

~~NAME: WA~~
NAME = Waqar

ID = 14013

Sub = ET-procedures

Assignment

Q.

Difference b/w CT & MR:

CT-Scan:

Radiation	=> work through Radiation
↓	
Patient	=> Not perform to pregnancy
↓	
Detector	=> Use for: Bone + soft tissue with dye
↓	
Raw data	=> less expensive than MRI
↓	
Image	=> less time consuming
	=> multiphase images are possible
	=> Radiation protection must in CT Room
	=> CT-scan machine is quite different to organize than MRI like (detector, Ring Rotator) → Thus padding are absent in MRI machine.
	=> not scared in CT like claustrophobia
	→ use for tumors, bone fracture, cancer

MRI:

- RF pulse used.
- give brief detailed than CT
- more expensive
- Time 15-2 Hr
- Allergy possible (contrast)
- Commonly use for diagnosis of ankles, breast, heart, blood vessels, wrists.
- RF → patient → Receiver → Image

Q 4

Single slice:

The single slice CT had an x-ray source and a single detector. Data acquisition involve moving both the tube and detector across the scanning plane to acquire a series of transmission measurements. All the data collected through a 180° rotation. Single slice CT consists of gantry (x-ray tube, high voltage generator, detector, pre & post pt collimator) UPS table & control panel. Disadvantages is High pt dose, slow performance, low MPR accuracy, artifacts.

Multi slice:

Advantages:-

- > 3D image
- > Reduce Artifact
- > low Rad

Dis-Adv:-

- > Big Artifact
- > expensive

-> 1980s

-> short scan time / increase matrix size

-> 3 sec => matrix = 1024 x 1024.

- 1990s

-> 4-slice

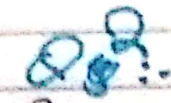
-> 0.5 sec

-> multiple detectors are placed to each other so many data collected in single scan.

-> spiral mode

-> consist of: gantry (x-ray tube, high voltage generator, x-ray detector, cooling system, Rows of detector, variable collimator control panel.

3



Ans:- Volume Rendering (VR):-

In VR display multiple tissue & show their Relationship to one another. VR built by collecting the & manipulating the data along a line from the viewer eye through the set of data. It is the contribution of each voxel along the line. Each voxel is assigned an opacity value base on it Hounsfield unit.

This opacity value determine the degree to which will contribute along with other voxel along with some time. This process is repeated with each line producing one voxel in the VR image. No information is ignored. Every voxel contribute to the image. Final image. The image can be rotated and viewed from any angle, by varying opacity & WW & WL functions.

(4)

Q5:

General protocol for Contrast studies:

- ⇒ Dr Recommend contrast-scan
- To be Ensure ~~not~~ any allergic reaction
- Contrast injected by two method manually & use of injector. ^{metal}
- Mostly use 25-27G needle ↑↓ pore
- Mostly use of
- Using of Venipuncture techniques in IV.
- Better to Explain the procedure to pt.
- Contrast protocol is specific of Region of Interest (liver, coronary, kidney).
- Smaller the number, larger the bore
- 1kg / 1CC, suppose 80kg perso - need 8cc contrast
- when contrast give orally than mix in juice of water
- Mostly use of urografin / ultravist
- Every contrast have own time inside the body
- when BP increases or such other type of Allergy may occur when use of Dext injection & Elevation feet
- when contrast injection has been end then start the scan as soon as possible
- ⇒ After the contrast scan Recommended water to pt to flush out the contrast from body

(4)

=> 150cc/sec/sec is common

=> We have a lots of ways to inject the contrast.

=> Concern must

=> use of veins (Basilic vein, iliac vein, jugular vein).

=> Liver: 150cc 15cc/sec, 18G

Acute Aneurysm (Dissection) = low dose of contrast delayed in Abdomen 35sec

=> ~~Imo~~ In most places delayed 35sec the contrast

Q³

5

Sure start:

~~def function:~~ The use of state-of-the-art helical CT scanners allows for ultra fast examination of larger regions of the body. Due to the short examination time, optimum utilization of intravenous contrast medium bolus is of extreme importance. The sure start function

Example: planning the individual scan delay on the Aquilion by using the sure start bolus tracking tool is illustrated. The selected scan plane just above the origin of anterior coronary arteries is chosen to start the scanning at the optimal time by monitoring the arrival of the contrast bolus in a region of interest place in the descending aorta. Important landmark is this plane are the sternum anterior & the descending posteriorly. segment of pulmonary trunk are also seen & anterolateral chest wall. A HU after initiation of contrast injection.