

The Abdominal X-Ray



this was taken at the 1950s

Contents:

- Normal Anatomy
- Types of Projection
- Assessing the Film
- Technical Qualities
- Gas containing structures
- Solid Organs
- Bones
- Soft Tissues
- Presenting the film

normal anatomy impt , types of projection impt , how to assess the film , technical qualities , gas containing structures
Abdominal x-ray 99% supine, 1% erect, lateral decubitus

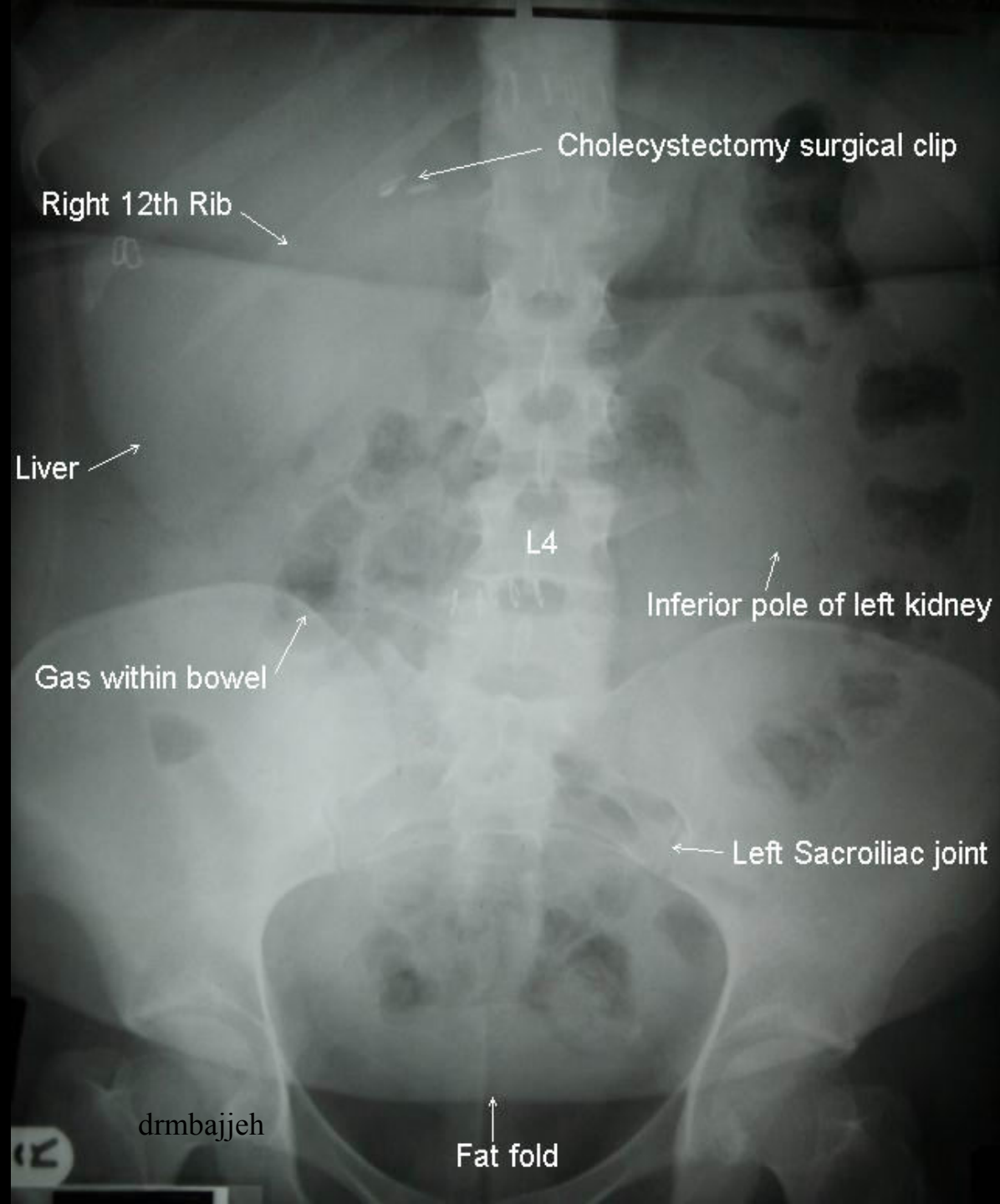
Abdominal X-Ray Projections:

- Supine 99%
- Erect
- Lateral decubitus.

Knowledge of the anatomy of the abdomen allows localization of the abnormalities observed on the AXR.

Anatomy on the Abdominal X-Ray:

for example: the dr loves memorizing for evaluation haha
Sha3ban what is A : 12 rib
Ola what is B ? are these normally placed here ?
No , iatrogenic
what are the possible organs in this place ?
gallbladder so what are they ? cholecystectomy surgical clips
so if a pt came with abdominal pain and you saw these clips what to exclude ? gallbladder
Alaa what is C ? liver?! OMG
huda what is this the lowest point ? end of fat fold
اخوكو مزنووء
Kiswani what is D ? gas in the small intestine
Momani E ? vertebra
how ? above L5 !!!! hahaha which one ? L4
Shawabke F ? lowe pole of left kidney والله قدها
Saeed G ? large intestine hahaha , iliocecal hahahaha *left sacro iliac joint



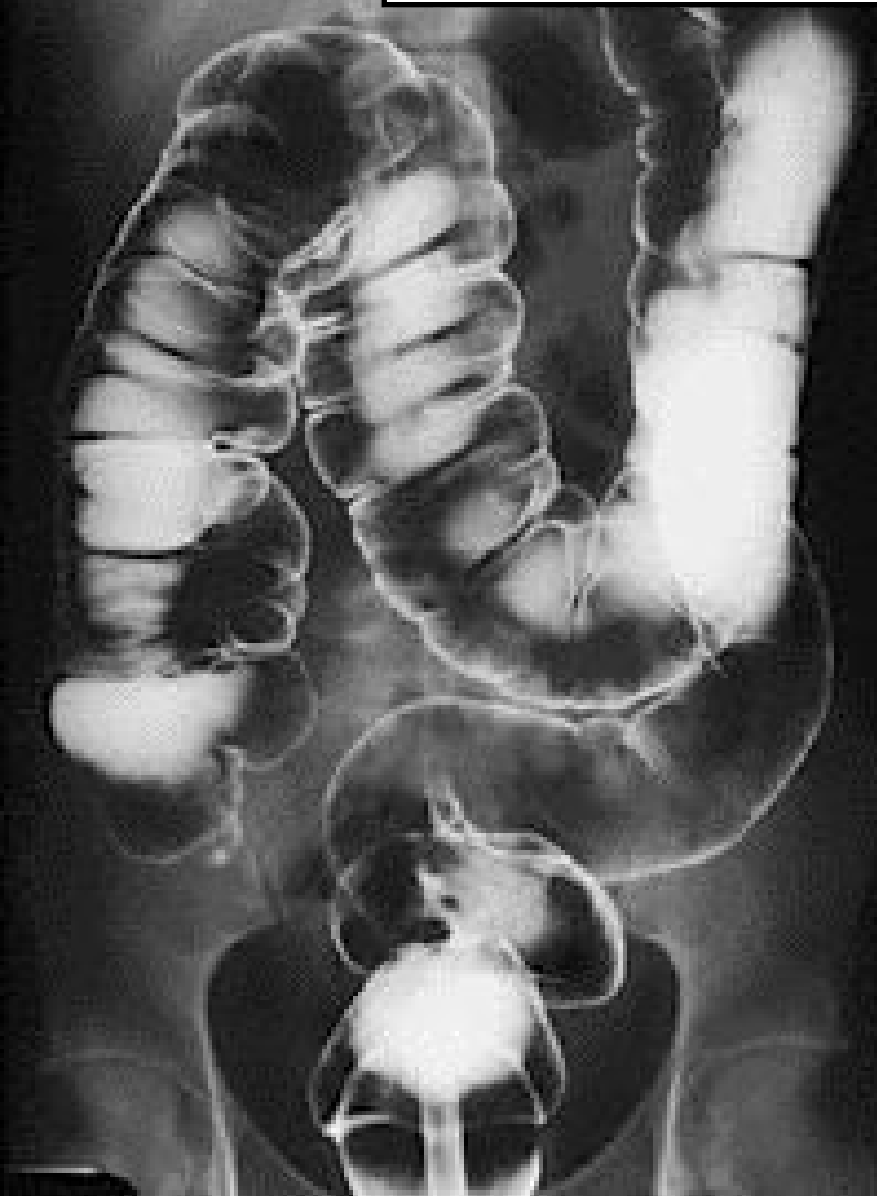
Abdominal X-Rays:

left pic : KUB No !! this is IVU (intravenous urogram) because we gave contrast
right pic : ct scan , coronal section , look at aorta , spleen , liver , kidney , psoas



Abdominal X-Rays:

left pic : double contrast barium enema (double contrast no , barium enema no)
right pic : barium follow through



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Film Specifics and Technical Factors:

The initial assessment of an AXR is the same as for a CXR:

Film Specifics:

- Name of Patient
- Age & Date of Birth
- Location of Patient
- Date Taken
- Film Number (if applicable)



Film Technical factors:

- Type of projection (Supine is standard)
- Markings of any special techniques used

Assess the Film in Detail:

how to read the film ? Name , age , date , number , location of pt
this is imp't why ? : if you make a comment on x-ray for wrong patient it is disaster
date is imp't : one has lesion 5*5 after 6 month and chemoembolization became 2*cm , if the radiologist switch'
Note : chemoembolization we go to artery supplying the tumor and insert and embolus lead to cutting of blood supply so the tumor will shrink example Focal nodular hyperplasia in liver
Black bits : intraluminal normal unless too much or in wrong place extraluminal abnormal

'BLACK BITS' AIR

- Intra-luminal gas can be normal.
- Extra-luminal gas is abnormal.
- However, intra-luminal gas can be abnormal if it is in the wrong place or if too much is seen.

Assess the Film in Detail:

'BLACK BITS' (Continued) - Intra-luminal gas:

- The maximum normal diameter of the large bowel is 55mm.
- Small bowel should be no more than 35mm in diameter.
- The natural presence of gas within the bowel allows assessment of caliber - although the amount varies between individuals.
- The caecum is not said to be dilated unless wider than 80mm.
- Large and small bowel may be distinguished by looking at bowel wall markings, as shown in the box below.

Assess the Film in Detail:

The **haustra** of the large bowel extend only a third of the way across the bowel from each side, whereas the **valvulae conniventes** of the small bowel tranverse the complete distance.

Intra-luminal gas (continued):

It is usual to see small volumes of gas throughout the GI tract and the absence in one region may in itself represent pathology.

For example, if gas is seen to the level of the splenic flexure and nothing is seen beyond this, a site of the obstruction at this site – a **'cut off'** point is noted.

Assess the Film in Detail:

Intra-luminal Gas:

Low Small Bowel Obstruction

small bowel : central , multiple loops ,
volvula conniventes
most common cause of intestinal
obstruction : adhesions , hernia



Assess the Film in Detail:

If bowel obstruction is observed try to look for the cause. For example a hernia as the cause of obstruction.

fluffy appearance of small bowel ,, its hernia



Hernia.

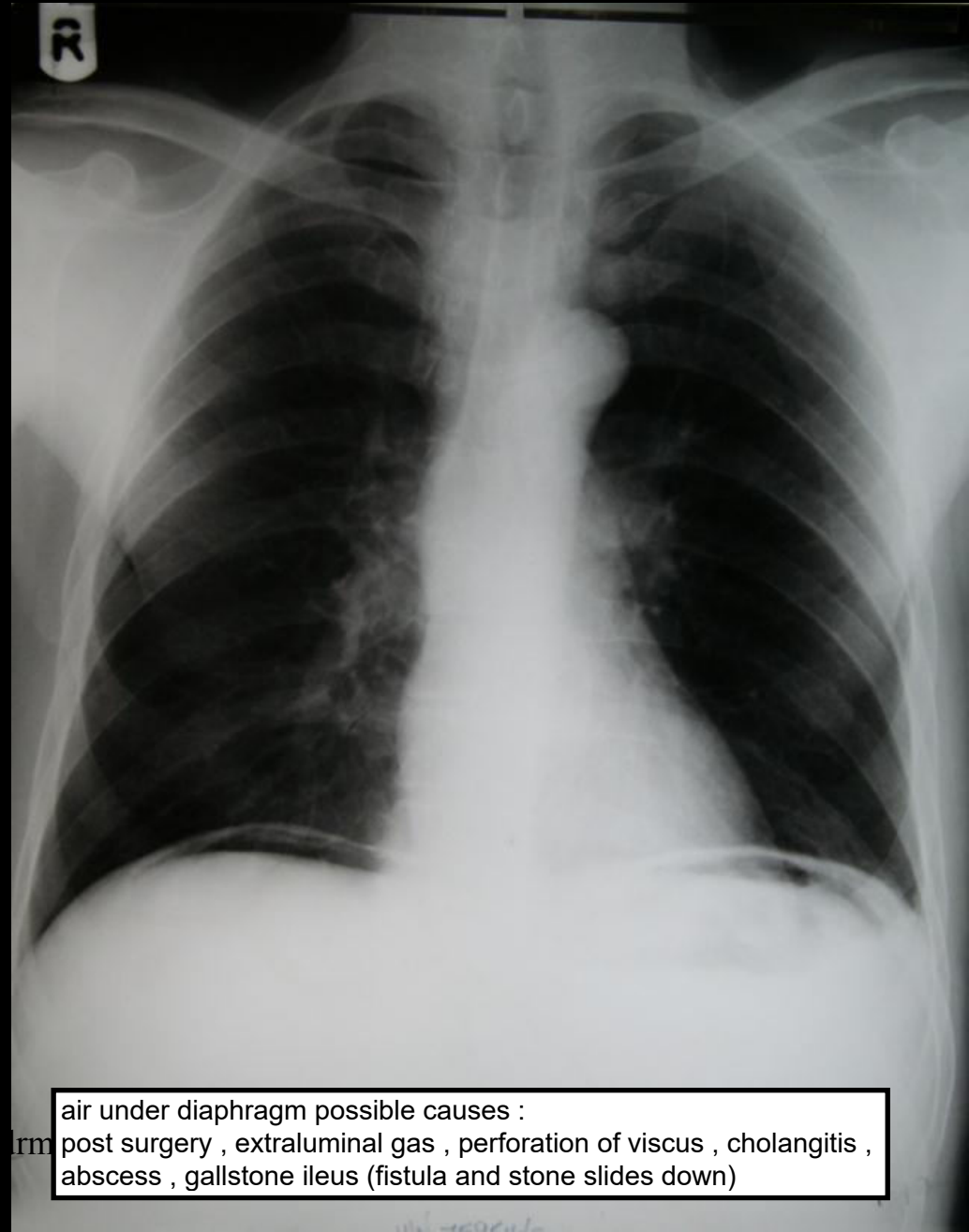
Assess the Film in Detail:

Extra-luminal Gas:

When an bowel is obstructed, or any other gas containing structure perforates, its contained gas becomes extra-luminal.

Extra-luminal gas is never normal, but may be seen following intra-abdominal surgery or endoscopic retrograde cholangiopancreatography (ERCP).

Extra-luminal gas seen on erect CXR.



air under diaphragm possible causes :
post surgery , extraluminal gas , perforation of viscus , cholangitis ,
abscess , gallstone ileus (fistula and stone slides down)

Assess the Film in Detail:

Causes of Extra-luminal gas:

- Post Abdominal Surgery/ERCP
- Perforation of viscus (eg. bowel, stomach)
- Gallstone ileus
- Cholangitis (infection with gas forming organisms)
- Abscess

Pneumoperitoneum = gas under diaphragm

An erect CXR (not AXR) is the best projection to diagnose a pneumoperitoneum (gas in the peritoneal cavity).

why not abdomen? because it wont show gas under diaphragm

Assess the Film in Detail:

- **‘WHITE BITS’ = Calcification**

Calcified structures (‘WHITE BITS’) are often seen on AXR. The main question is – does its presence have any important implications. Calcification can be broadly divided into 3 types:

- (1) Calcium that is an **abnormal structure** - eg. gallstones and renal calculi
- (2) Calcium that is **within a normal structure**, but represents **pathology** - eg. nephrocalcinosis,
- (3) Calcium that is **within a normal structure**, but is **harmless** - eg. lymph node calcification.

Bones are normal ‘white’ structures. On the AXR they comprise mainly those of the thoraco-lumbar spine and pelvis. Findings are largely incidental as direct bone pathology would be investigated with specific views.

Assess the Film in Detail:

left pic multi calcifications in horizontal order , which organ ? pancreas
right pic 4 rounded calcified areas



Pancreatic Calcification



Gallstones

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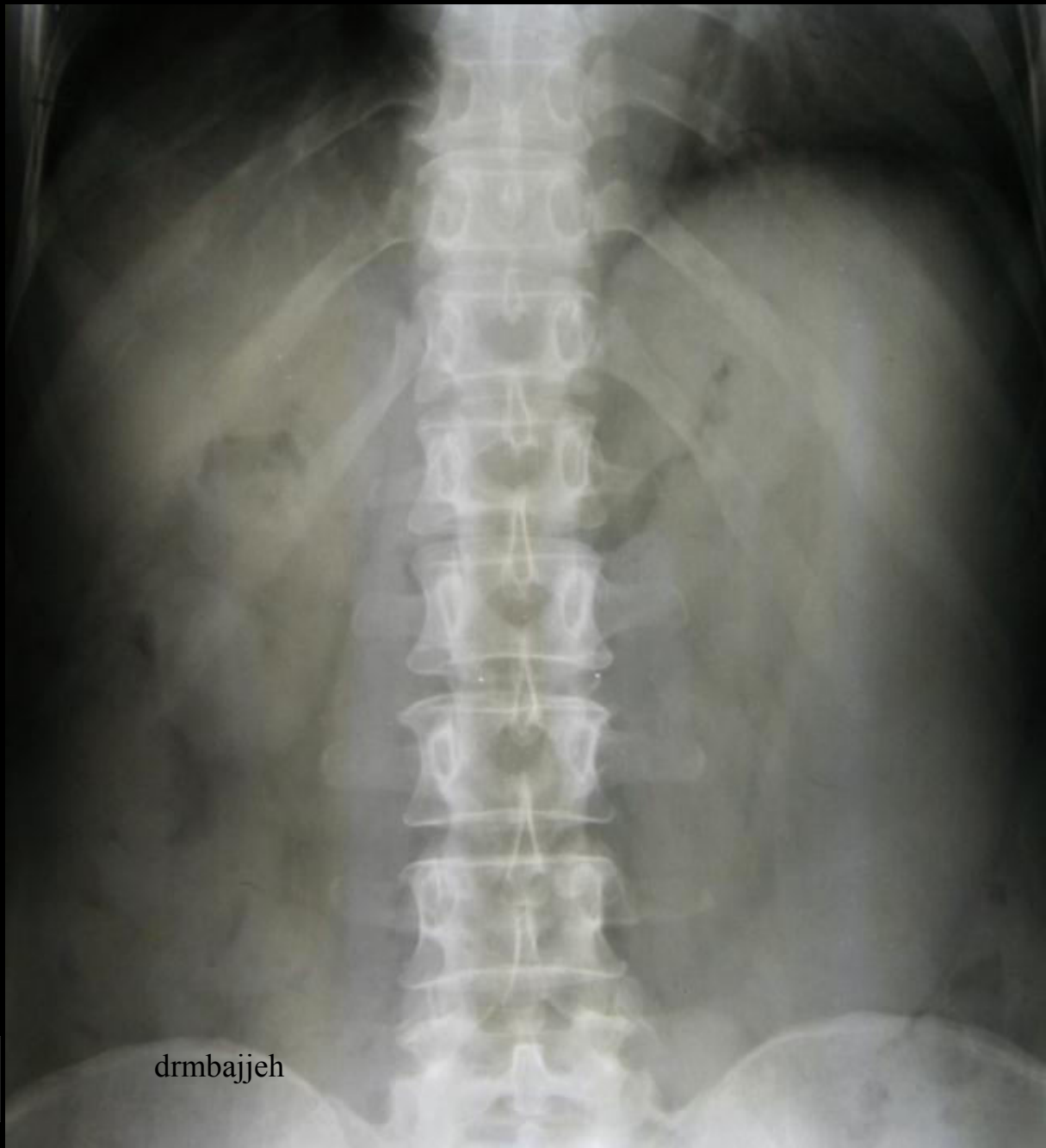
Assess the Film in Detail:

'GREY BITS' = Soft Tissues

Soft tissues represent most of the contents of the abdomen and feature heavily in the AXR. However, these tissues are poorly seen when compared to other imaging techniques such as ultrasound or CT.

The kidneys, spleen, liver and bladder (if filled) can be seen in addition to psoas muscle shadows and abdominal fat. Rarely would action be taken on the basis of this imaging alone.

Assess the Film in Detail:



Splenomegaly

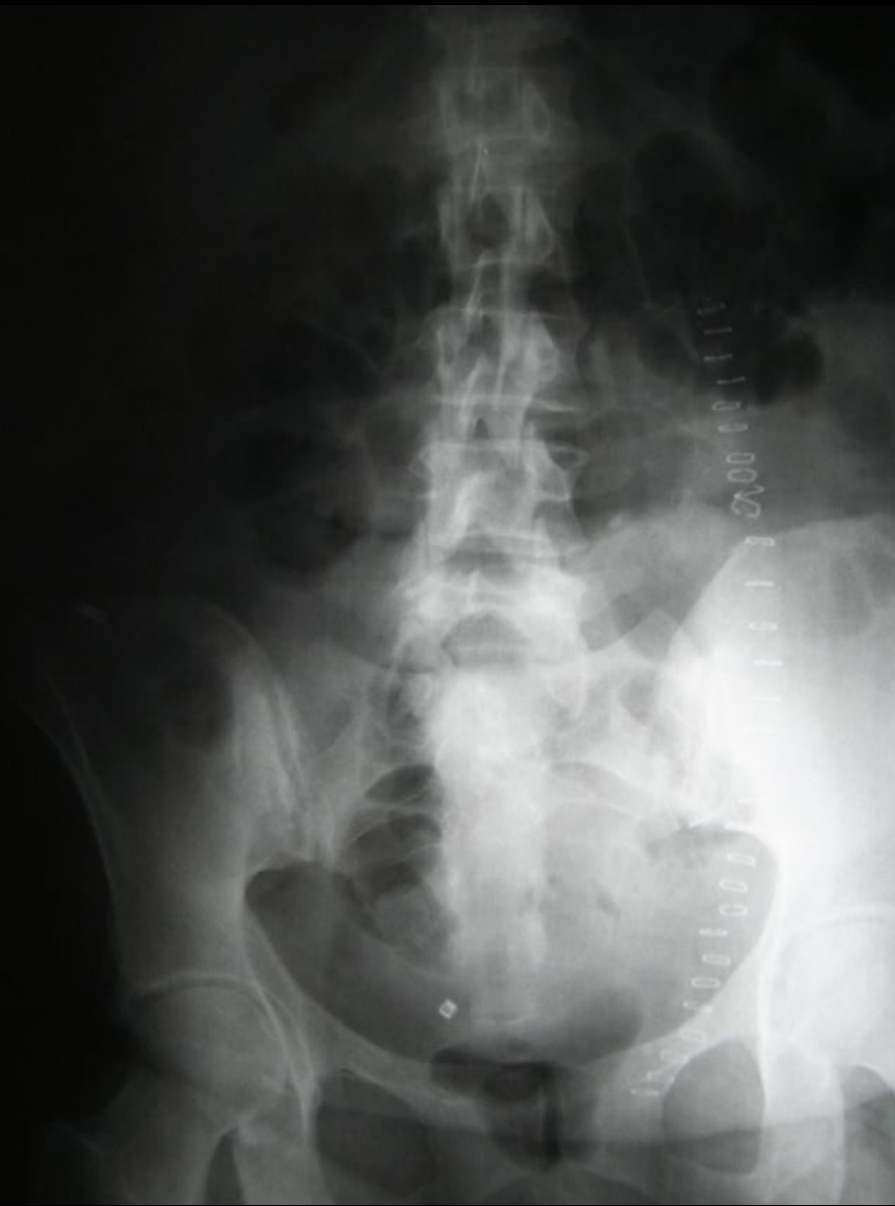
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Assess the Film in Detail:

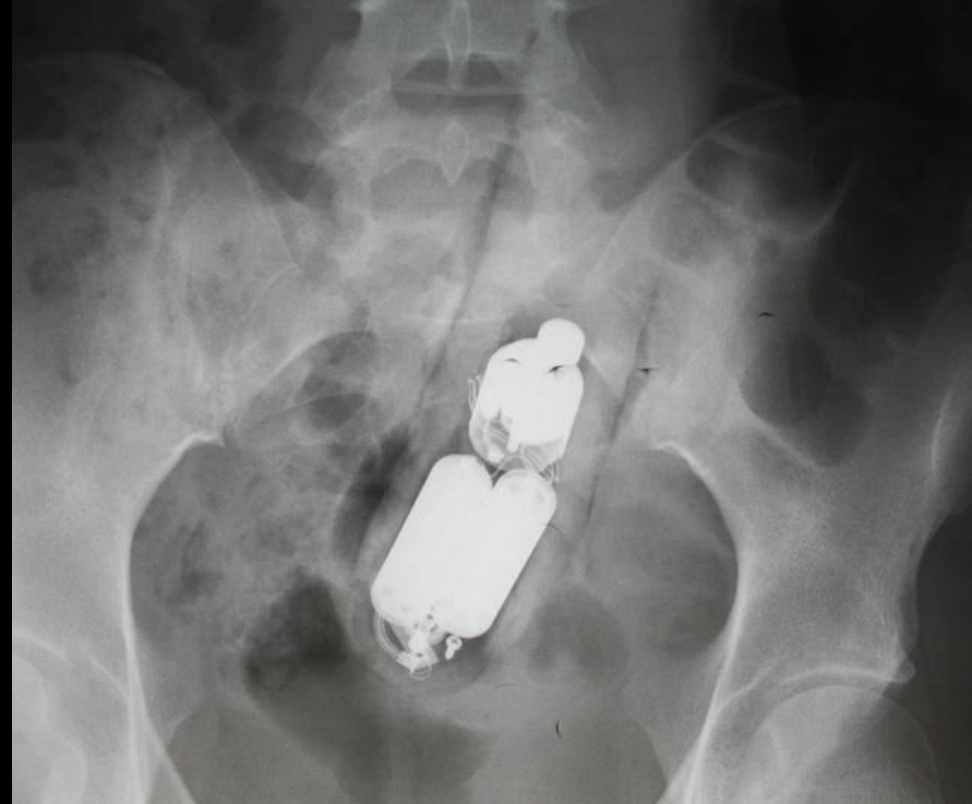
'BRIGHT WHITE BITS' = Foreign Bodies

Foreign Bodies represent an interesting final observation. Objects that may be seen include ingested and rectal foreign bodies, items in the path of the x-ray beam such as belt buckles, dress buttons and jewelry. Other objects may have been deliberately placed for example an aortic stent, an inferior vena cava filter or a suprapubic urinary catheter. Sterilization clips and an intra-uterine device are common findings in women.

Assess the Film in Detail:



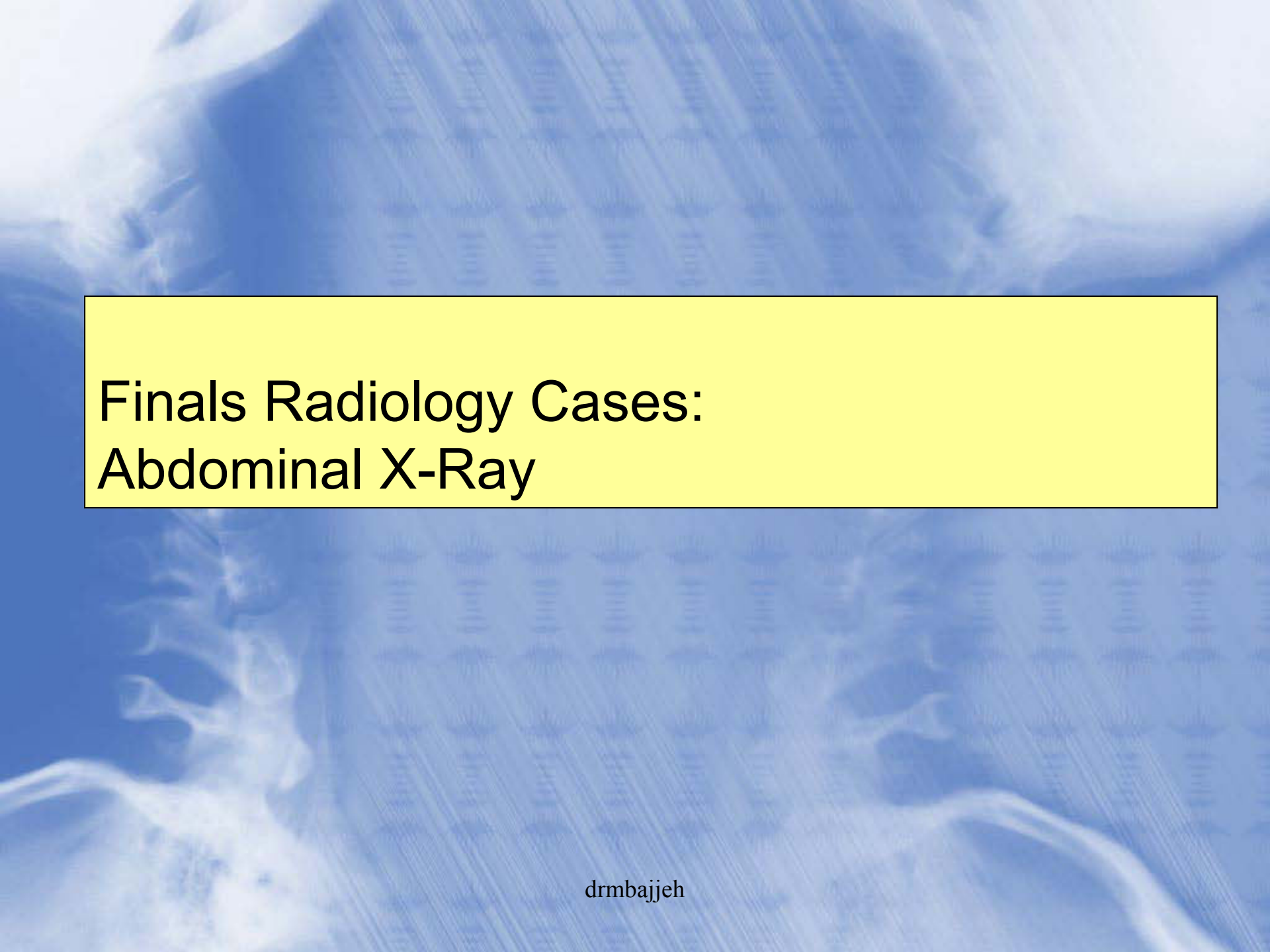
مرة وحدة لقوقها حاشية مخدرات جواتها بكياس ، طلعو كيس منها وفحصوها طبعا لو فقع واحد بس ، مخدرات اوفر دوز ، بتموت عطول ، طبعا هاي المرة عدت المطار من كوبا ومطار امريكا ووقعت يا حرام بس اجبت تركب بالتكسي



Sterilisation and Surgical Clips

foreign bodies (v.impt)
right pic : drugs

Foreign body per rectum



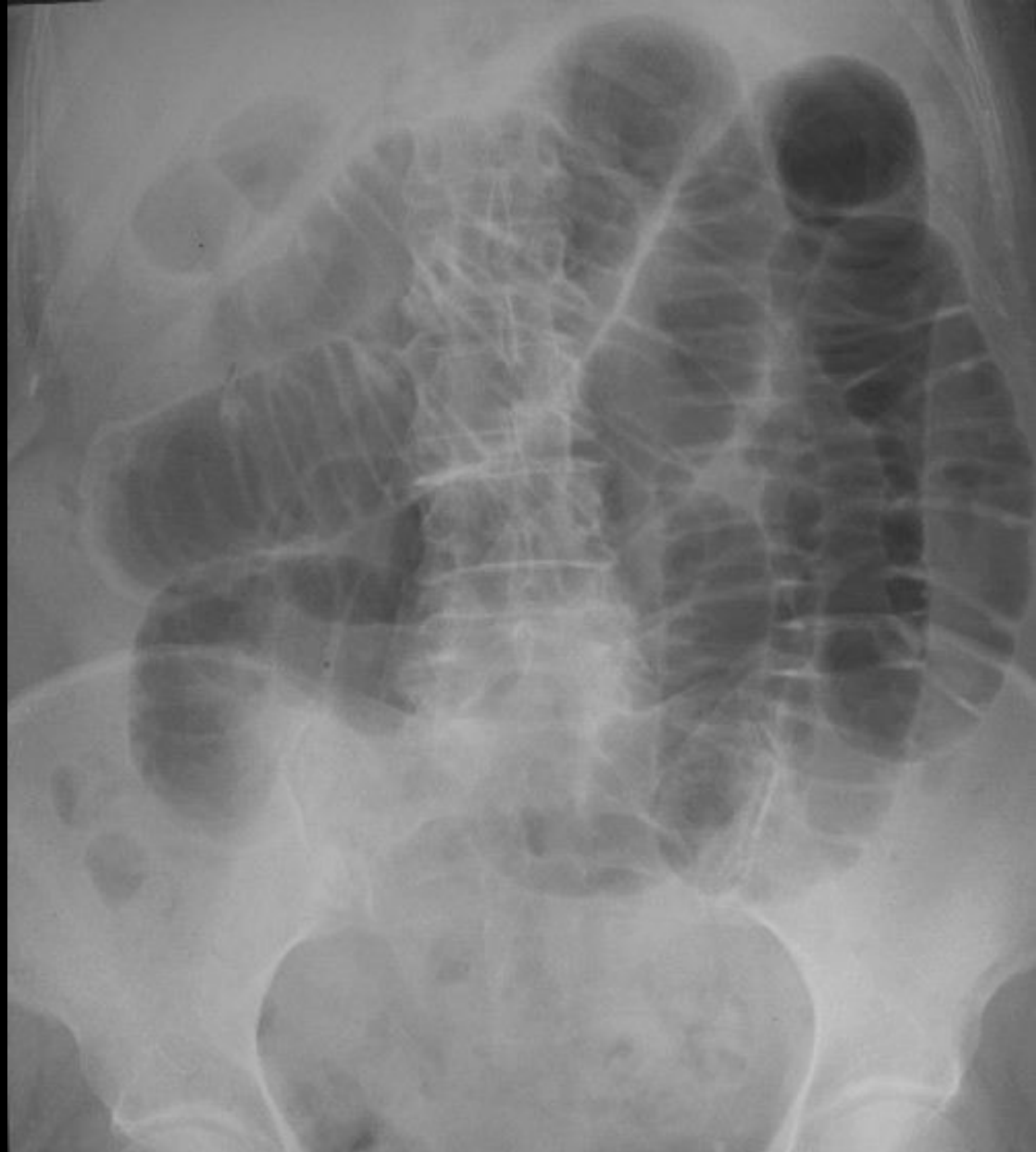
Finals Radiology Cases: Abdominal X-Ray

Case 1:

This 67 year-old woman presented to the surgical ward with a distended abdomen and vomiting.

Present this x-ray

Give a diagnosis and potential causes



zou'bi : this is small bowel obstruction , dilated small bowel , multiple dilated loops centrally with transitional zone at the RIF

صفر طبيعا

first say it is a plain abdomen X ray

if the patient had appendectomy ? Adhesion cause obstruction

Case 1: Answer

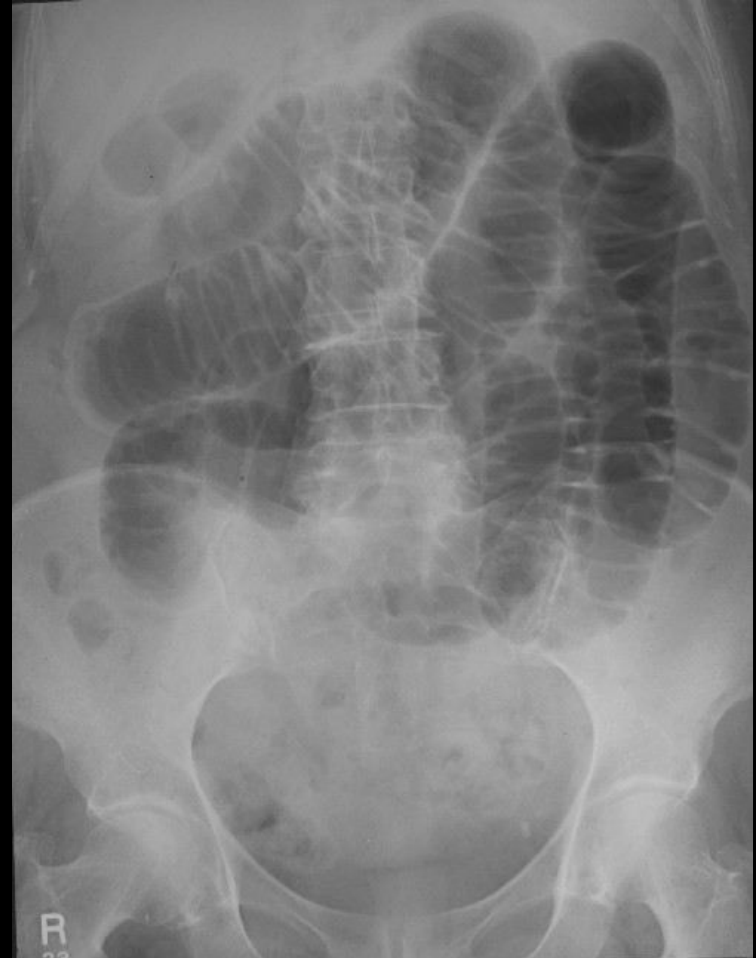
Radiology Report:

Plain abdominal radiograph.

Multiple dilated loops of small bowel within the central abdomen. Gas is not seen in the large bowel. No evidence of hernia or gallstone to suggest potential cause of the dilated loops.

These findings are in keep with a low small bowel obstruction.

I would like to know if the patient has a history of abdominal surgery as the commonest cause is surgical admissions.



The three commonest causes of small bowel obstruction are:

- Surgical adhesions
- Herniae

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•Intraluminal mass eg, small bowel lymphoma or gallstone (in gallstone ileus)

Case 2:

This 71 year-old gentleman visits his GP complaining of blood in his urine. He has had a number of UTI's in recent years.

Present this x-ray

Give a diagnosis and potential causes

gentleman . bladder , dermoid tumor in ovaries , calcified uterine fibroid
2 opacities , laminated , most likely stones



Case 2: Answer

Radiology Report:

Plain abdominal radiograph.

Two rounded radio-opacities measuring 4cm within the pelvis. Both opacities are smooth in outline, laminated in nature, have the same density as bone and project over the bladder. No other renal tract calcification.

Does the patient have a history of neurogenic bladder?

Given the size of these stones and history of UTI's these are bladder calculi.



Bladder calculi are more common in those with a history of:

- UTI's
- A neurogenic bladder
- Bladder diverticulum

Case 3:

punctuate bilateral calcification in the area of both kidneys
most likely kidney calcification like medullary sponge kidney

This patient was admitted with poor renal function.

Present this x-ray

Give a diagnosis and potential causes



Case 3: Answer

Radiology Report:

Plain abdominal radiograph

Multiple areas of punctuate calcification project over the renal outlines bilaterally.

The calcification is within the medulla of the renal parenchyma. The bones are normal in appearance.

These findings are consistent with nephrocalcinosis



Causes of Nephrocalcinosis include:

- Hyperparathyroidism
- Medullary sponge kidney

There will be the opportunity during the rest of the day for EVERYONE to present at least one AXR during the small group sessions.

Thank you

drmbajjeh

Abdomen and gastro - intestinal tract imaging

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Interventional Radiology
Hashemite University

- It is important to know the anatomical location of the kidneys so if you saw a lesion in that area, you will know that it is related to the kidneys.
- The kidneys lie between level of L1 and L3, the hilum is at level L2.
- the right kidney is lower than the left.
- kidneys are clearly seen in slide #5
- sometimes kidneys can reach L4, this is normal due to inspiration unless there is a pathology causing this.
- To define them we count from T12 ((the last vertebra that is attached to rib)) down to L1 or from L5 and we move upward.
- ❖85% of kidney stones are visible on x-ray, the rest are radiolucent and can be seen on CT scan ((uric acid stones)).
- ❖15% of gallbladder stones are visible on x-ray (radio-opaque, contain calcium

Abdomen and GIT investigation

- *Plain abdomen films still retain as one of the most useful initial investigations.*
- *The following structures should be checked :*
 - ❖ Bowel gas pattern
 - ❖ Radio-opaque stones or calcification
 - ❖ Extraluminal free gas
 - ❖ Signs of intestinal obstruction
 - ❖ Skeletal abnormalities

**plain abdominal film= abdominal x-ray:
***The following structures should be checked:**

- Bowel gas pattern
- Radio-opaque stones or calcification: Radio-opaque means white, while radiolucent means black.
- Extraluminal free gas (perforation).
- Signs of intestinal obstruction
- Skeletal abnormalities

-How is the plain AXR taken?

- ~ The patient must lie supine then define the centering points and then take the image of the wanted area.
- ~ Usually we try to include the lung base in the AXR, above and go as low as possible.
- ~ This depends on the size of the patient, but this is not necessary



the image is better than the image in slide #3, it is very clear (you can see psoas muscle, intervertebral disc) due to good exposure. *over exposure is not always good



-This is KUB why?
Because we can see the
symphysis pubis.
-There is a stone in the
right kidney
Q: how did you know that
the lesion is in the
kidney? Due to
anatomical location.
- check the neck slide



Q: what is your next step? We need to do CT or U/S (usually U/S is done because it's cheap) to know whether it is:

◀ Obstructive: causes hydronephrosis which can damage the kidney within few hours, so it is an emergency and needs nephrostomy or lithotripsy.

Or

◀ Non-obstructive: the patient can go home and come back to have lithotripsy.

In the same image, we can see two white spots, it can be in the ureter, arterial or venous calcification or something like food with high density in small or large bowel.

: How to know if it is in the ureter or not? By using CT scan or if the CT is not available then give the patient IV contrast and observe its excretion.

- If it normal: the lesion is not in the ureter.
- If it abnormal: it is a stone in the ureter

Contrast medium in G.I.T studies

❑ Barium sulfate: is the most commonly used in barium studies of the GIT.

❑ Gastrografin: is used in:

- suspected bowel perforation
- post-operative for leakage.
- meconium ileus (in neonates).

Types of contrast

Barium sulphate, gastrografin, non-ionic contrast medium (NICM).

***Gastrografin** is water soluble so we can use it in meconium ileus (I.O in newborn we don't use barium because it is thick so it can make it worse

***Barium**:

1- Barium swallow: to visualize the area from mouth to stomach, the contrast is given orally.

2-Barium meal: to visualize the stomach and duodenum, the contrast is given orally.

3-Barium follow through: to visualize small intestine, the contrast is given orally.

4-Barium enema: to visualize the colon, the contrast is given per rectum.

Gastrografin is contra-indicated in Barium swallow and meal if the patient is at risk of aspiration such as in infants, because gastrografin can induce pulmonary edema and chemical pneumonitis.

❑ Non ionic contrast medium (omnipaque) is used in barium swallow studies in infants.

Gastro-intestinal tract investigations

BARIUM SWALLOW

*Barium swallow:

-used to study the esophagus.

-How it is done?

●We take images of the three parts of the esophagus.

●First ask the patient to swallow the contrast and take the images anteriorly of

the upper third, then ask the patient to swallow again and take the image of the upper third laterally.

●Then repeat this for the second and third parts.

-used for any esophageal disease

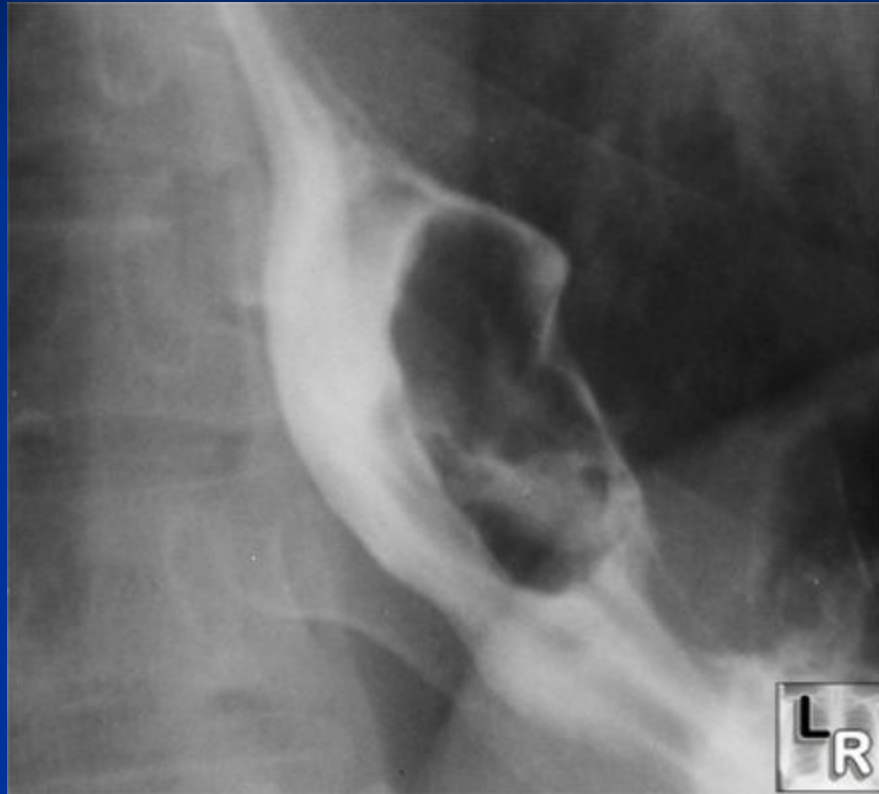
- Is the examination of the esophagus with contrast medium .
- The contrast used is barium sulfate for most examination .
- Non ionic contrast media is used in infants and small children .

Barium swallow / 2

Indication of Ba. swallow:

- 1- Symptoms of gastro-esophageal reflux
- 2- dysphagia which could be related to :
 - Esophageal stricture
 - Esophageal tumor
 - Suspected achalasia
 - Vascular abnormalities
 - Esophageal web

there is a mass in the wall of the esophagus.

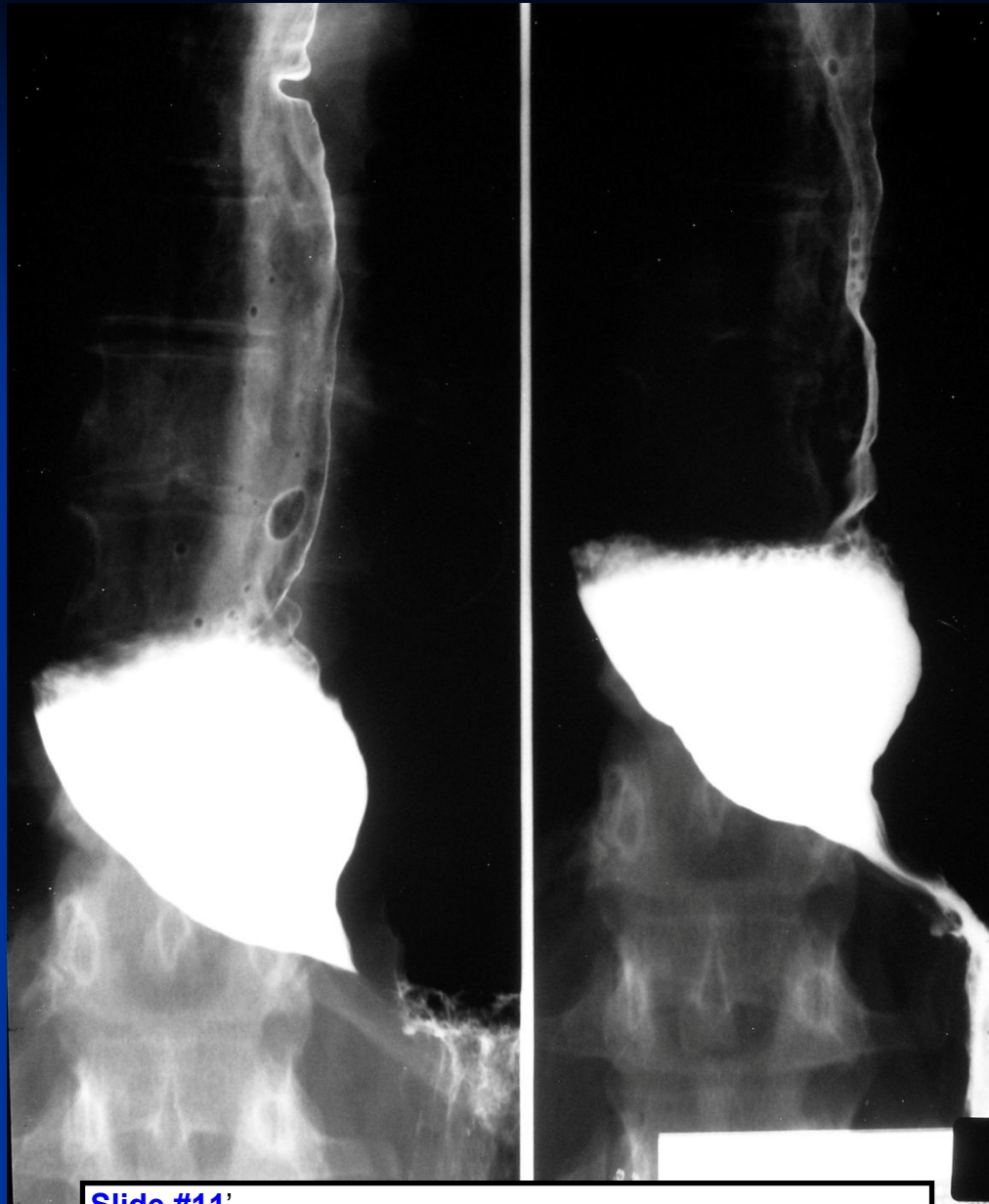




esophageal tumor/ mass

Slide #10

there is an area where the barium is thin, we need further investigation because it be



Slide #11'

- Achalasia is failure of lower esophageal sphincter to relax.
- The treatment: myomectomy or ballooning.

BARIUM MEAL

- Is the examination of the stomach and duodenum with barium sulfate .
- Double contrast is obtained by introduction of gas into the stomach using effervescent powders and barium.
- The gastro-esophageal junction is observed for reflux .

Indication :

- ❖ Gastro esophageal reflux
- ❖ Gastric or duodenal ulcer
- ❖ Hiatus hernia
- ❖ Suspected gastric tumor

***Barium meal:**

- to study the stomach and duodenum.
- We use double contrast: gas and barium.
- When the stomach is empty it is collapsed because it also contains rugae which disappear when the stomach is full to increase the size and surface area.
- The patient should be fasting so the stomach would be collapsed which make it difficult to see the abnormalities so we distend the stomach by gas.
- How: by giving the patient فوار then he drinks barium, which results in a reaction and the patient is asked to roll to one side then to the opposite side.
- The patient must keep his mouth closed preventing gas from leaving.

the stomach is clear, we can see rugae, and there is bulge in the lesser curvature (small diverticulum)



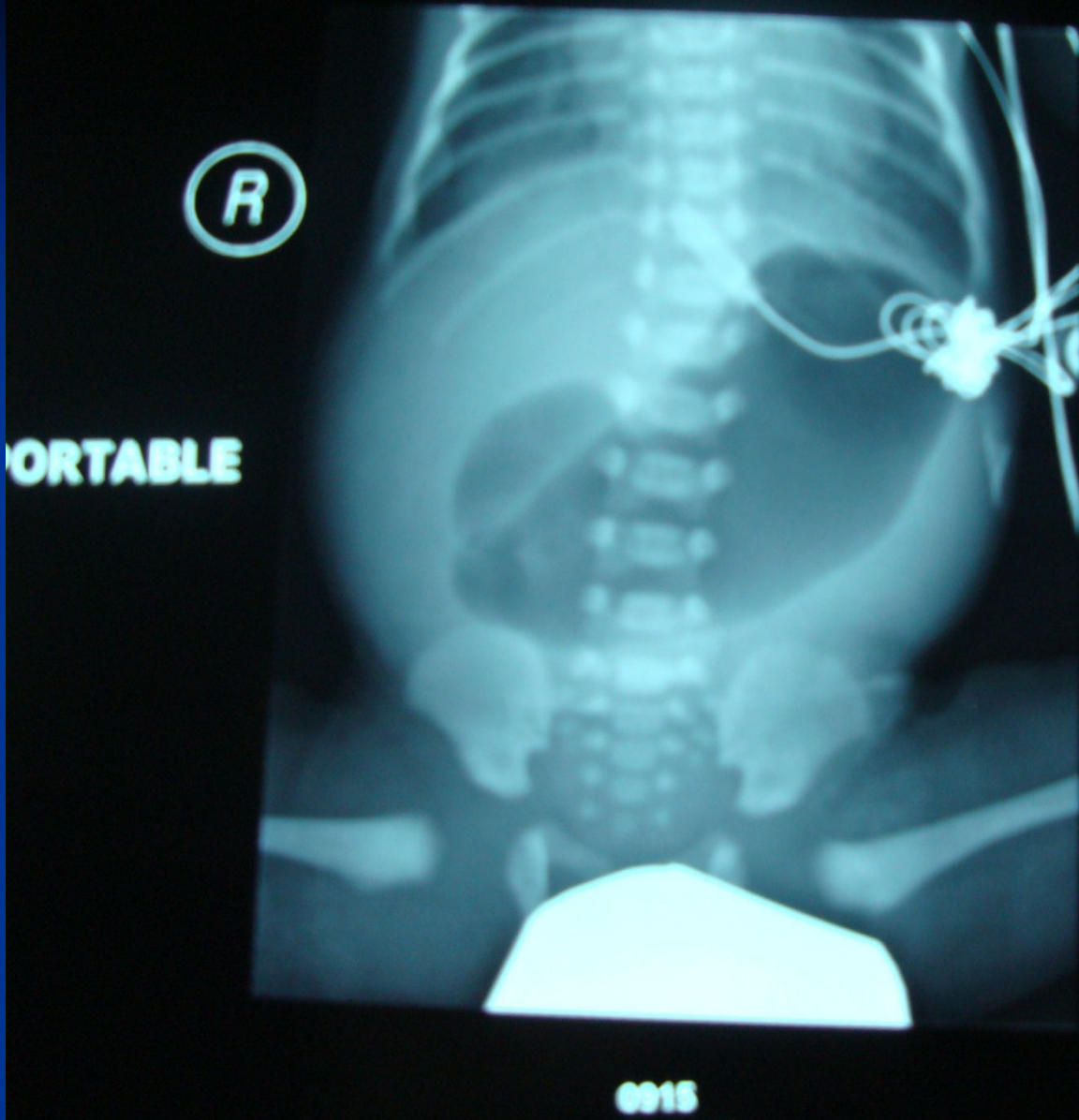
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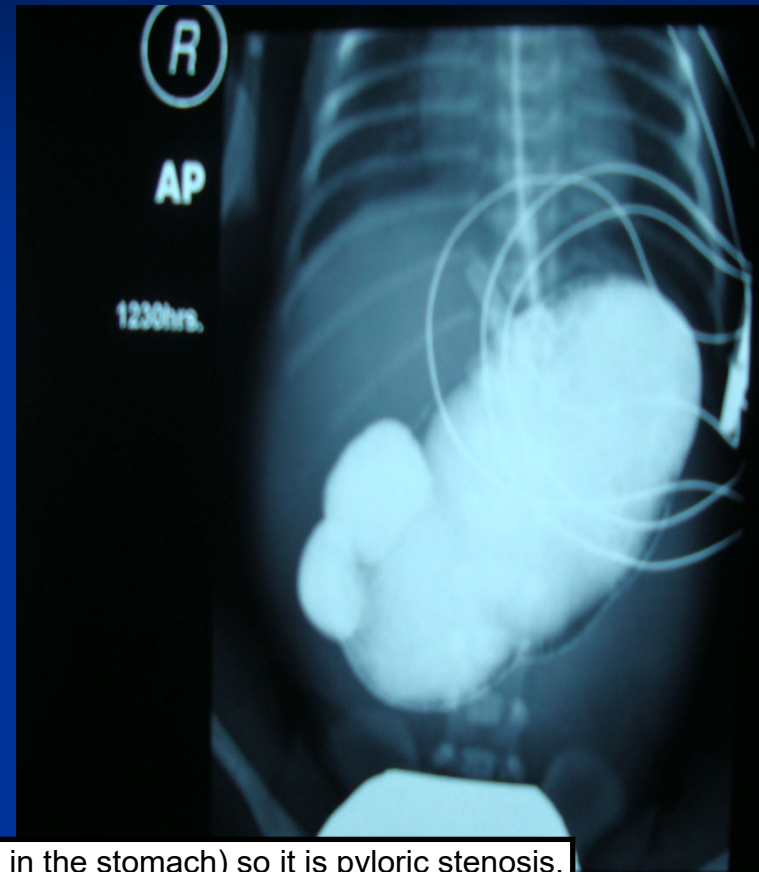
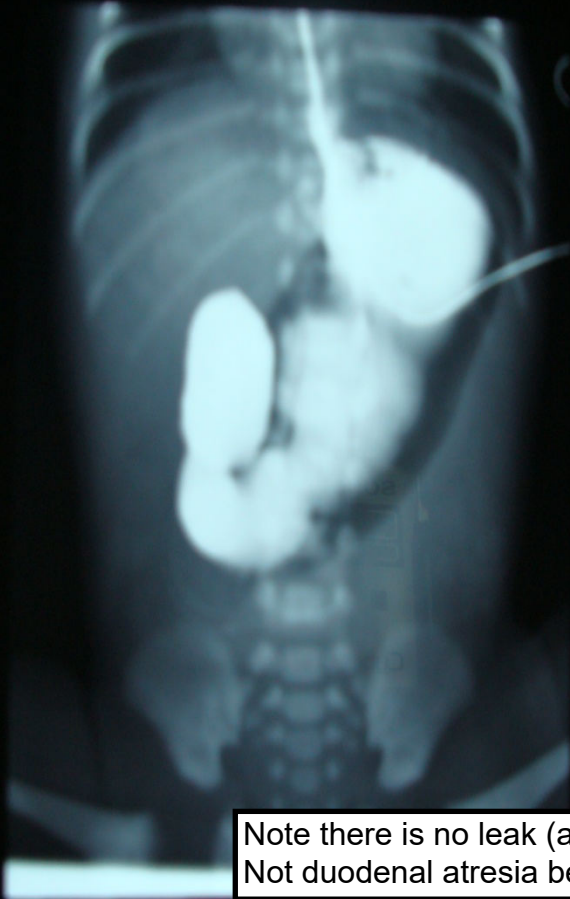
there is a white spot in the stomach which means a collection of barium, so there is a depressed lesion where barium is collected
→ it is an ulcer
-While a mass will be black.





plain x-ray of a child with history of sever vomiting, the stomach is distended, and no gas is found outside the stomach so it is most likely pyloric stenosis but to make sure the child was given a contrast





Note there is no leak (all the contrast is in the stomach) so it is pyloric stenosis.
Not duodenal atresia because there is no double bubble sign

Barium follow-through

- Is the investigation of the small intestine with contrast - medium (usually barium sulfate)
- Transit of barium is observed through the small bowels .
- Full-length abdominal films are taken every half hour until barium reaches the large bowel .
- Spot films of the terminal ileum are obtained .

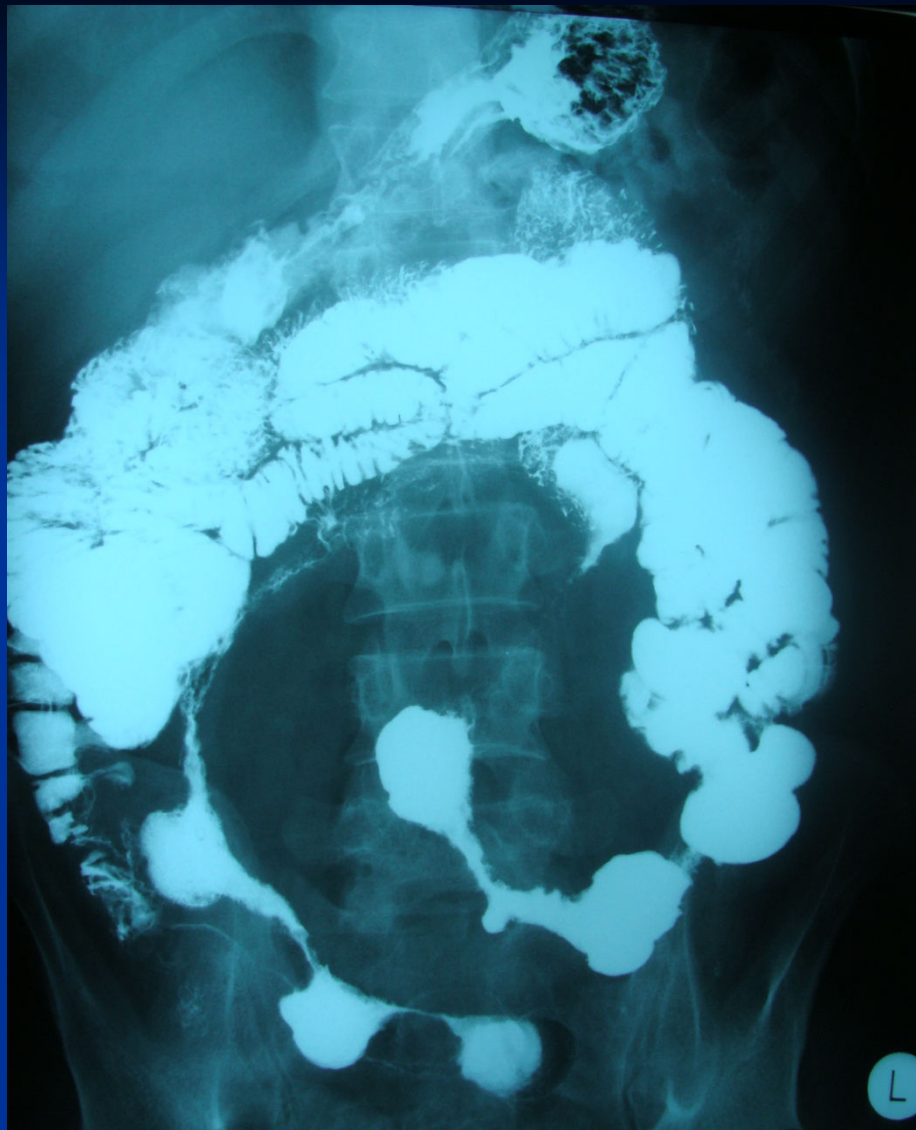
Indication :

- ❖ Inflammatory bowel disease, most often Crohn's disease.
- ❖ Small bowel tumors / lymphoma
- ❖ Small bowel obstruction

lymphomas appear as filling defects.

***Barium follow through:**

- study of the small bowel (from the duodenum to ileocecal valve) why? Because if we continue after that to large bowel there will be overlap and the images will not be clear.
- Food takes 24 hours to pass from mouth to anus, most of the time is spent in small bowel.
- How it is done? We starts taking images when the contrast reach the duodenum the keep taking images every 20-30 minutes not continuously because it takes long time to move, so to decrease the harm of the x-ray.
- However the time decreases if the patient has diarrhea and increases if the patient has constipation.
- What is spot film?
 - It is a high quality image in which large amount of x-ray was used.
 - It is harmful so it is not used always.
 - Used mostly for terminal ileum because most of the diseases affect the terminal ileum.



-There is something called **MRE**: MRI enterography, in which we can see the movement of bowel and detect if it is absent or present (e.g. Peristalsis is absent in terminal ileum in crohns disease)
*The best study for small bowel is MRE.
*The best study for large bowel is MRI or CT.

the bowels are normal but they are pushed upward by a certain pathology (in this case the patient has uterine cancer).
-we can see also contraction in some areas which can be peristalsis, tumor or stricture so barium follow through is not very useful in reality.
*Actually all barium meal, follow through or meal are not useful because it is hard to detect abnormalities in them, while barium swallow is the most useful one.

Barium enema

- Is the study of the large bowel with double contrast (Barium and air).
- Barium is run into the colon by Foleys catheter placed in the rectum.
- Air insufflation into the large bowel produces a double contrast examination .

Indication :

- Investigation of abdominal mass
- Large bowel obstruction / volvulus.
- Diverticular disease
- Suspected colonic tumor

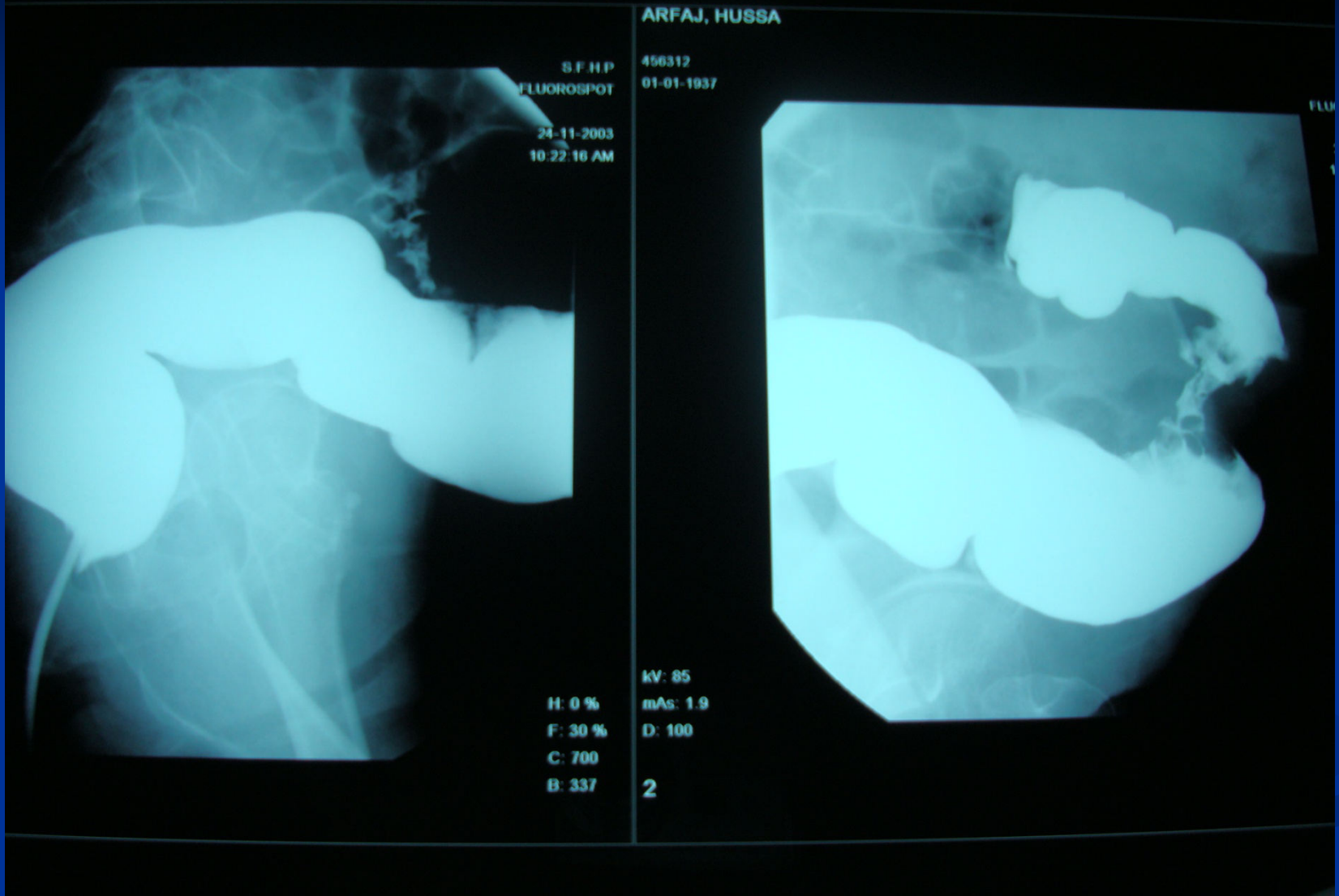
***Barium enema:**

- The patient must be fasting and should be given laxative one day before to empty all stool.
- The patient must lie prone then bring the barium sac which contains 2 liters and this sac is connected to a rectal tube that along head with a balloon.
- The barium sac should be placed at a high level and insert rectal tube to the rectum then inflate the balloon to prevent the barium from escaping.
- Insert the rectal tube gently and use gel to avoid injury to the anus.
- Now the barium enters the rectum –sigmoid –descending –transverse – ascending colon –ileocecal valve, now you should close it (stop the flow of barium).
- When the color is completely white, it is called single contrast barium enema, you can detect any filling defect or mass but you can't feel any mucosal lesions
- There is a double contrast barium enema to detect mucosal lesion, in which the barium sac is placed at a low level and the patient is asked to strain and to turn to right and left to empty the barium. Now a small amount of barium remains inside.
- Gas is used to inflate the bowel so the barium is distributed.



there is single contrast (bright white), barium enema and double contrast.
-we can see also diverticulosis in the descending colon

lateral decubitus, in the right picture you can see the apple core appearance (a sign of colon carcinoma).



Small bowel obstruction

- Mechanical small bowel obstruction develops when there is impairment to the onward flow of bowel contents.
- Gas and fluid accumulating proximal to the site of obstruction causing progressive dilatation of small bowel.
- The initial radiological investigation for suspected small bowel obstruction is supine and erect plain abdominal films.

Causes of small bowel obstruction

The most common causes are:

- ❖ **Adhesions:** is the most common cause, about 70% of cases.
- ❖ Strangulated hernias
- ❖ Tumors of small bowels
- ❖ Inflammatory bowel disease

What are the common signs of small bowel obstruction ?

- Dilatation of small bowel loops, usually centrally placed in abdomen.
- Multiple air fluid levels.
- Absence of gas in the colon.
- If gas is still present, it indicate that the obstruction is recent or that it is incomplete.

Distinction between small and large bowel dilatation

*Small bowel obstruction:

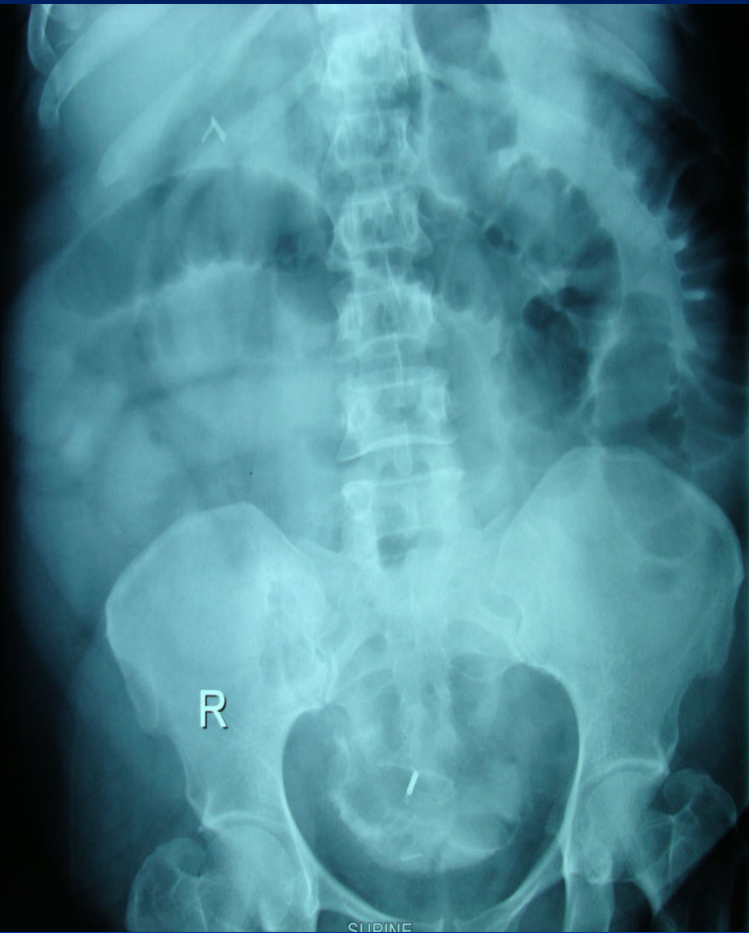
- most common causes: adhesions and hernia.
- small vs. large bowel obstruction

Small bowel

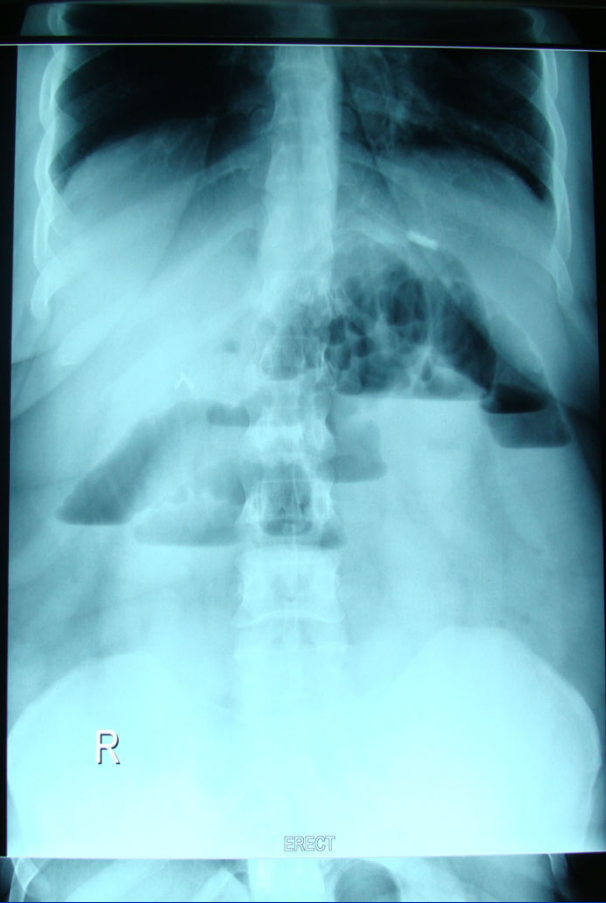
Large bowel

Distribution of loops	Central	Peripheral
Number of loops	Many	Few
Diameter	2.5-3 cm	5-7 cm
Haustra	Absent	Present
Valvulae conniventes	Present in jejunum	Absent
Solid feces	Absent	Present





Security Forces Hospital
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120510
KAT TARA' ALPILAN
UFYANI, SALEHA
35275
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1/11/06
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35.75
YANI, SALEHA
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Security Forces Hospital

Security Forces Hospital

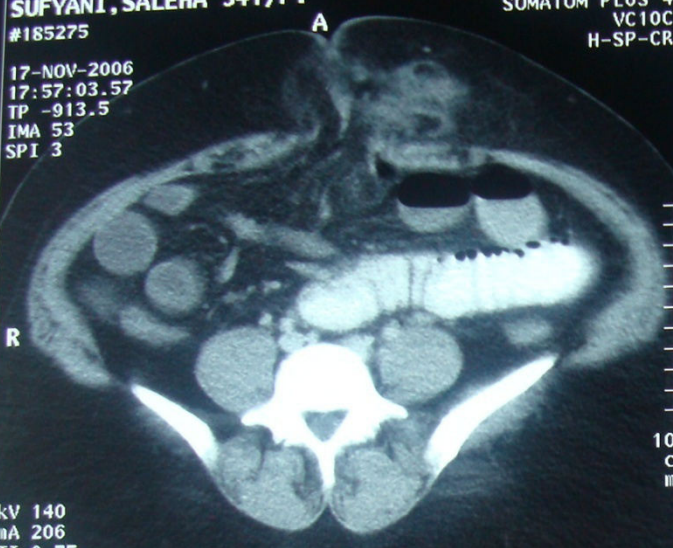
CT scan shows anterior bulge so the cause of the obstruction is hernia.

344 8/-54
ABS0ULO 121I000
GASTROGRAFIN [70S. DELAY]
100 MLS OMNIPAQUE

S. FORCES HOSPITAL
SOMATOM PLUS 4
VC10C
H-SP-CR

SUFYANI, SALEHA 34Y/F.
#185275

17-NOV-2006
17:57:03.57
TP -913.5
IMA 53
SPI 3



10 cm

kV 140
mA 206
TI 0.75
GT 0.0
SL 8.0/12.0
344 8/-54
ABS0ULO GASTROGRAFIN [70S. DELAY]
121I300 100 MLS OMNIPAQUE

W 352
C 35

1211000 100 MLS OMNIPAQUE

S. FORCES HOSPITAL
SOMATOM PLUS 4
VC10C
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SUFYANI, SALEHA 34Y/F.
#185275

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17:57:03.88
TP -918.5
IMA 54
SPI 3



10 cm

kV 140
mA 206
TI 0.75
GT 0.0
SL 8.0/12.0
344 8/-54
ABS0ULO GASTROGRAFIN [70S. DELAY]
121I000 100 MLS OMNIPAQUE

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C 35

1211300 10

S. FORCES HOSPITAL
SOMATOM PLUS 4
VC10C
H-SP-CR

SUFYANI, SA
#185275

17-NOV-2006
17:57:04.19
TP -923.5
IMA 55
SPI 3




10 cm

kV 140
mA 206
TI 0.75
GT 0.0
SL 8.0/12.0
344 8/-54
ABS0ULO
121I000

S. FORCES HOSPITAL
SOMATOM PLUS 4
VC10C
H-SP-CR

SUFYANI, SALEHA 34Y/F.
#185275

17-NOV-2006
17:57:05.13
TP -938.5
IMA 58
SPI 3



10 cm

S. FORCES HOSPITAL
SOMATOM PLUS 4
VC10C
H-SP-CR

SUFYANI, SALEHA 34Y/F.
#185275

17-NOV-2006
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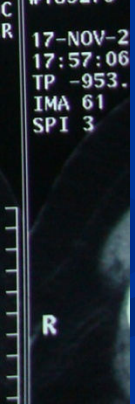


10 cm

S. FORCES HOSPITAL
SOMATOM PLUS 4
VC10C
H-SP-CR

SUFYANI
#185275

17-NOV-2
17:57:06
TP -953.
IMA 61
SPI 3



10 cm

Large bowel obstruction

- The plain abdominal film is useful for the diagnosis of large bowel obstruction.
- The large bowel proximal to the obstruction is dilated.
- Fluid levels are present in the erect position and tend to be long.
- In equivocal cases, a barium enema can be performed and locate the site and cause of obstruction.

Large bowel obstruction / 2

Most common Causes of large bowel obstruction:

- ❖ Colonic carcinoma
- ❖ Diverticula disease
- ❖ Volvulus of sigmoid colon.
- ❖ Paralytic ileus: causes small and large bowel obstruction, especially in the post operative stage

Air under the diaphragm

- Free abdominal air is called pneumoperitonium and is usually due to perforation.
- It accumulates under one or both diaphragms when the patient is in erect position.
- Lateral decubitus film can be used for very ill patients.
- Free air is not seen in up to 20% of patients.

Causes of free abdominal air

- ❖ Post laparotomy or laparoscopy.
(are usually absorbed within 1 week)
- ❖ Post peritoneal dialysis.
- ❖ Viscus perforation, the most common causes are:
 - perforated peptic ulcer
 - perforated appendix (appendicitis)
 - rupture diverticulum (diverticulitis)





Radiology of the liver, Gallbladder And Biliary system

Plain film is used for:

- Detection of radio-opaque calculi.
- Calcification in the liver or in the gallbladder wall.
- Gas in the biliary tree.

Ultrasound and CT of the liver

- Liver ultrasound is an accurate imaging modality for focal or diffuse disease of the liver, staging primary tumors, detecting secondary deposits
- Ultrasound will visualize the gallbladder, CBD, hepatic and portal veins.
- If ultrasound is not conclusive for liver disease or mass lesion, CT is indicated.
- CT demonstrate the full range of liver disease, including cirrhosis and tumors.

Liver MRI

- MRI provide excellent images of the liver as does CT, but without the risk of radiation.
- Blood vessels and bile ducts may be shown without injection of contrast by using magnetic resonance angiography (MRA) and magnetic resonance cholangiography (MRCP).

gallbladder

Dept.

GHAMIDI, SHEEMA

6656 SECURITY FORCES HOSP.
13.25.11 15.01.06
MI 1.1

3.5C4DH/1.8
Abdomen
100%
14dB RS3
13.0cm 17fps

THI

Measure

SIEMENS GHAMIDI, SHEEMA

6656 SECURITY FORCES HOSP.
13.25.20 15.01.06
MI 1.1

3.5C4DH/1.8
Abdomen
100%
14dB RS3
13.0cm 17fps

THI

Text

SIEMENS GHAMIDI, SHEEMA

6656 SECURITY FORCES HOSP.
13.25.25 15.01.06
MI 1.1

GHAMIDI, SHEEMA

6656 SECURITY FORCES HOSP.
13.25.37 15.01.06
MI 1.1

3.5C4DH/1.8
Abdomen
100%
14dB RS3
12.0cm 17fps

THI

Text

SIEMENS GHAMIDI, SHEEMA

6656 SECURITY FORCES HOSP.
13.25.42 15.01.06
MI 1.1

3.5C4DH/1.8
Abdomen
100%
14dB RS3
12.0cm 17fps

THI

Text

SIEMENS GHAMIDI, SHEEMA

6656 SECURITY FORCES HOSP.
13.25.57 15.01.06
MI 1.1

SIEMENS GHAMIDI, SHEEMA

6656 SECURITY FORCES HOSP.
13.26.06 15.01.06
MI 1.3

3.5C4DH/1.8
Abdomen
100%
14dB RS3
13.0cm 17fps

SIEMENS GHAMIDI, SHEEMA

6656 SECURITY FORCES HOSP.
13.26.14 15.01.06
MI 1.3

3.5C4DH/1.8
Abdomen
100%
14dB RS3

∅ D=106,7mm

SIEMENS GHAMIDI, SHEEMA

6656 SECURITY FORCES HOSP.
13.26.36 15.01.06
MI 1.3

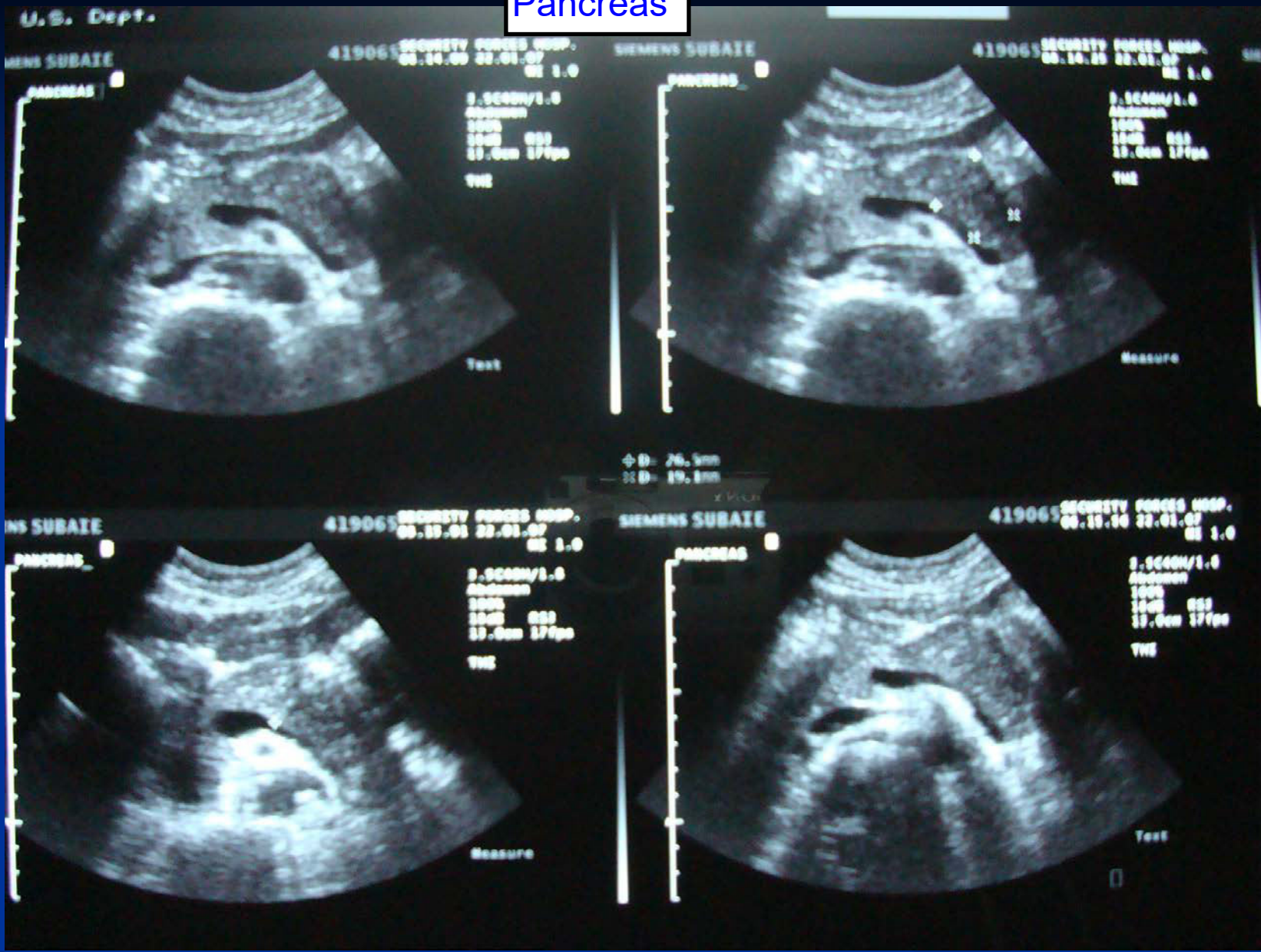
RT KID

RT KID

SPLEEN

3.5C4DH/1.8
Abdomen
100%
14dB RS3

Pancreas



GALLSTONES

- ❑ Stones in the gallbladder are relatively common and occur in approximately 10% of population.
- ❑ Types of gallstones:
 - ❖ Cholesterol gallstones: are the most common, accounting for more than 80 % of cases.
 - ❖ Pigment gallstones: usually form when there is excess bilirubin and calcium salts in bile.
 - ❖ Mixed stones: are mixture of cholesterol and calcium salts.

The predisposing causes include:

Obesity, diabetes, liver cirrhosis, and blood disorders such as sickle-cell anaemia.

Radiological features of gallstones

- Plain film reveal approximately 10 to 20% of calculi as they are radio-opaque.
- **Ultrasound is the best test for gallstones,** which is non-invasive and very accurate.
- A gallstone on ultrasound is echogenic, it appears as a white structure that casts a dark shadow behind it.



Figure 1

***Gallbladder:**
-The best study for GBS is U/S



multiple GBS



Q: If you see GBS on x-ray, what is your next step and why?

U/S, to eliminate acute cholecystitis.

If there is no cholecystitis: the patient can go home.

If there is cholecystitis, the patient needs cholecystectomy.

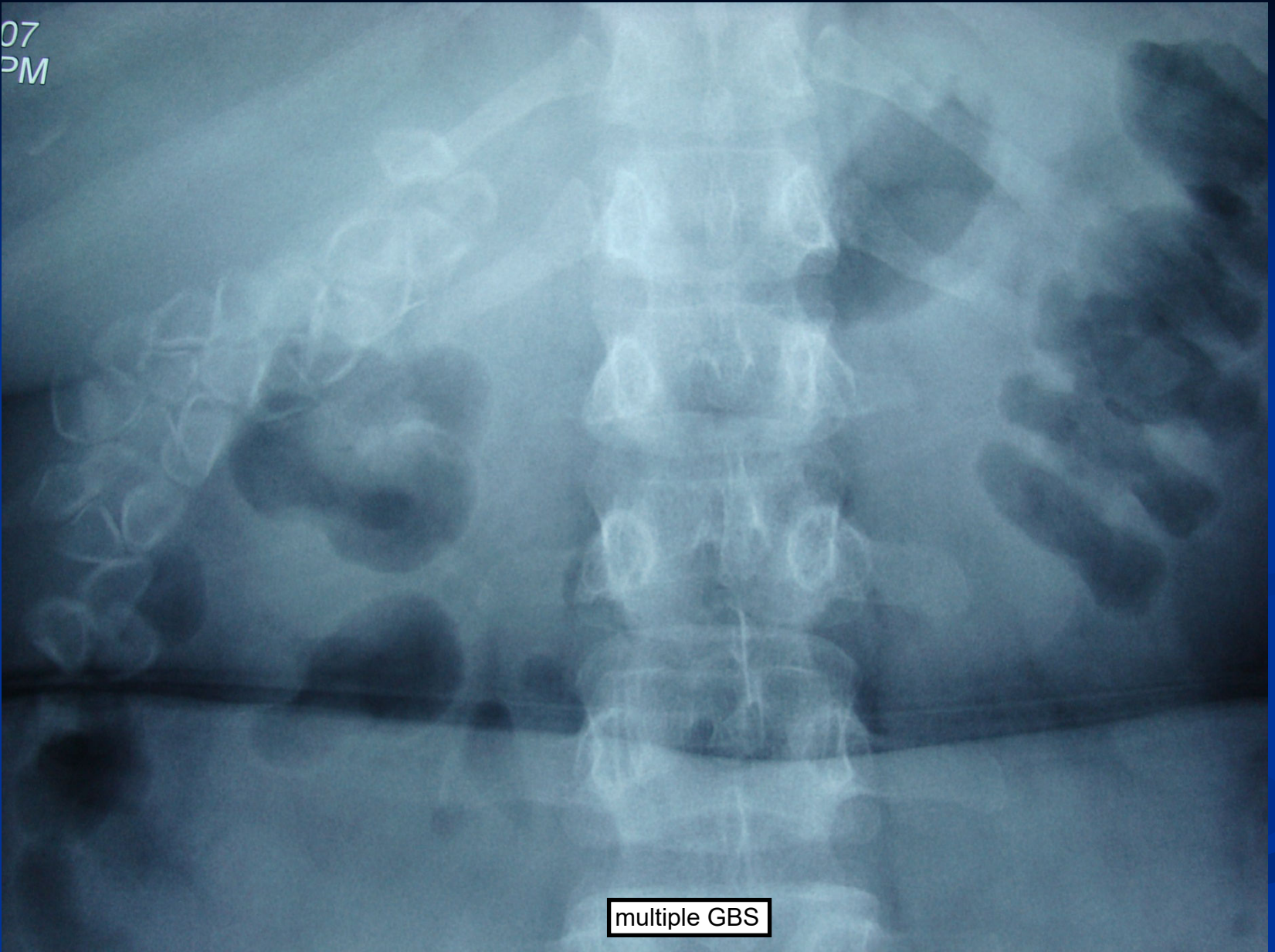
-Signs of acute cholecystitis:

1-The gallbladder wall is thickened.

2-Pericholecystic fluid.

3- Sonographic murphy's

07
PM



multiple GBS

Acute cholecystitis

- Is a sudden inflammation of the gallbladder that causes severe abdominal pain.
- In the vast majority of cases this result from stone obstructing the cystic duct which lead to infection of static bile and the gallbladder mucosa.

The ultrasound features are:

- ❖ Distended gallbladder with gallstones.
- ❖ The gallbladder wall is thickened (greater than 3 mm) and edematous
- ❖ Pericholecystic fluid, and in some complicated cases pericholecystic abscess.



Acalculous cholecystitis

- Cholecystitis can develop in patients without gallstones, but it is rare.
- Hospitalized patient, such as those in cardiac intensive care units, are most likely to develop this condition, which may be due to ischemia.

Endoscopic retrograde cholangiopancreatography (ERCP)

Indication:

- Obstructive jaundice
 - Removal of known CBD stones
 - Pancreatic tumors, that cause bile duct obstruction and jaundice
-
- An endoscope is introduced and advanced through the mouth into the duodenum, with injection of contrast into the ampulla of Vater, to demonstrate both the bile ducts and the pancreatic ducts.
 - CBD stones can be removed through the endoscope by insertion of a catheter with a basket or balloon.
 - Malignant CBD strictures can also be stented.



ERCP with three stones



NASSER

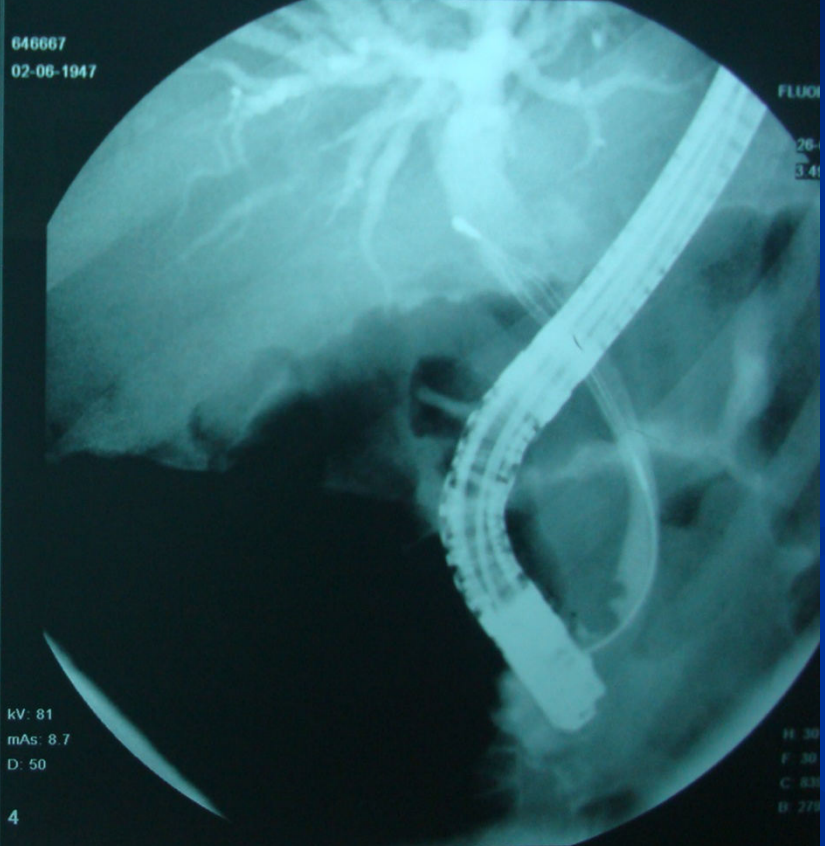


S.F.H.P
FLUOROSPOT

26-08-2003
3:48:19 PM

H: 30 %
F: 30 %
C: 795
B: 307

SUBAIE, NASSER



646667
02-06-1947

FLUOR
26-
3:4

kV: 81
mAs: 8.7
D: 50

4

H: 30
F: 30
C: 83
B: 275

A scenic landscape featuring a large body of water in the foreground, a dense forest of evergreen trees in the middle ground, and snow-capped mountains in the background. The scene is framed by dark evergreen branches on the left and right sides. The text "Thank You" is overlaid in the center in a red, rounded font with a white outline.

Thank
You