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**Subject CR & DR**

**Ans No.01:**

**Digital subtraction angiography (DSA):**

is a fluoroscopy technique used in interventional radiology to clearly visualize blood vessels in a bony or dense soft tissue environment Images are produced using contrast medium by subtracting a "pre-contrast image" or mask from subsequent images, once the contrast medium has been introduced into a structure hence the term "digital subtraction angiography". Subtraction angiography was first described in 1935 and in English sources in 1962 as a manual technique. Digital technology made DSA practical from the 1970s.DSA is primarily used to image blood vessels. It is useful in the diagnosis and treatment of arterial and venous occlusions, including carotid artery stenosis, pulmonary embolisms, and acute limb ischemia arterial stenosis, which is particularly useful for potential kidney donors in detecting renal artery stenosis (DSA is the gold standard investigation for renal artery stenosis cerebral aneurysms and arteriovenous malformations (AVM).DSA is done less and less routinely in imaging departments. It is being replaced by computed tomography angiography (CTA), which can produce 3D images through a test which is less invasive and stressful for the patient.

**Ans No.02:**

**COMMON ARTIFACT IN DR:**

Flat panel detectors

used for projection

radiography

Cassette and fixed

panel detectors

Examples from multiple

manufacturers and

models.

 **Cause:**

* Detector support electronics are visible due to

excessive backscatter

* Resolution:
* Reduce backscattered radiation by
* Collimating to no more than the detector edges
* Avoiding overexposure
* Placing lead behind the detector.

**Clinical Image Artifacts:**

* Technologists should be trained how to:
* Recognize common artifacts
* Resolve the problem themselves when

possible or

* When to contact a physicist or service

engineer for assistance.

**Flat Field Artifact Check:**

* A flat field image should be acquired
* After gain calibration to detect calibration errors
* After a wireless detector drop to look for damage
* As part of routine QC
* Acquire image of full detector using gain

calibration technique and a uniform phantom

* Apply minimal image processing.

To determine location of artifact cause within

the imaging chain, repeat exposure with

* Detector rotated or shifted (wireless detector)
* Collimator rotated
* Different filter
* Different SID
* Detector outside of Bucky or table.

poor spatial resolution.

**Ans No.03:**

Artifact due to imaging plate image procesing algorith etc.

Non avalibility of post procesing function.

Increase sensitivity to scatter radiation.

More expensive then screen film radiography.

wear and tear.

Infection control.

sensor size and thickness.

**Ans No.04:**

 Better image quality at lower dose

• DR images can be higher in contrast and sharpness

• DR panels (CsI) require less exposure to achieve equal to or better image

quality

• Significantly less Exposure Latitude with DR

• CR Exposure Range -4x to +16 x mAs

• DR Exposure Range ± 4x mAs

• Image Saturation can occur with DR !!!! Data is not recoverable !!!

• With DR Accurate exposure is key (similar to film)

CR vs DR Image Quality and Dose

So DR is batter then CR

**Ans No.05:**

**IMAGE RECEPTER OF CONVENTIONAL IMAGING SYSTER:**

There are three key part of image receptor for conventional radiography.

Film to record image.

Intensifying screen to expose the film.

Cassette to protect the screen and film.

More conventional radiographic casset have pair of screens that sandwich the film. This design uses double emulsion film.

A part of casset use in the conventional x.ray film radiography contain flurocent phosphor is active material.

Different type of intensifing screen emit different intinsites and color of light when irriated by x ray.

Radiographic intensifing screen resemble flexible sheet of plastic or cordboard.

Intensifing screen in size that compare to film size.

**Digital radiography:**

With digital radiography no cassettes are used. The x-rays 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 standard radiographic x-ray tube

Image captured by digital image detector

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

Transfer to a system computer

Output via digital-to-analogue converter (DAC) to video format

Post-processing of image

Display on to suitable display device