Al-Mustaqbal University

Radiological Techniques Department

Radiographic technique

Paranasal sinuses

Lecture 3

Third stage

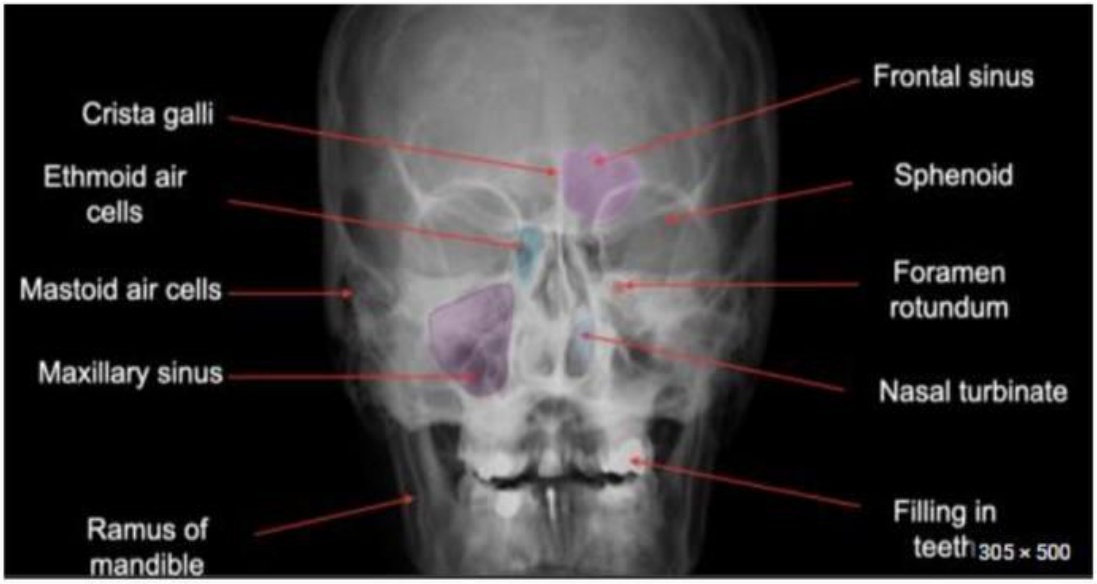
By

Assistant lecturer

Mustafa Kamil Muneam &Mustafa Khalil

2024 - 2025

Paranasal sinuses



Acute sinusitis may manifest radiologically as fluid levels in the maxillary sinus. Chronic sinusitis disease requires more comprehensive imaging by CT and/or MRI. Some radiology departments will no longer perform plain sinus radiographs.

Occipito-mental (Figs 8. 8.40b)

This projection is designed to project the petrous part of the temporal bone below the floor of the maxillary sinuses so that fluid levels or pathological changes in the lower part of the sinuses can be clearly visualized.

Position of patient and image receptor

- The projection is best performed with the patient seated facing the vertical Bucky/receptor.
- The patient's nose and chin are placed in contact with the midline of the receptor and then the head is adjusted to bring the orbito-meatal baseline to a 45° angle to the Bucky/ receptor.
- The horizontal central line of the Bucky/receptor should be at the level of the lower orbital margins.
- The median sagittal plane is at right-angles to the Bucky/ receptor by checking the outer canthi of the eyes and the EAMs are equidistant.
- The patient should open their mouth as wide as possible prior to exposure. This will allow the posterior part of the sphenoid sinuses to be projected through the mouth.

Direction and location of the X-ray beam

- The collimated horizontal beam should be centered to the Bucky/receptor before positioning is undertaken.
- To check the beam is centered properly the crosslines on the Bucky/receptor should coincide with the patient's anterior nasal spine.

• Collimate to include all of the sinuses.

Essential image characteristics (Fig. 8.40c)

• The petrous ridges must appear below the floors of the maxillary sinuses.

• There should be no rotation. This can be checked by ensuring the distance from the lateral orbital wall to the outer skull margins is equidistant on both sides.

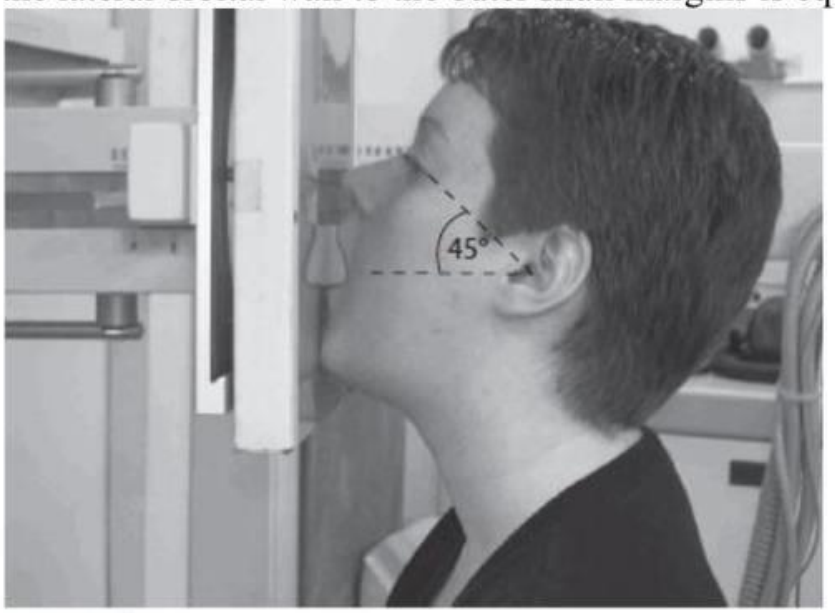
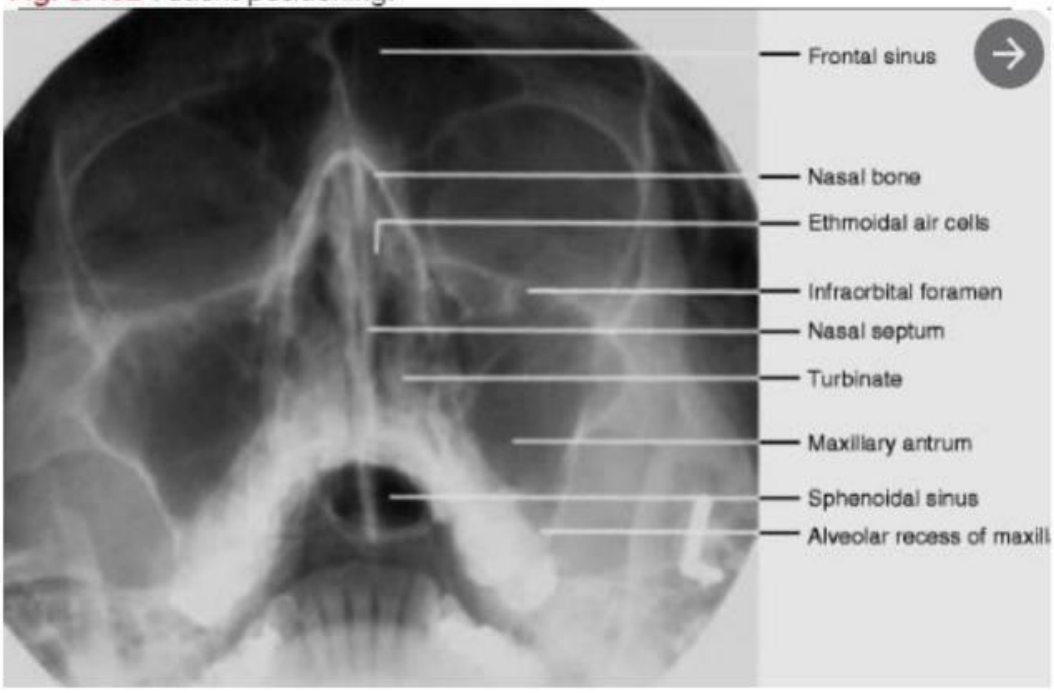


Fig. 8.40b Patient positioning.



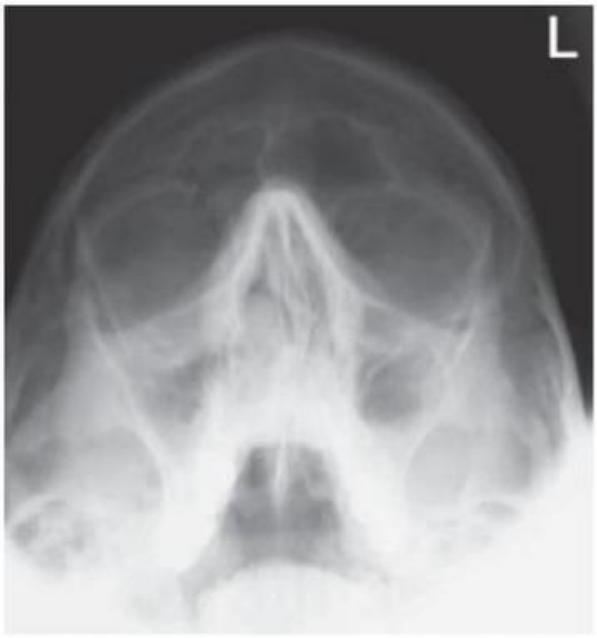


Fig. 8.40c OM radiograph with the mouth open.

Common faults and solutions

• Petrous ridges appearing over the inferior part of the maxillary sinuses. In this case several things may have occurred: the orbito-meatal baseline was not positioned at 45° to the film; a 5–10° caudal angulation may be applied to the tube to compensate.

• Always check the baseline angle immediately before exposure.

Occipito-frontal(Fig. 8.41a)

This projection is used to demonstrate the frontal and ethmoid sinuses.

Position of patient and image receptor

• The patient is seated facing the vertical Bucky/skull unit cassette holder so the median sagittal plane is coincident with the midline of the Bucky and is also perpendicular to it.

• The head is positioned so that orbito-meatal baseline is raised 15° to the horizontal.

• Ensure the nasion is positioned in the centre of the Bucky.

• An 18 × 24 cm cassette, if used, is placed longitudinally in the Bucky tray, with the image receptor height adjusted so that its centre coincides with the nasion.

Direction and location of the X-ray beam

• The central ray is directed perpendicular to the vertical Bucky along the median sagittal plane so the beam exits at the nasion.

• A collimation field should be set to include the ethmoidal and frontal sinuses. The size of the frontal sinuses can vary from one individual to another.

Fig. 8.41a Patient positioning.

Essential image characteristics (Fig. 8.41b)

- All the relevant sinuses should be included within the image.
- It is important to ensure 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 orbital margins. If this is the same on both sides of the skull then it is not rotated.

Fig. 8.41b Radiograph of OF 15° sinuses caudal.

Lateral (Figs 8.42a, 8.42c)

Position of patient and image receptor

- The patient sits facing the vertical Bucky/receptor and the head is then rotated such that the median sagittal plane is parallel to the Bucky/receptor and the interpupillary line is perpendicular to it.
- The shoulders may be rotated slightly to allow the correct position to be attained and the patient may grip the Bucky for stability.
- The head and Bucky heights are adjusted so that the centre of the Bucky/receptor is 2.5 cm from the outer canthus of the eye.
- If used, an 18 × 24 cm CR cassette is positioned longitudinally in the erect Bucky such that its lower border is 2.5 cm below the level of the upper teeth.

Direction and location of the X-ray beam

- A collimated horizontal central ray should be employed to demonstrate fluid levels.
- The X-ray tube should have previously been centred to the Bucky/receptor such that the central ray will now be centred to a point 2.5 cm posterior to the outer canthus of the eye.

Essential image characteristics (Fig. 8.42b)

- A true lateral will have been achieved if the lateral portions of the floors of the anterior cranial fossa are superimposed.

Fig. 8.41b Radiograph of OF 15° sinuses caudal.

Lateral (Figs 8.42a, 8.42c)

Position of patient and image receptor

- The patient sits facing the vertical Bucky/receptor and the head is then rotated such that the median sagittal plane is parallel to the Bucky/receptor and the interpupillary line is perpendicular to it.
- The shoulders may be rotated slightly to allow the correct position to be attained and the patient may grip the Bucky for stability.
- The head and Bucky heights are adjusted so that the centre of the Bucky/receptor is 2.5 cm from the outer canthus of the eye.
- If used, an 18 × 24 cm CR cassette is positioned longitudinally in the erect Bucky such that its lower border is 2.5 cm below the level of the upper teeth.

Direction and location of the X-ray beam

- A collimated horizontal central ray should be employed to demonstrate fluid levels.
- The X-ray tube should have previously been centred to the Bucky/receptor such that the central ray will now be centred to a point 2.5 cm posterior to the outer canthus of the eye.

Essential image characteristics (Fig. 8.42b)

- A true lateral will have been achieved if the lateral portions of the floors of the anterior cranial fossa are superimposed.