Muscles of Gluteal Region
Lecture Objectives

• List the muscles of the gluteal region.
• Describe the attachments of the gluteal region muscles and their nerve supply.
• Describe the greater and lesser sciatic foramina and their contents.
Sciatic Foramina

- Greater sciatic foramen
- Lesser sciatic foramen

- Associated notches
  - Greater sciatic notch
  - Lesser sciatic notch

- Associated ligaments
  - Sacrotuberous ligament → greater sciatic foramen
  - Sacrospinous ligament → lesser sciatic foramen
Sciatic Foramina: Connections

- Greater sciatic foramen
  - Pelvis & gluteal region
- Lesser sciatic foramen
  - Perineum & gluteal region
Sciatic Foramina: Contents

• Greater sciatic foramen
  • Piriformis m.
  • Branches of sacral plexus
  • BVs

• Lesser sciatic foramen
  • Obturator internus m.
  • Nerves and BVs to perineum
Greater Sciatic Foramen
Lesser Sciatic Foramen
Muscles of Gluteal Region

- Superficial layer
  - Extensors, abductors

- Deep layer
  - Lateral rotators
Muscles of Gluteal Region

• Extensor
  • Gluteus Maximus
Muscles of Gluteal Region

• Abductors
  • Gluteus Medius m.
  • Gluteus minimus m.
  • Tensor fasciae latae
Muscles of Gluteal Region: Lateral View

(A) Posterior views

(B) Iliotibial tract

(C) Lateral view

Gluteus medius
Gluteus minimus
Tensor fasciae latae

Axis (center) of greater trochanter
Iliotibial tract
Muscles of Gluteal Region

• Superficial layer
  • Relations
    • Neurovascular bundle
Muscles of Gluteal Region

• Deep layer
  ➢ Lateral rotators
  • Piriformis m.
    • Greater sciatic foramen
  • Obturator internus m.
    • Lesser sciatic foramen
Muscles of Gluteal Region

- Deep layer
  - Lateral rotators
    - Superior gemellus m.
    - Inferior gemellus m.
    - Quadratus femoris m.
Hip Rotators

(D) Superior view

(E) Superior view

Medial rotation at hip of planted limb advances opposite side of pelvis and free limb
Lateral rotation at hip of advancing limb keeps foot parallel to line of advancement

Center of rotation (fulcrum) of head of femur and lever (red dashed line) formed by head, neck, and greater trochanter of femur

Medial rotation
Lateral rotation

Tensor fasciae latae
Gluteus minimus
Gluteus medius (anterior fibers)
Quadratus femoris
Gluteus maximus

Pubic ramus
Pubic symphysis
Obturator externus
Obturator internus
Triceps coxae
Piriformis
Posterior superior iliac spine
Anterior superior iliac spine

Direction (line) of advancement

Advancing (free) limb
Planted (fixed) limb
Pelvis

Copyright © 2010 Wolters Kluwer Health | Lippincott Williams & Wilkins
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal Attachment</th>
<th>Distal Attachment</th>
<th>Innervation(^a)</th>
<th>Main Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gluteus maximus (Fig. 5.34A &amp; C)</td>
<td>Ilium posterior to posterior gluteal line; dorsal surface of sacrum and coccyx; sacrotuberous ligament</td>
<td>Most fibers and in iliobial tract, which inserts into lateral condyle of tibia; some fibers insert on gluteal tuberosity</td>
<td>Inferior gluteal nerve (L5, S1, S2)</td>
<td>Extends thigh (especially from flexed position) and assists in its lateral rotation; steadies thigh and assists in rising from sitting position</td>
</tr>
<tr>
<td>Gluteus medius (Fig. 5.34A, C, &amp; E)</td>
<td>External surface of ilium between anterior and posterior gluteal lines</td>
<td>Lateral surface of greater trochanter of femur</td>
<td></td>
<td>Abduct and medially rotate thigh; keep pelvis level when ipsilateral limb is weight-bearing and advance opposite (unsupported) side during its swing phase</td>
</tr>
<tr>
<td>Gluteus minimus (Fig. 5.34A–D)</td>
<td>External surface of ilium between anterior and inferior gluteal lines</td>
<td>Anterior surface of greater trochanter of femur</td>
<td>Superior gluteal nerve (L5, S1)</td>
<td></td>
</tr>
<tr>
<td>Tensor of fascia lata (Fig. 5.34J)</td>
<td>Anterior superior iliac spine; anterior part of iliac crest</td>
<td>Iliobial tract, which attaches to lateral condyle of tibia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piriformis (Fig. 5.34F &amp; G)</td>
<td>Anterior surface of sacrum; sacrotuberous ligament</td>
<td>Superior border of greater trochanter of femur</td>
<td>Branches of anterior rami of S1, S2</td>
<td></td>
</tr>
<tr>
<td>Obturator internus (Fig. 5.34H)</td>
<td>Pelvic surface of obturator membrane and surrounding bones</td>
<td>Medial surface of greater trochanter (trochanteric fossa) of femur(^b)</td>
<td>Nerve to obturator internus (L5, S1)</td>
<td>Laterally rotate extended thigh and abduct flexed thigh; steady femoral head in acetabulum</td>
</tr>
<tr>
<td>Superior and inferior gemelli (Fig. 5.34H)</td>
<td>Superior: ischial spine; Inferior: ischial tuberosity</td>
<td>Medial surface of greater trochanter (trochanteric fossa) of femur(^b)</td>
<td>Superior gemelli: same nerve supply as obturator internus; Inferior gemelli: same nerve supply as quadratus femoris</td>
<td></td>
</tr>
<tr>
<td>Quadratus femoris (Fig. 5.34I)</td>
<td>Lateral border of ischial tuberosity</td>
<td>Quadrate tubercle on intertrochanteric crest of femur and area inferior to it</td>
<td>Nerve to quadratus femoris (L5, S1)</td>
<td>Laterally rotates thigh(^c); steadies femoral head in acetabulum</td>
</tr>
</tbody>
</table>

\(^{a}\) The spinal cord segmental innervation is indicated (e.g., “S1, S2” means that the nerves supplying the piriformis are derived from the first two sacral segments of the spinal cord). Numbers in boldface (S1) indicate the main segmental innervation. Damage to one or more of the listed spinal cord segments or to the motor nerve roots arising from them results in paralysis of the muscles concerned.

\(^{b}\) The gemelli muscles blend with the tendon of the obturator internus as it attaches to the greater trochanter of the femur.

\(^{c}\) There are six lateral rotators of the thigh: piriformis, obturator internus, superior and inferior gemelli, quadratus femoris, and obturator externus. These muscles also stabilize the hip joint.
Surface Anatomy of Buttock

- Highest points of iliac crests
  - L4-L5 (for lumbar puncture)
- Intergluteal cleft
  - Sacrum & coccyx
- Gluteal fold
- Gluteus maximus
  - Inferior edge – line between coccyx and ischial tuberosity
  - Superior edge – line between PSIS and greater trochanter
    - Gluteus medius
Surface Anatomy of Buttock

• Nelaton line
  • Between ASIS and ischial tuberosity
  • Pass by greater trochanter
    • Greater trochanter above the line in:
      • Hip dislocation
      • Femur neck fracture
Intragluteal Injection

• Vital structures

• Safe area
  • Quadrants
  • Line between PSIS & greater trochanter
Surface Anatomy Sciatic Nerve

- Location of sciatic nerve
  - Line between greater trochanter and ischial tuberosity
  - Down middle of posterior thigh