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Bs RADIOLOGY 4TH SEMESTER

PAPER RADIOLOGICAL POSITIONING

Question No. 1

DENTAL OPG (ORTHOPANTOMOGRAM):-

- X-ray use radiation to take pictures of bone and other parts inside the body.
- An OPG is a panoramic x-ray of upper & lower jaws, including the teeth.
- The OPG unit is specifically designed to rotate around the patient's head during the scan.
- An OPG will take approximately 20 seconds.
- An OPG can be used to look for
 - Fractures
 - Dislocated jaw
 - Infection
 - Dentition (teeth)
- it can also be used for surgical planning.

BENEFITS OF AN OPG:-

- Painless, fast and easy
- No radiation is left in your body after the OPG is finished.

RISK OF OPG:-

ESSENTIAL IMAGE CHARACTERISTICS:

There should be good contrast & density between the enamel & dentine. The anatomical detail should be clearly defined with optimal resolution if the focal trough has been carefully placed in position.

Edge to Edge incisors.

Correct anatomical coverage which should include the entire mandible and temporo-mandibular joints.

The Spinal shadow should be minimized.

The air shadow at the roof of the mouth should be minimized if the tongue was placed correctly.

No removable metallic foreign bodies.

No evidence of movement unsharpness.

ADDITIONAL CONSIDERATIONS:-

It is essential that the patient is able to co-operate and stay still for up to 20 seconds for a successful examination to take

Place.

Problems can occur with producing an optimal image with this technique, due to a number of factors, including patient movement & positioning errors.

Question No. 2

How Will You Scan A Patient Lower

BACK PAIN:-

An x-ray is a useful for many condition This can help the doctor to understand the cause of chronic back pain or view the effects of injuries disease or infection doctor will suggest a lumbar spine x-ray to diagnose

The MRI was developed in 1980s and has revolutionized treatment with low back pain.

LUMBAR SPINE:-

ANTERO-POSTERIOR

The Patient lies Supine on the Bucky table, with the median Sagittal plane coincident with, and at right angles to, the midline of the table and Bucky.

The anterior posterior iliac spines should be equidistant from the tabletop.

The hip and knees are flexed and feet are placed with their plantar aspect on the tabletop to reduce the lumbar arch and bring the lumbar region of the vertebral column parallel with the image receptor.

Image receptor should be large enough to include the lower thoracic vertebrae and the Sacroiliac joints and is centered at the level of the lower costal margin.

The exposure should be made on arrested expiration, allowing the diaphragm to move superiorly. The air within the lungs would otherwise cause a large difference in density and poor contrast between the upper and lower lumbar vertebrae.

DIRECTION AND CENTRING OF X-RAY BEAM:-

The Direct the Central ray toward the midline at the level of the lower costal margin.

ESSENTIAL IMAGE CHARACTERISTIC:-

The image should include from T12 down to the bottom of the Sacro-iliac joints.

Rotation can be assessed by ensuring that the sacroiliac joints are equidistant from the spine.

The exposure used should produce a density such that bony detail can be discerned throughout the region of interest.

- * Lumbar Spine Lateral view
- * Lumbar Spine Oblique

Question No. 3

KNEE - ANTERO-POSTERIOR:-

POSITION OF PATIENT AND IMAGE

RECEPTOR:- Patient of an old age

Come with complain of knee pain view should be knee antero-posterior or lateral.

The Patient is either supine or seated on the X-ray table, with both legs extended.

For Computed radiography, an 18x24cm image receptor is generally used.

The affected limb is rotated to centralize the patella between the femoral condyles and sandbags are placed against the ankle to help maintain this position.

Image receptor should be in close contact with the posterior aspect of knee joint, with its central level with upper border of tibial condyles.

DIRECTION AND CENTRING OF X-RAY BEAM:-

Centre 2.5cm below the apex of the patella through the joint space, with the central ray at 90 degree to the long axis of tibia.

ESSENTIAL IMAGE CHARACTERISTIC:-

The distal third of femur and proximal third of tibia are included.

The patella must be centralized over the femur.

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ADDITIONAL CONSIDERATION:-

This position can also be undertaken in the erect position.

KNEE LATERAL:-

POSITION OF PATIENT AND IMAGE RECEPTOR:-

Patient lies on the side to be examined with the knee flexed at 45 or 90 degrees.

The other limb is brought forward in front of the one being examined & supported on a sandbag.

Sandbag is placed under the ankle of the affected side to bring the long axis of tibia parallel to image receptor.

The position of limb is now adjusted to ensure that the femoral condyles are superimposed vertically.

The centre of image receptor is placed with medial tibial condyle.

DIRECTION AND CENTRING OF X-RAY BEAM:-

Centre to the middle of the Superior border of the tibial Condyle, with the central ray at 90 degrees to the long axis of tibia.

ESSENTIAL IMAGE CHARACTERISTICS:

The patella should be projected clear of the femur.

The femoral Condyle should be superimposed.

Proximal tibio-fibular is not clearly visible.

ADDITIONAL CONSIDERATION:-

Over-rotation = fibula is projected too posteriorly

Under-rotation = fibula head is hidden behind tibia.

A 3 to 5 degree cranial tube angulation can sometime help superimpose the femoral Condyles

Question No. 4:-

ANSWER:-

A Patient fell from bike after being hit by Car. now

of headache. x-ray prescribe for the skull is MRI and CT scan.

Testing is needed to determine the cause of your headaches. we use MRI and CT scan for diagnosis.

The CT (computerised tomography) scan uses x-ray technology to create a cross-section images of the body interior.

A CT scan show high-quality scans and is often used to check for any bleeding in the brain.

A CT Scan uses x-rays and computers to make images of the body. it can help the doctors to diagnose headaches and their causes.

This test can help your doctor rule out ~~out there~~ other causes of your pain such as.

A brain tumor.

A sinus blockage

Injuries.

Bleeding in the brain etc.

MRI (Magnetic Resonance imaging) test that make clear images of the brain without the use of x-rays.

- This Scan can give information about the cause of your headache.
- MRI creates image through magnetised radio waves.
- The MRI can often provide a greater detail to images, making it an optimal tool for detecting certain conditions.
- Brain MRI may be selected to assess developmental abnormalities, blood vessel issues, and chronic nervous system disorders.
- MRI can help the doctor that may cause your symptoms. Such as a brain tumor, infection in your brain and hydrocephalus.
- Both scans are effective and produce superb images, making them incredibly useful in process of diagnosis.

Question No. 5

ANSWER:-

The amount of current flowing through filament is controlled by mA selector.

- kVp determine the quality of x-ray beam. When we say the quality of the x-ray beam means its energy and penetrability.
- kVp is applied to the x-ray tube which accelerates electrons from Cathode to the anode in radiography or Computed tomography. Tube voltage, in turn determines the quantity and quality of the photons generated.
- When film density is kept constant the higher the kVp, the lower the resolution and image contrast percentage. Also higher the mAs the higher the resolution and image contrast percentage.

mAs determines number of x-rays produced per unit time. The number of x-rays reaching the film determines the degree of blackening of the film.

KVP:- kVp control the property called "radiographic Contrast" of an x-ray image. Each body part contain a certain type of cellular composition which require an x-ray beam with a certain kVp to penetrate it.

PELVIS - ANTERO-POSTERIOR:-

- The Patient lie Supine with their median sagittal plane perpendicular to the tabletop.
- The midline of Patient must coincide with the Centred primary beam & table bucky mechanism.
- The limbs are slightly abducted and internally rotated to bring the femoral necks parallel to image receptor.

DIRECTION AND CENTRING OF X-RAY BEAM:-

- Centre in the midline with vertical central beam to the Centre of image receptor.
- The Centre of image receptor is placed in midway b/w the upper border of Symphysis pubis and anterior superior iliac spine for whole pelvis and proximal femora

Essential Image Characteristics:-

iliac crest and proximal femora

- iliac crest and proximal femur including the lesser trochanter should be visible on image
- No rotation
- The iliac bone and obturator foramina should be same size and rotation.

ADDITIONAL CONSIDERATION:-

- At first visit and trauma cases gonad protect is usually omitted however local protocol can vary