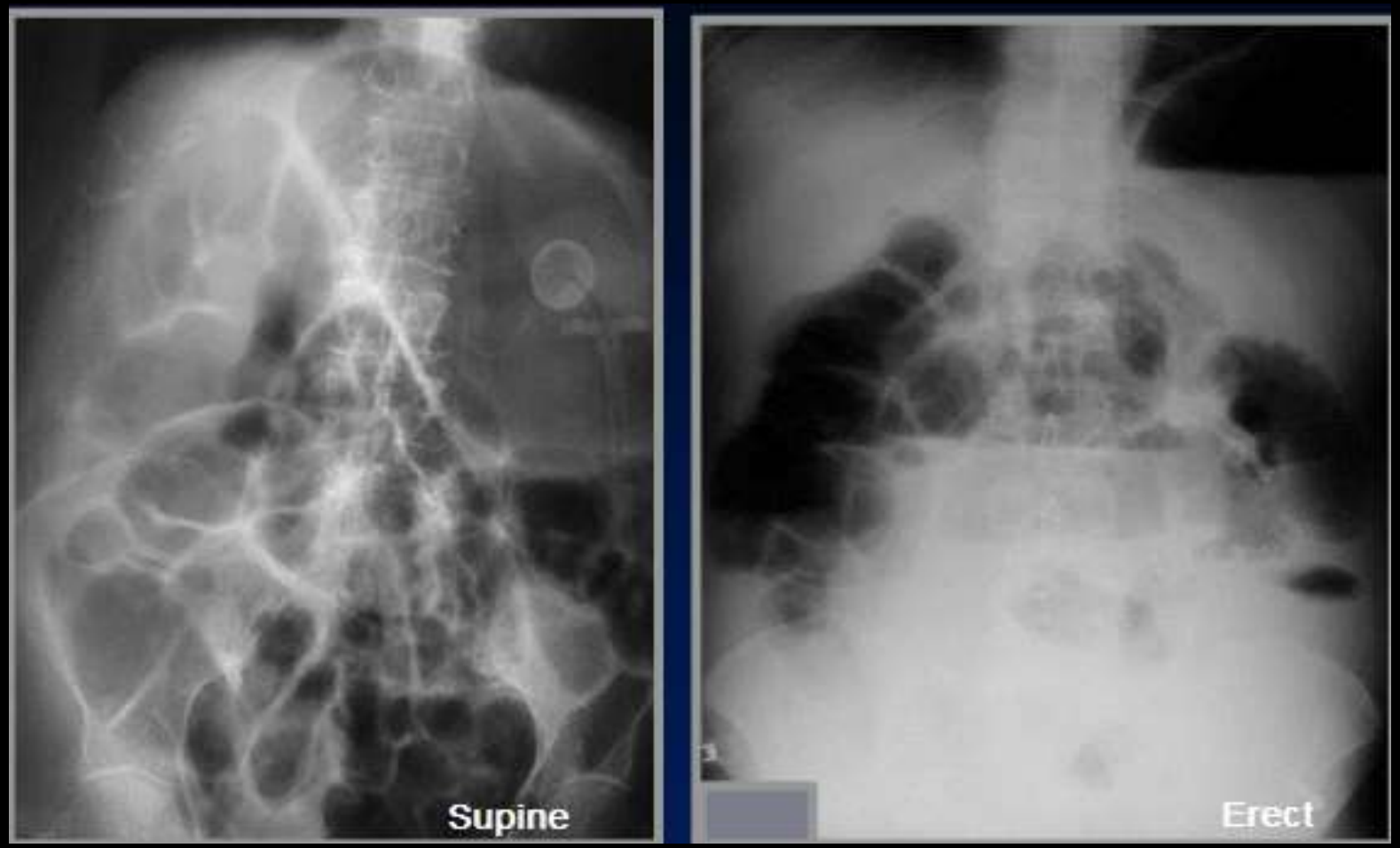


FOTO BNO SUPINE DAN BNO TEGAK/ERECT

- Deskripsi/Expertise :
- PSOAS line tidak jelas
- Distribusi udara abnormal
- Tampak distensi udara dalam usus halus dan usus besar/colon.
- Tidak tampak kalsifikasi.
- Air fluid level (+) panjang, free air sub diafragma (-)

Kesan : Ileus paralitik

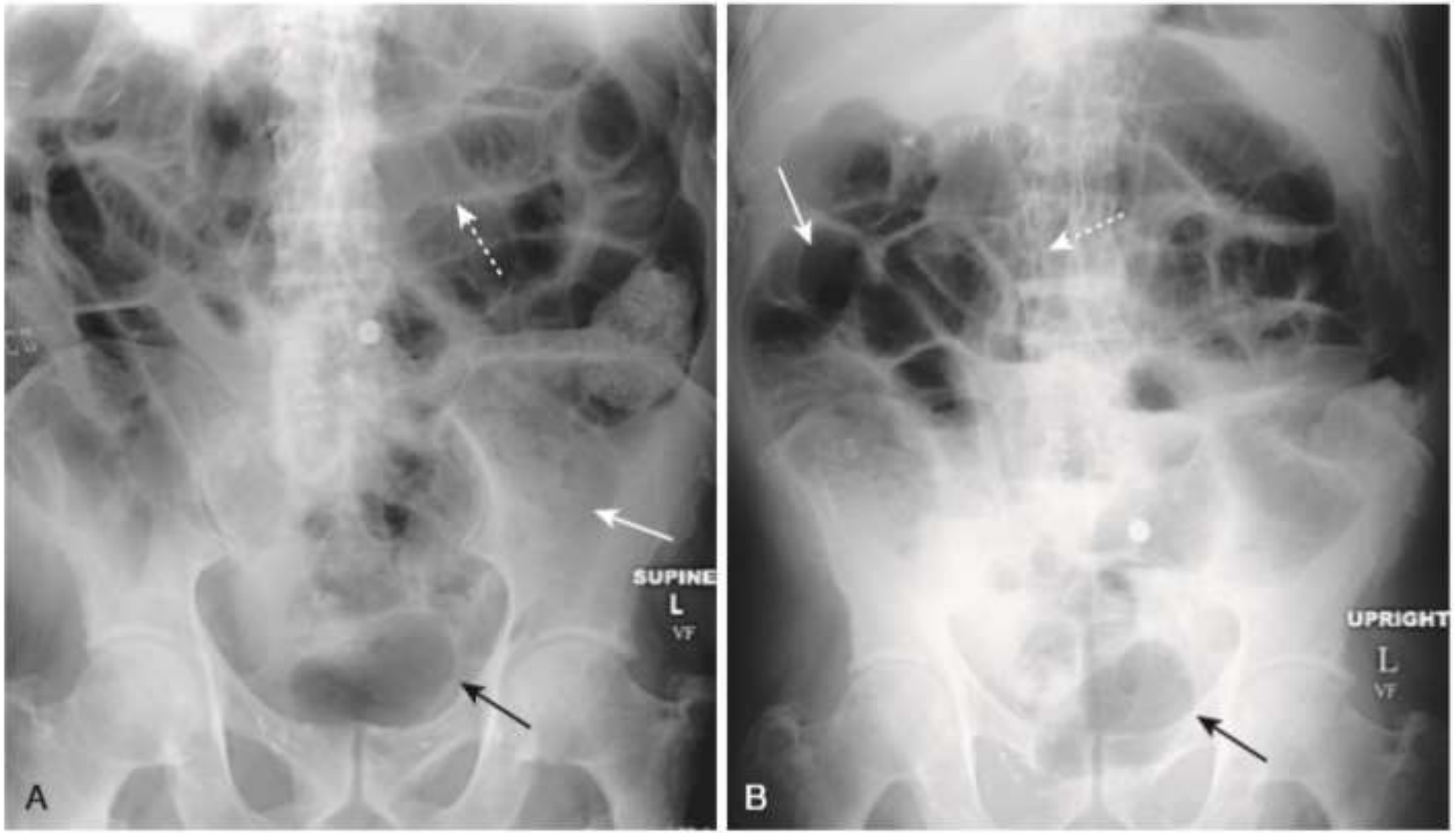
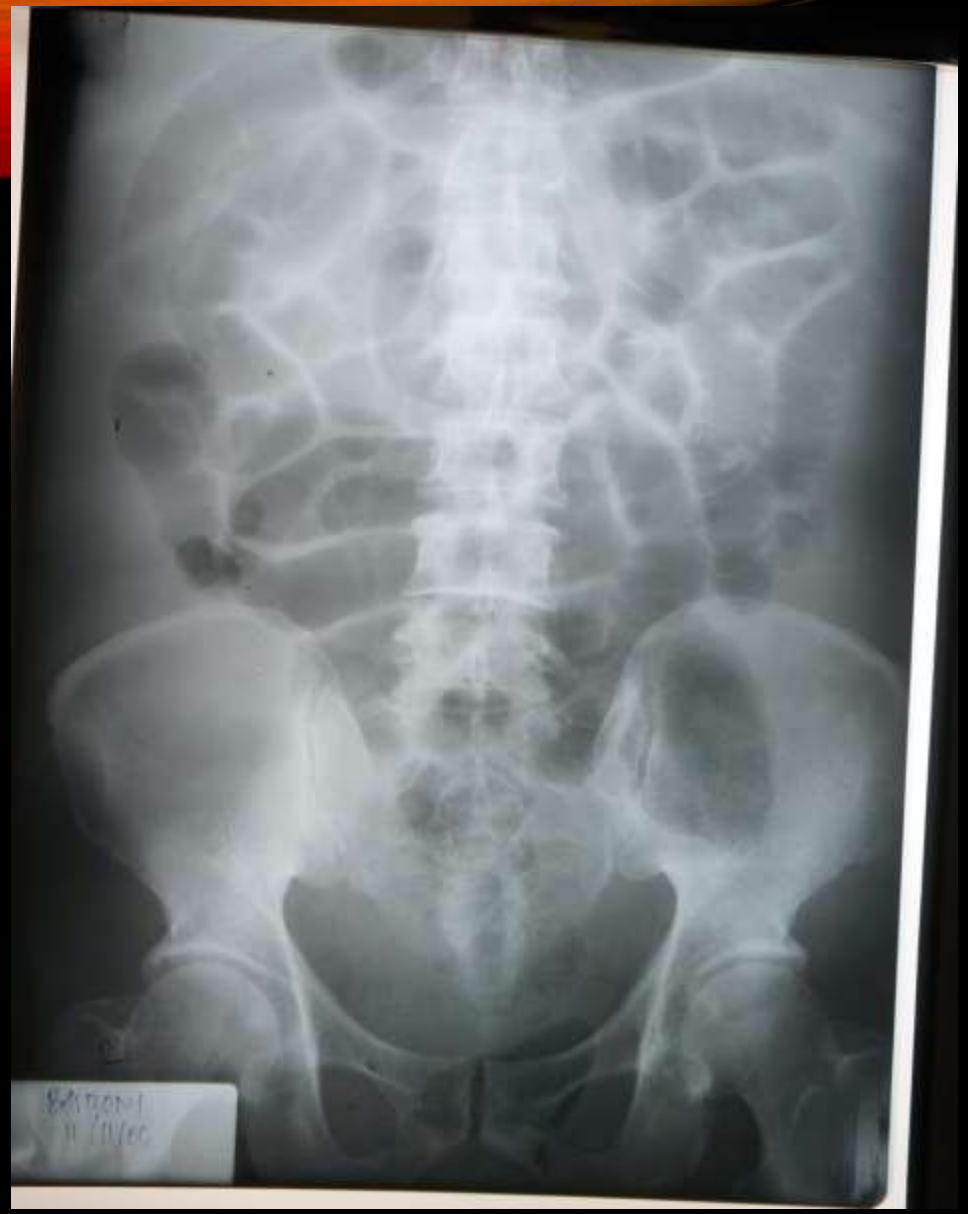


FIGURE 16-3 Generalized adynamic ileus, supine (A) and upright abdomen (B). There are dilated loops of large *(solid white arrows)* and small *(dotted white arrows)* bowel with gas seen down to and including the rectum *(solid black arrows)*. The patient had absent bowel sounds and had undergone colon surgery the day before.

MECHANICAL SBO

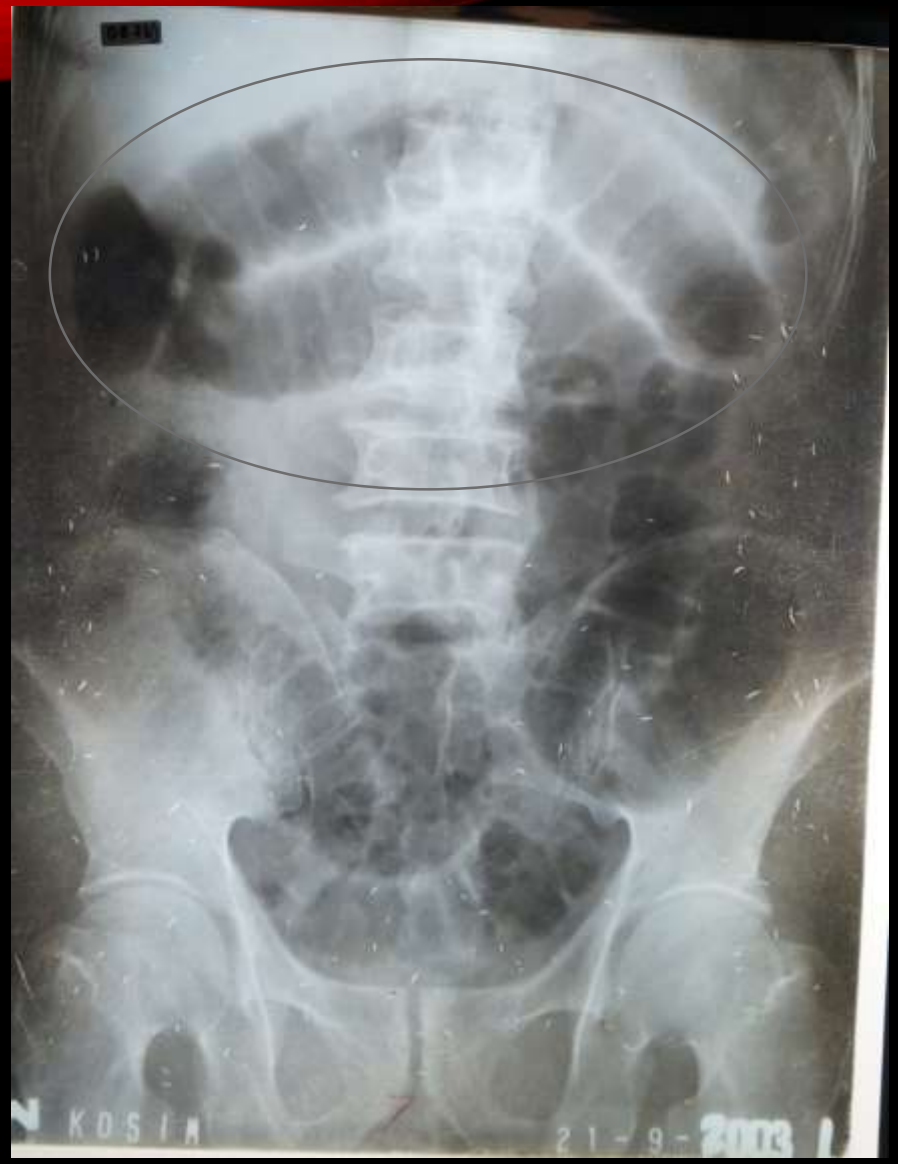
= ILEUS OBSTRUKSI LEVEL USUS HALUS
= ILEUS OBSTRUKSI LETAK TINGGI

DISTENSI USUS HALUS

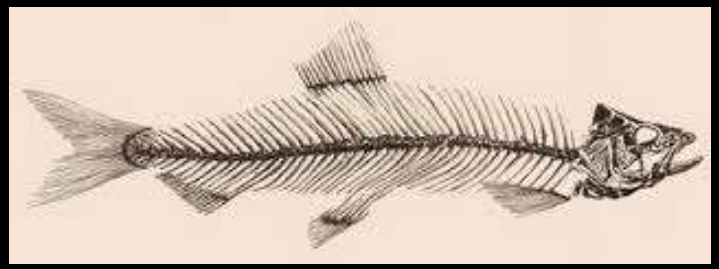


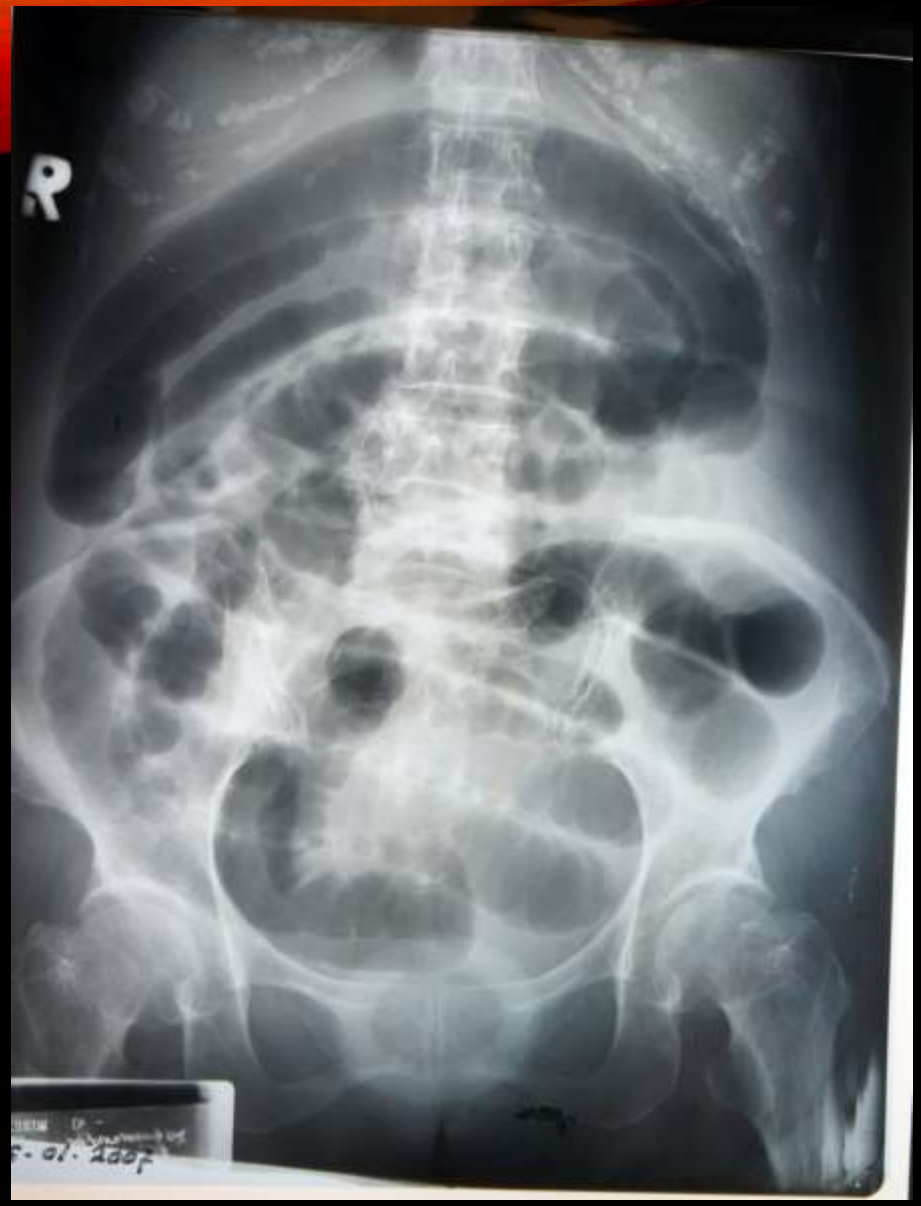
Coiled Spring

DISTENSI USUS HALUS → SUSPEK ILEUS OBSTRUKTIF



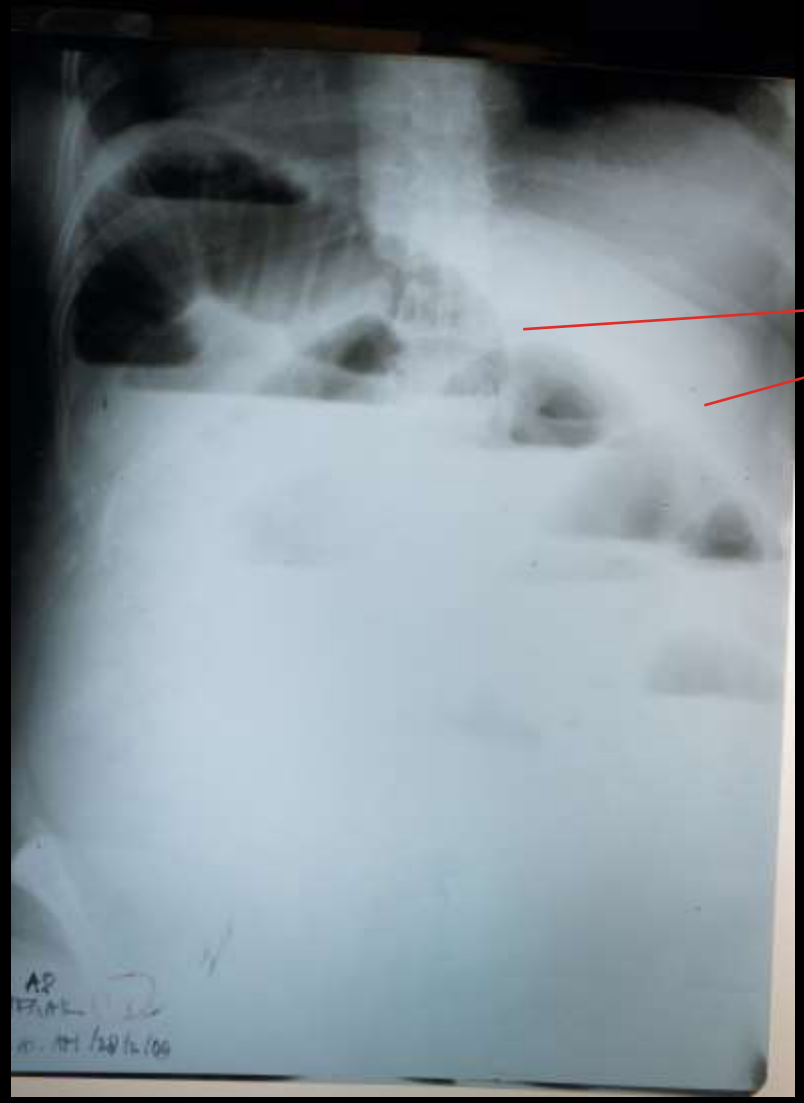
HERRING BONE SIGN





DISTENSI → SUSPEK ILEUS OBSTRUKTIF

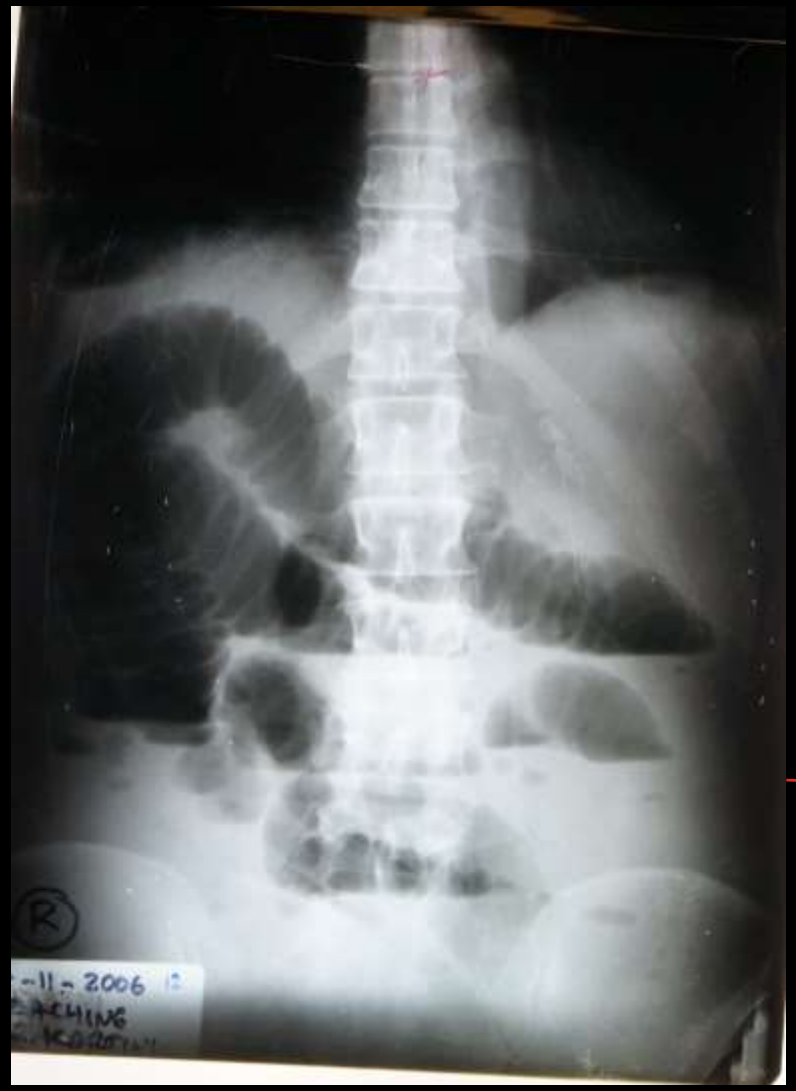
BNO 3 POSISI ½ DUDUK (ERECT), ILEUS OBSTRUKTIF



AIR FLUID LEVEL →
Step Lader Patern

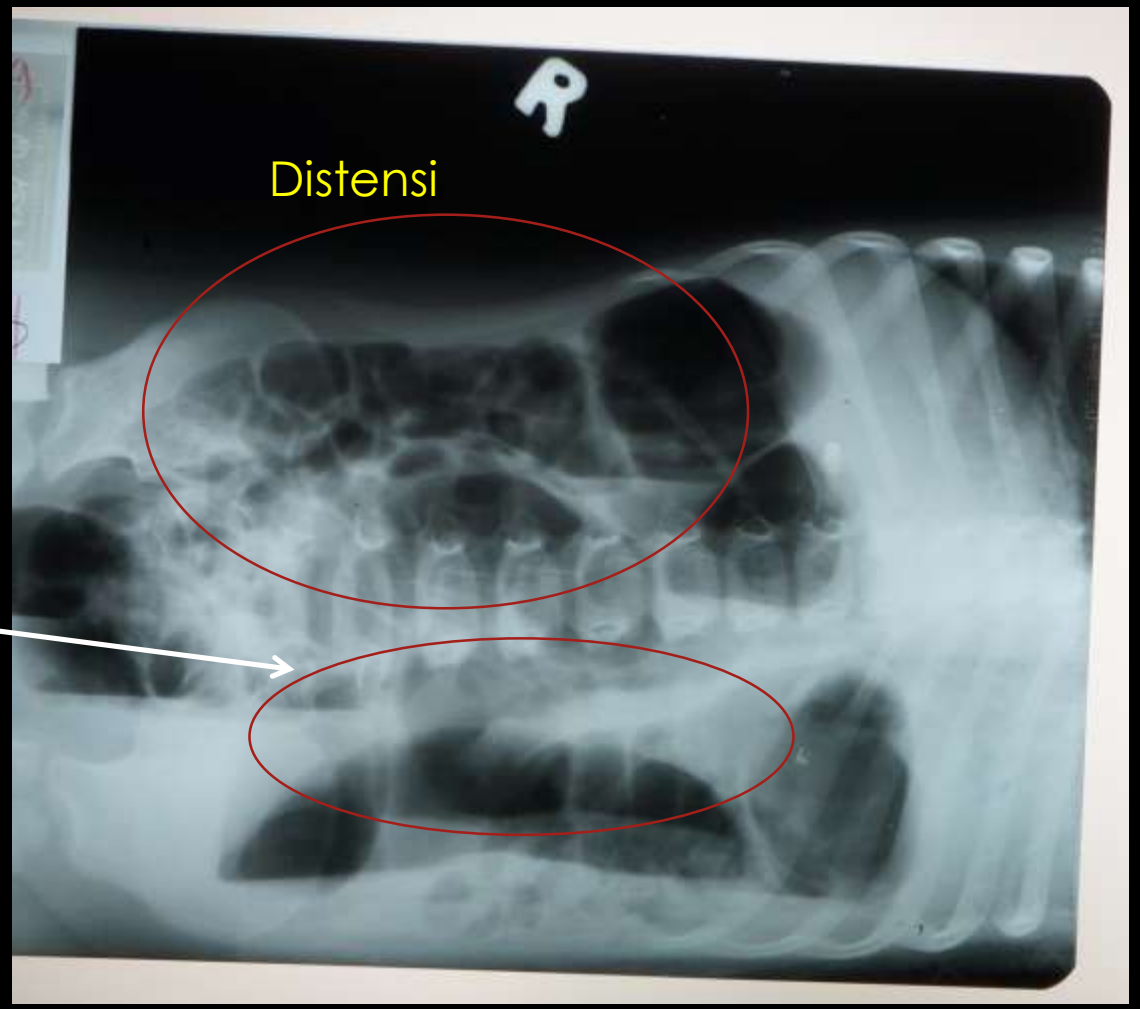
BNOPOSISI ½ DUDUK, ILEUS OBSTRUKTIF

Distensi



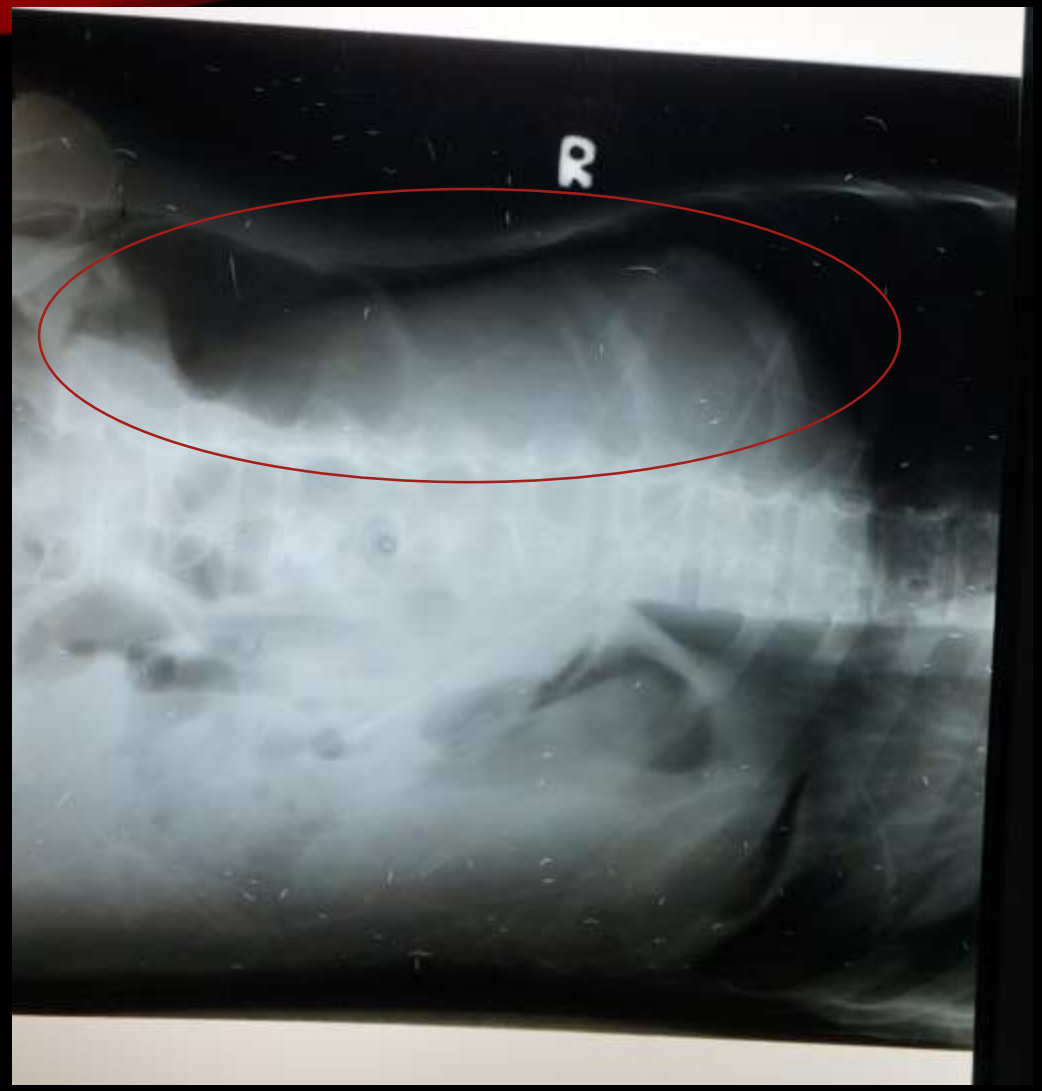
Multipel Air Fluid Level → Step ladder Patern

BNO 3 POSISI LEFT LATERAL DECUBITUS (LLD)→ ILEUS OBSTRUKTIF



Multipel Air Fluid Level
→STEP LADDER
PATERN

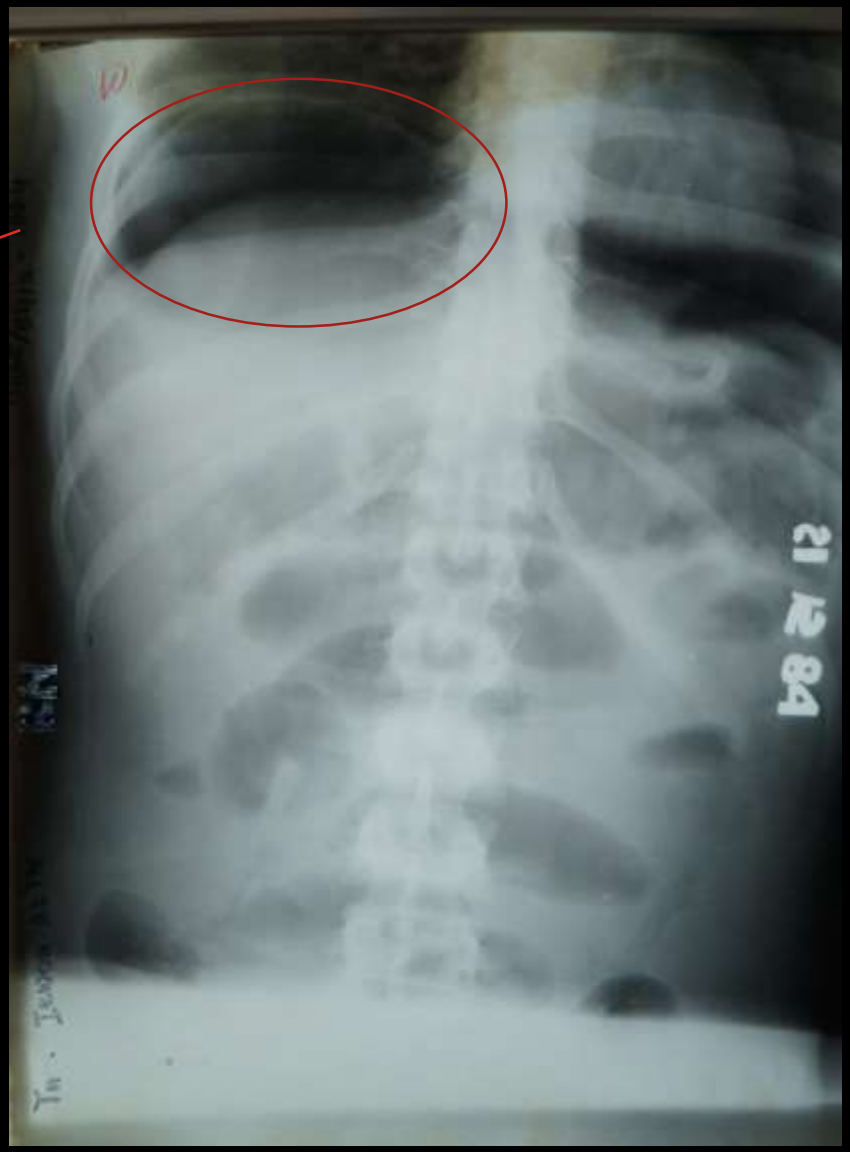
Free Air



BNO 3 POSISI LEFT LATERAL DECUBITUS (LLD)

BNO ½ DUDUK (ERECT),FREE AIR

Free Air



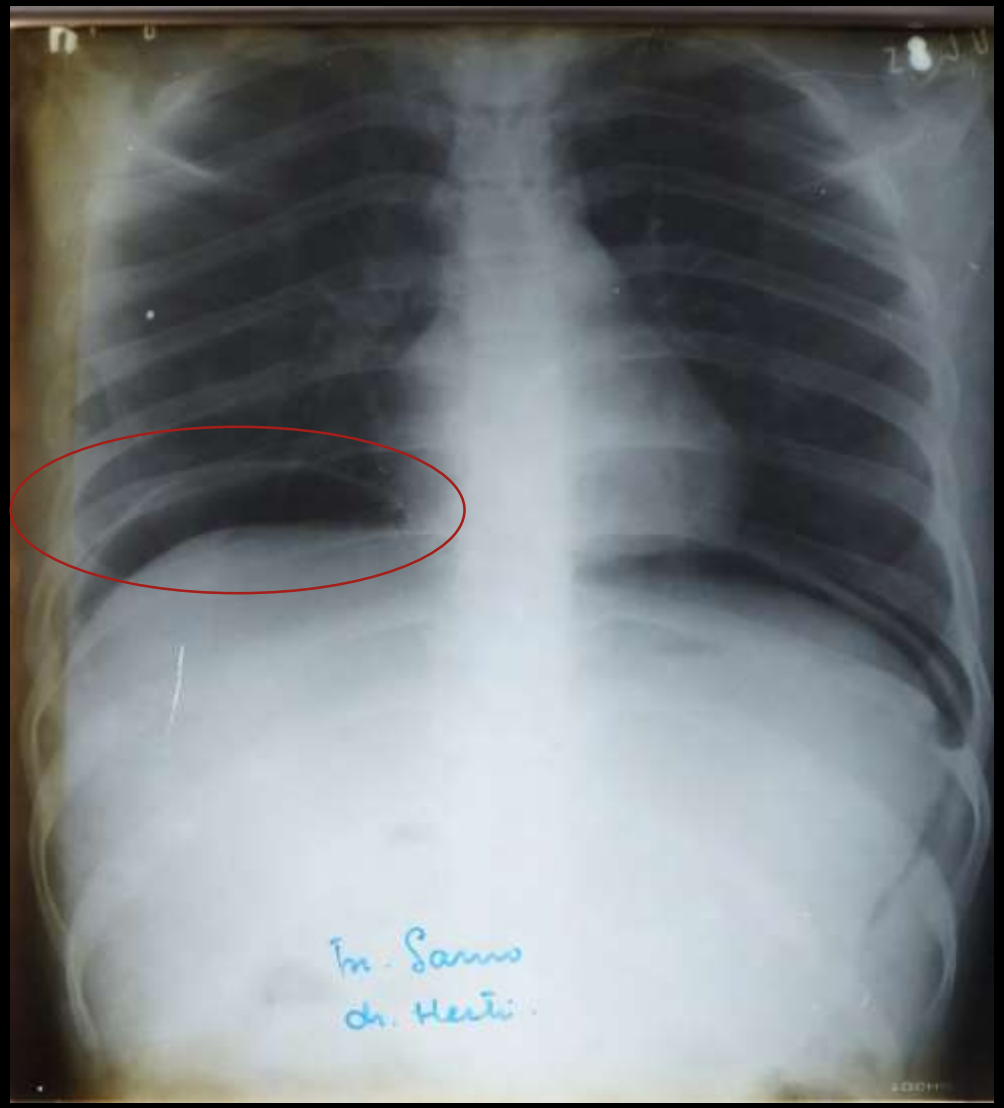
Deskripsi :

- Distensi usus halus dominan di sentral
- Air fluid level (+)
- Free air sub diafragma kanan (+)

Kesan :
Pneumoperitoneum

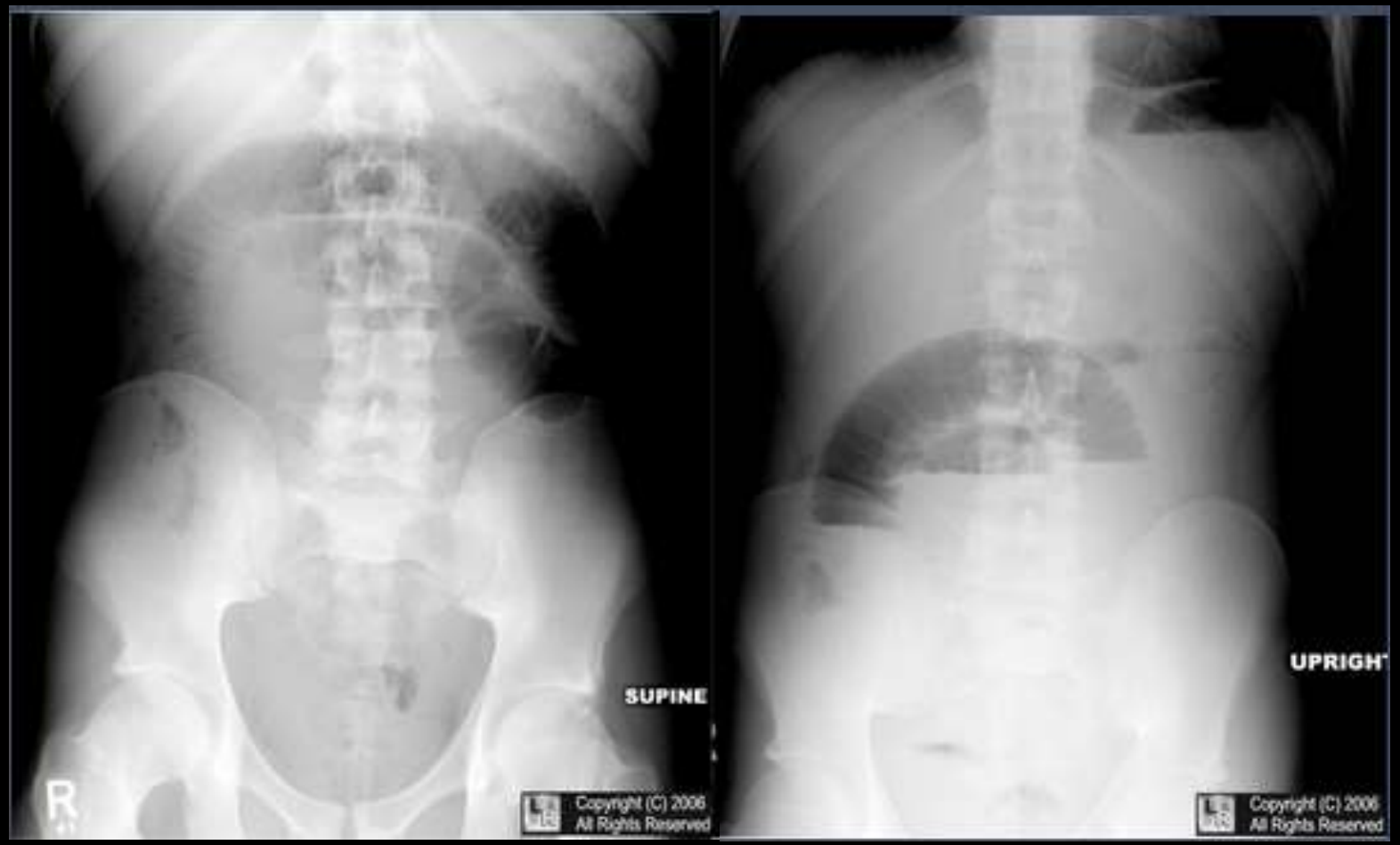
FREE AIR SUBDIAFRAGMA KANAN+KIRI

Free Air



ILEUS OBSTRUKSI LETAK TINGGI

FOTO BNO SUPINE DAN BNO TEGAK/ERECT



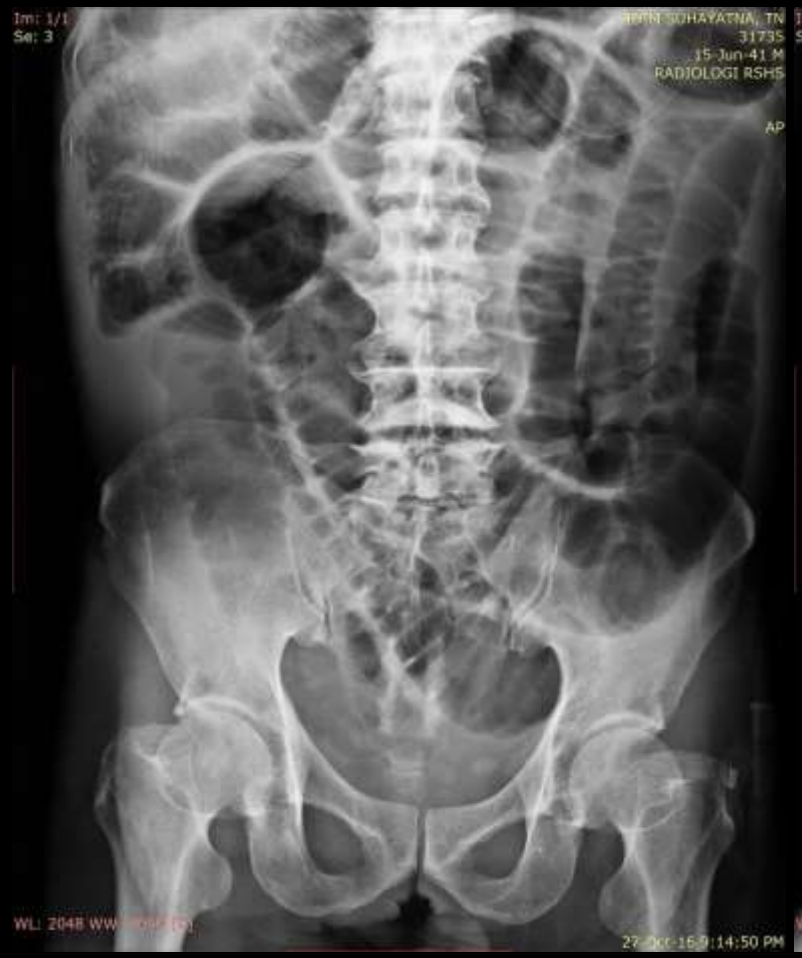
- Deskripsi/Expertise :
- PSOAS line tidak jelas
- Distribusi udara abnormal
- Tampak distensi udara dalam usus halus
- Tidak tampak distensi udara dalam usus besar/colon
- Tidak tampak kalsifikasi
- Air fluid level (+), free air sub diafragma (-)

Kesan : Ileus obstruksi letak tinggi

LBO MECHANICAL

= ILEUS OBSTRUKSI LEVEL USUS BESAR
= ILEUS OBSTRUKSI LETAK RENDAH

ILEUS OBSTRUKSI LETAK RENDAH



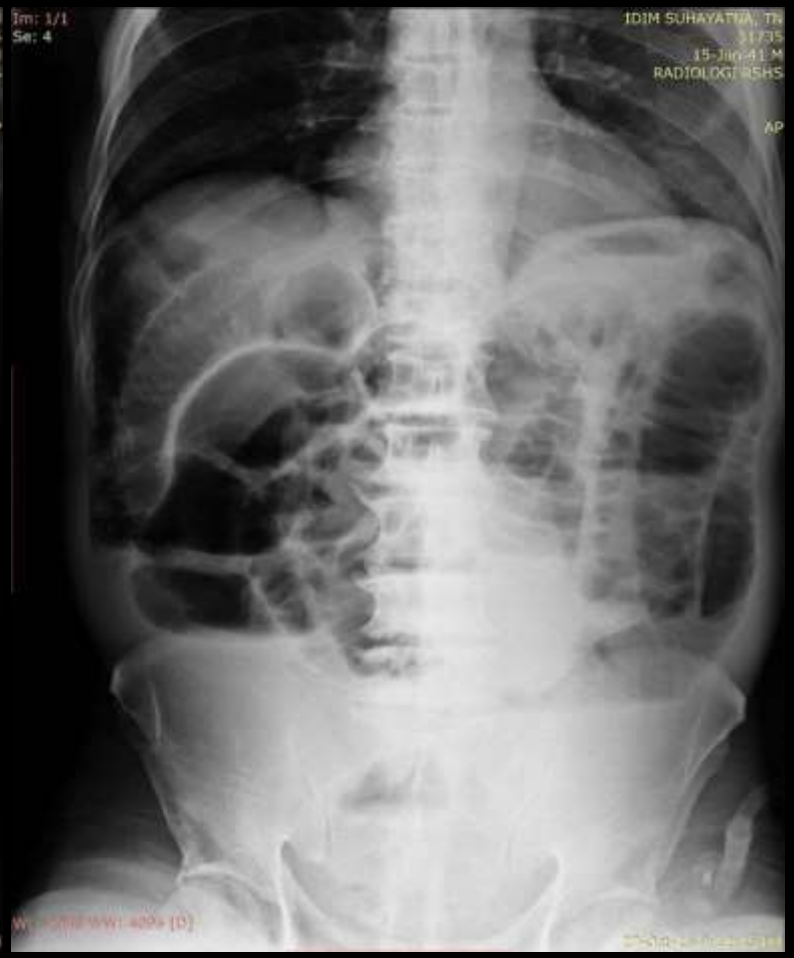
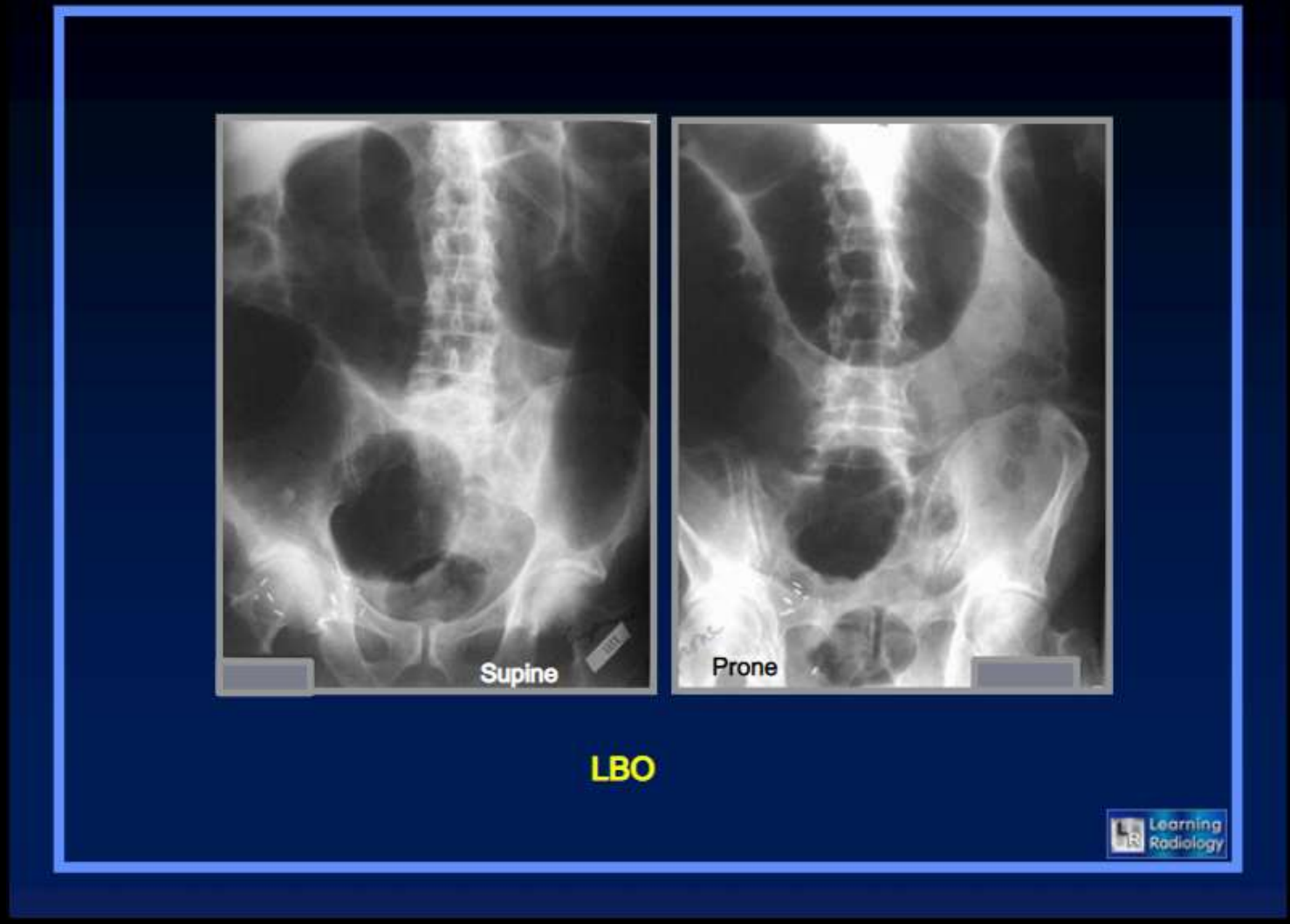


Foto bno supine dan bno tegak/erect

Deskripsi/Expertise :
PSOAS line tidak jelas
Distribusi udara abnormal
Tampak distensi udara dalam usus halus dan usus besar/colon.
Tidak tampak kalsifikasi
Air fluid level (+), free air sub diafragma (-)

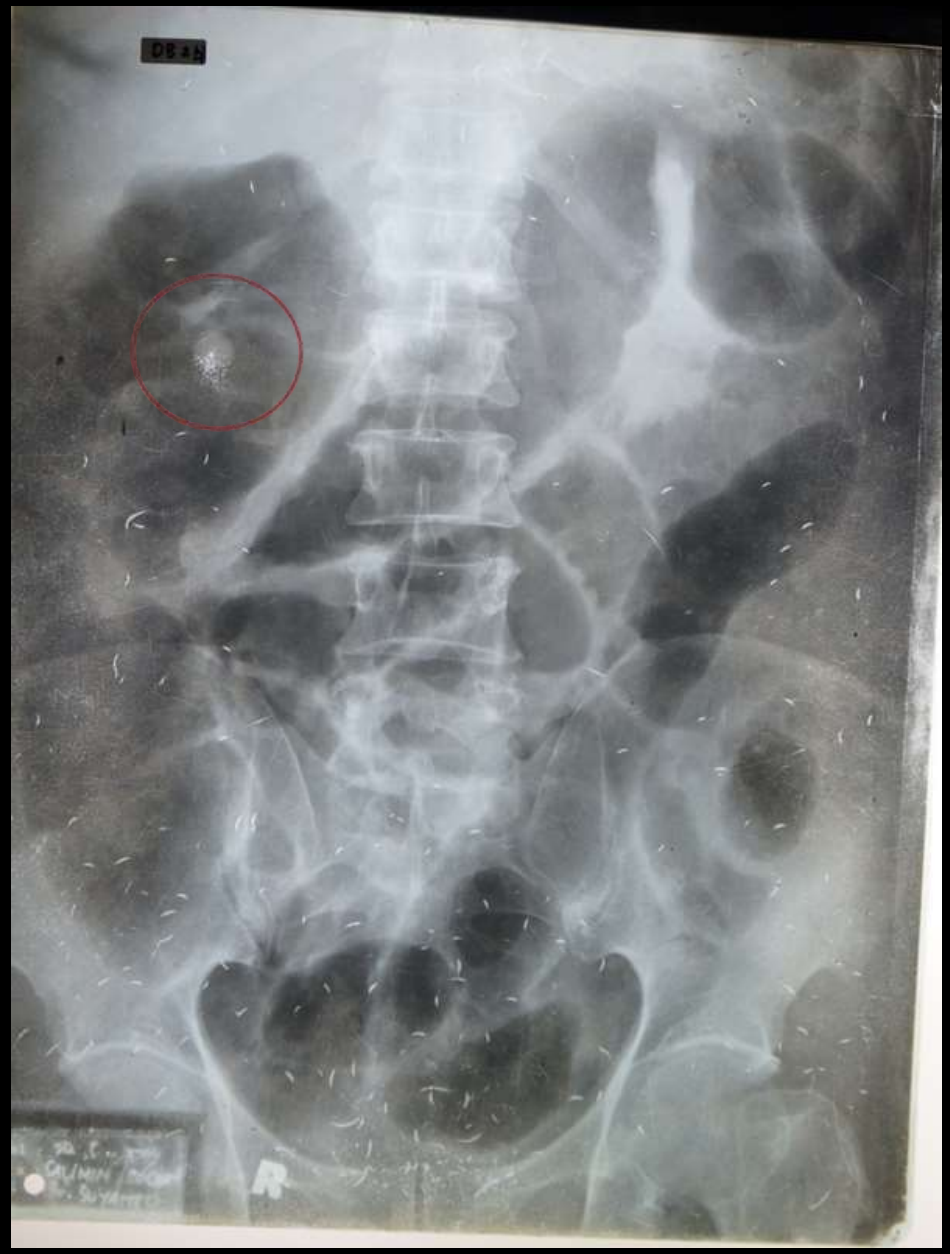
Kesan : Ileus obstruksi letak rendah

ILEUS OBSTRUKSI LETAK RENDAH



KASUS - KASUS

1



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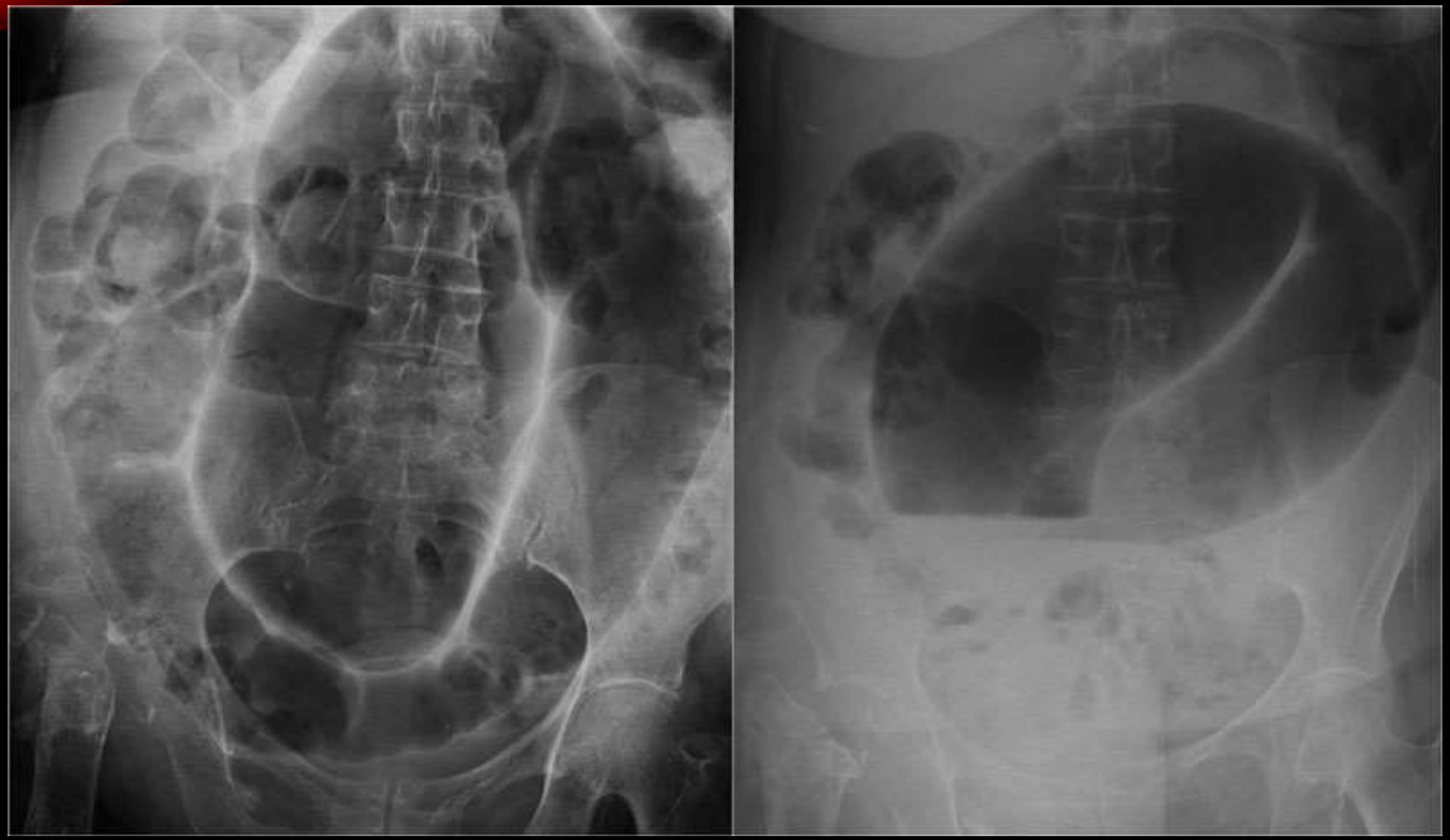
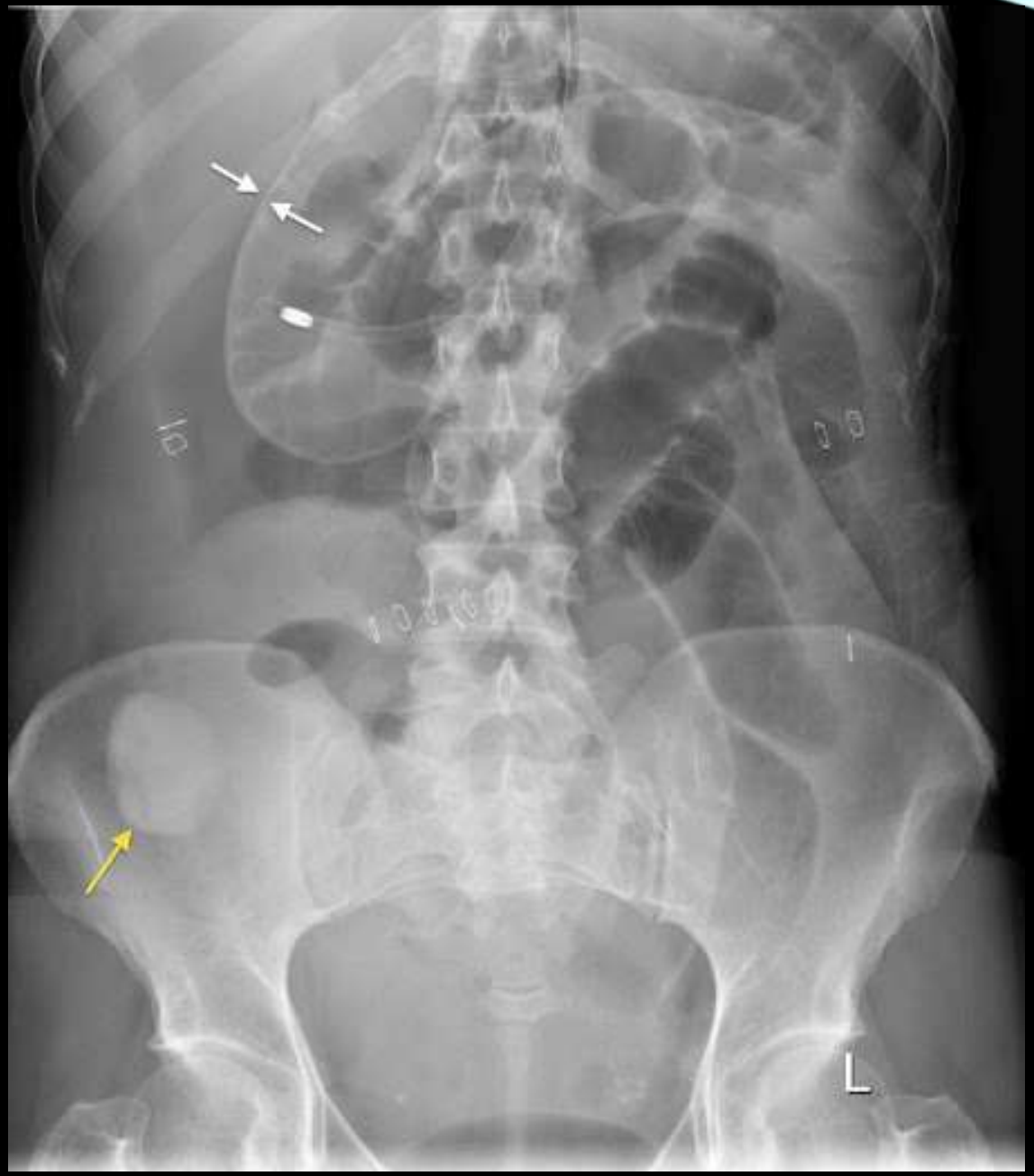


3

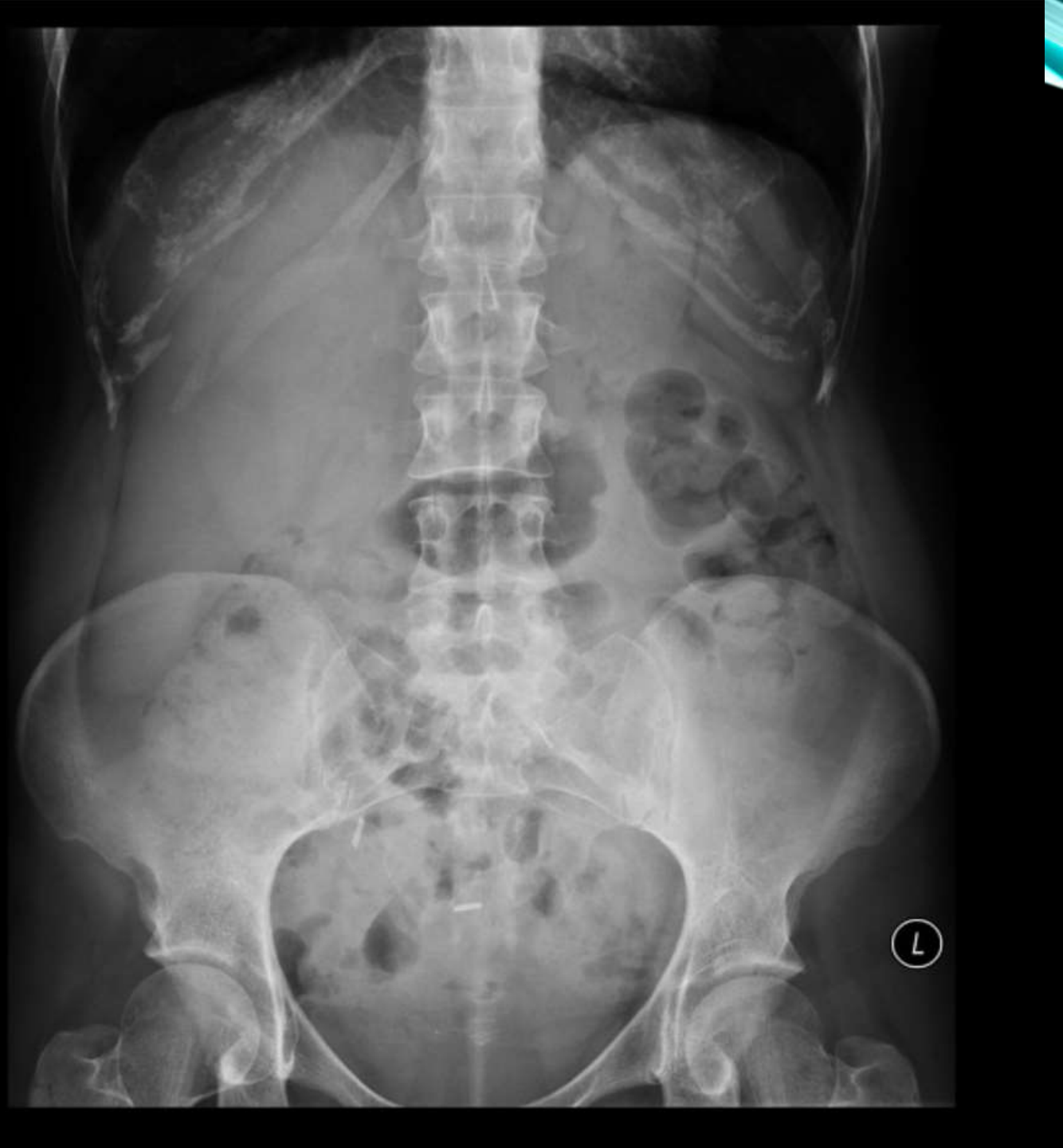
Pasien datang dengan keluhan nyeri perut 2 hari pasca operasi (ileostomy dan colectomy) e.c ulcerative colitis.

STOMA → panah kuning.



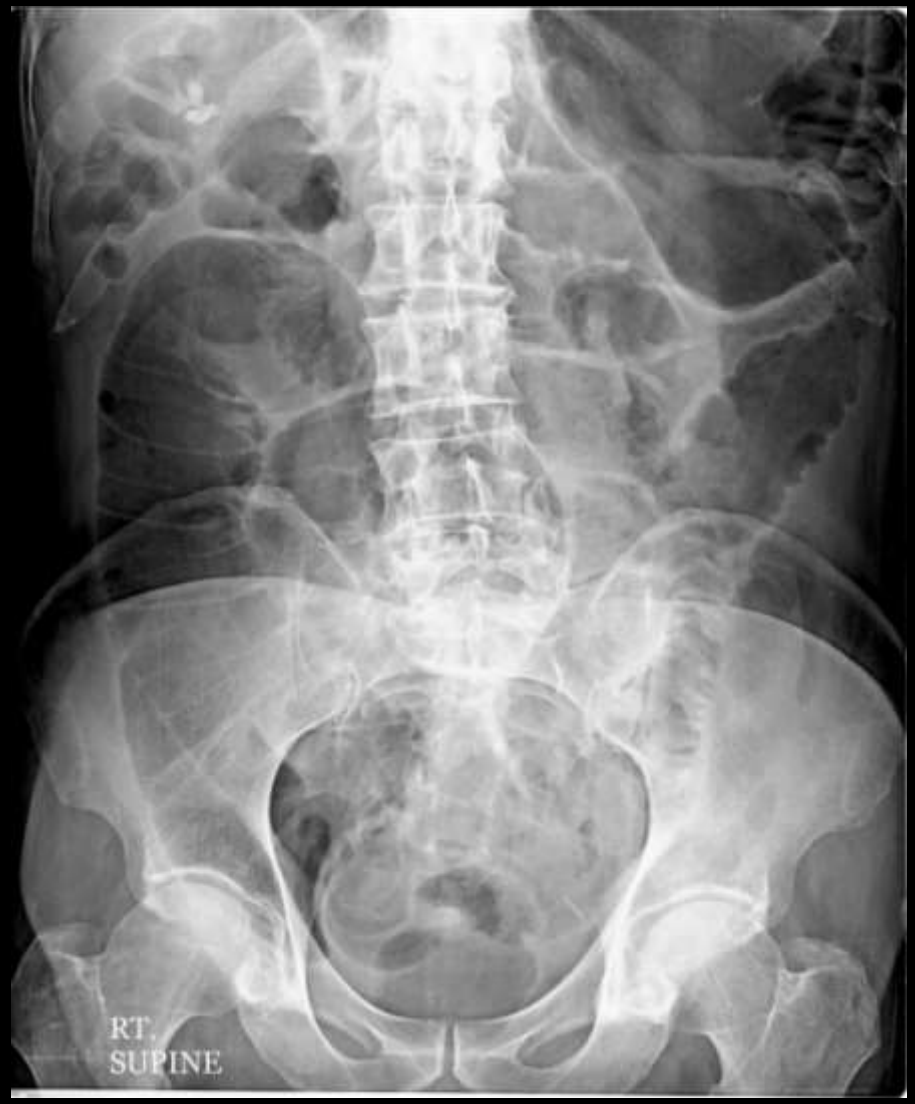
4

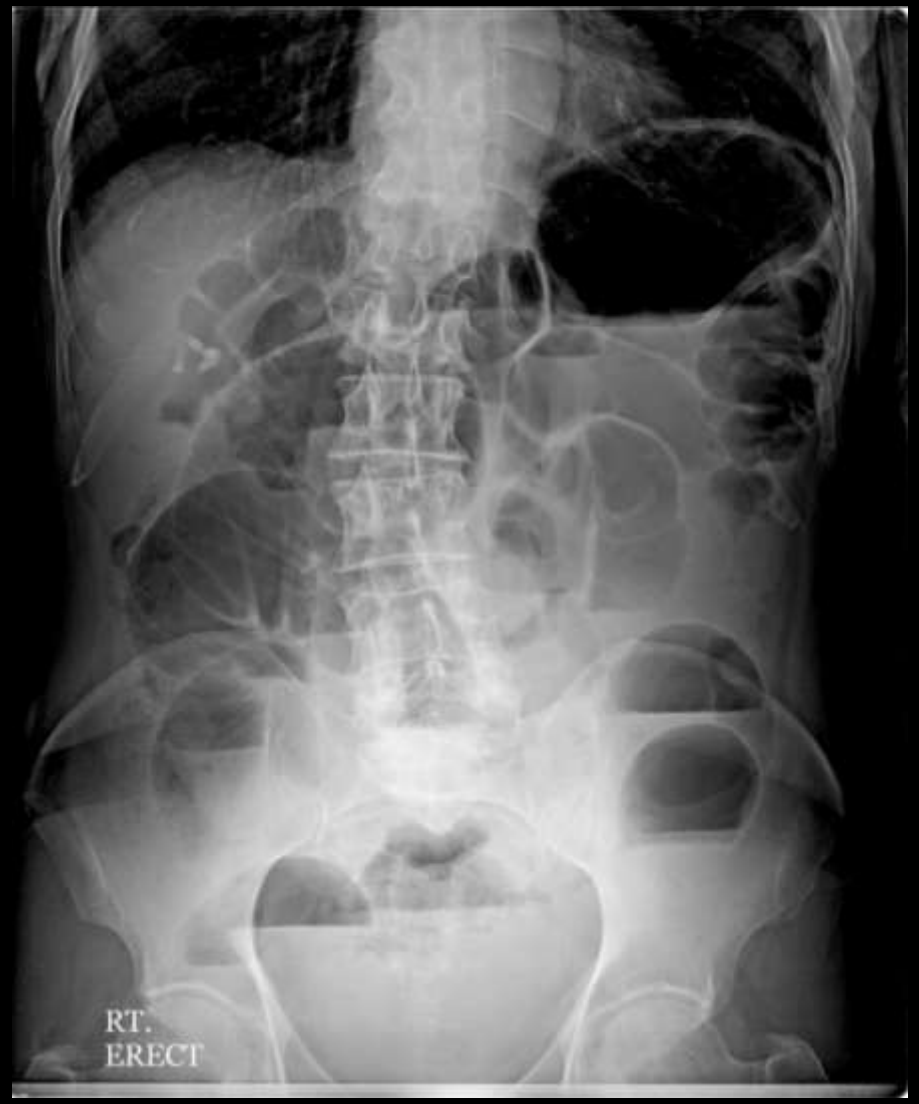
Pasien datang dengan keluhan muntah dan nyeri perut
ONSET: 24 jam



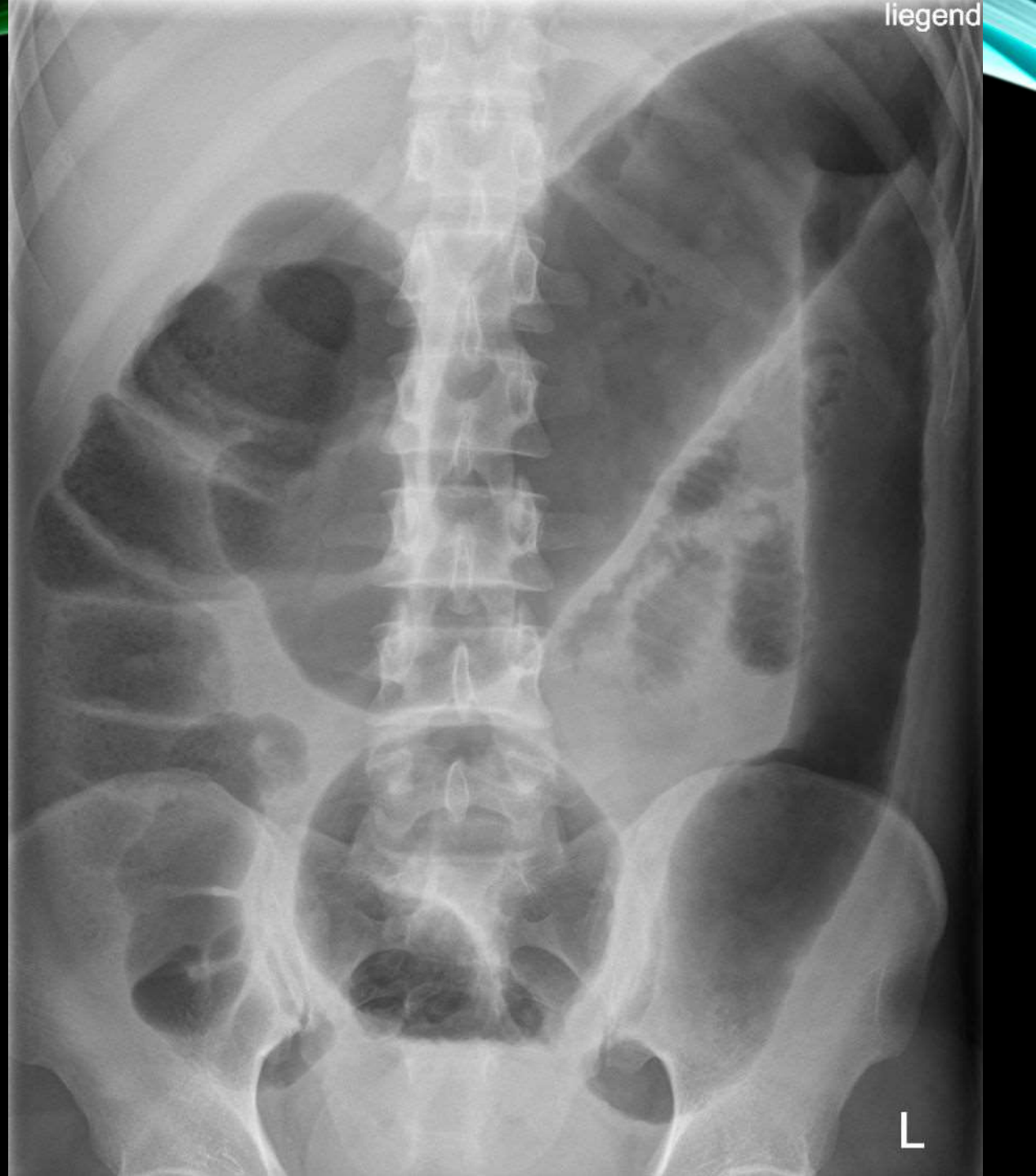
Severe abdominal pain disertai vomitus

5



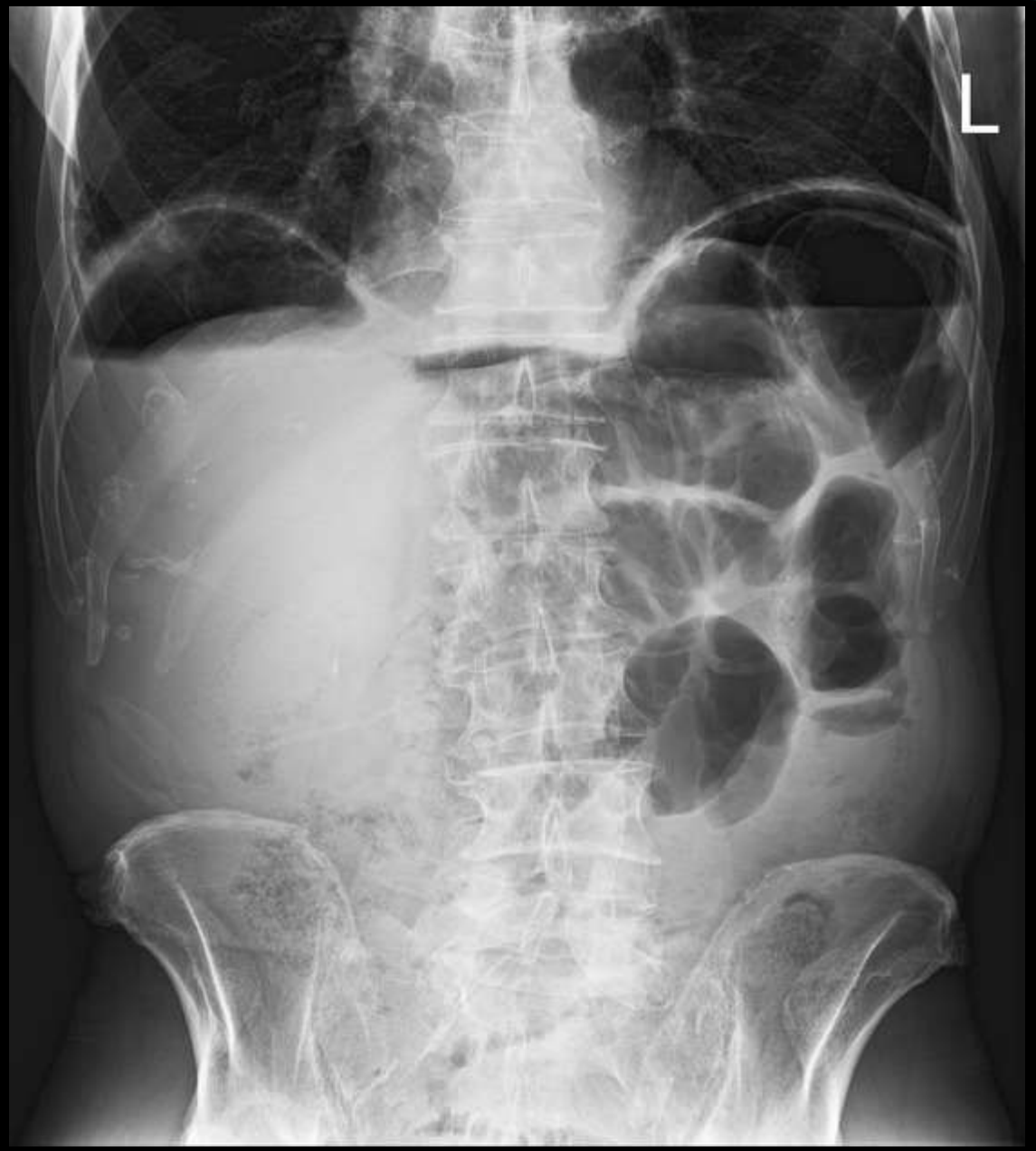


6

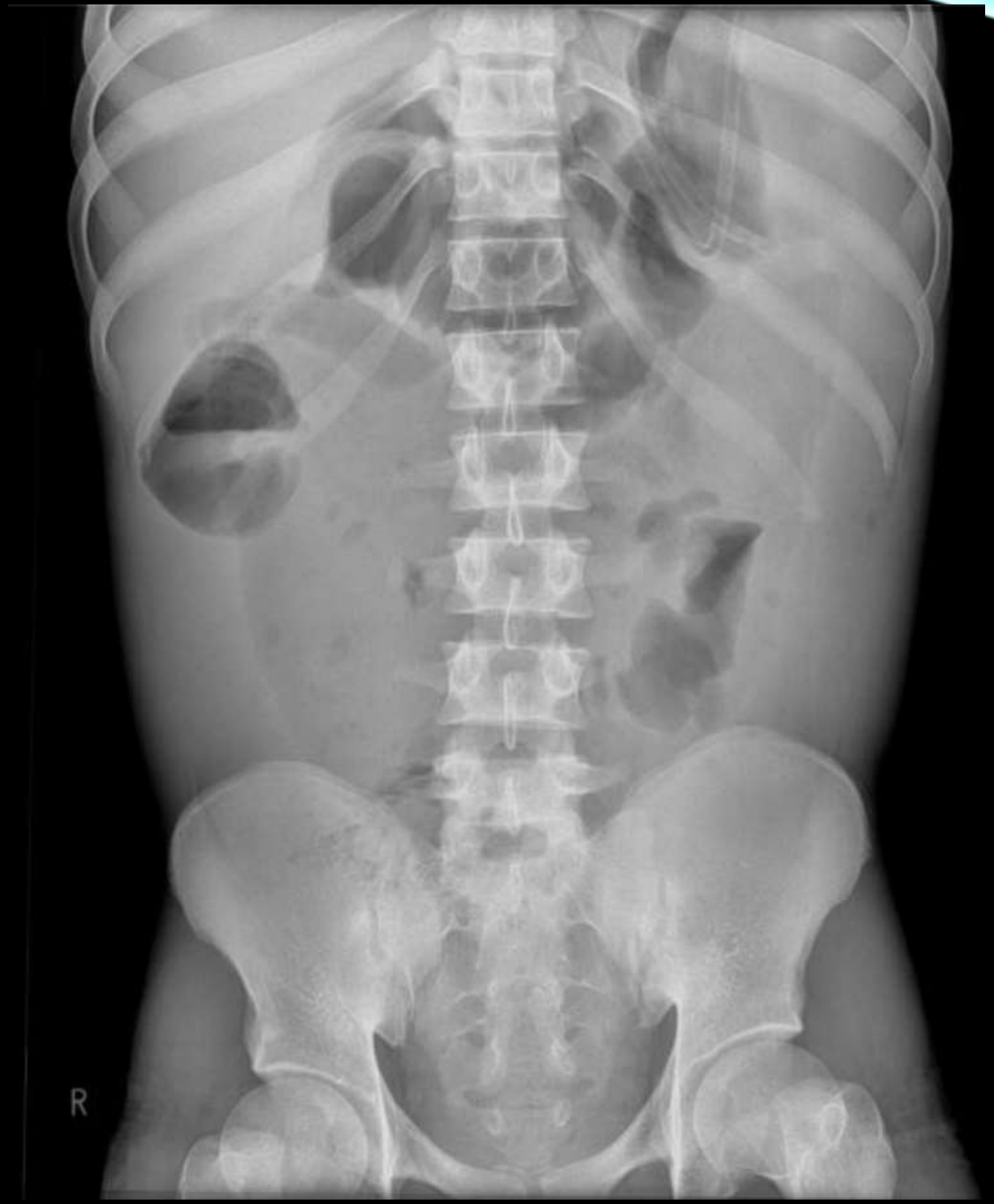


7

Nyeri epigastrium, vomitus, konstipasi, dan distensi abdomen selama 2 hari.



8



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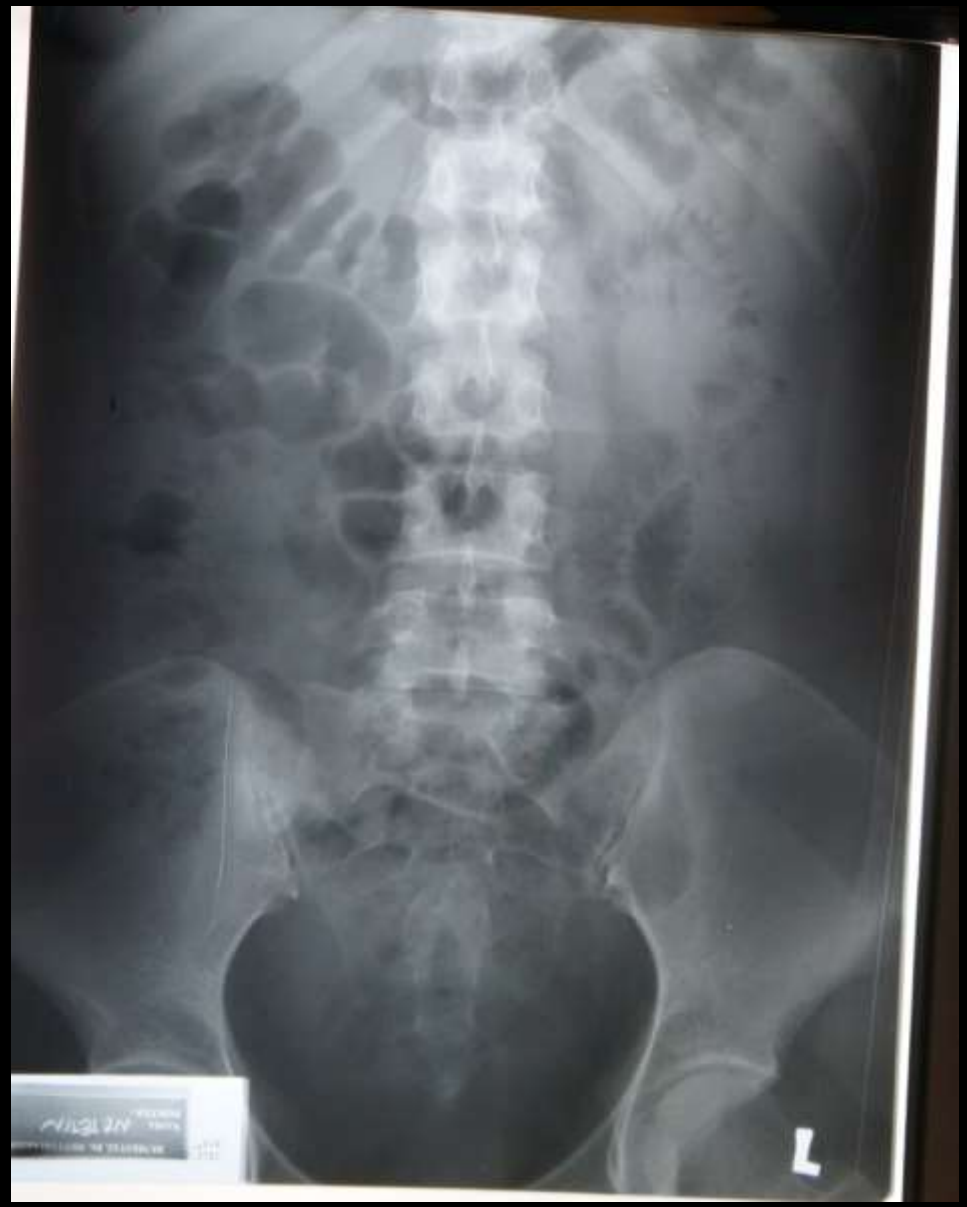

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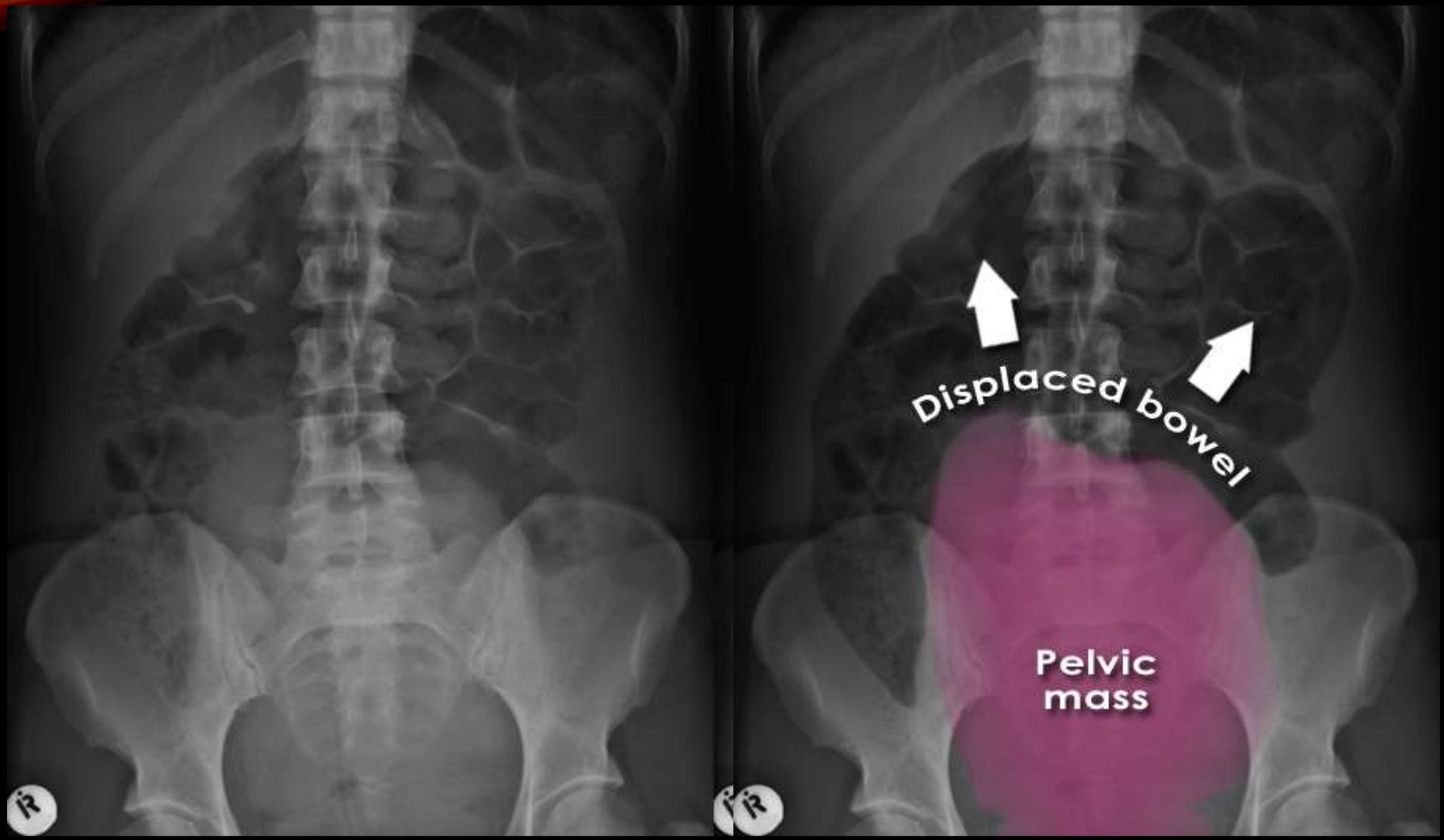

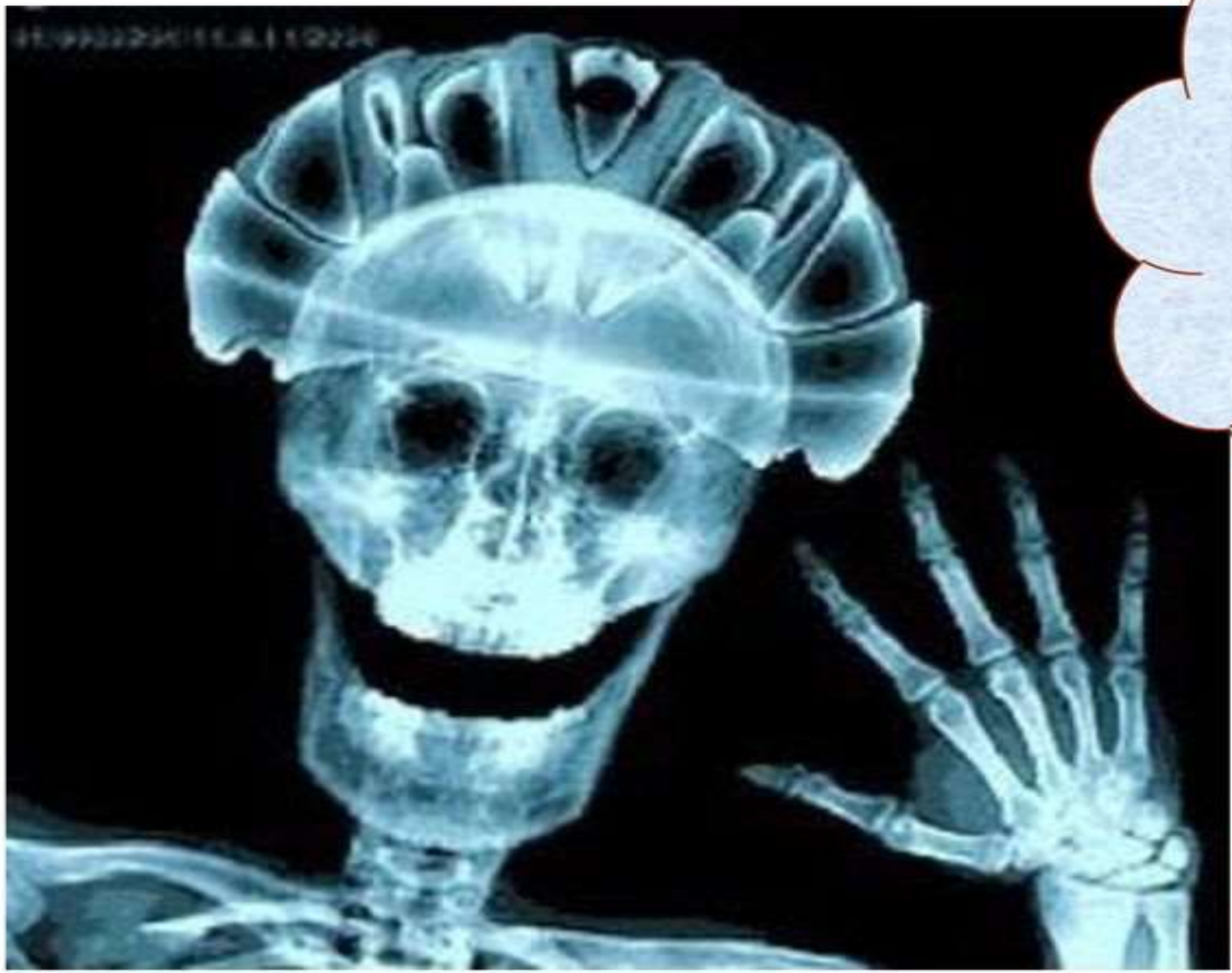

THANK YOU