Anatomy Experience with coursepack development

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Some background

- Students asked for images to be included in CP
- Anatomy CP has historically been 95+% text based
- Only a few cartoon figures or schematics included
- Some faculty used word to accomplish this and some used PowerPoint
LOWER LIMB MUSCLES

I. Related Readings:

Moore and Dalley – pp. 545-551, 563-572, 589-592, 595-602

II. Objectives and Study Guide – A student’s level of mastery for these stated goals will be determined by their ability to correctly answer a series of test questions which sample these behaviors. Each of the following statements an be prefaced with the phrase, “The student should be able to . . .”

A. Describe the location, functions, and innervation of these hip joint muscles:

1. iliopsoas
2. gluteus maximus
3. gluteus medius
4. gluteus minimus
5. tensor fascia lata
6. piriformis
7. obturator internus
8. obturator externus
9. gemellus superior
10. gemellus inferior
11. quadratus femoris

B. Describe the location, characteristics, and function of the following fascia and fascial structure:

1. superficial fascia
2. fascia lata
3. tibial tract
4. saphenous opening
5. intermuscular septa

C. Describe the location (compartment), functions, and innervation of these thigh muscles:

1. sartorius
2. rectus femoris
3. vastus medialis
4. vastus lateralis
5. vastus intermedius
6. gracilis
7. pectineus
8. adductor brevis
9. adductor longus
10. adductor magnus
11. biceps femoris
12. semitendinosus
13. semimembranosus
I. The Gluteal Region

A. Overview

1. 2 layers of muscle within a single compartment

   a. superficial layer
      i. consists of the three gluteal muscles and the tensor fascia lata
      ii. principally extensors, abductors, and medial rotators of the hip
      iii. all have proximal attachments to the postero-lateral surface of the ala of the ilium

   b. deep layer
      i. consists of the piriformis, obturator internus, superior and inferior gemelli, and the
         quadrates femoris
      ii. all have distal attachments on or near the intertrochanteric crest
      iii. all are lateral rotators and stabilizers of the hip
B. Superficial layer of Gluteal Muscles

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal attachment</th>
<th>Distal attachment</th>
<th>Action</th>
<th>Innervations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>gluteus maximus</td>
<td>posterior gluteal line of the ilium, sacrum and sacrotuberous ligament</td>
<td>iliotibial band (and hence the fascia lata) and the gluteal tuberosity of the femur</td>
<td>Thigh/hip extension; some lateral rotation; stabilizer</td>
<td>Inferior gluteal nerve</td>
<td>Largest and most superficial gluteal muscle</td>
</tr>
<tr>
<td>gluteus medius</td>
<td>External surface of ilium</td>
<td>Lateral surface of greater trochanter</td>
<td>Thigh/hip abduction and medial rotator; critical during swing phase of gait</td>
<td>Superior gluteal nerve</td>
<td>Most superior part extends above the superior border of the gluteus maximus</td>
</tr>
<tr>
<td>gluteus minimus</td>
<td>External surface of ilium</td>
<td>Anterior surface of greater trochanter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tensor fascia lata</td>
<td>Anterior superior iliac spine ans anterior part of the iliac crest</td>
<td>Iliotibial tract which extends all the way to the lateral tibial condyle</td>
<td>Weak thigh/hip flexor and abduction (by tensing the IT band)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3 types of muscle tissue

I. **skeletal muscle**
   A. attached to the bony skeleton via tendons
   B. in the middle ear and attached to the outer eye layer
   C. entrance and exit of the digestive tract (gut tube)
   D. contractile activity initiated and controlled (+ only) by somatic nervous system

II. **cardiac muscle (myocardium)**
    A. the thickest layer of heart wall
    B. contractile activity modulated (+/-) by autonomic nervous system

III. **smooth muscle**
    A. walls of the internal organs (viscera)
    B. ciliary muscle of eye
    C. walls of most blood vessels
    D. existing contractile activity modulated (+/-) by autonomic nervous system

* modulated vrs. controlled: in this context 'modulated' means the nervous system changes an already existing contractile activity of the muscle cells whereas 'controlled' means the muscle cells' activity is initiated and recurring excitation by the nervous system is required for function of the muscle
Other Connective tissue specializations

Ligaments
Retinacula
Tendons
Aponeurosis

I.  tendons
   A.  Dense regular CT with surrounding investing fascia that connect skeletal muscle to bone
       (e.g. iliotibial tract connects the tensor fascia lata muscle to the lateral condyle of the tibia)
   B.  Aponeurosis
       1.  a fibrous sheet or flat, expanded tendon, giving attachment to muscular fibers (e.g.
           external abdominal oblique). Usually fairly thick.

II.  fascia as ligaments
   A.  sometimes fascia thickens and specializes to become a band or sheet that connects two or
       more bones or cartilages
   B.  a retinaculum is a type of ligament that retains or holds back other structures such as
       tendons, nerves, and vessels. Details in limb units.

Note:
  ligaments, tendons, and investing fascia have similar histological makeup and tend to blend together
and reinforce one another when in physical proximity. They are sometimes difficult to distinguish or
separate from one another in an embalmed cadaver.
  ligaments and tendons have a vulnerable blood supply and thus their capacity to regenerate after
injury is limited
Lecture #1: Learning Goals

The student will be able to:
1. compare & contrast the 4 basic tissue types found in human organs
2. describe what a membrane is and give examples
3. describe the characteristics, functions and general location of basic types of fascia
4. list from superficial to deep and vice versa the typical layers of the body wall