

(1)

Name	Abizullah
ID NO	14705
Assignment	CR and DR Lab
instructor	Mam Maheen
program	BS (Rad)

(2)

Q NO (1)

Ans

Digital Subtraction Angiography:

- ⇒ It is fluoroscopic techniques.
- ⇒ it is used in interventional radiology.
- ⇒ it is also for visualizing blood vessels in bony and soft tissue structures.

Indication:

- they are numerous indication.
- ⇒ arterial stenting
 - ⇒ Endovascular embolization.
 - ⇒ Thrombectomy
 - ⇒ arterial balloon angioplasty.
 - ⇒ endovascular aneurysm repair.

(3)

Contraindication:

- ⇒ Renal insufficiency
- ⇒ hypersensitivity to contrast media.

patient preparation:

- ⇒ review of any relevant vascular imaging study.
- ⇒ Reports must be checked.
- ⇒ When person have sensitive to contrast it gives medication
- ⇒ renal function test.
- ⇒ prior surgical procedure.
- ⇒ prior myocardial infarction.
- ⇒ the patient heart rate and blood oxygenation are monitored continuously.

(4)

⇒ All procedure must be performed under strict aseptic condition.

⇒ anesthesiologist give anesthesia to the patient with proper limit.

⇒ the patient position must be checked and Right.

Equipment:

the fluoroscopy unit that can be rotated ^{axially} around the floating-top-table.

⇒ Collimator and x-ray tube must be adjusted.

⇒ image enhancement.

Techniques:

The non contrast image of the region takes before injected contrast agent the show anatomy and also radiopaque foreign bodies.

(5)

⇒ When Contrast are injected the image show the vessels superimposed of the anatomy and also stored.

⇒ the resulting subtraction image show filled vessels.

⇒ the subtraction image can be viewed in real time image.

⇒ Since image subtraction causes a decrease in signal to noise ratio.

Complication:

⇒ arteriovenous fistulae

⇒ local tissue damage

⇒ thrombus formation.

⇒ puncture site.

(6)

Q NO (2)

Ans

Artifacts:

Any undesirable object recorded in radiographic image cause degraded image quality.

(1) Poor collimation artifacts:

⇒ When radiographer take X-ray from patient.

⇒ When collimation size are not adjust properly.

⇒ The image will be form unsharp image.

⇒ The film should be not cleared.

(7)

⇒ the unsharp image
zoom due to
improper collimation,

⇒ When we avoid them
these artifacts
because due to when
we got proper
knowledge abouts
the x-ray Machine and
also we checked
the Collimator Size
and body parts.
and also Casette
should be adjuste.

⇒ So the result is that
the artifacts will be
removed,

②

Exposure through back
of cassette:

⇒ When radiographer exposure
the patient
⇒ at this time

(8)

We not check the
Cassette.

=> the Cassette set on
busy toy

=> the various pattern of
Image appears on
Cassette.

=> So the artifact should
be formed on
Image.

=> it is cause due to
poor basic knowledge
of construction of
Cassette.

=> We avoid them, ~~the proper~~
we take proper
Education of radiographer
in handling of Cassette.

③ Scratches Artifacts.

⇒ Scratches Artifacts occur due to mishandling of image plate during cleaning process.

⇒ When radiographed take image the kink marks on image appear.

⇒ So result is that when we take cassette and image plate should be handled with care.

(4) Dust artifacts

Dust artifacts occur due to dust particles wedge over imaging plate.

(10)

these particles produce
artificial on image.
=> the focal radiopacity
appearance produce.

=> So the solution is
that the Regular
cleaning of imaging
plate with (Ethyl Alcohol)

=> Towel or paper should not
be used for
cleaning.

(5) Damage of Imaging plate due to roller:

This type of artificial occurs
due to mechanical damaging
of imaging plate as
due to roller.

=> When radiographer take
chest X-rays. So the
one side show
radiopacity and focal
linear radiopacity.

(11)

So when we solve
that the Replace
the part of rollers,

(8)

Hair burn artifacts
be produce
we avoid them all
these artifacts due
proper to Education
and also Check the
machine before the
exposure.

② Jewellery:

When patient not remove
Jewellery during exposure
the artifacts produce
on image.

⇒ So result is that we
remove Jewellery.

(8) Finger Marks:

Finger Marks artificial
can occur

When we used

imaging plate by hands

⇒ the finger mark
or sign retained in

imaging plate

⇒ it is also produce
artificial.

(9) Air:

Air produce artificial
on image.

because when patient
taking breath during
exposure.

⇒ the ventral ~~filled~~ and
lungs filled in air.

⇒ the image will form
blue.

So result is that the patient
not take breathing during
exposure time.

(10) Double exposure artifact.

Double exposure artifact on image.

⇒ When radiologist takes Double Image on each imaging plate.

⇒ the image will be superimposed with each other.

⇒ the image is not visible completely.

⇒ the artifacts will be produced.

⇒ the Duplication of image will be appear.

⇒ When we solve that because of proper knowledge of using x-ray equipment.

Q NO 3

Ans

Disadvantage of DR.

- ① Digital Radiographic exposure to radiation to cause ~~that~~ harmful biological change.
- ② it can cause permanent to living cell and tissue.
- ③ it can cause genetic mutation occur.
- ④ it can cause cancer.
- ⑤ Digital radiography radiation harmful to ~~skin~~ skin.
- ⑥ it is harmful for thyroid gland.
- ⇒ it is more sensitive to eye.
- ⇒ harmful for bone marrow.

(15)

- ⑦ must learn machinery, Technology and positioning.
- ⑧ must still adhere to good Technique for acquiring images.
- ④ initial cost is high compare with traditional radiography.
- ⑩ increase sensitivity to scatter radiation.
- ⑪ it is more expensive
- ⑫ Lack of full familiarity to radiologist.
- ⑬ poorer spatial resolution.
- ⑭ Artificial due to imaging plate.
- ⑮ Non-availability of post processing functions.

(16)

(16) greater Technical Complexity.

(17) Difficulty for Seasoned practitioners with ingrained radiographer habits.

(18) Other Technology Cost associated with digital radiology.

(19) is designed to reduce the use of film.

(20) reduce chemical process time.

Q No 4

Ans

Image quality DR

Image quality Screen
Film radiography

1
① Better image quality at lower x-rays exposure.

① No better image quality at lower exposure than DR.

(2) Image Quality does not degrade over time

(2) Screen... film image quality degrade over time.

(3) The image quality depends upon brightness because when exposure is tube is not properly adjust
=> the effect should be image quality
=> the image quality of DR is superior than Screen film radiography

(3) Image quality depends upon optical density.
=> optical density control by mAs and SID.
=> over exposure is too dark, high OD
=> under exposure is too light, low OD

Image Quality DR

(4) Image Contrast

The Digital radiographic Quality depends upon Image Contrast

→ because of when ~~the~~ KVP control contrast it effect on Image Quality.

⇒ low kVp of DR is high image contrast.

The DR is Superior Image Quality.

⇒ Now day DR machine used.

(5) Image Detail

Image Quality depend upon Spatial resolution.

⇒ Image receptor is thin high Spatial resolution

⇒ Small focal spot high Spatial resolution

Image Quality Screen Film

(4) Image Contrast

KVP control image contrast and show effect on image Quality.

⇒ high kVp is low contrast.

⇒ High contrast scale image produce short gray scale

⇒ low contrast scale image produce long gray scale.

(5) Image Detail

image detail must be two type

⇒ Sharpness of image detail is measured by Spatial resolution

⇒ Smallest focal spot and longest SID.

(6) Distortion

When patient positioning is not proper.

⇒ the x-ray tube is not adjust.

⇒ the construction of image receptor is not perfect

⇒ the image quality should be badly effected.

⇒ so the DR exposure time is very short.

⇒ the image quality will be best than screen film radiography.

⇒ the visibility of image is measured by contrast resolution.

⇒ that effect OD and contrast effect is the visibility of image.

⇒ Image Detail ~~control~~ control focal spot size.

(6) Distortion:

Distortion controlled by patient positioning.

⇒ Alignment of tube.

⇒ anatomical part smaller than normal

⇒ Image receptor

⇒ Image quality depends upon Distortion...

⇒ the post

(20)

(7) Image Noise

with the DR
the x-rays
exposure is not
more scattered
than screen film
radiography because
of short ~~time~~
exposure time

⇒ the scattered
radiation produce
image noise
it effect on
image quality:

the patient
position is
not proper,
no tube adjust
⇒ the image
quality will
be bad, and
not show
clearly any thing.

(7) Image Noise

⇒ scattered radiation
occur in
screen film radiograph
⇒ image noise
effect on image
quality

Q NO 5

Ans

Image receptor in
Conventional radiography

① Image receptor is the primary medium of conventional radiography.

② It is composed of base and emulsion.

③ base is made up of polyester and blue color.

④ Base is foundation of radiographic film.

Image receptor in Digital Radiography.

① pixel are present in image receptor of Digital radiography.

② Determined by pixel size.

③ It is divided into two types

(i) Indirect DR
(ii) Direct DR

(4) (i) Indirect DR
Image receptor

⇒ Scintillator use

⇒ it is semiconductor

⇒ made up amorphous silicon

IR Conventional

(5) Between the base and emulsion a thin material is called as adhesive layer.

(6) the protective covering of emulsion is called as overcoat.

(7) emulsion is the heart of radiographic film.

(8) the emulsion consist of gelatin and silver halid crystal

(9) Emulsion coating layer 3 + 5 μ m. thick

(10) Sensitivity center present

IR Digital radiograph

(5) Indirect DR image receptor \Rightarrow x-ray convert into light photos and then light convert into electronic signal.

(6) indirect conversion are two types

(A) charge couple device

\Rightarrow Scintillator

\Rightarrow sensor chips

\Rightarrow No photo diode.

(B) thin Film Transistor

\Rightarrow Scintillator

\Rightarrow photo diode

= thin Film Transistor.

(ii) Direct Digital

Radiography.

(a) Do NOT use Scintillator

IR Conventional

(11)

Radiographic film manufacture in total darkness

(12) The base of radiographic film is 150 to 300 μ m thick, Semitransparent,

(13) Image forming x-ray that exist The patient and interact with image receptor,

(14) The medium that convert x-ray beam into visible image is called as image receptor

(15) the classic image receptor is photographic film.

(16) Determined by focal spot size

IR Digital

(9) ~~IR~~ Direct Digital radiography image receptor

=> X-ray photon is directly convert into electronic signal.

(10) it is semiconductor

(11) ~~amorph~~ amorphous Silicon made up.

(12) it is single type

(13) Direct Conversion

=> Semiconductor

=> thin Film

Transistor

=> NO photodiode

Thank you