Lateral – supine with horizontal beam (supine)

Position of patient and cassette

• The patient lies supine, with the head raised and immobilized on a non-opaque skull pad. This will ensure that the occipital region is included on the final image.

• The head is adjusted, such that the median sagittal plane is perpendicular to the table/trolley and the interorbital line is perpendicular to the cassette.

• Support the grid cassette vertically against the lateral aspect of the head parallel to the median sagittal plane, with its long edge 5 cm above the vertex of the skull.

Direction and centering of the X-ray beam

• The horizontal central ray is directed parallel to the interorbital line, such that it is at right-angles to the median sagittal plane.

• Centre midway between the glabella and the external occipital protuberance to a point approximately 5 cm superior to the external auditory meatus.

• The long axis of the cassette should be coincident with the long axis of the skull.

Essential image characteristics

• The image should contain all of the cranial bones and the first cervical vertebra. Both the inner and outer skull tables should be included.

• A true lateral will result in perfect superimposition of the lateral portions of the floors of the anterior cranial fossa and those of the posterior cranial fossa. The clinoid processes of the Sella turcica should also be superimposed.

Common faults and remedies

• Failure to include the occipital region as a result of not using a pad that ensures the head is raised far enough from the table/ trolley surface.

• Poor superimposition of the lateral floors of the cranial fossa. Always ensure that the inter-orbital line is perpendicular to the film and that the median sagittal plane is exactly perpendicular to the table/trolley top.

Lateral – erect

Position of patient and cassette

• The patient sits facing the erect Bucky and the head is then rotated, such that the median sagittal plane is parallel to the Bucky and the inter-orbital line is perpendicular to it.

• The shoulders may be rotated slightly to allow the correct position to be attained. The patient may grip the Bucky for stability.

• Position the cassette transversely in the erect Bucky, such that its upper border is 5 cm above the vertex of the skull.

• A radiolucent pad may be placed under the chin for support.

Direction and centering of the X-ray beam

• The X-ray tube should have been centered previously to the Bucky.

• Adjust the height of the Bucky/tube so that the patient is comfortable.

• Centre midway between the glabella and the external occipital protuberance to a point approximately 5 cm superior to the external auditory meatus (EAM).

Occipito-frontal

Occipito-frontal projections can be employed with different degrees of beam angulation. The choice of projection will depend upon departmental protocol and the anatomy that needs to be demonstrated.

Position of patient and cassette

• This projection may be undertaken erect or in the prone position. The erect projection will be described, as the prone projection is uncomfortable for the patient and will usually be carried out only in the absence of a vertical Bucky.

• The patient is seated facing the erect Bucky, so that the median sagittal plane is coincident with the midline of the Bucky and is also perpendicular to it.

• The neck is flexed so that the orbito-meatal base line is perpendicular to the Bucky. This can usually be achieved by ensuring that the nose and forehead are in contact with the Bucky.

• Ensure that the mid-part of the frontal bone is positioned in the center of the Bucky.

• The patient may place the palms of each hand either side of the head (out of the primary beam) for stability.

• A 24 _ 30-cm cassette is placed longitudinally in the Bucky tray. Ensure that the lead name blocker will not interfere with the final image.

Direction and centering of the X-ray beam

Occipito-frontal

• The central ray is directed perpendicular to the Bucky along the median sagittal plane.

• A collimation field should be set to include the vertex of the skull superiorly, the region immediately below the base of the occipital bone inferiorly, and the lateral skin margins. It is important to ensure that the tube is centered to the middle of the Bucky.

Essential image characteristics

• All the cranial bones should be included within the image, including the skin margins.

• It is important to ensure that the skull is not rotated. This can be assessed by measuring the distance from a point in the midline of the skull to the lateral margin. If this is the same on both sides of the skull, then it is not rotated.

Fig. 8.11b OF 15°.

Fig. 8.11c OF 20°.

Occipito-frontal:

The petrous ridges should be completely superimposed within the orbit, with their upper borders coincident with the upper third of the orbit.

– **OF10°↓:** the petrous ridges appear in the middle third of the orbit.

– **OF15°↓:** the petrous ridges appear in the lower third of the orbit.

– **OF20°↓:** the petrous ridges appear just below the inferior orbital margin.

Fronto-occipital

Fronto-occipital (FO) projections of the skull will demonstrate the same anatomy as OF projections. The orbits and frontal bone however, will be magnified as they are positioned further from the image receptor. Such projections should only be undertaken when the patient cannot be moved and must be imaged supine. These projections result in an increased radiation dose to the orbits and some loss of resolution of the anterior skull structures due to increased object-to-receptor distance.

Position of patient and image receptor

• The patient lies supine on the trolley (or X-ray table) with the posterior aspect of the skull resting on the image receptor/ gridded CR cassette.

• The head is adjusted to bring the median sagittal plane at right-angles to the image receptor and coincident with its midline. In this position the EAMs are equidistant from the image receptor to ensure no rotation.

• The orbito-meatal baseline should be perpendicular to the image receptor.

Direction and location of the X-ray beam

• All angulations for FO projections are made cranially.

• The collimated vertical X-ray beam is directed perpendicular to the image receptor along the median sagittal plane.

• The collimated field should be set to include the vertex of the skull superiorly, the base of the occipital bone inferiorly and the lateral skin margins.

FO10° ↑, FO15° ↑, FO20° ↑:

•The technique used for these three projections is similar to that employed for the OF except cranial angulations are applied. The degree of angulation will depend upon the projection required.

• Remember that the image receptor must be displaced superiorly to allow for the tube angulation.

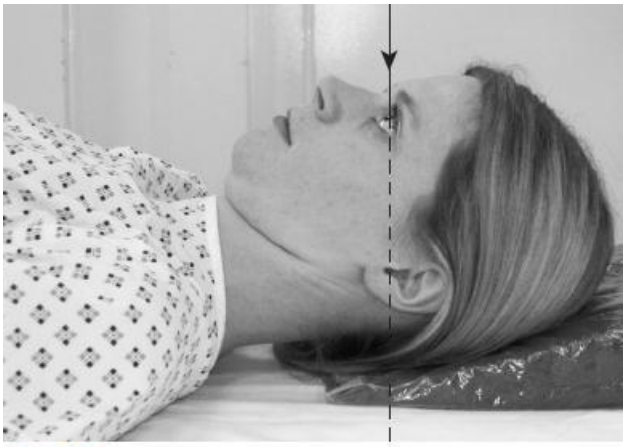

Fig. 8.12a FO projection.

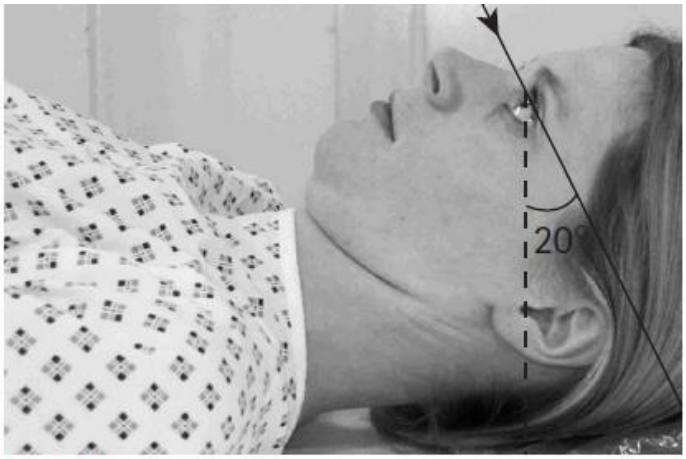

Fig. 8.12b FO 20° projection.

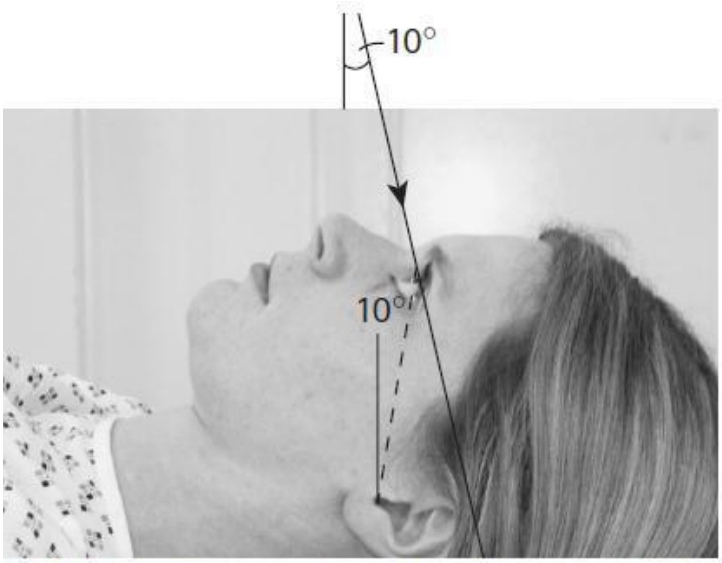

Fig. 8.12c FO 20° projection achieved with 10° tube angle and RBL raised 10°.