

# The 'Fourth'

# Hamstring

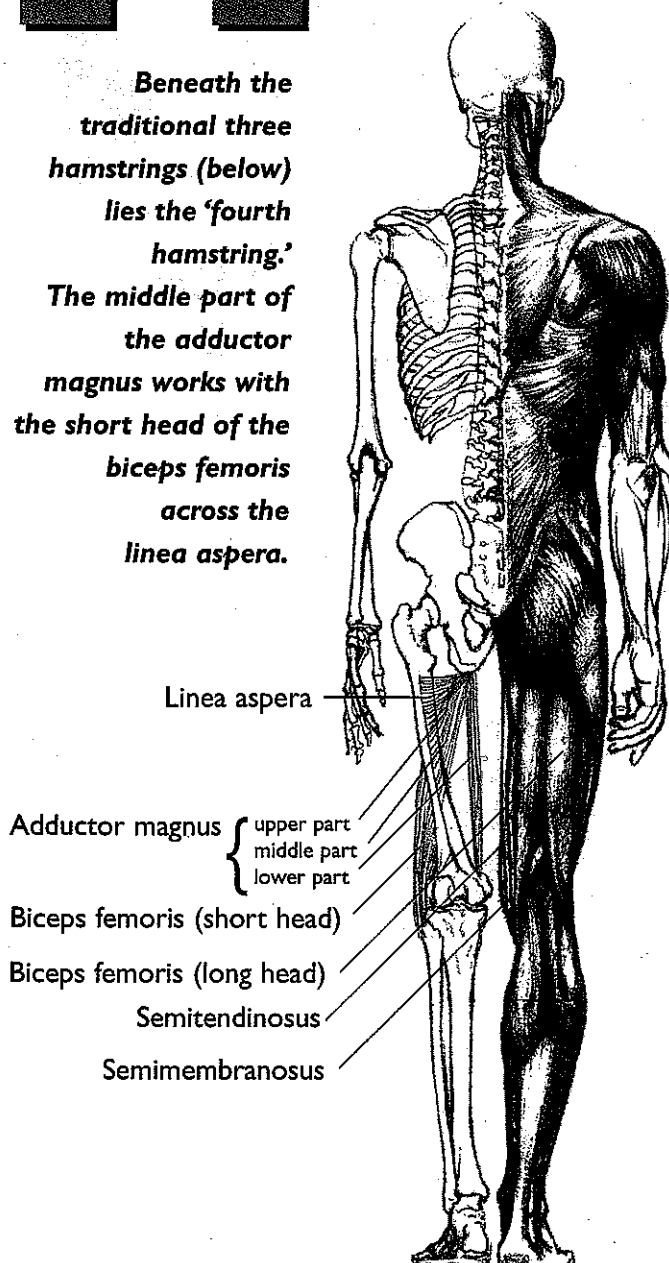
WORKING WITH THE HAMSTRINGS

PRESENTS A NUMBER OF PROBLEMS ...

**By Thomas Myers**

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**Beneath the traditional three hamstrings (below) lies the 'fourth hamstring.' The middle part of the adductor magnus works with the short head of the biceps femoris across the linea aspera.**



**E**verybody 'knows' there are three hamstrings, but my own work with the back of the hip and leg got a lot more effective when I discovered the fourth one.

Just to set the scene, the hamstrings are three muscles, known formally as the ischio-crural muscles which fill the posterior compartment of the thigh. They originate from the Ischial Tuberosity (IT), and widen as they go down to insert into both sides of the lower leg. There are two medial muscles – the semitendinosus, which inserts into the medial side of the tibial condyle as part of the triple tendon insertion called pes anserinus (goose's foot); and the semimembranosus, which inserts just behind and below it. The lateral muscle, the biceps femoris, likewise starts on the IT, but goes to the fibular head on the lateral side. The biceps is the only muscle (though quite a strong one for all that) that pulls up on the fibula, while all the rest of the lower leg muscles (e.g., the soleus, three peroneals, flexor hallucis longus, etc.) pull the fibula down.

Working with the hamstrings presents a number of problems, not least of which is how resistant they are to being stretched, being so dense with their stringy fascial underpinnings, and their tendency to be recontracted by clients as soon as they walk out the door.

There is another problem, though, and that is that all three hamstrings are two-joint muscles. If you "let your fingers do the walking" from the origin of the ham-

strings on the IT to their insertions below the knee, you cross both the hip and the knee joints. Inevitably, then, the muscles act on both of them, extending the hip and flexing the knee as they contract. (Let us leave out any rotational action on either of these joints for now and stick to the sagittal plane motions of flexion and extension.) Certainly, the hamstrings prevent hip flexion in stand-

'locals' which lie beneath the 'express' train of the hamstrings.

One part of the fourth hamstring is the short head of the biceps, which starts out from the same attachment at the head of the fibula, but splits from the long head. It crosses only the knee to attach to the lateral side of the linea aspera – the 'rough line' that stretches up and down the back of the femur. Now, let your eye trav-

only one. Besides all the other work you might do in the surrounding field of the myofascia, let's look at what can be done with these two underlying pieces. The short head of the biceps is especially implicated in cases where, in relaxed standing, the tibia sits behind the femur. Be careful. Because of the muscle mass on the front of the thigh and the back of the lower leg, it may appear as

***To reach and work with this muscle, lie your client on their abdomen with the knee flexed (foot up in the air). Go just medial to the large biceps femoris tendon, about 2 inches to 5 inches above the knee crease, and press in.***

ing to keep us from folding up.

They surely are used in running to actively extend the hip. But if all these muscles cross two joints, how does the body modulate their effect, allowing them to flex the knee sometimes while at other times extending the hip?

The standard answer, and it definitely is part of the story, is that by selective contraction of antagonistic muscles, like the quadriceps, we can isolate one action of the hamstrings. This explanation, however, is insufficient to help the bodywork therapist with the postural positioning of the hamstrings, which often stubbornly persist in maintaining a posterior tilt to the pelvis even when the knee is free.

At other times, the knee seems held in flexion (or, more commonly, the tibia is held posteriorly relative to the femur), while the pelvis seems to be free to move from posterior toward anterior tilt. The refinements of the hip-femur-tibia-fibula relationship is left to the 'fourth' hamstring, a set of two, one-joint (monarticular) muscles hiding under the other three. If we lift them up, we can peer underneath to see the two

el along the illustration. If we keep going, imagining the linea aspera as just a local train stop on a longer track, what keeps going in the same direction? Don't know? Don't worry, you are not alone.

The answer is labeled for you: The middle section of the adductor magnus. The adductor magnus lives up to its name – it is huge and actually comprises several muscles. There is the adductor minimus portion, which is the top part which lies just below the quadratus femoris at the top part of the linea aspera. The middle part, which we are attempting to call 'adductor one-joint hamstring' (but don't look for the textbooks to change soon), goes from the bottom of adductor minimus to the top of the adductor hiatus, and interacts with the short head of the biceps. The lower part, below the hiatus, goes to the femoral epicondyle just above the knee, and could be called a one-joint gracilis.

#### **How to reach, work with the fourth hamstring**

Can you see it now? The fourth hamstring mimics the biceps femoris, but instead of jumping two joints, each part of it jumps

though the lower leg is sitting behind the upper. To see whether the tibia is truly posterior relative to the femur, you have to mentally undress the skeleton of its musculature and see whether the bony relationship is off. Look at a few dozen people from the side, and you will be able to tell the difference. This small muscle also is implicated in cases where the knee is held in chronic flexion while standing, but these cases are fairly rare.

To reach and work with this muscle, lie your client on their abdomen with the knee flexed (foot up in the air). Go just medial to the large biceps femoris tendon, about 2 inches to 5 inches above the knee crease, and press in. You will find a small muscle mass there, too low on the thigh to be the main belly of the long head of biceps. This is the short head. You can stimulate it from here easily. To lengthen it, hold it firmly but gently to the back of the femur, and then have your client slowly lower their leg back to the table. The client's work does the stretching, you just have to hold it. You can repeat this a few times, generally holding the muscle a little more strongly or deeply each time.

## fourth hamstring

To work with the middle part of adductor magnus is not as easy. Lie your client on their side this time, with the upper leg flexed at the hip and a knee resting on a pillow, so the inner aspect of the thigh on the table is available. Find the division between the hamstrings and the

adductors by conducting this test: If you give the client something to push against while they bring their knee back along the table (hip extension, as in running), the hamstrings will tighten up. If the client lifts their foot straight for the ceiling, the adductors will pop into tension.

By keeping your hand lightly on the back quadrant of the thigh, you will find the border between these two groups. Sink into the valley of this division, about halfway between hip and knee, and you will be working on the middle part of adductor magnus, the hip extensor part of the fourth hamstring. If the client presses the outside of their knee into the table, it will relax the muscle. If the client takes their knee forward and back along the table, they will periodically use and relax it. In any case, the muscle is there to work on, whatever your method of choice.

Through working on these two underlying myofascial structures, stubborn hamstrings can sometimes be persuaded to melt, or at least to allow the hip-femur-tibia relationship to shift. Thinking this way breaks down the artificial boundaries we humans like to put up: adductors are adductors, and hamstrings are ham-

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strings. Despite all these neat little divisions we like to make in the service of clear learning, let us not forget that the body works in a seamless continuity of function. There are a number of places in the body that work just this way - a long multi-joint muscle lying over a number of single-joint muscles which are the real workhorses. What are the muscles which underlie (and replicate) the biceps brachii? The sternocleidomastoid? The monarticular muscles are generally older (in terms of evolution) and sturdier.

They are, therefore, more likely to be involved in postural patterns and inviting us to stand still in meditation. The overlying polyarticular muscles allow us a graceful acceleration and coordination in movement. They are inviting us to dance. **MAB**

*Thomas Myers, Certified Advanced Rolfer, is known around the world as a writer and teacher on the art and science of structural integration, having studied with eminent bodyworkers Dr. Ida Rolf and Dr. Moshe Feldenkrais. He has served as chair of the Rolf Institute's Anatomy Faculty and as a founding member of the National Certification Board of Therapeutic Massage and Bodywork. Myers is a featured lecturer at the Multidisciplinary Approaches to Myofascial Pain Conference, Oct. 23-25, 1998 in Berkeley, Calif. For more information on the conference, call The International Alliance of Healthcare Educators (IAHE) at (800) 311-9204, ext. 9498. Myers can be reached at 20 Roundabout Dr., Scarborough, ME 04074, or by phone at 207/883-2756 or 888/546-3747.*

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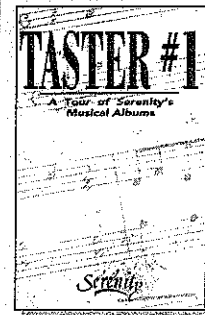
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