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PAPER : RADIOLOGICAL POSITIONING.

Ans: (2) / (OPG) ORTHOPANTOMOGRAPHY :

- * Any bulky clothing and radio opaque object, such as jewellery, dentures or hearing aids should be removed from image area.
- * The equipment brought to the start position and careful explanation given to the patient.
- * A 15 x 30 cm image receptor is used. Many machines. Direct Radiography (D.R) technology may be utilized on newer equipment.
- * The patient walk into the machine, holding the handles and adopting a sitting position.
- * The head is tilted downward until the Frank fort. plane is parallel with floor and machine height adjusted allow patient. Upper and lower incisor with in ~~groove~~ groove the chain should be placed on the rest.
- * The patient is not rotated by ensuring the sagittal plane light runs down the middle

* of the face. Close the head resistant.

* the patient is asked place their tongue on the roof their mouth reduce the air shadow and is asked to keep still for 20 second.

* the exposure is taken. observe the patient carefully.

DIRECTION AND CENTRING OF X-RAY BEAM

* the antero-posterior light should be centered distally to the upper lateral incisor. this allow optimal positioning of focal though the zone of focus outside of which the anatomical detail becomes blurred.

ESSENTIAL IMAGE CHARACTERISTICS

* Correct anatomical coverage, which should include the entire mandible and temporomandibular joint.

* there should be good contrast and density between the enamel and dentine. the anatomical detail should be clearly defined with optimal resolution. the focal though has been carefully placed in position.

* Edge to edge incisor.

- * No removable metallic foreign bodies.
- * No evidence of movement in sharpness.
- * No evidence of positioning error, including rotation & error with occubital plane
(Both external edge of the rami ~~edge~~ should be parallel each other.)
- * The spinal shadow should be minimized.
- * The air shadow the ~~proof~~ of the mouth should be minimized if the tongue was placed correctly.

ADDITIONAL CONSIDERATION

- * Problem can occur with producing optimal image with this technique due to number of factors, including patient movement and positioning error.
- * It is essential that the able to co-operate and stay still of up to ~~20~~ (20) second for a successful examination to take place.



Ans (2) :- LUMBER SPINE ANTERO - POSTERIOR

⇒ Positioning of patient and image Receptor:

* the patient lies supine in the bucky table with median Sigmoidal plane coincident with and Right angle to the median of the table and bucky.

* The Anterior Superior iliac spine should be equidistant from the table top.

* the hip & knee are flexed and feet are placed with their plantar aspect on the table top & Reduce the lumbar arch and bring the lumbar region of the vertebral column parallel with the image Receptor.

* the image Receptor should be large enough to include the lower thoracic vertebra and the sacro-ileic joint and 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 be otherwise cause large different density and poor contrast ~~density~~ between upper and lower lumbar vertebra.

DIRECTION AND CENTERING OF X-RAY BEAM

* Direct the central ray toward the midline at the level of the lower costal margin.

ESSENTIAL IMAGE CHARACTERISTICS

* The image should include from T12 down the bottom of the sacro-iliac joint.

* Rotation can be assessed ensuring the sacro-iliac joint are equidistant from the spine.

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

The lumbar spine AP image consist five vertebra. it is utilized many imaging content include trauma, postoperatively and chronic condition.

orientation : → postocut

detector size → 35 cm x 43 cm

exposure → 70-80 kVp → 40-60 mAs

SID → 110 cm

Grid → yes ensure correct grid.

* Collimation :- Superiorly to include the T12/L2 junction.

* inferior to include sacral ~~key~~ region.

* lateral to include the transverse process and sacro iliac joints.

Patient position :- the patient is

position depending on clinical history. erect are supine

* ideally spinal imaging should be taken erect in the setting of non trauma to give functional overview of the lumbar spine.

* All imaging of patient with suspected spinal injury must occur in the supine position without moving the patient.

* in the supine projection hand are placed by the patient side.

TECHINICAL FACTORS :- Antero-posterior projection.

* Suspended expiration (for uniform density)

* Centering point

* The level of the iliac crest at the MSP.

* the central Ray is perpendicular to image receptor.

(Lumbar Spine lateral view)

The lumbar spine lateral view images the lumbar spine which consist five vertebra. it is utilized in many imaging context included trauma postoperatively and for chronic condition.

TECHNICAL FACTORS

* lateral projection. * expiration to minimized supine position of the diaphragm over the upper lumbar spine.

Centering point is level of iliac crest.

* Coronal centering point is directly over the lumbar vertebra.

* the central ray is perpendicular to the image receptor.

* Collimation

* Superiorly to include T12/L1.

* inferior to include the sacrum.

* In the lateral decubitus position the patient that the humeri extended 90 degree to the thorax.

* When implementing horizontal beam technique, ensure the distal upper limb are not overlying the region of interest. the patient arm across the upper thorax.

Ans 3 : KNEE - ANTERO-POSTERIOR

⇒ Position of ~~image~~ patient and image Receptor.

* For (CR) Computed Radiography, an 18x24 cm image receptor is generally used.

* The patient is either supine or seated on the x-ray table both leg extended.

* The affected limb rotated to ~~centrize~~ Centrize the patella and the femoral condyle and sandbags place against ankle to help maintain this position.

* The image receptor should be closed contact with the posterior aspect of knee joint with a center level with the upper border of the tibial condyle.

DIRECTION AND CENTERING OF X-RAY BEAM

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

ESSENTIAL IMAGE CHARACTERISTICS

* the patella must be centralized over the femore.

* The distal third of femore and proximal of tibia are included.

ADDITIONAL CONSIDERATION:

* this projection can also be under taken in the erect position (weight bearing)

The AP view position is Right to the old age patient. Because the old age patient are not rotate the leg to the lateral position.

So we take the * Radiograph to of AP position.

And the lateral side position of a patient.

the patient lies table top and supine position.

the horizontal central ray directed upper border of lateral tibia condyle at 90° to long axis of tibia.

Knee Horizontal Beam lateral.

Ans 5(B) :- PELVIS :- (AP)

The AP pelvis view is a part of pelvic series examining the iliac crest, scapula, proximal femur, pubis ischium and the great pelvic ring. It is of considerable importance in the management of severely injured patients presenting to emergency departments.

PATIENT POSITIONING :-

- * Patient is supine.
- * Lower limb are internally rotated $15-20^\circ$ from the hip.
(do not attempt this if a fracture is suspected)

TECHNICAL FACTORS

- * AP projection.
- * Centering point.
 - * the mid point of anterior superior iliac spine the pubic symphysis.
- * Collimation:
 - * laterally to the skin margin
 - * superior to the iliac crest
 - * inferior to the proximal third of the femur.

* Superior to Above the iliac crest
 * inferior

~~orientation~~ orientation → (land. slope)

detector size size 35 cm x 43 cm

Exposure 70-80 kVp and 20-30 mAs

SID 100 cm

grid yes.

Q5 Part (A)

KVP is called the property called "Radiographic Contrast" of an x-ray image (the ratio of transmitted radiation through regions of different thickness or density).

Each body part contains a certain type of cellular composition which requires an x-ray beam with a certain kVp to penetrate it.

MAs :- The mAs (milliampere second) determines the

Number of X-ray produce per unit of time and the number of X-ray reaching the film determines the degree of Blackening of the film

the type of film or screen system being used increasing kVp \downarrow increasing the penetrating power of X-ray beam.

Ans 4e

\Rightarrow The following X-rays may suggested.

\Rightarrow Skull occipital - frontal (20 degree)

\Rightarrow Skull occipital - frontal (30 degree \nearrow) or Reverse Townes

\Rightarrow Skull fronto - occipital (20 degree \nearrow)

\Rightarrow Skull Lateral.

\Rightarrow Skull Horizontal Ray Lateral.