Reading Hospital School of Health Sciences
Medical Imaging Program
MI 243 Clinical Seminar IV
2022

Hip

Routine: 2 views; AP and AP Oblique Modified Cleaves Method "Frog-Lateral" (Axiolateral replaces the AP Oblique if patient is unable to oblique)

Projection: **AP**

Patient Prep: Remove pants (including sweatpants, hosiery); Check for artifacts on underwear (snaps, beading, etc.) * Pediatrics – remove diaper, wrap patient in a sheet

Technique: 85 kVp,  ; non-AEC = 10 mAs (Bucky)

SID: 40"

Collimation: 10 x 12 Portrait

Patient Position: Patient supine. Adjust pelvis so it is not rotated. Medially rotate the lower limb and foot 15 to 20 degrees, unless contraindicated. Place a sandbag lateral to the ankle to aid the patient in maintaining this position. **Never *force*** a patient to internally rotate their legs.

Central Ray: Perpendicular to the femoral head. CR is 1.5" distal to the midpoint of the line drawn between the ASIS and pubic symphysis.*

Marker: Right or left marker on appropriate anatomical side, placed laterally in the upper corner.

Shielding: No shielding on AP

Breathing: Suspended respiration.

Purpose/Structures: Head, neck, trochanter, and proximal 1/3 of the femur.

Evaluation Criteria:

- Regions of the ilium and pubic bones adjoining the pubic symphysis
- Hip joint clearly demonstrated
- Proximal one-third of the femur
- Femoral head, penetrated and seen through the acetabulum.
- Entire long axis of the femoral neck should be demonstrated and not foreshortened
- Greater trochanter should be visualized in profile.
- Lesser trochanter is usually not projected beyond the medial border of the femur, or only a very small amount of the trochanter visible.
- Any orthopedic appliance should be demonstrated in its entirety **
- *RH - Pubic symphysis MUST be visualized on this view*

Additional Hip Notes:

* Merrill's suggests centering over femoral neck instead of the hip joint (2 ½" distal to the midpoint of a line drawn between the ASIS and pubic symphysis)

** If patient has hardware, the entire device must be on both hip views.

- Exception: If patient has an intramedullary femoral rod, only the proximal aspect of the prosthesis needs to be included

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Hip

Routine: AP and AP Oblique Modified Cleaves Method "Frog-Lateral"
(Axiolateral replaces the AP Oblique if patient is unable to move affected hip)

Projection: **AP Oblique Modified Cleaves Method "Frog-lateral"**

Patient Prep: Remove pants (including sweatpants, hosiery); Check for artifacts on underwear (snaps, beading, etc.) * Pediatrics – remove diaper, wrap patient in a sheet

Technique: 85 kVp,  ; non-AEC = 10 mAs (Bucky)

SID: 40"

Collimation: 10 x 12 Portrait

Patient Position: Patient supine. Have the patient flex the hip and knee of affected side, foot flat on table near opposite knee. Have the patient brace the sole of the foot against the opposite knee and abduct the thigh 45°. Use a sponge to support knee. Avoid rotation of the pelvis.

Central Ray: Perpendicular to femoral head. CR is 1.5" distal to the midpoint of a line drawn between the ASIS and pubic symphysis.*

Marker: Right or left marker on appropriate side, placed laterally in the upper corner.

Shielding: Shielding not required per RH protocol

Breathing: Suspended respiration.

Purpose/Structures: AP oblique projection of the femoral head, neck and trochanteric area

Evaluation Criteria:

- No rotation of the pelvis
- Acetabulum, femoral head, and femoral neck clearly demonstrated
- Lesser trochanter on the medial side of the femur
- Femoral neck without superimposition by the greater trochanter; excessive abduction causes the greater trochanter to obstruct the neck
- Femoral axes extended from the hip bones at equal angles
- *RH: Any orthopedic appliance should be demonstrated in its entirety* ***

Additional Hip Notes:

* Merrill's suggests centering over femoral neck instead of the hip joint (2 ½" distal to the midpoint of a line drawn between the ASIS and pubic symphysis)

*** If patient has hardware, the entire device must be on both hip views.

- Exception: If patient has an intramedullary femoral rod, only the proximal aspect of the prosthesis needs to be included

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Hip

Routine: AP and AP Oblique Modified Cleaves Method "Frog-Lateral"
(Axiolateral replaces the AP Oblique if patient is unable to move affected hip)

Projection: **Axiolateral (X-table lateral) Danelius- Miller Method**

Patient Prep: Remove pants (including sweatpants, hosiery); Check for artifacts on underwear (snaps, beading, etc.) * Pediatrics – remove diaper, wrap patient in a sheet

Technique: 90 kVp, ○●○; non-AEC = 32 mAs (Bucky)

SID: 40" for gridded free detector / 57.5" or 59" for DR wall bucky

Collimation: 12 x 10 Landscape (will be portrait to affected leg)

Patient Position: Flex the unaffected leg back and rest the heel on the box- support with sandbags (this will allow visualization of the affected hip). Adjust the pelvis so it is not rotated. Ask the patient if they are able to medially rotate the affected lower limb and foot 15 to 20 degrees. *Never force a patient to internally rotate their legs for trauma. If patient can't, or if there is a known fracture, leave the leg in the natural position.

Central Ray: Centered at the groin, perpendicular to the long axis of the femoral neck.

- On wall bucky - first rotate the foot end of the bed away from IR 45 degrees. Then center to the groin.
- On free detector- place the gridded detector landscape in the holder with its proximal border at the crease above the iliac crest. Angle detector away from the body 45 degrees. X-table beam angling 45 degrees into the groin. Adjust the detector and beam so they are in alignment while maintaining 40" SID and alignment. Measure patient for technique. *See additional notes.*

Marker: Right or left marker on appropriate anatomical side, placed at top of light field.

Shielding: No shielding

Breathing: Suspended respiration.

Purpose/Structures: Head, neck, trochanters, and proximal 1/3 of the femur

Evaluation Criteria:

- Hip joint with the acetabulum
- Femoral neck clearly without overlap from the greater trochanter.
- Small amount of the lesser trochanter on the posterior surface of the femur.
- Small amount of the greater trochanter on the anterior and posterior surfaces of the proximal femur when the femur is properly inverted.
- Ischial tuberosity below the femoral head and neck.

- Soft tissue shadow of the unaffected thigh not overlapping the hip joint or proximal femur
- Any orthopedic appliance demonstrated in its entirety **

Additional Hip Notes:

* When using free detector, you must measure the patient for the lateral technique. Use the calipers to measure the patient's affected hip in the same direction as the central ray would enter.

** If patient has any orthopedic hardware, the entire device must be shown on both views
    - Exception is if the patient has an intramedullary femoral rod, only the proximal aspect of the prosthesis needs to be included.
    - If necessary, to include entire hardware, you can collimate to 14 X 10 using DR

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Hip - *Special View*

Projection: **Modified Axiolateral (Clements- Nakayama method)**

Patient Prep: Remove pants (including sweatpants, hosiery); Check for artifacts on underwear (snaps, beading, etc.) * Pediatrics – remove diaper, wrap patient in a sheet

Technique: 90 kVp, ; non-AEC = 32 mAs (Wall bucky)

SID: 40" for gridded free detector / 57.5" or 59" for DR wall bucky

Collimation: 12 x 10 Landscape (will be portrait to affected leg)

Patient Position: Allow both legs to rest neutrally. Do not attempt to rotate either leg.

Central Ray: Centered at the groin, perpendicular to the long axis of the affected femoral neck with the addition of a 15° posterior angle.
- On wall bucky- first rotate the foot end of the bed away from IR 45 degrees.
- On free detector- place the gridded detector landscape in the holder with its proximal border at the crease above the iliac crest. Angle detector away from the body 45 degrees. Angle CR 45° cephalad and 15° posteriorly. Adjust the detector and beam so they are in alignment while maintaining 40" SID and alignment. Will need to measure patient for technique.

Marker: Right or left marker on appropriate anatomical side, placed at top of light field.

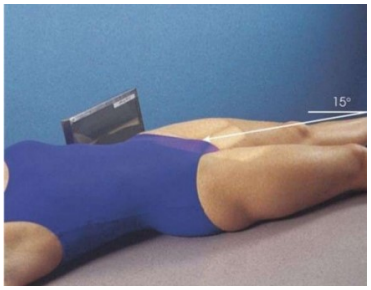
Shielding: No shielding

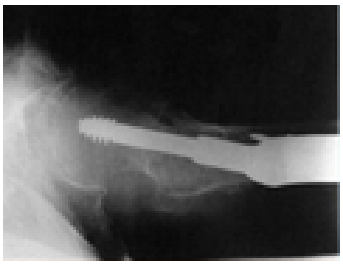
Breathing: Suspended respiration.

Purpose/Structures: Provides lateral view for fractures or dislocation assessment when neither leg can be moved.

Evaluation Criteria:
- Hip joint with the acetabulum
- Femoral head, neck and trochanters
- Any orthopedic appliance in its entirety (exception: femoral rod)

Additional Hip Notes:
- When using free detector, you must measure the patient for the lateral technique. Use the calipers to measure the patient's affected hip in the same direction as the central ray would enter.





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Hip - *Special View*

Projection: **Lateral (Lauenstein and Hickey Methods)**

Patient Prep: Remove pants (including sweatpants, hosiery); Check for artifacts on underwear (snaps, beading, etc.) * Pediatrics – remove diaper, wrap patient in a sheet

Technique: 85 kVp, ; non-AEC = 9 mAs (Bucky)

SID: 40”

Collimation: 10 x12 Portrait

Patient Position: Flex affected knee and draw thigh up to right angle with affected hip. Support opposite limb at hip and knee level. Rotate pelvis no more than necessary to achieve flexion of the affected thigh.

Central Ray: Lauenstein Method – CR enters at hip joint, midway between ASIS and symph.
Hickey Method – CR enters 1” below hip joint using a 20-25° cephalad angle

Marker: Right or left marker on appropriate anatomical side, placed at top of light field.

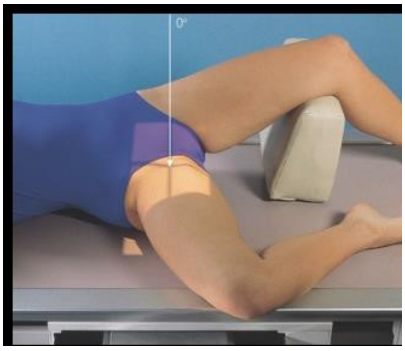
Shielding: No shielding

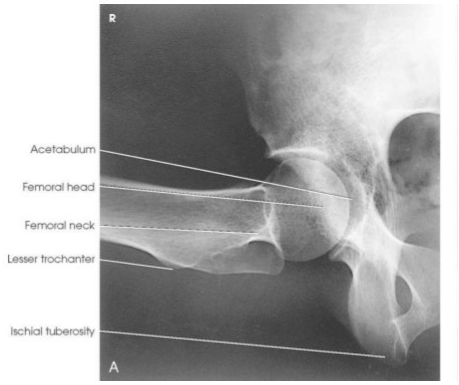
Breathing: Suspended respiration.

Purpose/Structures: Shows the hip joint and the femoral head’s relationship to the acetabulum

Evaluation Criteria:

- Hip joint centered to the radiograph
- Hip joint, acetabulum and femoral head
- Femoral neck overlapped by the greater trochanter in the Lauenstein method
- With cephalad angulation in the Hickey method, the femoral neck free of superimposition





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Hip - *Special View*

Projection: **PA Axial Oblique (Teufel Method)**

Patient Prep: Remove pants (including sweatpants, hosiery); Check for artifacts on underwear (snaps, beading, etc.) * Pediatrics – remove diaper, wrap patient in a sheet

Technique: 85 kVp, ; non-AEC = 14 mAs (Bucky)

SID: 40”

Collimation: 10 x12 portrait

Patient Position: Patient lies in anterior oblique position, resting on the affected side. Elevate the unaffected side so patient is 38° from fully prone.

Central Ray: 12° cephalad to the affected acetabulum. (at the inferior level of the coccyx and approx.. 2” lateral towards side of interest from MSP.

Marker: Right or left marker on appropriate anatomical side, placed at top of light field.

Shielding: No shielding

Breathing: Suspended respiration.

Purpose/Structures: Fovea capitis and the superior wall of the acetabulum

Evaluation Criteria:

- Hip joint and acetabulum near the center of the radiograph
- Femoral head in profile to show the concave area of the fovea capitis
- Superoposterior wall of the acetabulum

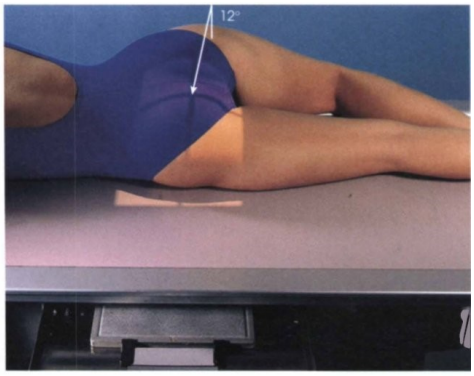

Fig. 7-55 PA axial oblique acetabulum: Teufel method.