

*Department of
Radiology
Techniques
The Second Stage*



Elbow Joint

Lecture 4

Assist. Lecturer

Tariq Nadhim Jassim

Fadhil Aad Leftah Al-zurfi

Basic Projections of Elbow Joint

Three Positions

1- Anterior - Posterior (AP)

2- Oblique

3- Lateral

Cassette Out Bucky (10 x 8 inches).

1- Anterior - Posterior (AP)

Position of Patient

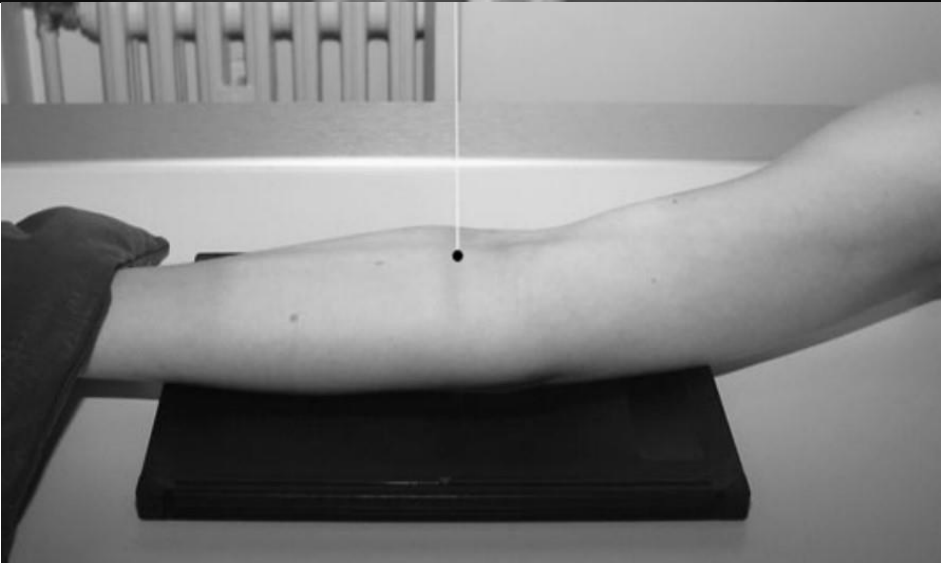
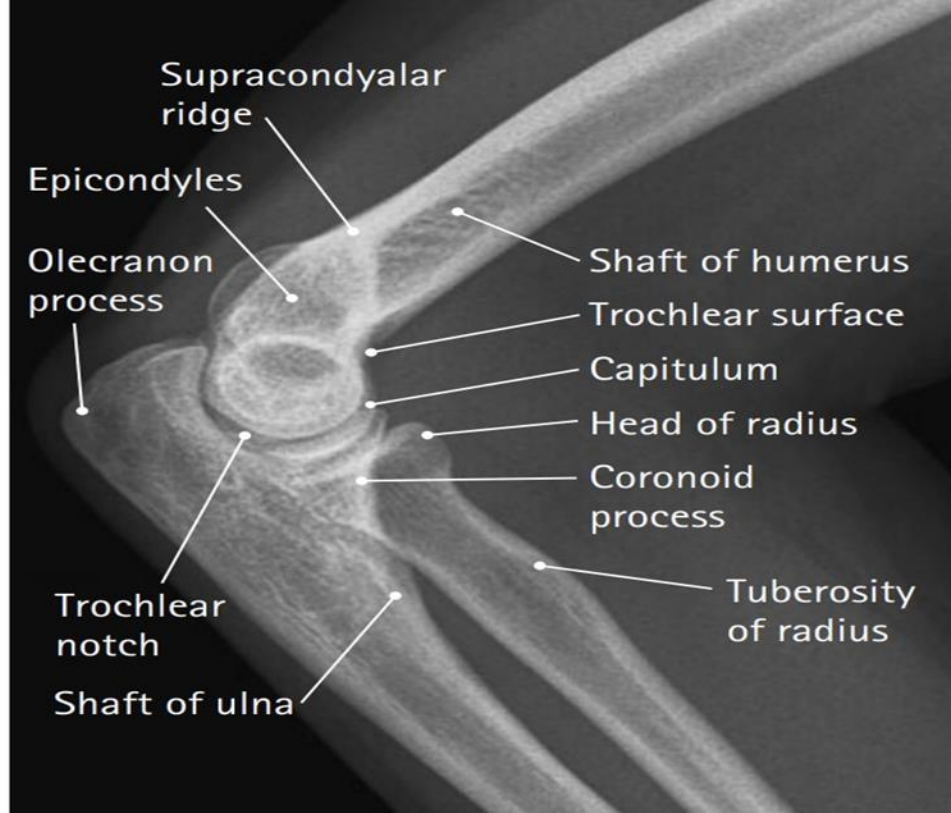
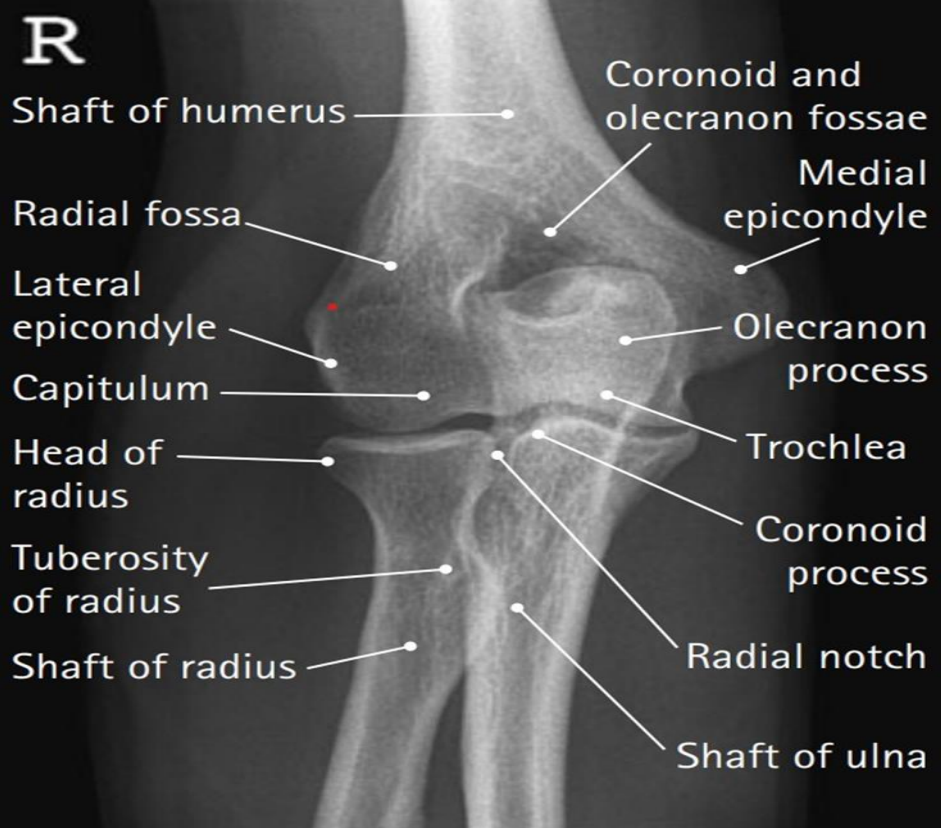
- The patient is seated alongside the table, with the affected side nearest to the table.
- The arm and forearm extended fully, such that the posterior aspect of the entire limb is in contact with the tabletop and the palm of the hand is facing upwards.
- cassette is positioned under the elbow joint, with its short axis parallel to the forearm.
- The arm is adjusted such that the medial and lateral epicondyles are equidistant from the cassette.

Direction and centering of the X-ray beam

- The vertical central ray is centered **through the joint space 2.5 cm distal to the point midway between the medial and lateral epicondyles of humerus.**

Essential image characteristics

- The central ray must pass through the joint space at 90 degrees to the humerus to provide a satisfactory view of the joint space.
- The image should demonstrate the distal third of humerus and the proximal third of the radius and ulna.



Normal antero-posterior radiograph of elbow

Antero-Posterior – Partial Flexion

A- Forearm in contact with Cassette

B- Arm in contact with Cassette

A- Forearm in contact with Cassette

Position of Patient

- The posterior aspect of the forearm is placed on the table, with the palm of the hand facing upwards.
- The cassette is placed under the forearm, with its center under the elbow.
- The arm is adjusted such that the medial and lateral epicondyles of the humerus are equidistant from the cassette.
- The limb is supported and immobilized in this position.

Centering of the X-ray beam

- The vertical central ray is centered in the midline of the forearm 2.5 cm distal to the crease of the elbow.

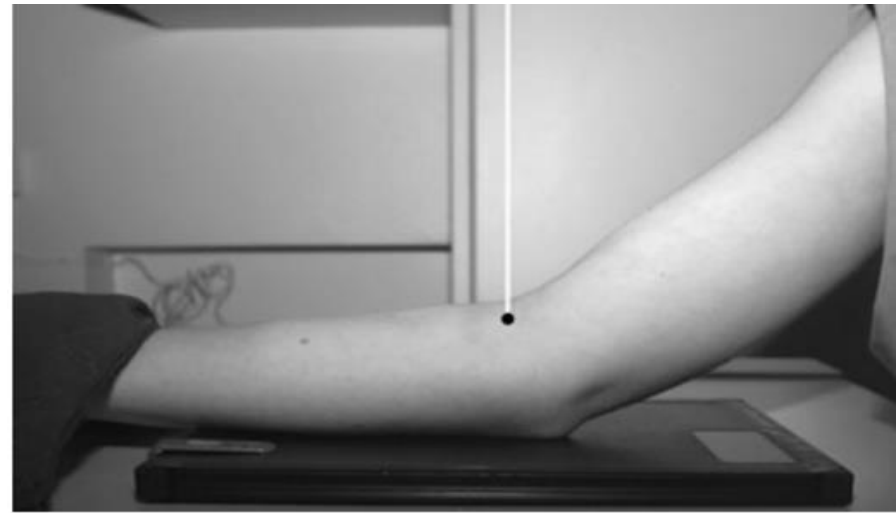


Image Characteristics

- The image should demonstrate the distal third of humerus and the proximal third of the radius and ulna.



Antero-posterior radiograph of elbow in partial flexion

B- Arm in contact with Cassette

Position of Patient

- The posterior aspect of the humerus is placed on the table, with the palm of the hand facing upwards.
- The cassette is placed under the forearm, with its center under the elbow .
- The arm is adjusted such that the medial and lateral epicondyles of the humerus are equidistant from the film.
- The limb is supported and immobilized in this position.

Centering of the X-ray beam

- The vertical central ray is centered in the midline of the forearm 2.5 cm distal to the crease of the elbow.



Image Characteristics

- The image should demonstrate the distal third of humerus and the proximal third of the radius and ulna.



Antero-posterior radiograph of elbow – upper arm in contact with the cassette

Elbow Full flexion

A- Axial – upper arm in contact with Cassette

B- Axial – Forearm in contact with Cassette

A- Axial – upper arm in contact with Cassette

Position of Patient

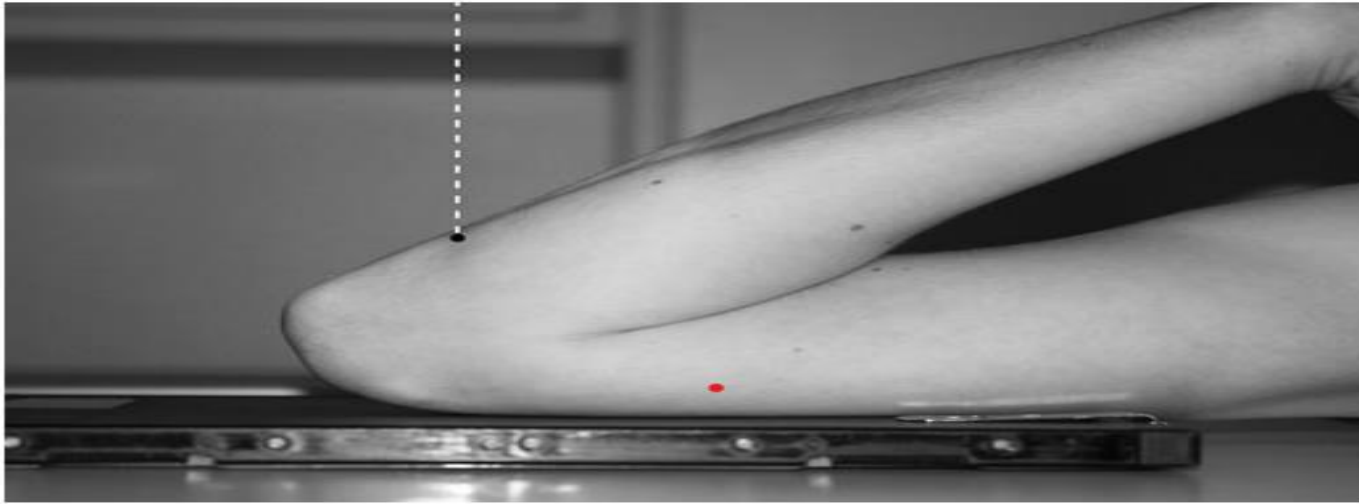
- The elbow is fully flexed, and the palm of the hand is facing the shoulder
- The posterior aspect of the upper arm is placed on the cassette, with the arm parallel to the long axis of the cassette.
- The patient's trunk is adjusted in order to bring the medial and lateral epicondyles of the humerus equidistant to the cassette.

Direction and Centering of the X-ray beam

- the vertical central ray is centered 5 cm distal to the olecranon process.

Essential Image Characteristics

- The image will include the olecranon process and the lower third of the radius and ulna superimposed on the lower third of the humerus.



Axial radiograph of elbow – upper arm in contact with the cassette

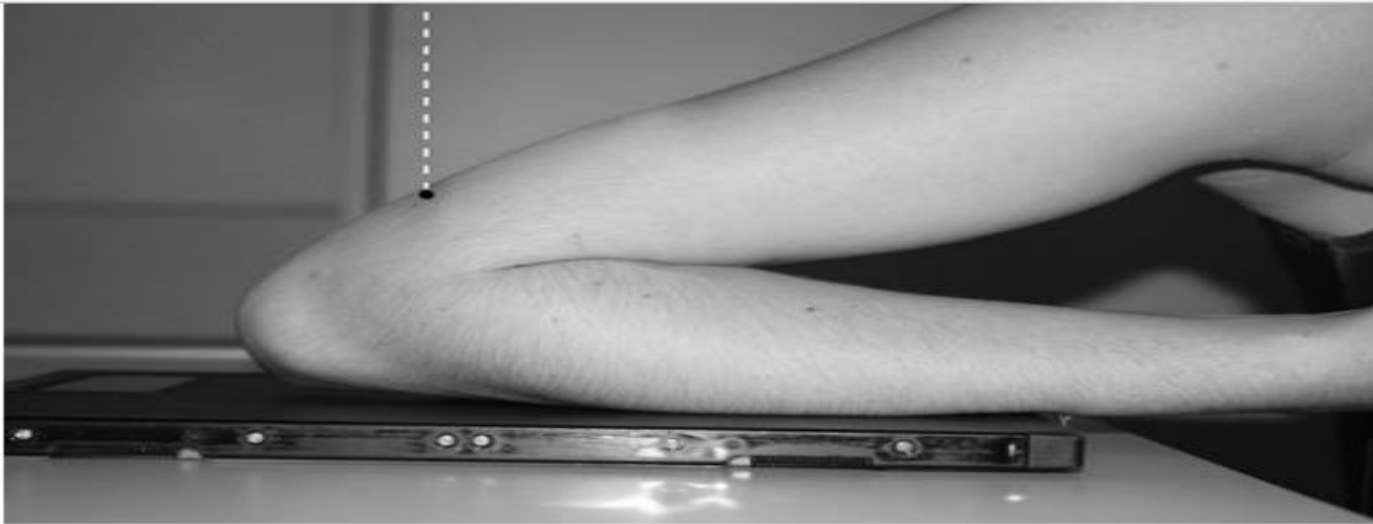
B- Axial – Forearm in contact with Cassette

Position of Patient

- The elbow is fully flexed and the palm of the hand is facing upwards.
- The forearm is fully supinated, with the posterior aspect of the forearm resting on the cassette and the arm parallel to the long axis of the cassette.
- The patient's trunk is adjusted in order to bring the medial and lateral epicondyles of the humerus equidistant to the cassette.

Direction and Centering of the X-ray beam

- the vertical central ray is directed to a point on the posterior aspect of the upper arm 5 cm proximal to the olecranon process.



Axial radiograph of elbow – forearm in contact with the cassette



2- Oblique

Position of Patient

- The patient is positioned for an anterior projection of the elbow joint.
- The cassette is positioned under the elbow joint, with the long axis of the cassette parallel to the forearm.
- The humerus is then rotated laterally until the line between the epicondyles is approximately 20 degrees to the cassette.
- The forearm is immobilized using a sandbag.

Direction and Centering of the X-ray beam

- The vertical central ray is centered 2.5 cm distal to the midpoint between the epicondyles.

Essential Image Characteristics

- The image should demonstrate clearly the proximal joint space between the radius and the ulna.



Normal
Oblique radiographs of elbow to show proximal radio-ulnar joint

Fracture radial head

3- Lateral

The elbow is positioned as for the lateral elbow. The hand is then moved through different degrees of rotation, enabling visualization of small fissure fractures through the head of the radius.

Position of patient and cassette

- **For the first projection**, the patient is positioned as for a lateral elbow projection, with the palm of the hand vertical. The forearm is immobilized using a sandbag.*
- **For the second exposure**, the upper arm and elbow are maintained in the same position, whilst the hand is rotated medially until the palm of the hand rests on the table. The forearm is immobilized using a sandbag.*
- **For the third exposure**, the upper arm and elbow are maintained in the same position, whilst the hand is rotated further medially, until the palm of the hand is vertical, facing away from the body. forearm is immobilized using a sandbag.*

Direction and Centering of the X-ray beam

- the vertical central ray is centered to the lateral epicondyle of the humerus.

Essential Image Characteristics

- The elbow joint should be seen in the true lateral position in each projection.
- Sufficient detail of bony trabeculae should be demonstrated to enable fine fractures to be detected.



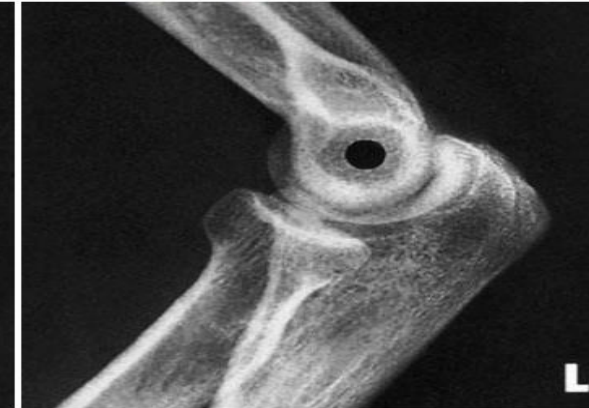
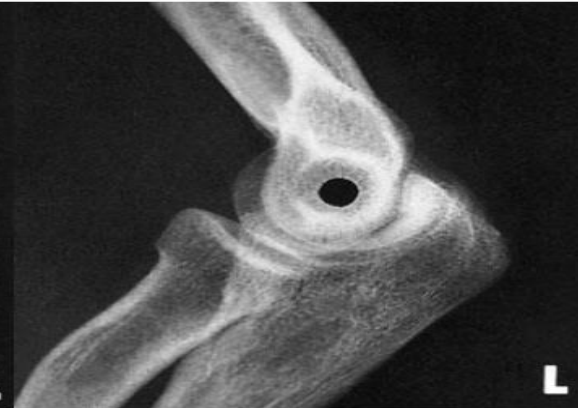
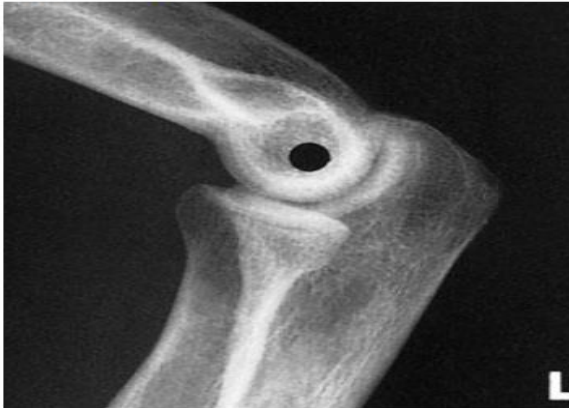
Lateral radiograph of elbow for head of radius – palm at right angles to the table



Lateral radiograph of elbow for head of radius – palm in contact with the table



Lateral radiograph of elbow for head of radius – palm facing away from the trunk





Antero-posterior radiograph of elbow showing avulsion injury of the lateral epicondyle

Lateral radiograph of elbow showing elevation of anterior and posterior fat pads

Lateral radiograph showing dislocation of the elbow

Lateral radiograph showing fracture through the olecranon process, with displacement due to triceps muscle pull



Thanks

