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Assignment → CR and DR
Programme → BS-Radiology
4th Semester.

Q: → 1-

Ans: →

→ Digital Subtraction
Angiography (DSA)

→ It is a fluoroscopy technique used in interventional radiology to clearly visualize blood vessels in a bony or dense soft tissue environment.

→ Image are produced using contrast medium by subtracting a "pre-contrast image", once the contrast medium has been introduced into a structure.

→ It is first described in 1935 & in english source p-1-0

2)

in 1962 as a manual
technique.
→ Digital technology made
DSA practical from
the 1970s.

procedure →

→ DSA and Fluoroscopy →

→ In traditional angiography,
images are acquired
by exposing an area
of interest with time
controlled x-rays while
injecting contrast medium
into the blood vessels.

→ Together with all overlying
structure.

→ The images are useful
for determining anatomical
positions and variations,
but unhelpful for
visualizing blood vessels
accurately.

→ IV Digital Subtraction
Angiography →

D.S.A

(3)

→ (IV-DSA) is a form of angiography which was first developed in 1970s.

→ IV-DSA is a computer technique which compares x-ray image of Region of the body before and after radiopaque iodine based dye has been injected intravenously into the body.

Applications :-

DSA is primarily used to image blood vessels. It is useful in the diagnosis & treatment of arterial and venous occlusions, including carotid artery stenosis, pulmonary embolism, and acute limb ischemia.

P.T.O

Q-3:->

ANS:->

Disadvantages of DR:->

- > ~~Less sharp than~~
- > Poor Spatial Resolution
- > Artifacts due to imaging plate, image processing algorithms etc.
- > Non-availability of Post processing functions.
- > Increased sensitivity to scattered Radiation.
- > More expes. expensive than Screen-film Radiography.
- > Lack of familiarity to Radiologist & radiographers.
- > wear & tear.
- > infection control
- > Sensor size & thickness.

Q.2.

Ans.

→ Common Artifacts
in DR:→

There are three common
artifacts in DR.

i) Preprocessing artifacts:→

→ Before an image is prepared
for processing, several mani-
pulations of the output
of image receptor may
be necessary to correct
for potential artifacts.

→ A single pixel or a
single row or column
normally will not interfere
with diagnosis.

→ However many of these
defects must be corrected.

→ Flatfielding is a software
correction that is performed
to equalized the response
of each pixel to a
uniform x-ray beam.

(b)

(ii) Image Receptor Artifacts

→ If a CR IP has been used for 24hrs it should be erased again before used.

→ when a completely erased IP is processed the resultant image should be uniform & artifact free.

→ Rough handling or faulty card construction of a digital IP can result in artifacts.

(iii) Software Artifacts

The digital Radiograph is a raw data sets.

→ As such these images are ready for processing.

→ For processing images are

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manipulated into for-
presentation images that
the radiologic technologist
can use for QC
and for interpretation
by the radiologist.

How to Avoid

most Radiographic Artifacts
can be prevented by
a proper storage &
handling of films. ~~and~~
~~best~~ ~~optimal~~ ~~handling~~
technique

Q:- 4/27

Ans:-

Digital Image Quality

- DR image can higher
in contrast sharpness.
- DR image panels (est)
required less exposure
to achieve equal to
or better image quality.
- Significantly less exposure
latitude with DR.

P-T-O

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- DR exposure range is $\pm 4 \times \text{mAs}$.
- image saturation can occur with DR data is not recoverable.

• CR Image Quality

- CR exposure range is $-4 \times \text{to} +16 \times$.
- CR provide broader dynamic range and high potential for post processing.
- The voltage range from 40 to 90kV.

Q:-5
Ans:->

Image Receptor
of conventional
Radiography->

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→ There are three
key part of image
receptor for conventional
Radiography:-

Film Record image:-

- Intensifying Screen to expose film.
- Cassett to protect the screen & film.
- A More conventional radiographic cassetts have pair of screen that sandwich the film.
- This design used double emulsion film.
- A part of cassetts use in the conventional x-ray film Radiography contain fluorescent phosphor is active material.
- Different type of intensifying screen emit different intensity and color of light when irradiated x-ray.

- Radiographic intensifying screen resemble flexible sheet of plastic or cardboard.
- Intensifying screen size that compare to film size.

Digital Radiography

- with digital Radiography no cassettes are used.
- The x-ray hit a permanently placed set of hardware, which then sends the digital information directly to a readout mechanism.

-: Standard DR process:-

- x-ray produced by a standard radiographic x-ray tube.
- image captured by digital image detector.

(11)

Digitised into a
a stream of data
via an analogue-
to-digital converter
(ADC) .

-> post processing
of image .

