Paper : Radiological Positioning

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Q NO1:- Dental OPG ?-

Ans:- Dental OPG:-

OPG (orthopantomogram) is the type of Dental X-rays.

→ OPG produces a panoramic view of the jaw.

equipment of OPG:-

A specialized x-ray machine is used in dental OPG examination, part of the machine rotate around the patients head.

OPG Diagnosis:-

→ Teeth general view

→ Teeth (cavities)

→ Teeth impaction

→ Fractures

→ Dislocation → infection →

Tumours & sinuses.

QNO 1 :— Dental OPG :-

Ans:— Dental OPG :-

Position of Patient :—

→ 1st of all make sure to remove the jewellery, dentures or, hearing aids from the area which is imaged

Ee any other radioopeque objects should remove

→ The procedure should be explained to patient clearly Ee the machineray brought nearer to start Position.

→ Then the Patient walked into the machine holding the handle and adapting 'Sking' Position.

→ The head downwards tilted to Parallel the Frankfort plane with and the machine weight adjusted to allow the Patient to bite the bite blocks with upper & lower incisors within the grooves.

→ The should be placed on the rest, will close lips & eyes.

→ Instruct the patient to not rotate & ensure the light at the middle of face then close the head restraints.

→ Asked the patient to hold the tongue and

press behind at the palate, to reduce the air shadow & keep for 20 second

→ Radiograph is taken in carfully patient observation

Image Receptor :—

→ Normaly 15x30 cm IR is uses but new equipment is utilized for Direct Radiography

Techniques :—

→ maintain anatomical coverage which include the entire mandible & temporo-mandibular joints.

→ ensure good contrast densities between enamel & dentine

→ edge to edge incisors

→ No evidence of movement- unsharpness and positioning error.

→ reduced spine shadow

→ tongue should be correctly placed at hard palate

→ eyes & lips should clear during exposure.

Additional consideration

Number of factors cause erro in this technique e.g Patien movement & Positioning error

→ The patient should stay for 20s of exposure.

(b)

Q No 2 :-

Ans :- The back pain has number of couses and types trauma, weight lifting, weakness and aideng Stones can couse lower back, so i will scan regard causes.

Lumber ~~Lumber~~ Spine AP View :-
AP wiew of lumber sine as following :-

Positron of patient

→ 1st of all the patient lying on supine positron on the bucky table

→ Ideally Spinal imaging should be taken erect in sitting if not trauma, to give functional view of Lumber spine

→ All imaging of patient with suspected Spinal injury must occur in the supine Position with out moving the Patient

→ Patient will be with mid sagittal plane at right angle.

→ The superior iliac spine will be equidistant from the table top

→ Hip & knee will be

Flexed

→ Feet will be on plantar aspect

→ lumber region of vertebral colum will be in parallel with the image receptor

→ In supine position the hand are placed by patient's side.

Image Receptor:-

→ The image receptor should be large enough to cover the thoracic vertebrae & sacro-iliac joint

→ At the center of the level of lower costal margin.

Direction & centring of x-ray beam :-

central ray directed towards midline at level of lower costal margin

Essential Characteristics :-

→ Image will be include from T12 down to bottom of sacro-iliac joints

→ Exposure should be produce a density such as the bony detail

→ Rotation can be assessed by ensuring that sacro-iliac joint are equidistant from the spine.

Other factors :-

⟹ Collimation :- Superiorly To include T12/L1 Junction.

Detector size :-
35cm x 43 cm

exposure :- 70 - 80 KVP
40 - 60 mAs

SID :- 110cm

2) Lumber Lateral :-

Patient Position :-

→ The patient position is erect, supine or Lateral or the patient lies on their side on bucky table.

→ In Lateral position so that ~~forearm~~ forearm are

parallel to thorax.

→ The arms should be raised and resting on pillow in front of the patient head.

→ Hip & Knee are flexed for stability

Image Receptor :—

→ The IR is centered at the level of lower costal margin

Direction & centring :—

→ central ray directed at right angle to line of spinous process towards a point 7.5cm anterior to

to third lumber spinous process at level of costal margin.

Essential Characteristics :-

→ The image must be included T12 & downward to cover the lumber sacral joint.

→ projection produces will be clearly view through the centre of intervertebral discs spaces.

→ Anterior & posterior margin of vertebral column will be superimposed.

Some factors

Collimation :- Superiorly include T12 / L4 Inferiorly Sacrum.

Detector size :-

35 cm × 43 cm

Exposure :- 70 - 80 kVp
60 - 80 mAs

SID :- minimum will be 110 cm.

3) Lumber Obliaue View :—

Potient Positron

→ The potrent postion supine on buelcy table

→ Rotaled at 45° to right Ee left side.

→ Hip Ee knee will be ploxed

→ Foam pad is placed at 45° to support the Patient.

Image Reeepter :—

It dreeled towards middle vicular lies on raised side verhcaly at the level of lower costal margin.

Essential Characteristics

→ Posterior elements of vertebrae are aligned in such a way to show the classic scalting dog appearance

Other Factors

Collimation :- Superiorly T12/L1 inferiorly sacrum

Detector size :- 35cm x 43cm

Exposure :- 70-80 kVp 60 mAs

SID → 110 cm

Lumber Sacral junction (L5-S1) - Lateral

Patient Position :-

→ The patient lies on Side of bueleg table

→ Arm raised and hand resting on pillow

→ Knee and hip are flexed

→ Dorsal aspect of trunk should be at right angle

→ Coronal plane running through centre of spine must be coincide with & perpindicular mid line

Image Receptor

→ IR center at level of 5th Lumber spinal process

Direction and centring

→ central ray directed at right angle to Lumber Seeral region

Essential charaderistics

Area of interest should be included L5 Lumber vertebrae and 1st sacral segment

Q NO 3 :—

Ans :— When an old age Patient has come to department with a complaint of Knee Pain the following view should be done.

Knee AP :—

Position of Patient & Image receptors :—

Patient Position :—

→ The patient should supine on the table with the knee and ankle joint in contact with the table

→ Leg should be extended

→ ensure the knee is not rotated

→ The limb should be rotated to centralize the Patella b/w the Femoral condyles

→ To maintain this position sand bags are placed against the ankle.

Image Receptor :—

18x24 image receptor is usualy used for CR

→ Detector size 24 cm x 30 cm

SID = 100 cm

→ No grid will use.

→ The Posterior aspect of

the Knee joint should be in contact with Image receptor

Direction and centring of X-ray beam :—

→ 2.5cm below the apex of patella through the joint space centered the X-ray beam

→ And central ray should be 90° to the long axix of the tibia

Essential Image Characteristics :—

→ The Patella should be centralized over the femur.

→ Both proximal and distal third of femur should includ

Additional consideration :—

→ It can also taken in erect postion

→ carfully observe the patient to not rotate the knee during exposure.

Knee Lateral :—

Patient Position :—

→ Laying the patient on the side of interest with the of interest closest to the table and anteriorly rolled the other lower limb.

→ Slightly flexed the affected knee to 45° to the best of Patient ability

→ Support the limb with sand bags.

→ To bring the long axis of the tibia parellel to the image receptor

→ Placed the sandbag under the side of the affected knee.

Collimation:-
TO include the Distal Femur collimate it ~~Supperior~~ superrior
→ No grid will used
→ Detector size 35cm x 43cm

Direction & centring of X-ray Beam

Center the X-ray to middle of superrior border of the medial tebular condyle
→ And central ray at 90° to the long axis of tibia

Essential image Characteristics:-
→ The patella should be projected clear of the femur

→ The femoral condyles must be superimposed

→ The proximal part of the tibio-fabular joint is'nt ~~clear~~ clearly visible.

Additional consideration:-

→ To superimpose the femoral condyle A 3-5° cranial tube can help some time

⇒ over rotation :- fibula is projected to posteriorly

⇒ Under rotation :- fibula head is hidden behind the tibia.

Q NO 4 :—

Ans :— The following x-rays may suggested :-

→ Skull occipito - frontal
(20 degree ↓)

→ Skull occipito - frontal
(30 degree ↑)
or Reverse towne's

→ Skull fronto - occipital
(20 degree ↑)

→ Skull - Lateral

Q NO 5 :-

A) KVP & mAs setting importance on x-ray machine :-

KVP :- The Kilo volt peak is responsible for quality & quantity of x-rays.

Change in KVP changes the quality of image.

→ The KVP change the contrast of radiograph.

When we increases the KVP from the specific level the contrast will increase, & decreases the KVP from optimize level The contrast will decreases So changes in contrast

can change the quality of image.

→ KVP also affect the Spatial resolution of image

mAs :- The milli ampere second is responsible for quantity of x-rays

→ If mAs changes from the setting it will change the optical desities, contrast at some extent & spatial resolution of radiograph

→ The adjustment of KVP and mAs for each Procedure is specific

→ The proper adjustment of MAS & level depends upon the Patient, body parts, IRE & machine quality

→ ~~Start~~ Standard techniques require specific value of KVP & MAS which can change accordingly.

(13) Positioning & Techniques of Pelvis X-ray :-

→ The pelvis series is composed on anterioposterior (AP) with additional projection

→ Based on indication & pathology

Pelvic — AP view :—

→ The pelvis view part of a pelvic examing the illiac crest, sacrum, proximal femur pubis & great pelvic ring.

Patient Position

→ Patient position is supine

→ lower limb are
internaly related 15-25°
from hip

→ The patient mid saggital
plane will perpindicular
to table top

→ Limbs are slightly abducted
& rotated Internaly

→ femoral neck parallel to
OR

→ avoid pelvic rotation

Direction of central beam

→ central beam towards
center of IR

→ centring x-ray beam
will be on mid line

→ The center of IR is placed midway

Additional Consideration

At 1st visit Se trauma cases good prediction is usually omitted.

→ It is in follow up images

Other factor

Collimation :- Lateral to skin margin to above illiac crest superiorly.

Detector size :- 35x43 cm

Exposure :- ~~70~~ 70-80 KVP

20-30 mAs

SID ⟶ 100 cm.