

RADIOLOGICAL POSITIONING

FINAL EXAMS 2020

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Q1. What is an dental OPG .
Describe the positioning and patient positioning technique in detail .

DENTAL OPG:

An OPG is a panoramic or wide view X-ray of the lower face, which displays all the teeth of the upper and lower jaw on a single film. It demonstrates the number, position and growth of all the teeth including those that have not yet surfaced or erupted.

POSITION OF PATIENT AND IMAGE RECEPTOR:

⇒ Any bulky clothing and radiopaque objects such as jewellery, dentures or hearing aids should be removed from the imaged area.

⇒ The equipment is brought to the start position and careful explanation is given to the patient.

⇒ A 15×30 cm image receptor is used on many machines however; direct radiography (DR) technology may be utilize on newer equipment.

⇒ The patient walks into the machine, holding the handles and adopting a skying position.

⇒ The head is tilted downwards until the Frankfort plane

is parallel with the floor and the machine height adjusted to allow the patient to bite into the bite block, with upper and lower incisors within the grooves. The chin should be placed on rest.

⇒ Ensure the patient is not rotated by ensuring the sagittal plane light runs down the middle of the face, close the head restraints

⇒ The patient is asked to place their tongue on the roof of their mouth to reduce the air shadow and is asked to keep still for 20 seconds.

⇒ The exposure is taken, observe the patient carefully.

DIRECTION AND CENTRING OF XRAY BEAM:

The antero posterior light should be central distally to the upper lateral incisors. This allows optimal positioning of the "focal trough" the zone of focus outside of which the anatomical detail becomes blurred.

ESSENTIAL IMAGE

CHARACTERISTICS:

Correct anatomical coverage which should include 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 if the local trough has been carefully placed in position.

Edge to edge incisors.

No removable metallic foreign bodies.

No evidence of movement unsharpness.

The spinal shadow should be minimized.

How will you scan a patient with lower back pain. Write a basic view for lumbar xray?

SCANNING OF BACK PAIN THROUGH XRAY

These images show alignment of your bones and whether you have arthritis or broken bones. An xray particularly useful in identifying degenerative changes or fractures and can help identifying certain types of rheumatological causes of pain. Flexion and extension may also be ordered if spinal instability is suspected.

LUMBAR SPINE AP VIEW

POSITION OF PATIENT AND IMAGE RECEPTOR

The patient lies supine on the bucky table, with median sagittal plane coincident with and at right angles to the middle of the table and bucky.

The anterior superior iliac spine should be equidistant from the table top.

The hips and knees are flexed and the feet are placed with their plantar aspect on the table top to 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 vertebrae and the sacroiliac joints and is centered at the level of 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 CENTERING OF THE BEAM:

Direct the central ray towards the midline at the level of costal margin (1-3).

ESSENTIAL IMAGE CHARACTERISTIC:

The image should include T12 down to the bottom of

the sacroiliac joints.

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

Q3 Patient of old age come in the department with a complaint of knee pain, what view should be done.

KNEE - ANTERO-POSTERIOR

For a patient of old age with knee pain AP view should be done.

POSITION OF PATIENT AND IMAGE RECEPTOR:

For computed radiography (CR) an 18 x 24 cm image receptor is generally used.

The patient is either supine or seated on xray table

with the both legs extended

The affected limb is rotated to centralize the patella between the femoral condyle and sand bags are placed against the ankle to help maintain the position.

The image receptor should be in close contact with the posterior aspect of knee joint, with its centre level with the upper borders of tibial condyles.

DIRECTION AND CENTERING OF BEAM:

Centre 2-5 cm below the apex of patella through the joint space, with the central ray at 90 degrees to the long axis of tibia.

ESSENTIAL IMAGE CHARACTERISTIC

The patella must be centralized over the femur.

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

Q4 A patient fall from bike after being hit by a car, has now a complained of headache what are the x-rays prescribe for skull.

SKULL X-RAYS:

Following are the x-rays which are performed for skull.

Skull - scipittal frontal.
(20 degrees).

Skull - scipittal frontal (30 degrees)

Skull - lateral erect.

Skull - Fronto scipital 20 degrees
(Supine / trolley).

Skull - Modified half axial
(Supine / trolley).

Skull - lateral (Supine / trolley),

A patient fallen from bike (comes with complaint of headache) should be prescribed with X-rays of skull as follows

i) Occipital - frontal 20 degrees
or occipital frontal
30 degrees.

ii) Skull - lateral because
it covers temporal region
as well.

In these views we can
identify if there is
any fracture present due
to head injury.

Q5a) How you see the importance of kvp and mAs settings in your xray machine

kvp:

kvp controls the ~~number~~ energy of x-rays and a property called "radiographic contrast" of an x-ray image (the ratio of transmitted ~~radiations~~ radiations 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 seconds) determines the number of x-rays produced per unit time and the number of x-rays reaching the film determines the degree of blackening of film. The type of film or screen being used. Increasing kvp increases the penetrating power of x-ray beam.

So both are very important because one can determine energy of x-rays and one can determine number of x-rays. ie if we select low kvp then the image provided will be white/blur, and if high kvp is selected image will be black. So one should select appropriate kvp and mAs.

(b) Write about positioning and technique of pelvic x-ray.

PELVIS ANTERO-POSTERIOR

POSITIONING OF PATIENT

AND IMAGE RECEPTOR:

The patient lies supine with their median sagittal plane perpendicular to the table top.

The midline of patient must be centred with the primary beam and table bucky mechanism.

To avoid pelvic rotation, the anterior superior iliac spine for the whole of the pelvis must be equidistant from table top.

The limbs are slightly abducted and internally rotated to bring the femoral necks parallel to the image receptor.

DIRECTION AND CENTRING OF XRAY BEAM:

Centre in the midline with a vertical central beam to the centre of image receptor

The centre of image receptor is placed midway between the upper border of symphysis pubis and anterior superior iliac spine for the whole of the pelvis and proximal femora. The upper edge of image receptor should be 5 cm above the upper border of iliac crest to compensate

for the divergent beam and to ensure that the whole of the bony pelvis is included

ESSENTIAL IMAGE CHARACTER

The crests and proximal femora including lesser trochanters should be visible on the image.

No rotation. The iliac bones and obturator foramina should be the same size and shape.