Tib/Fib, Knee, Femur

RADT 1512

Lower Extremities Section II

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Additional Slides Provided by Weber Faculty
Tibia/Fibula

- Intercondylar eminence
- Lateral condyle
- Head
- Styloid Process
- Medial condyle
- Tibial tuberosity
- Tibia
- Anterior crest
- Fibula
- Lateral malleolus
- Medial malleolus
Tibia/Fibula


POSTERIOR ASPECT

- Intercondylar eminence
- Lateral intercondylar tubercle
- Medial intercondylar tubercle
- Medial malleolus
- Inferior tibiofibular articulation
Lateral Lower Leg

- Lateral condyle
- Tibial tuberosity
- Anterior border (crest)
- Head of fibula
- Medial malleolus
- Lateral malleolus

LATERAL ASPECT
AP Lower Leg

Central ray perpendicular to midpoint of leg

Foot is vertical

Femoral condyles parallel to film

AP Tibia and Fibula
AP Lower Leg (Tibia-Fibula)
Lateral Lower Leg

Central ray perpendicular to midpoint of leg

Femoral condyles perpendicular to film

LATERAL TIBIA AND FIBULA
Lateral Lower Leg

- Knee joint
- Slight overlap of tibia on fibular head
- Tibia
- Femoral condyles
- Fibula
- Ankle joint
- Fibula lying over posterior half of tibia
The Good, the Bad, the Ugly?

Knee

- Meniscus
  - Absorbs Impact!
  - Complete removal results in progressive arthritis
Knee

- Collateral Ligaments
  - Can be partially torn and yet the knee remain fairly stable.
  - NOT a single, thin ligament, but consists of many minor ligaments in different directions and layers, which mesh together into one single strong ligament.
Knee

- Anterior & Posterior Cruciate Ligaments
  - Injury sometimes referred to as a "sprain."
  - ACL most often stretched, torn, or both by a sudden twisting motion (when the feet are planted one way and the knees are turned another way).
  - PCL most often injured by a direct impact (automobile accident or football tackle)
Transverse Ligament

Connects medial and lateral meniscus
Lateral knee Joint
Patella (AP and Lateral)
AP Knee

Central ray ½ inch below apex of patella

Femoral condyles parallel to film
AP Knee

- Central ray depends on the measurement between the ASIS and the tabletop

<table>
<thead>
<tr>
<th>Description</th>
<th>Measurement</th>
<th>Angle</th>
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<tbody>
<tr>
<td>Thin pelvis</td>
<td>18 cm and below</td>
<td>3-5 degrees caudad</td>
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<tr>
<td>Average</td>
<td>19-24 cm</td>
<td>perpendicular</td>
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<tr>
<td>Large pelvis</td>
<td>25 cm and above</td>
<td>3-5 degrees cephalic</td>
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</table>
AP Knee

Femur

Patella

Femorotibial joint space

Fibula

Tibia

AP KNEE
Lateral Knee 5-8 degree angulation

Central ray 1 inch distal to medial epicondyle

Femoral epicondyles perpendicular to film
Lateral Knee

- Femur
- Patella
- Tibial plateau
- Tibia
- Femoral condyles
- Fibula
Oblique Knees-Int. & Ext. Rot.

Knee
AP Oblique Projection
Medial rotation

Central ray 5° cephalic, ½ inch below patella
Rotate leg 45° medially

Knee
AP Oblique Projection
Lateral rotation

Central ray 5° cephalic, ½ inch below patella
Rotate leg 45° laterally
Oblique Knees

EXTERNAL ROTATION

INTERNAL ROTATION

Femur
Patella
Lateral femoral condyle
Lateral tibial plateau
Fibula
Medial femoral condyle
Medial tibial plateau
Medial tibial condyle
Tibia

Lateral femoral condyle
Medial femoral condyle
Lateral tibial plateau
Lateral tibial condyle
Medial tibial plateau
Fibula
Tibia

AP OBLIQUE KNEE — LATERAL ROTATION

AP OBLIQUE KNEE — MEDIAL ROTATION
PA Axial or Tunnel View

Holmblad Method
PA Axial Standing

Demonstrates intercondylar fossa and the medial & lateral intercondylar tubercles of intercondylar eminence
PA Axial or Tunnel View

- Patella
- Lateral femoral condyle
- Medial femoral condyle
- Intercondylar fossa
- Medial intercondylar tuber
de
- Lateral intercondylar tuber
de
- Tibia
- Fibula

PA AXIAL INTERCONDYLAR FOSSA
PA Axial or Tunnel View

Camp-Coventry Method
PA Patella

Central ray perpendicular to mid-popliteal area

5°–10° lateral heel rotation

Cassette centered to patella

PA PATELLA
PA Patella
Lateral Patella

Patella in lateral profile
Open femoropatellar joint space

Knee flexed 5°-10°

LATERAL PATELLA
Tangential or Sunrise View

Degree of angulation depends on flexion of knee (typically 15-20 degrees)
Tangential Projection of Patella
Lateral Patella-Note Position
Femur
AP Femur

- Use 14X17 film portrait - collimate
- Place top of cassette at ASIS
- Medially rotate toes (15-20 degrees)
- CR perpendicular to mid femur
Lateral Femur (Non-Trauma)

- **Distal Femur**: pt lies on affected side and pulls unaffected leg up towards chest. Knee is bent 45 degrees and epicondyles are perpendicular to table.

- **Proximal Femur**: Cassette is placed at the level of ASIS. Patient is rotated slightly toward affected side with knee bent. Femur is straight down on table.
Lateral/AP Femur
Femur Fracture
Long Bone Measurement (Orthoroentgenography / Scanogram)

- Pelvis
- Knees
- Ankles

Demonstrates and compares entire R and L limbs from hip joint to ankles.

May be done upright or supine.

Position lateral malleoli 20 cm apart

Ensure no hip rotation

If standing, ensure weight evenly distributed

Remember R and L Markers
Arthrography

- Radiography of a joint or joints
  - Pneumoarthrography (gaseous medium)
  - Opaque Arthrography (H2O soluble iodinated medium)
  - Double Contrast Arthrography

Injection of contrast is performed with sterile technique. After aspirating any joint effusion, the radiologist injects contrast and manipulates the joint to ensure proper distribution of contrast material. Images are acquired with fluoroscopy and conventional radiographs.
Arthrogram of a Hip