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Q.1 What is dental OPG? Describe the positioning and patient positioning technique in detail?

Ans 1: OPG:

OPG (Orthopantomogram) and cephalogram are types of dental X-rays. An OPG produces a panoramic view of the jaw whilst a cephalogram is an X-ray of the facial structures.

Position of Patient and Image Receptor:

- Any bulky clothing and radio-opaque 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 15x30cm image receptor is used on many machines; however, Direct Radiography technology may be utilized on newer equipment.
- The patient walks into the machine holding the handles and adopting a

'Skiing' position:
The head is tilted downwards until the Frankfurt 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 the 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 sec.
The exposure is taken - observe the patient carefully.

Direction and Centring of X-ray Beam:
The antero-posterial light should be centred distally to the upper lateral incisor. This allows optimal positioning of the 'focal trough', the zone of focus outside of which the anatomical detail becomes blurred.

Essential Image Characteristics:
There should be good contrast and density between the enamel and 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
- No removable metallic foreign bodies.
- No evidence of movement unsharpness.
- No evidence of positioning errors, including rotation and errors within the occlusal plane.
- The spinal shadow should be minimized.
- The air shadow at the ray of the mouth should be minimized if the ~~mouth~~ tongue was placed correctly.

Additional Considerations:
- problems can occure with producing an optimal image with this technique, due to a number of factors, including patient movement and positioning errors.
- It is essential that the patient is able to co-operate and stay still for up to 20 seconds for a sucessful examination to take place.

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

Ans 1: KNEE - ANTERO - POSTERIOR:

* Positim of Patient and Image Receptor

- For Computed radiography (CR) an 18x24cm image receptor is generally used.
- The patient is either supine or seated on the X-ray table, with both

legs extended.

- The affected limb is rotated to centralized the patella between the femoral condyles, and sandbags are placed against the ankle to help maintain this position.
- The image receptor should be in close contact with the posterior aspect of the knee joint, with its centre level with the upper borders of the tibial condyles.

- Direction and centring of X-ray Beam:
- Centre 2.5cm below the apex of the patella through the joint ~~space~~ space, with the central ray at 90 degrees to the long axis of the tibia.

Essential Image Characteristics:

- The patella must be centralized over the femur.
- The distal third of femur and proximal third of tibia are included.

Additional Considerations:

- This projection can also be undertaken in the erect position.

Q2 How will you scan a patient with lower back pain. write a basic view for lumber X-rays?

1: Lumbar Spine (AP/PA view):

The lumbar spine AP view images the lumbar spine which consists of five vertebrae. It is utilized in many imaging contexts including trauma, postoperatively and for chronic conditions.

Patient position:

- The patient is erect or supine, depending on clinical history.
- Ideally, spinal imaging should be taken erect in the setting of non-trauma to give a functional overview of the lumbar spine.
- All imaging of patients with suspected spinal injury must occur in the supine position without moving the patient.
- In the supine projection hands are placed by the patient side.
- If performing erect, position the patient in the PA position; this has numerous advantages including reduced dose to the gonadal region and utilization of beam divergence arms can be placed by the side, or the handlebars of the erect bucky can be held for patient stability.

1: Technical factors:

- Anteroposterior projection
- Suspended expiration (for a uniform density).
- Centering Point.
- The level of the iliac crests at the MSP.
- The central ray is perpendicular to the image receptor.

* Collimation:
- Superiorly to include the T12 / L1 junction.
- Inferior to include the sacral region.
- lateral to include the transverse processes and sacroiliac joints.

* Orientation.
- portrait

- detector size:
- 35 cm x 43 cm

- exposure:
- 70 - 80 kvp
- 40 - 60 mAs.

- SID:
- 110 cm

- grid:
- Yes (ensure the correct grid is selected if using focused grids).

Image technical evaluation:

- The entire lumbar spine should be visible with demonstration of T_{11}/T_{12} superiorly and sacrum inferiorly.
- No patient rotation as evident by central spinous processes and the symmetrical appearance of the sacroiliac joints and iliac wings.
- Intervertebral joints are visualized.
- Adequate image penetration and image contrast is evident by clear visualization of lumbar vertebral bodies, pedicles and facet joints with both trabecular and cortical bone demonstrated.

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

Ans Firstly; when doctor take history from patient he prescribed a patient to to Skull x-ray.

- When the skull x-ray is done then after results. on the basis of result doctor decided wether we should go for skull CT or MRI.

- Skull X-ray is an imaging test doctors use to examine the bones of the skull including the facial bones, etc.

and if CT scans is necessary when there is swelling or bleeding in the brain or a fracture in the skull. If you have signs of a serious injury a CT scan is usually the best first test to diagnose but CT scans etc are knowing the result of x-rays of skull.

And the x-rays prescribe by the doctor is for skull.

Skull - AP

Skull - Horizontal Ray

Skull - Submentovertex

Skull - Townes

Q5 A) How you see the importance of kvp and MAs settings in your x-ray machine?

Ans Tube voltage, in turn, determines the quantity and quality of the photons generated. Along with MAs (tube current and exposure time product) and filtration, kvp (tube voltage) is one of the primary settings that can be adjusted on x-ray machines to control the image quality and patient dose

The kvp determines the quality of the x-ray beam and thus its ability to penetrate tissue. Higher kvp setting produce more penetrating beams with a higher percentage of radiation reaching the film.

A kvp setting 75 to 85 is adequate for penetrating most distal portions of a mature horse's leg. Lower kvp setting can be of value when radiographing immature horses and for soft-tissue technique.
A higher kvp setting allows for use of a lower mAs setting. This would generally mean a short time of exposure.

B) write about the positioning and technique of pelvic x-ray?

PELVIS - ANTERO-POSTERIOR:
The patient lies supine with their median sagittal plane perpendicular to the tabletop
The mid line of the patient must coincide with the centred primary beam and teble Bucky mechanism.
To avoid pelvic rotation, the anterial superior iliac spines must be equidistant from the tabltop.
The limbs are slightly abducted and internally rotated to bring the femoral necks parallel to the image receptor.

Direction and centring of X-ray Beam
Centre in the midline, with a vertical central beam to the centre of the image receptor.
The centre of the image receptor is placed midway between the upper border of the symphysis pubis and anterior superior iliac spine for the whole of

of the pelvis and proximal femora. The upper edge of the image receptor should be 5cm above the upper border of the iliac crest to compensate for the divergent beam and to ensure that the whole of the bony pelvis is included.

Essential Image Characteristics:

- iliac crests and proximal femora, including the lesser trochanters, should be visible on the image.
- No rotation. The iliac bones and obturator foramina should be the same size and shape.

Additional Considerations:

- At first visit and trauma cases, gonad protection is usually omitted, however local protocols can vary. It is used on follow-up images.