

Persistence
& Creativity

Anatomy Comics, Objectives 2.3 and 2.4



Simple
Comix

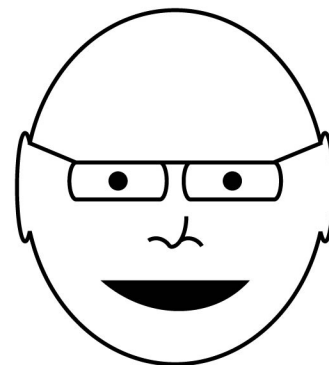
2.3 Identify the muscles and nerves (cutaneous and motor) of the gluteal and posterior thigh regions. Describe the actions and nerve supply of each muscle. Be prepared to discuss the motor and cutaneous deficits that would result from damage to these nerves.

2.4 Identify the muscles and nerves (cutaneous and motor) of the anterior and medial thigh regions. Describe the actions and nerve supply of each muscle. Be prepared to discuss the motor and cutaneous deficits that would result from damage to these nerves.



1. Which group of right thigh muscles is abnormal?

- A. Anterior compartment
- B. Medial compartment
- C. Posterior compartment
- D. Lateral compartment

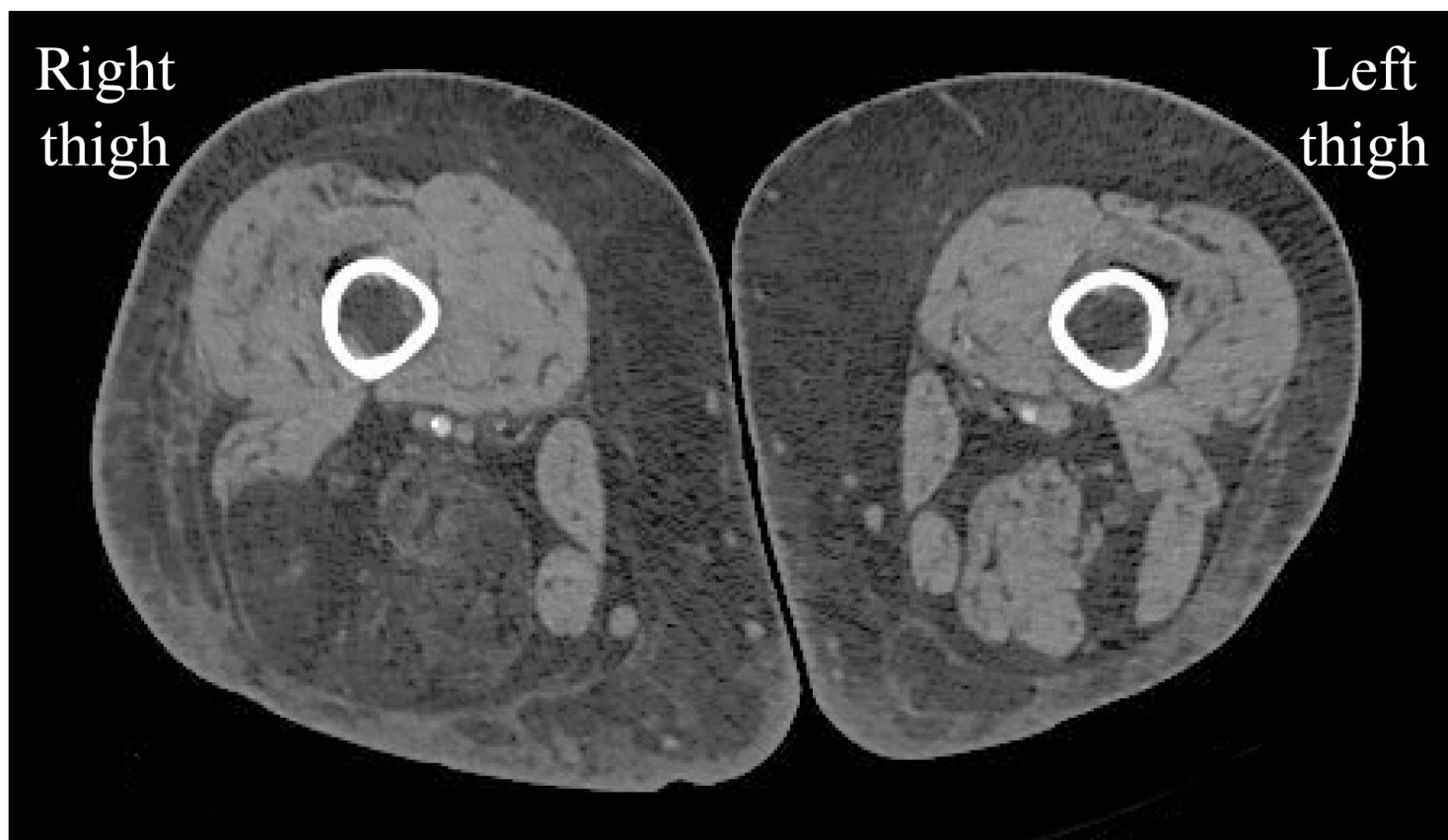


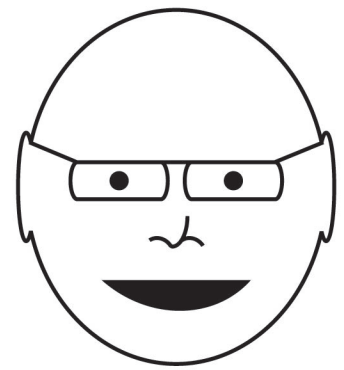
2. What is the most likely etiology of the muscle abnormality?

- A. Denervation
- B. Trauma
- C. Infection
- D. Neoplasm

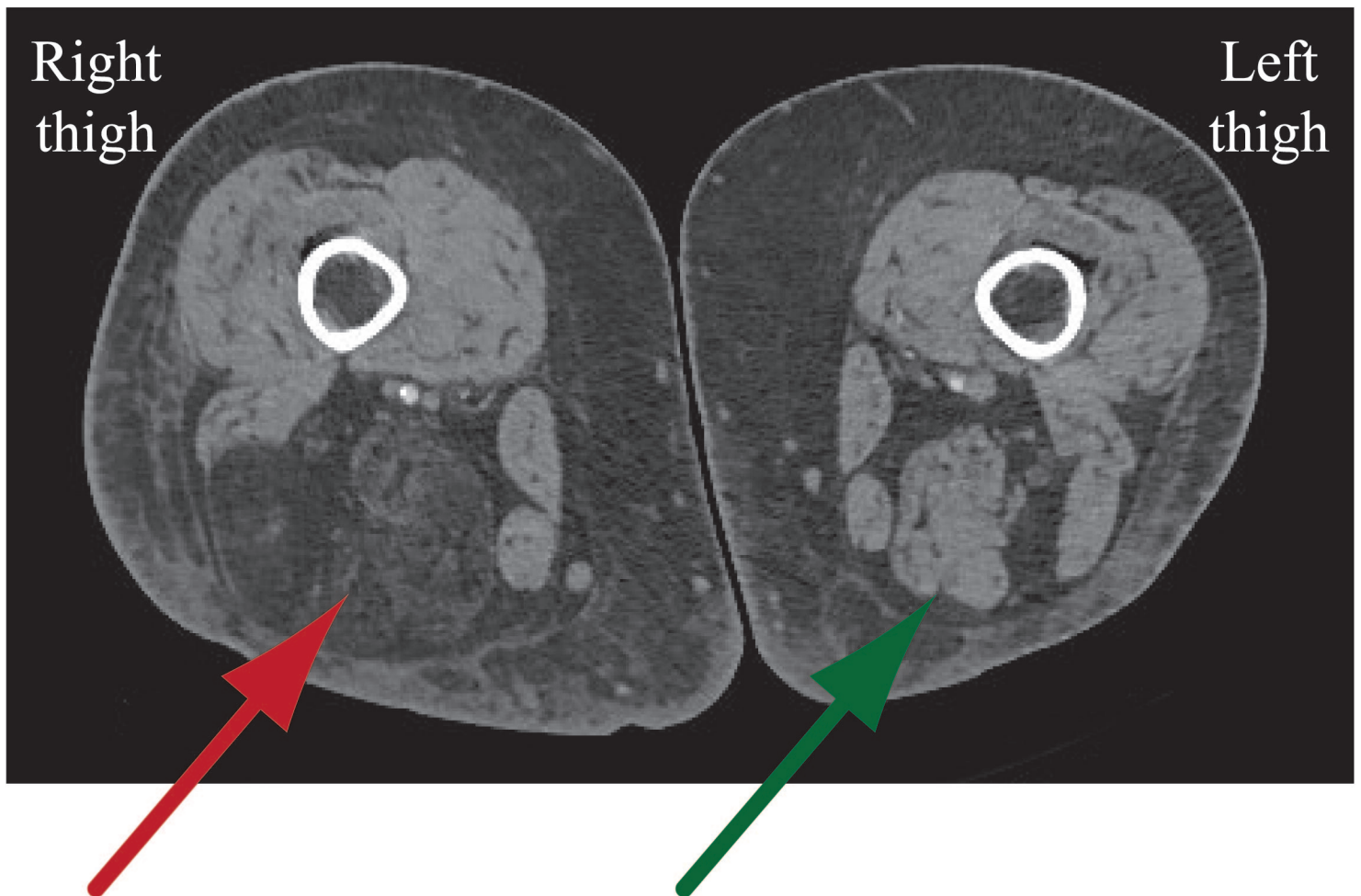


Wow, difficult case!



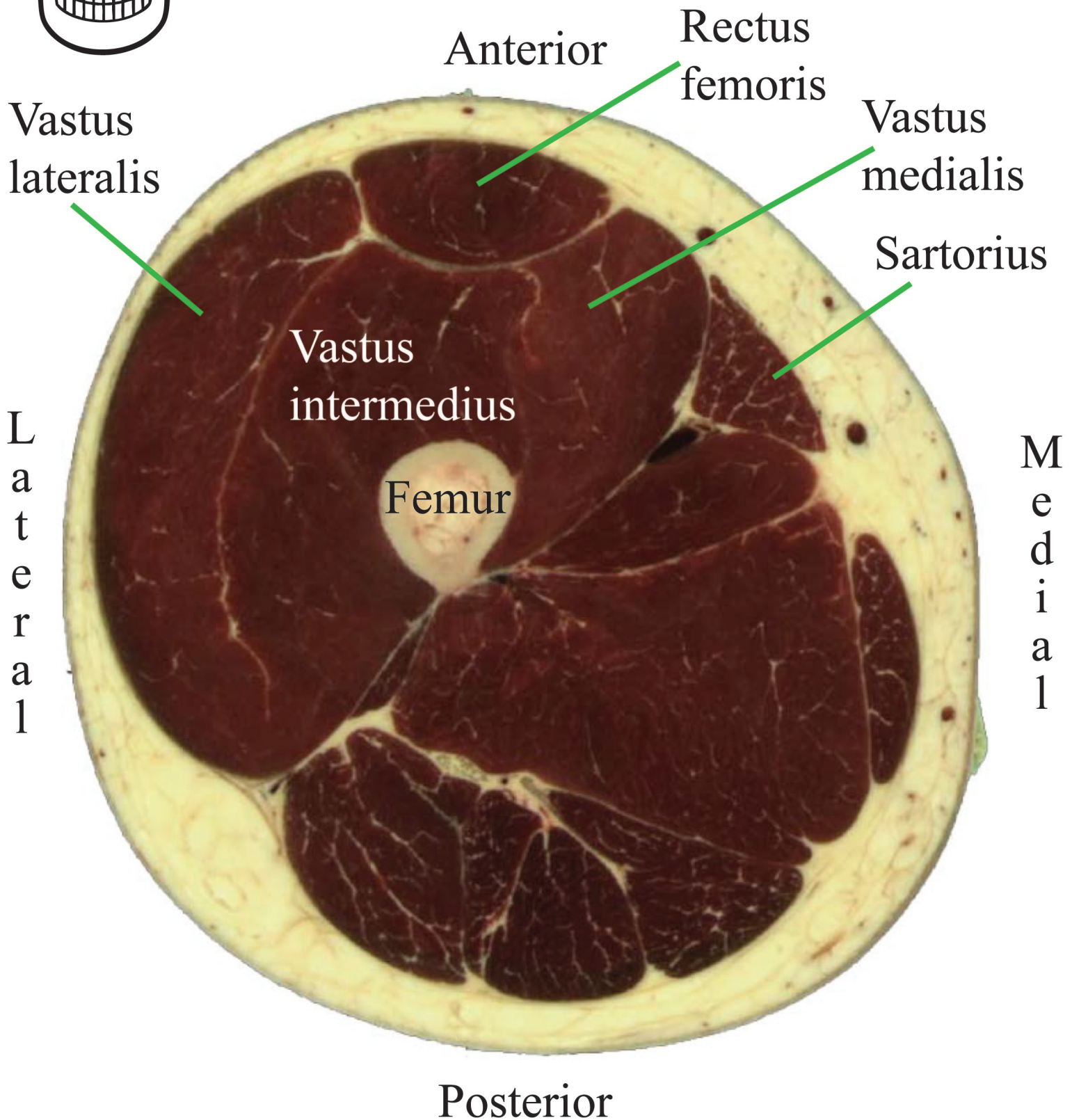


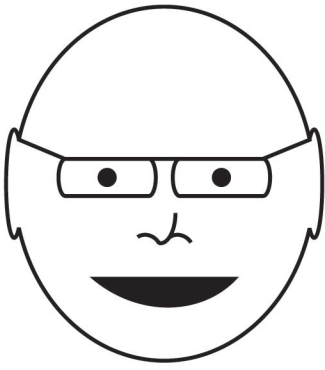
Actually, this is a fantastic case and will teach us a lot! The abnormal muscles (red arrow) are in the posterior compartment of the right thigh, notice that they are more lucent ie blacker than the same muscles (green arrow) in the normal left thigh. The cause in this case is denervation: loss of normal muscle innervation causes disuse atrophy of the effected muscles. There is a subtle clue to the diagnosis on this image which you will understand after we go over the anatomy, using images from the the visible human project.



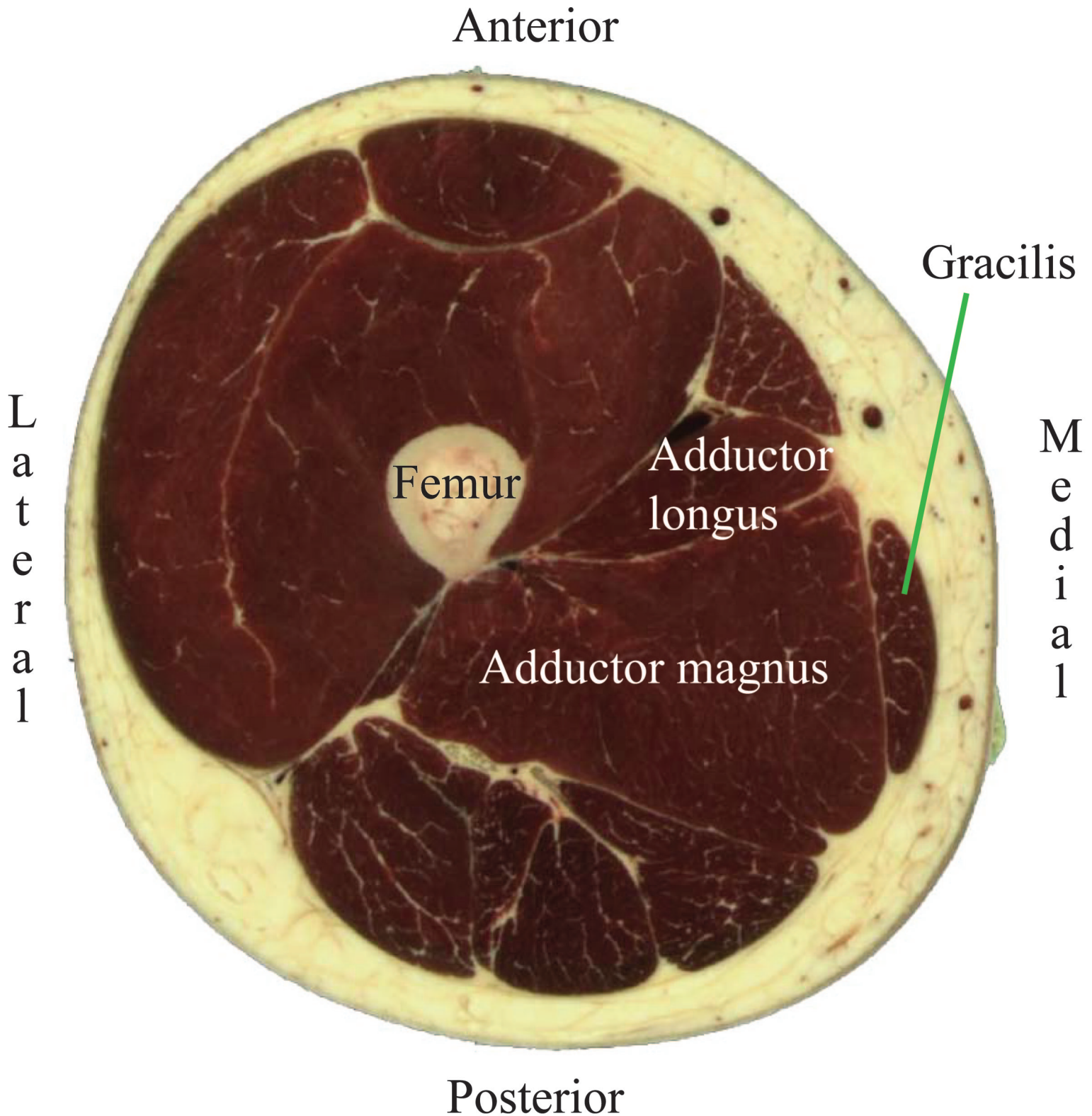


As usual, we will start with the anatomy, this time in the mid right thigh. There are 3 compartments in the thigh: anterior, medial and posterior. The anterior compartment muscles consist of the quadriceps muscles (Rectus femoris, Vastus medialis, Vastus intermedius and Vastus lateralis) and the Sartorius, all supplied by the femoral nerve.





By the time we have reached the mid-thigh, the only medial or adductor compartment muscles left are the Adductor magnus, the Adductor longus and the Gracilis, all supplied by the obturator nerve (basically).



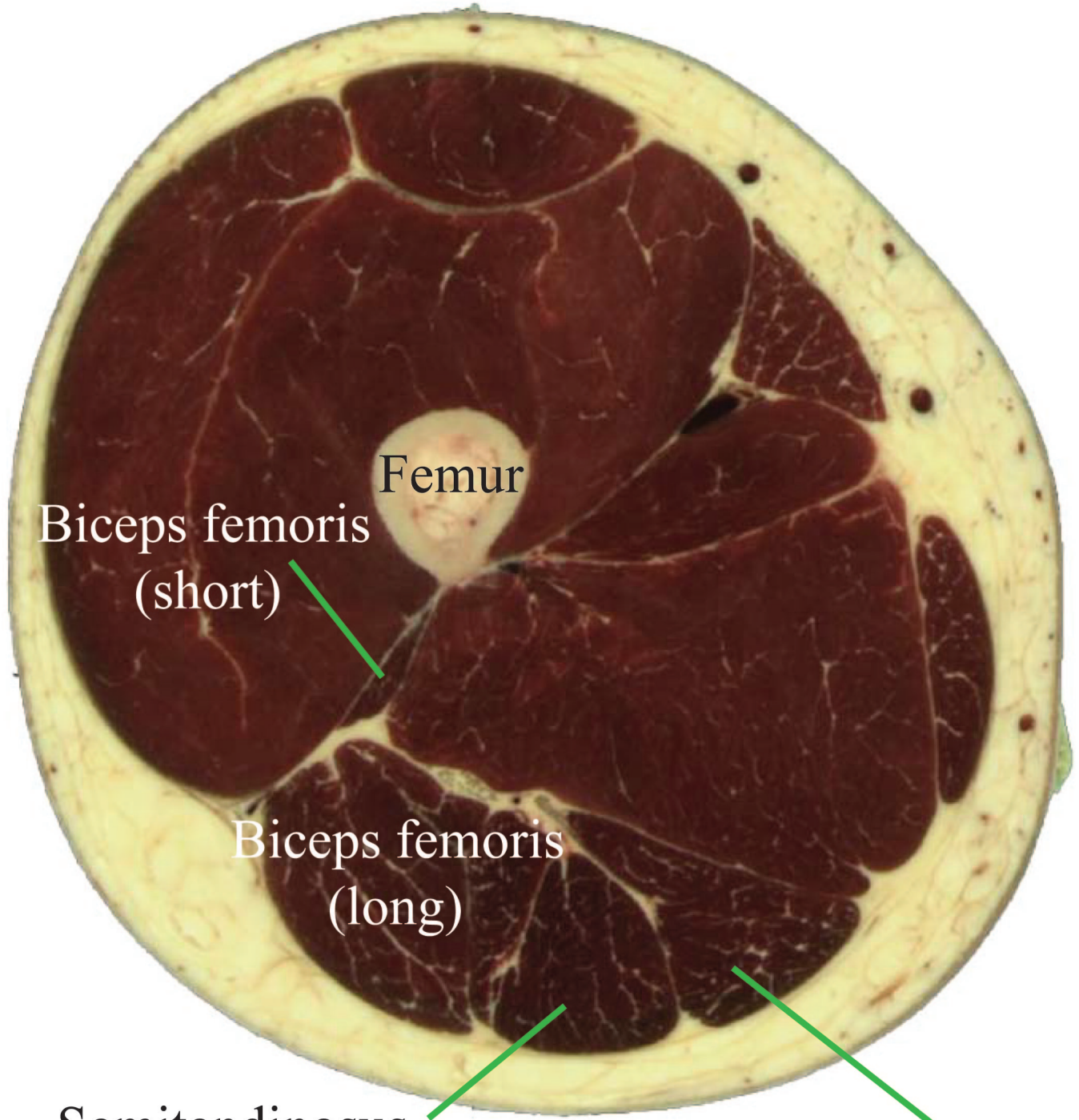


The last compartment is the posterior or hamstring compartment, consisting of the Biceps femoris (long and short heads), the Semimembranosus and Semitendinosus muscles, all (except one!) supplied by the tibial nerve.

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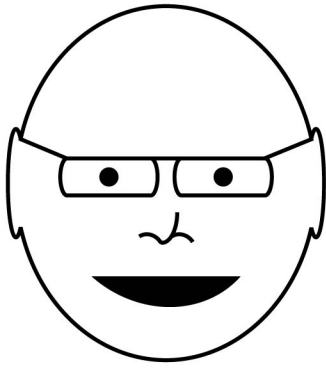
Biceps femoris
(short)

Biceps femoris
(long)

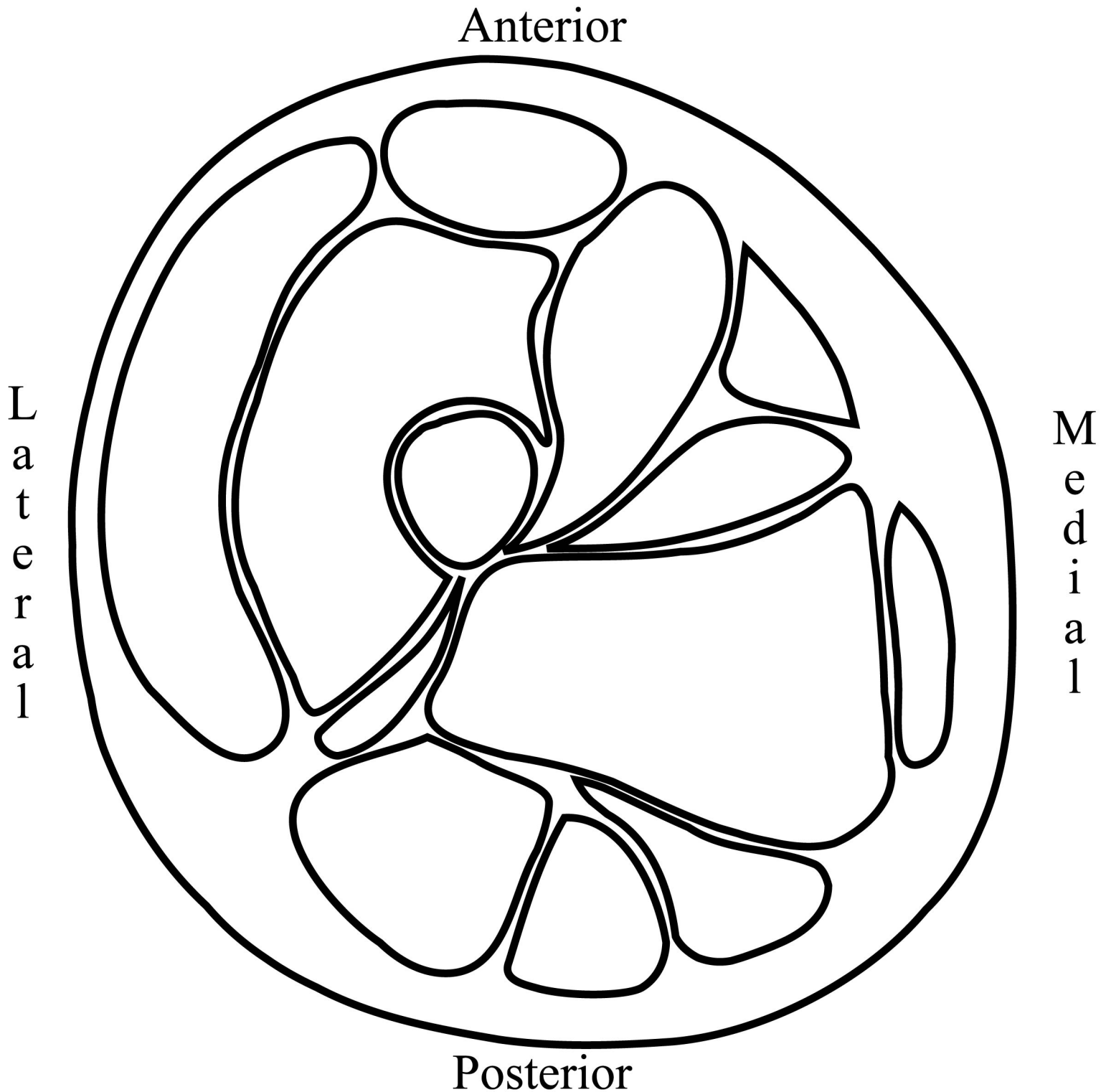
Semitendinosus

Posterior

Semimembranosus

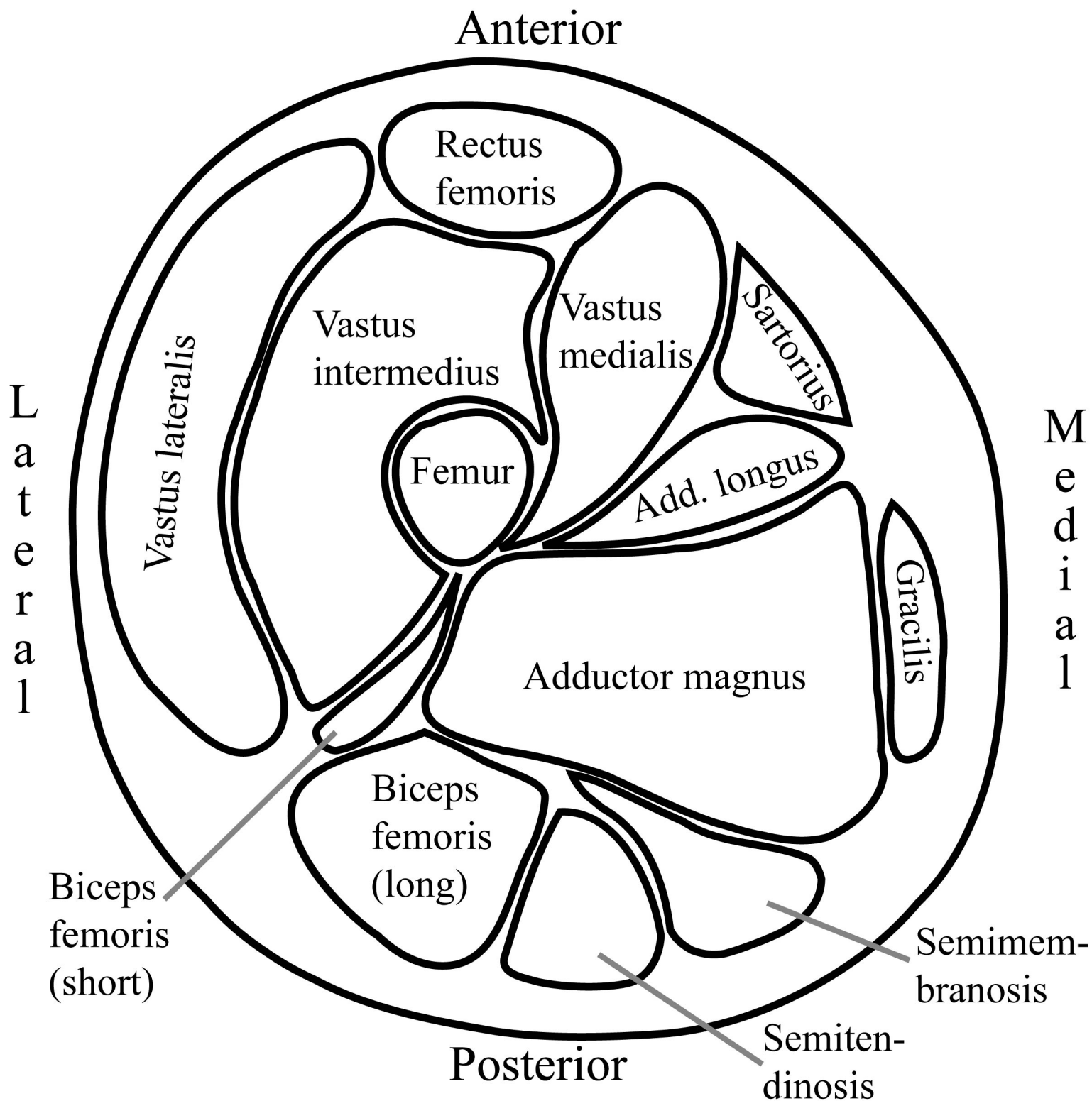


OK, now it's time to draw the muscles of the mid thigh. It is really complicated, so if you have to, go ahead and trace the schematic below and try to identify all of the muscles. The answers are available on the next page.

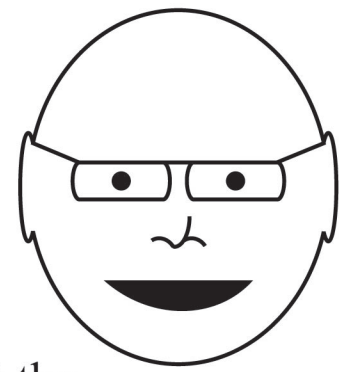




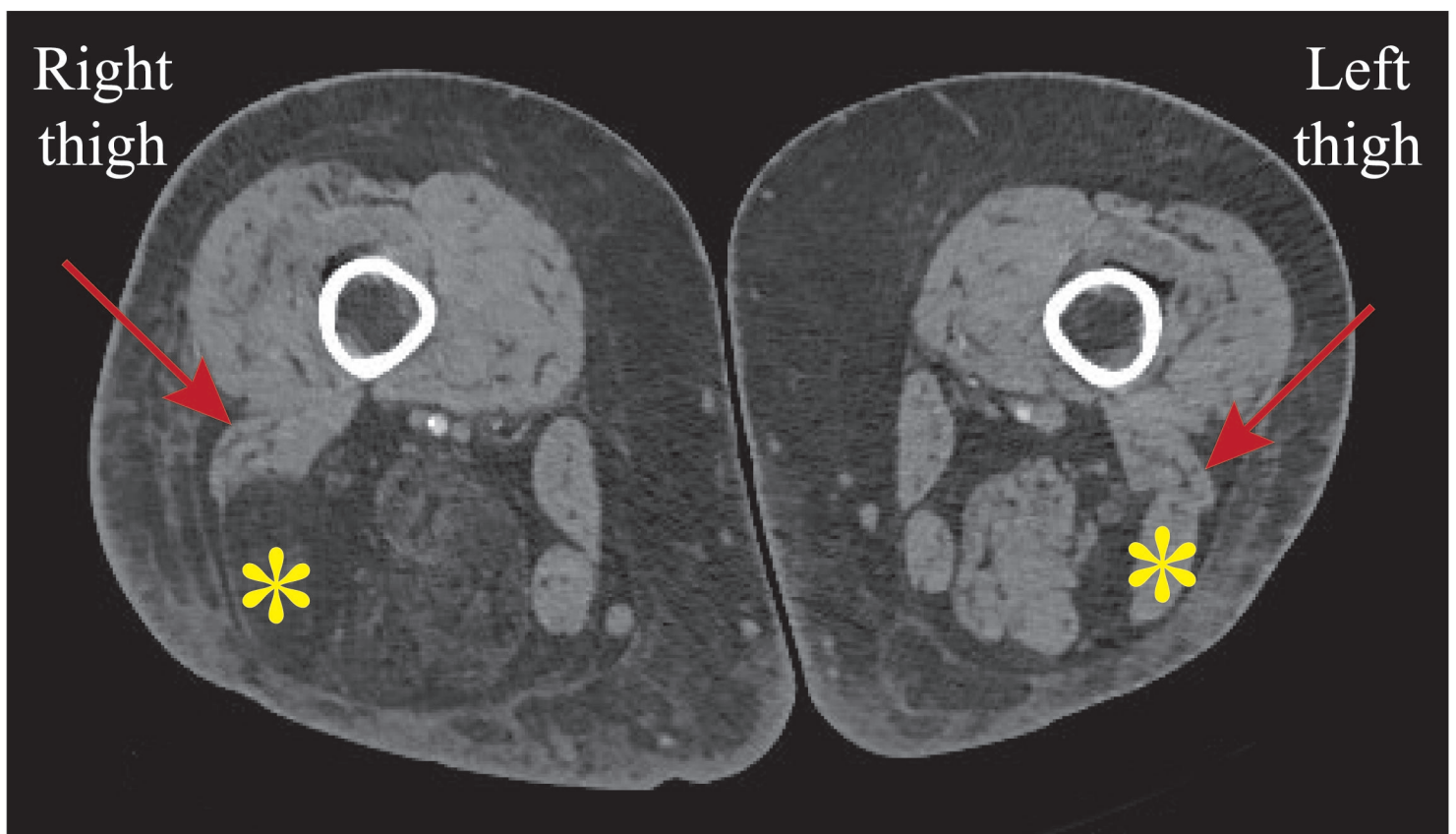
Here the muscles are labeled. See if you can remember the innervation and function of the muscles.

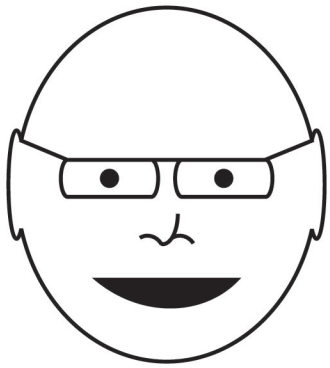


Yes of course, innervation! The hamstrings are supplied almost completely by the tibial nerve except for the short head of the biceps which is supplied by the common fibular nerve. This patient is a diabetic, which put her at risk for a mononeuropathy, essentially failure of a single nerve. In this case her right tibial nerve failed, leading to atrophy of all of the posterior compartment muscles except the short head of the biceps which was spared because of its separate innervation. The long heads of the biceps are each labelled with a yellow asterix, the left is normal and looks like all of the normal muscles, the right is fatty replaced and has the same appearance as the subcutaneous fat. Both short heads (red arrows) are normal.

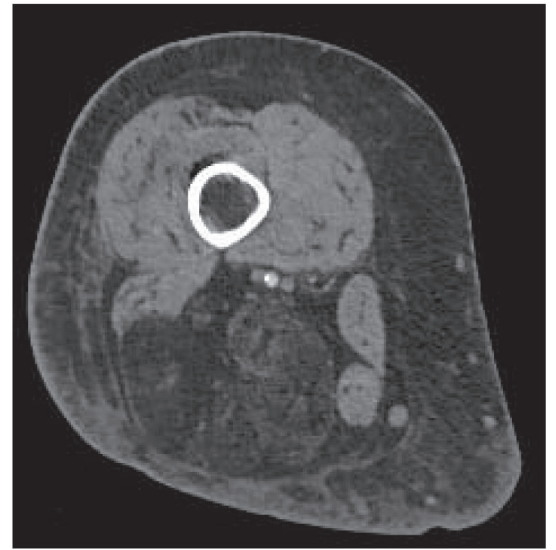


I see that you are easily excited.





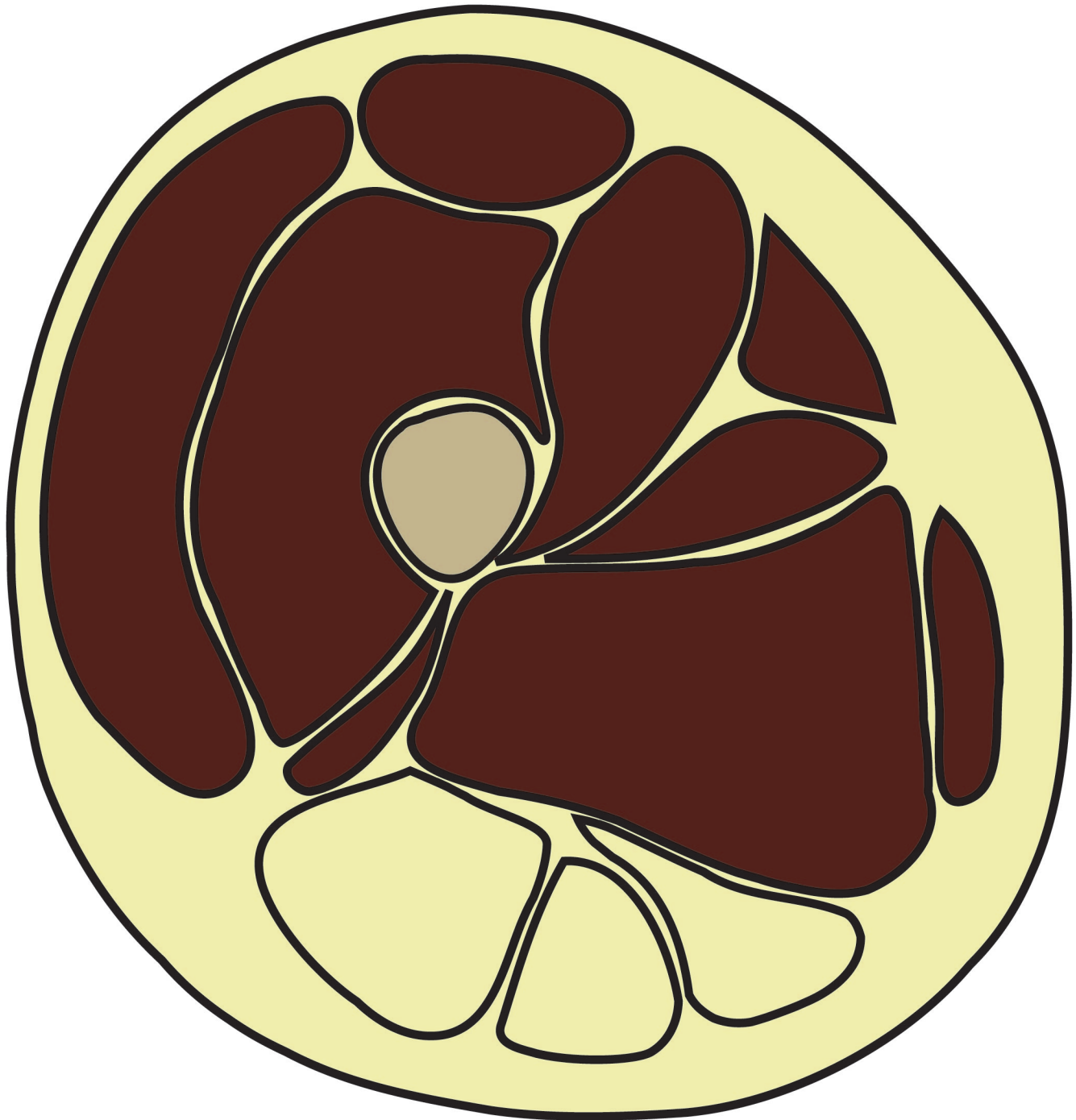
We can make our drawing look just like our case! Or at least similar. The drawing and visible human image are a little more proximal than the image in our case. I did that so we could see the muscles better.



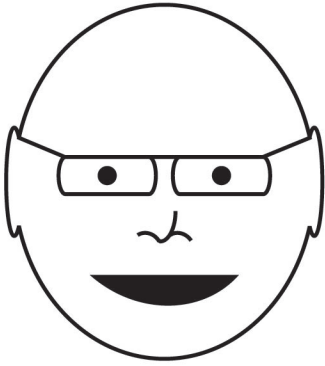
Anterior

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Posterior

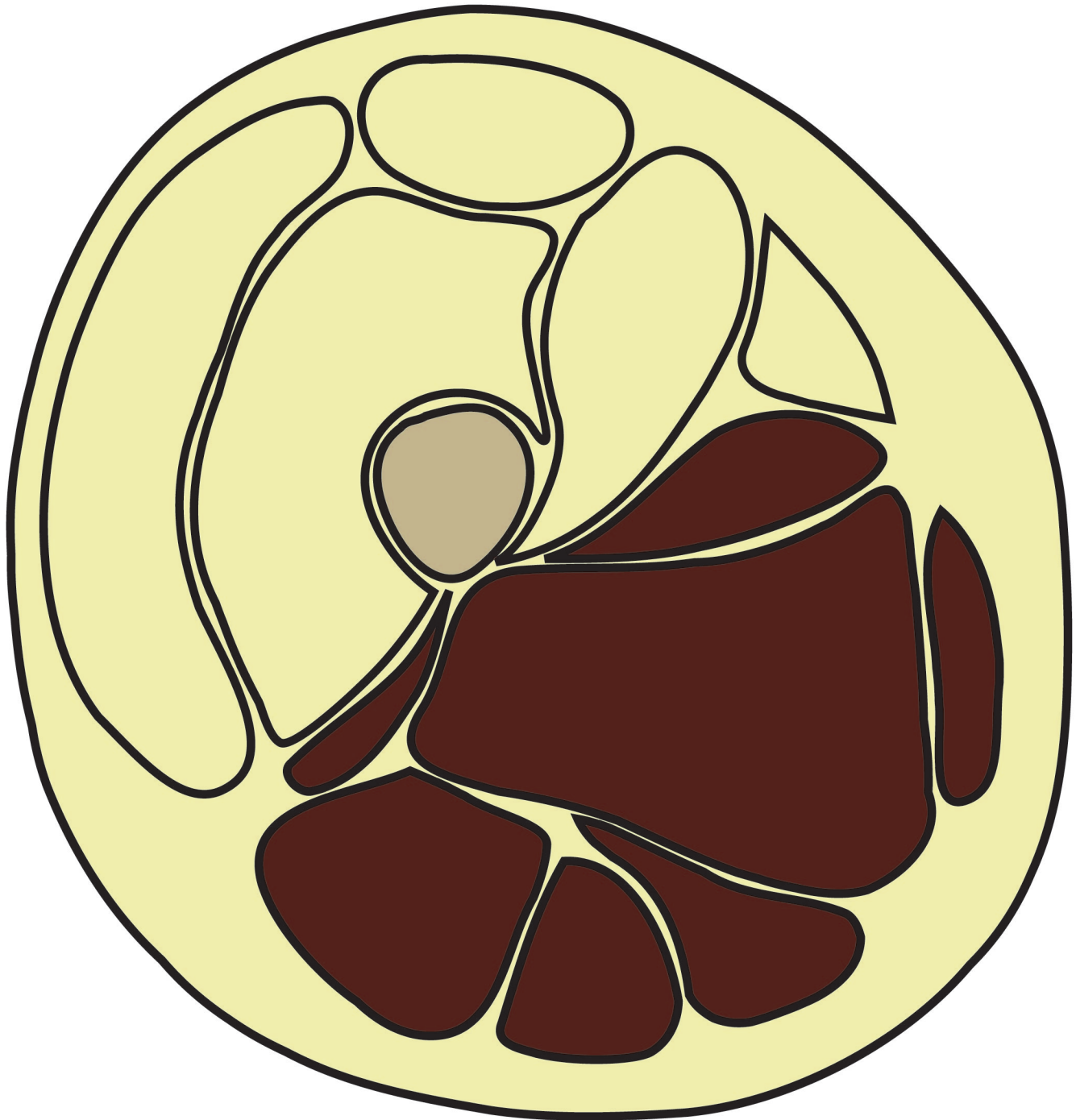


OK, now which nerve has failed!?
You should be able to tell me based
on your knowledge of anatomy.

Anterior

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Posterior

I'm diagnosing you with a severe acute case of Adobe Illustrator toxicity and am prescribing a six pack of IPA and one season of "Game of Thrones".



Only if you'll join me! That's it for this action packed episode of Anatomy Comics, join us next week when we journey to the compartments of the ankle and meet Tom, Dick and Harry!!

