



430 Radiology team

Lecture - 2

Contrast Media and safety in Radiology

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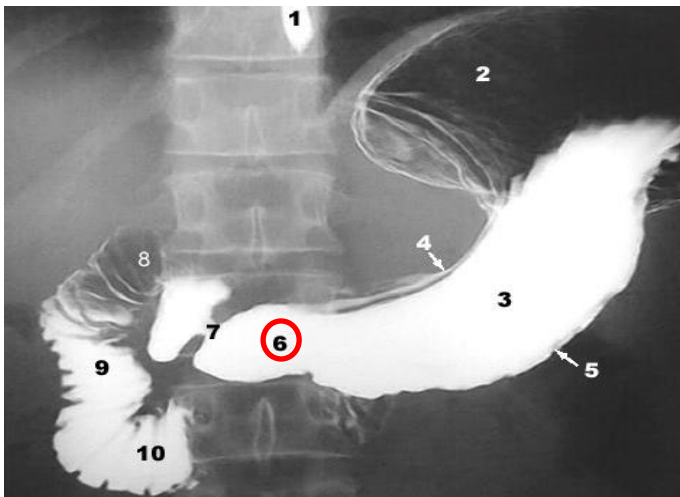
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❖ Contrast

- Radiographic contrast agents are used to visualize structures or disease processes that would otherwise be invisible or difficult to see.
- Barium is widely used to outline the gastrointestinal tract; all the other radio-opaque media rely on iodine in solution to absorb x-rays. Iodine containing solutions are used for urography, angiography and intravenous contrast enhancement at CT
- **Barium** contrast (not water soluble) usually we use it for upper GI study (orally) or lower GI study (as enema) because it is available, easy to use, gives good images, rarely to cause allergy and cheap but it is **contraindicated if there is perforation** (in case of perforation e.g. duodenal ulcer or post op leakage we use **gastrografin** (water soluble)
- If there is perforation & barium contrast used , the end result will be **chemical peritonitis**

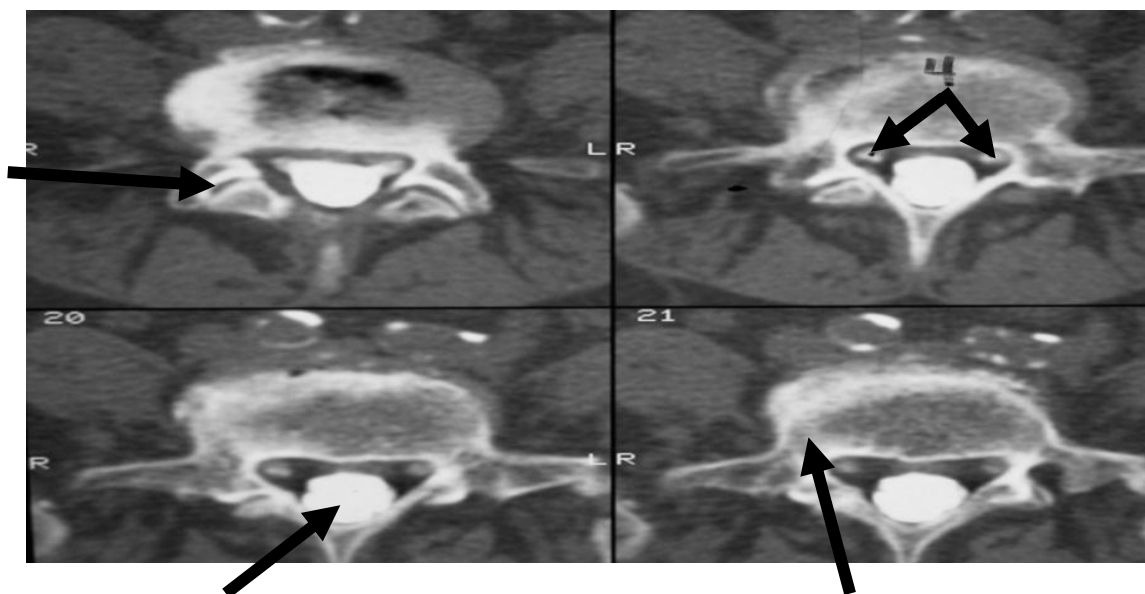
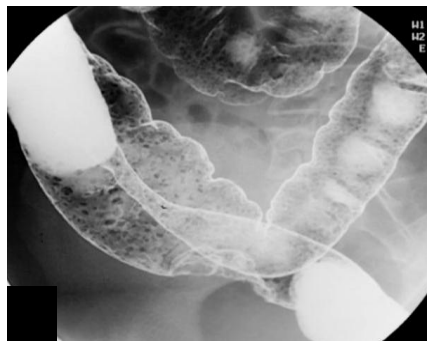
❖ How do I know if there is perforation?

- We know it if we see air under the diaphragm in x-ray
- Contrast agents could be used orally , enema , IV



1 esophagus 2 fundus of the stomach 3 body of the stomach
4 lesser curvature 5 greater curvature 6 pyloric antrum
7 pylorus 8 duodenal bulb (1st half of 1st stage of duodenum)
9 2nd stage of duodenum 10 3rd stage of duodenum

- Sometimes we use double contrast which is Barium + air

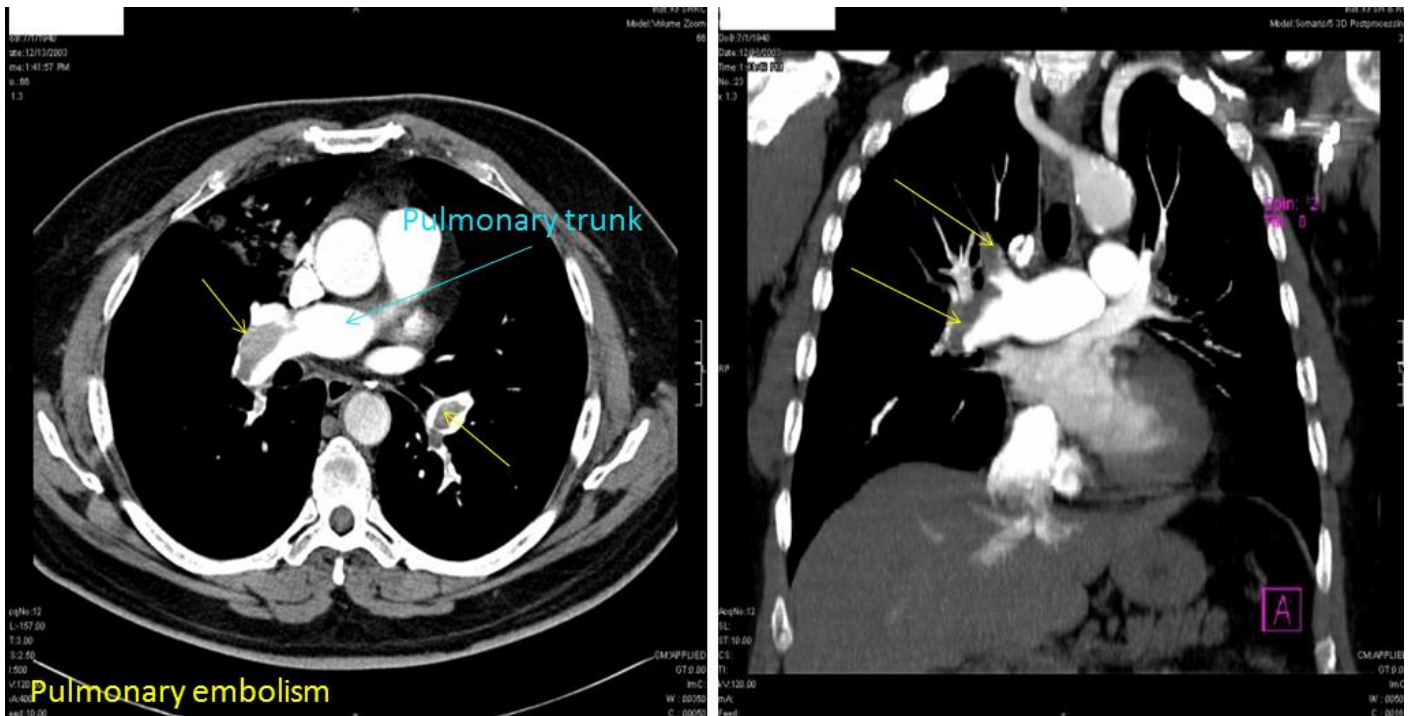


- This is a CT **Myelogram** which is examination of the thecal sac of the spinal cord within the lumbar area using a contrast.

❖ More investigations

- **Myelogram** is an x-ray examination of the spinal canal. A contrast agent is injected through a needle into the space around the spinal cord to display the spinal cord, spinal canal, and nerve roots on an x ray.
- **Sialogram** A sialogram is an x-ray of the salivary ducts and glands.
- **Sinogram**: an X-ray of a sinus that has been injected with a contrast.
- **Mamogram**: is an x-ray of the breast

- **Ductogram:** is a special type of mammogram used for imaging the breast ducts. It can aid in diagnosing the cause of abnormal nipple discharges.



Axial

coronal

- Ct scan of the chest with an IV contrast showing pulmonary embolism

Radiation dose

INVESTIGATION	RISK/ PA CHEST X RAY (0.03 m SV)
LUMBAR SPINE	100
ABDOMINE	50
IVU	150
CT HEAD	100
CT CHEST	300
CT ABDOMEN	400
BONE SCAN	200

EQUAVALANCY TO NATURAL BACKGROUND RADIATION

Abdominal region:	
Computed Tomography (CT)-Abdomen	3 YEAR
Computed Tomography (CT)-Body	3 YEAR
Intravenous Pyelogram (IVP)	6 MONTH
Radiography-Lower GI Tract	16 MONTH
Radiography-Upper GI Tract	8 MONTH

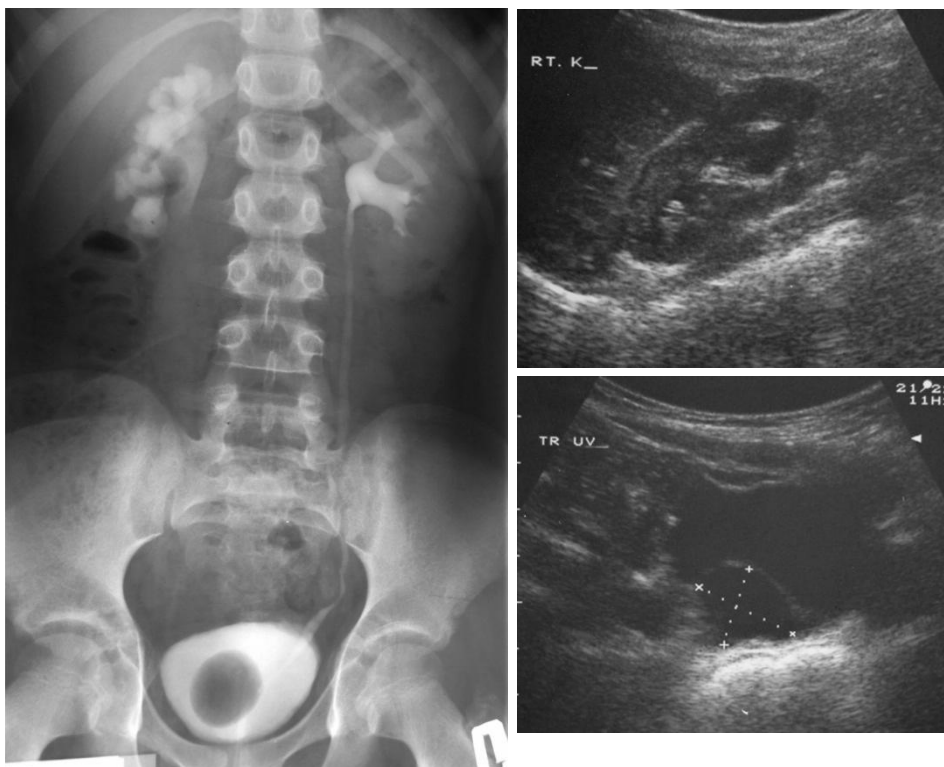
❖ Take precaution before giving contrast agent:

- 1-Previous reaction
 - 2-Asthmatic patient
 - 3-Renal impairment >> contrast might cause acute renal failure
 - 4-dm-atopic dermatitis
 - 5-Pregnant (contrast is contraindicated)
 - 6-Sickle cell anemia and multiple myeloma (contrast is contraindicated)
- Probably the patient will get anaphylactic shock from your contrast (skin erythema, etching, tachycardia, tachypnea, BP drop, bronchospasm) >> so we give antihistamine and epinephrine immediately

❖ Type of reaction

- 1-Mild (only nausea and vomiting)
 - 2-Moderate (bronchospasm and skin reaction)
 - 3-Sever (tachycardia & hypotension)
- How to treat? Atropine, adrenalin and anti-histamine
 - To protect the patient give him steroid prior to the study, cancel and change the modality if he has a special condition.

❖ Sometimes to reach a diagnosis you have to combine 2 modalities



- This is intravenous pyelography or intravenous urography (IvP or IVU)
- It is examination of urinary system. We give intravenous contrast media
- The diagnosis of this image is ureterocele
- In this case we used x-ray with a contrast and the ultra sound

❖ When you write a radiologic request please

- Make sure that the patient has no contraindication
- Write a good clinical details, write what you expect and what do you want the radiologist to roll out.
- Revise the contraindications of MRI from the previous lecture please.

Summary:

- **Barium** contrast is **contraindicated** if there is **perforation** and we use **gastrografin** instead.
- If there is **perforation & barium contrast used** , the end **result** will be **chemical peritonitis**
- **Sialogram** A sialogram is an **x-ray** of the **salivary ducts and glands**.
- **Myelogram** is an **x-ray** examination of the **spinal canal**. A contrast agent is injected through a needle into the space around the spinal cord to display the spinal cord, spinal canal, and nerve roots on an x ray.
- Contrast is **contraindicated** with **pregnant women**, **sickle cell anemia** and **multiple myeloma**.