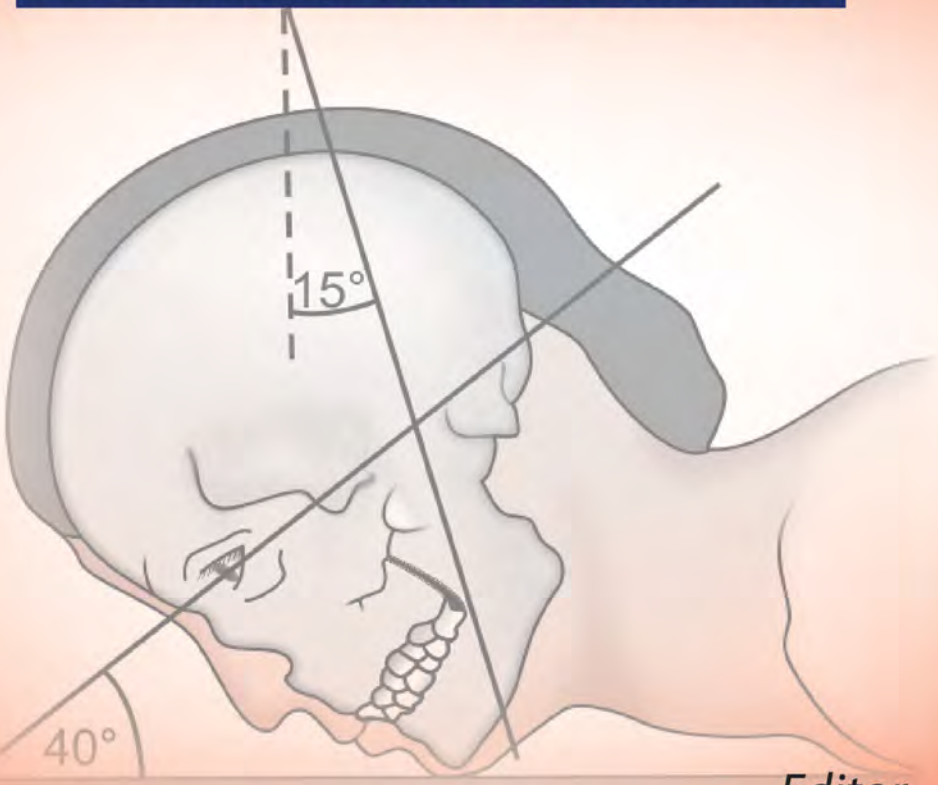
JAYPEE

Radiology of Positioning and Applied Anatomy

for Students and Practitioners



Editor
GS Garkal

FOURTH EDITION

Contents

4

Chest

Chest (posteroanterior view) (film size—12″ × 15″ or 14″ × 17″)

Position of the patient

Patient is asked to stand facing an upright cassette holder. Midline of the body should be in the midline of the cassette. Palpate lower end of ribs. They should be well within the cassette range. Ask the patient to rotate shoulder forward, flex the elbows and put the wrist on hips avoiding costophrenic angles. Upper border of the cassette should be 2–3 cm above the shoulder joint.

Central ray

The central ray is directed horizontally to the level of dorsal 5th vertebra. Stop breathing after deep inhalation for exposure **(Fig. 4.1)**.

Exposure settings

Distance	—	6 ft		
Focal spot	—	Large		
Grid	—	No		
mA station	—	200		
Exposure factors	—	kV	—	55–60
		mAs	—	16–20

Chest lateral view (film size—12″ × 15″ or 14″ × 17″)

Position of the patient

Patient is asked to stand in lateral erect position in front of upright cassette. Both the arms are elevated upward and forearms are resting on the head. Mid axillary line of body should be in the center of the cassette. Cassette should be placed 2–3 cm above the shoulder joint **(Fig. 4.2)**.

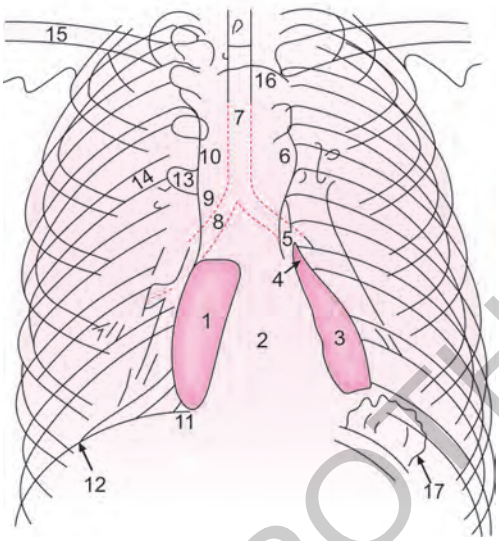


Fig. 4.1 Chest (PA view): line drawing of the radiograph. 1—Right auricle; 2—rights ventricle; 3—left ventricle; 4—left auricular appandage; 5—pulmonary artery; 6—aortic knuckle; 7—trachea; 8—right bronchus; 9—ascending aorta; 10—superior vena cava; 11—inferior vena cava; 12—diaphragm; 13—transverse process; 14—posterior part of rib; 15—clavicle; 16—upper edge of manubrium; 17—gas shadow in fundus of stomach

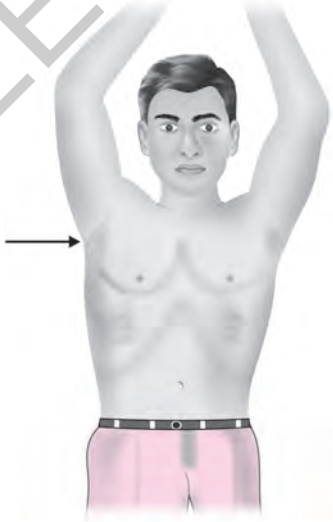


Fig. 4.2 Chest (lateral view): position of the patient

Central Ray

The central ray is directed horizontally at the level of T_5. Stop breathing after deep inhalation for exposure **(Fig. 4.3)**.

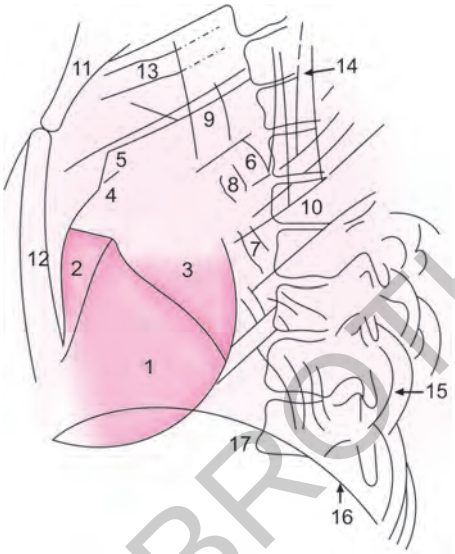


Fig. 4.3 Chest (lateral view): line drawing of the radiograph. 1—Left ventricle; 2—right ventricle; 3—left auricle; 4—right auricle; 5—superior vena cava and innominate vein; 6—descending aorta; 7—main bronchi; 8—bifurcation of trachea; 9—trachea; 10—dorsal vertebra; 11—manubrium; 12—body of sternum; 13—anterior end of ribs; 14—scapula; 15—posterior end of rib; 16—diaphragm; 17—inferior vena cava

Exposure settings

Distance	—	6 ft		
Focal spot	—	Large		
Grid	—	No		
mA station	—	200		
Exposure factors	—	kV	—	65–70
		mAs	—	32–48

Chest (antero-oblique view) (film size—12″ × 15″ or 14″ × 17″)

Position of the patient

Patient is asked to stand in front of upright cassette holder. Turn the patient 45° oblique (left or right). If the left side is near the cassette raise the right hand above head or place on the cassette. Place the left hand on left hip. Upper border of cassette should be 2–3 cm above shoulder joint **(Fig 4.4)**.

Fig. 4.4 Chest (antero-oblique view): position of the patient

Central ray

The central ray is directed horizontally at the level of a T_5. Stop breathing after deep inhalation for exposure **(Figs 4.5 and 4.6)**.

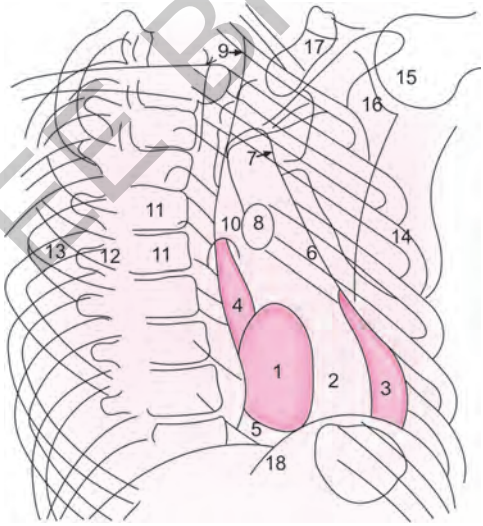


Fig. 4.5 Right anterior-oblique view: line drawing of the radiograph. 1—Right auricle; 2—right ventricle; 3—left ventricle; 4—left auricle; 5—inferior vena cava; 6—venus arteriosus; 7—distal portion of ascending aorta; 8—pulmonary artery (cross section); 9—trachea; 10—left bronchus; 11—dorsal vertebrae; 12—transverse process; 13—posterior portion of rib; 14—anterior portion of rib; 15—head of humerus; 16—glenoid cavity; 17—clavicle; 18—dome of diaphragm

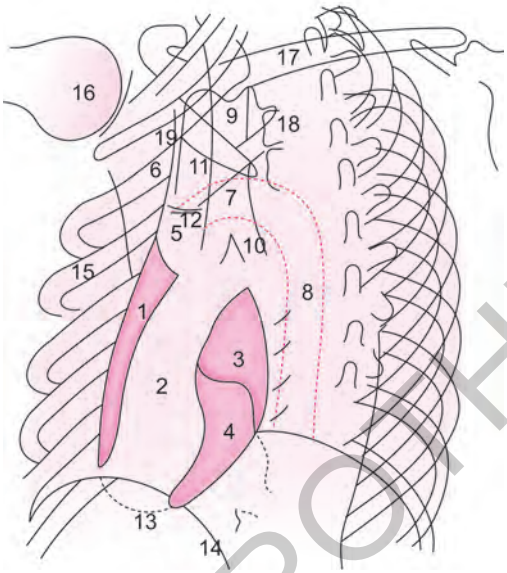


Fig. 4.6 Left anterior-oblique view: line drawing of the radiograph. 1—Right auricle; 2—right ventricle; 3—left auricle; 4—left ventricle; 5—ascending aorta; 6—superior vena cava; 7—arch of aorta; 8—descending aorta; 9—trachea; 10—left bronchus; 11—manubrium; 12—body of sternum; 13—lower border of right ventricle; 14—dome of diaphragm; 15—anterior portion of rib; 16—head of humerus; 17—clavicle; 18—dorsal vertebrae; 19—innominate vein

Exposure settings

Distance	—	6 ft		
Focal spot		Large		
Grid	—	No		
mA station	—	200		
Exposure factors	—	kV	—	65–70
		mAs	—	20–24

Chest (apicogram) (film size—12″ × 15″ (cross wise)

Position of the patient

Patient stands in AP position before up right cassette. Place the cassette 3-4 cm above the shoulder, patient is asked to lean as much as he can forward after resting the shoulder on the cassette (about 1 to 1½ feet ahead) **(Fig. 4.7)**.

Central ray

Central ray is directed horizontally with tube angle 30° toward head at the level of mid-sternum or xiphi-sternum. Stop breathing after deep inhalation for exposure.

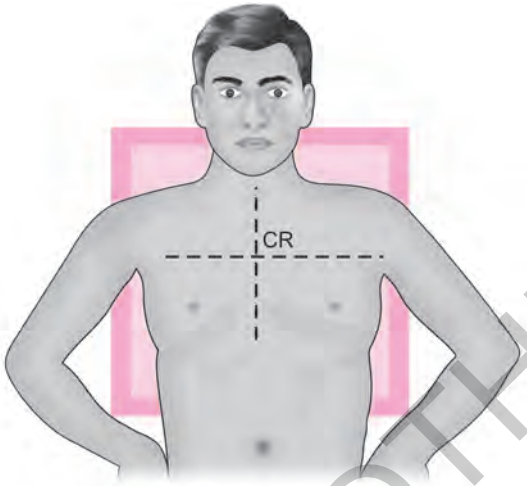


Fig. 4.7 Chest (apicogram): position of the patient

Exposure settings

Distance	—	5 ft		
Focal spot	—	Large		
Grid	—	No		
mA station	—	200		
Exposure factors	—	kV	—	60
		mAs	—	20

Chest for ribs—anteroposterior view (film size—12″ × 15″ or 14″ × 17″)

Position of the patient

Ask the patient to lie down in supine position. Midline of the body is in the midline of table. Place the cassette (under bucky) 2 cm above the shoulder **(Fig. 4.8)**.

Central ray

The central ray is directed vertically at the level of T_5 vertebra.

Exposure settings

Distance	—	100 cm		
Focal spot	—	Large		
Grid	—	Yes		
mA station	—	100-200		
Exposure factors	—	kV	—	60–70
		mAs	—	80–100

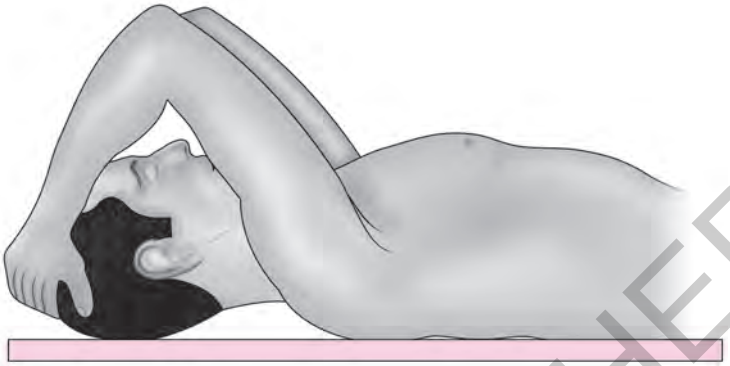


Fig. 4.8 Chest for rib (AP view): position of the patient

Ribs lateral-oblique view (supine/prone) (film size—12″ × 15″)

Position of the patient

Ask the patient to lie in supine position. Bring the affected side mid clavicular line in the center of table. Put the sand bag beneath the shoulder and hip and raise the unaffected side about 25–30°.

Central ray

The central ray is vertically to the midpoint of the film.

Exposure settings

Distance	—	100 cm		
Focal spot	—	Large		
Grid	—	Yes		
mA station	—	100-200		
Exposure factors	—	kV	—	65–75
		mAs	—	80–100

Posterior portion of ribs above diaphragm

Anteroposterior projection

The patient stands with his back against a vertical Potter-Bucky diaphragm **(Fig. 4.9A)**. The cassette-holder is adjusted so that the short center axis is aligned with the desired transverse plane through the thorax. The hemithorax being examined is aligned with the long center axis of the grid. The hands are clasped behind the head and the elbows are thrust toward each other to rotate the scapular images away from those of the ribs. The central ray is projected perpendicularly to the center of the film through the desired localization point. The breath is held at inspiration. The posterior

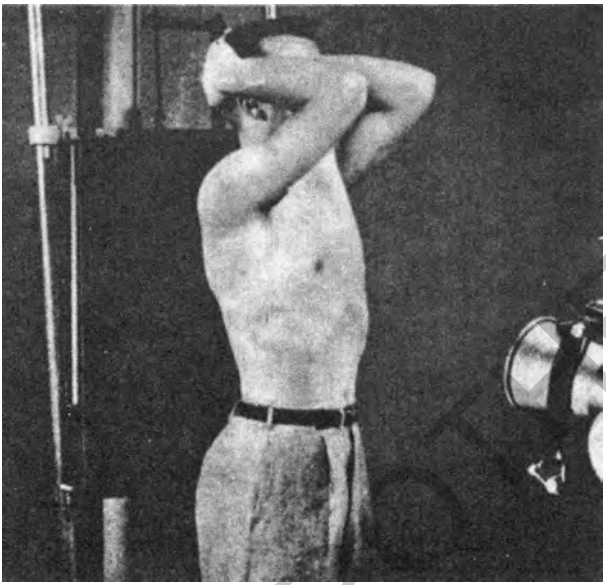


Fig. 4.9A

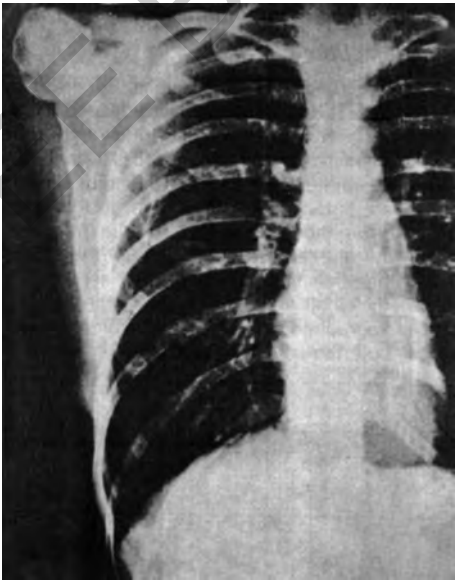


Fig. 4.9B

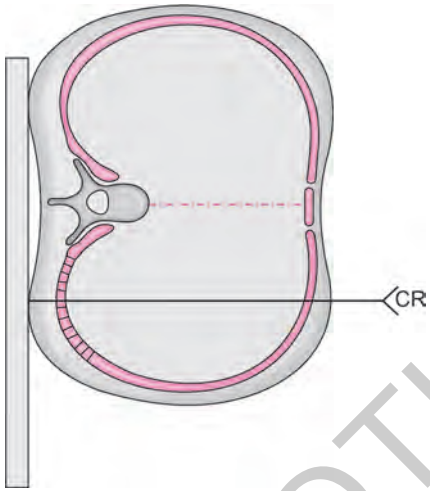


Fig. 4.9C

Figs 4.9A to C AP projection of ribs above diaphragm: position of the patient (A), radiograph (B), and drawing (C)

portion of the bodies of the eighth to tenth ribs, behind the image of the heart, should be radiographed with the exposure employed for those ribs visualized through the diaphragm **(Figs 4.9B and C)**

Posterior portion of ribs through diaphragm

Anteroposterior projection

The patient is placed supine on the X-ray table with the hemithorax being examined aligned with the long center axis of the table top. The arms are flexed and the hands are clasped at the back of the head, with the elbows almost touching **(Fig. 4.10A)**. The cassette-holder in the Potter-Bucky diaphragm is adjusted so that the short center axis is aligned with the desired transverse plane through the thorax. The central ray is projected perpendicularly to the center of the film through the desired localization point. The breath is held at expiration.

Because of the density of the liver, the right hemithorax must receive a greater exposure than the left. However, the kilovoltage should be kept as low as is commensurate with the amount of penetration needed. Superimposition of gas images in the colon can often be avoided by caudal or cephalic inclination of the central ray **(Figs 4.10B and C)**

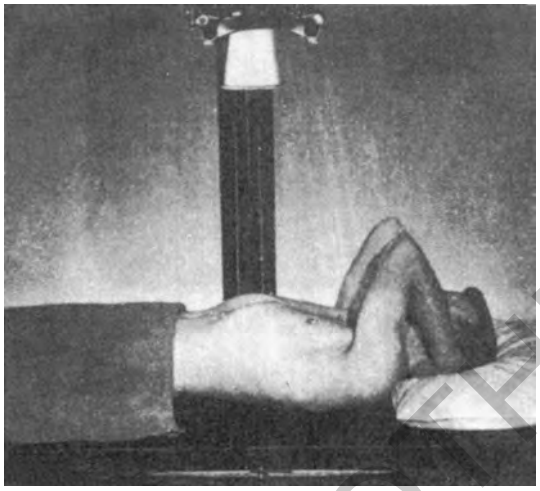


Fig. 4.10A

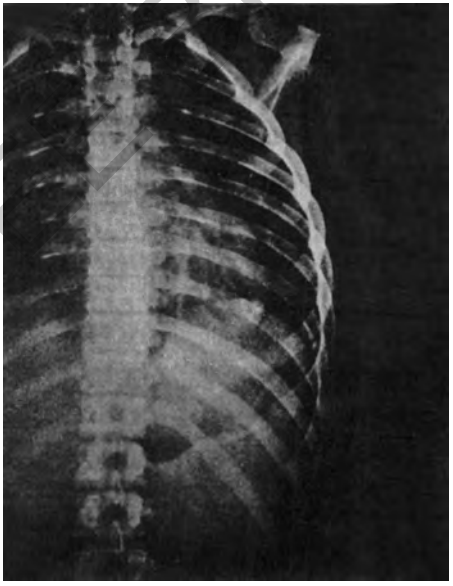


Fig. 4.10B

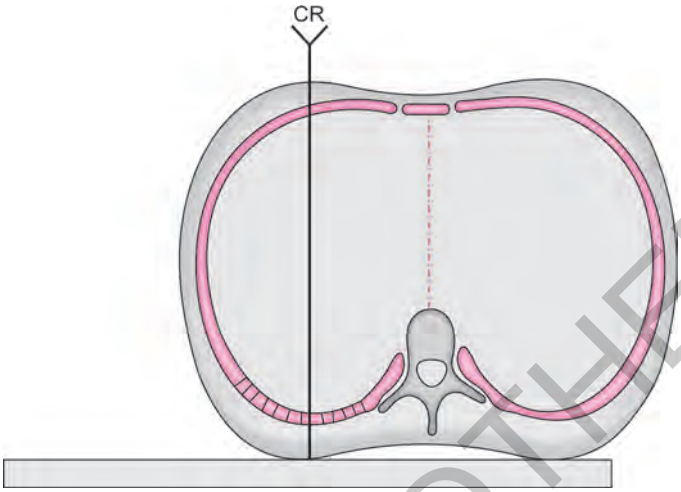


Fig. 4.10C

Figs 4.10A to C AP projection of ribs through diaphragm: position of the patient (A), radiograph (B), and drawing (C)

Lateroposterior (LP) portion of ribs above diaphragm

Anteroposterior oblique projection with part toward film

The patient stands with his back against a vertical Potter-Bucky diaphragm **(Fig. 4.11A)**. The cassette-holder is adjusted so that the short center axis is aligned with the desired transverse plan through the thorax. The patient is placed so that the affected hemithorax is aligned with the long center axis of the grid. The side opposite that being examined is then rotated away from the face of the grid until the posterior surface of the thorax forms an angle of 20 to 30 degrees with the plane of the film. The hands are clasped behind the head. The central ray is projected perpendicularly to the center of the film through the localization point. The breath is held at inspiration **(Figs 4.11B and C)**.

Lateroposterior portion of ribs through diaphragm

Anteroposterior oblique projection with part toward film

The patient assumes a supine position on the radiographic table with the affected hemithorax aligned with the long center axis of the Potter-Bucky

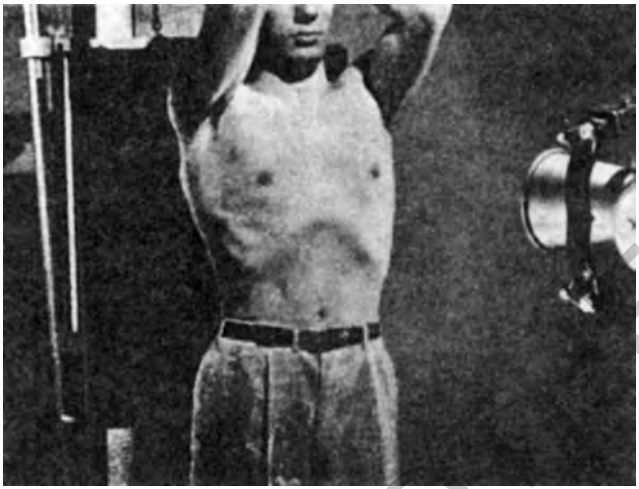


Fig. 4.11A

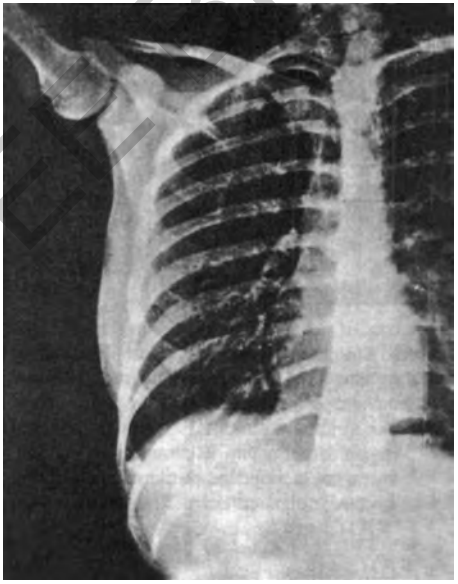


Fig. 4.11B

Radiology of

Positioning and Applied Anatomy

for Students and Practitioners

Salient Features

- Contains positioning of parts, diagrams and exposure factors
- Includes diagrammatic analysis of six views of skull in detail along with asked atypical orthopedic techniques by orthopedic surgeons for diagnostic purpose.

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Shelving Recommendation
RADIOLOGY

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