

# Orthopaedic Observations

## A Matter of Medicine ...

TM Pending

### “I Pulled a Hammy!”

By Brian Tenenhaus, MPT



The nice, middle-aged lady sat in the waiting room, looking onwards as her husband toiled through the exercises, sweat collecting on his brow, when she noticed how many of the patients were doing leg exercises. She wondered more specifically what was wrong with each of the patients. Moments later, a gentleman sat next to her, waiting for his appointment, when they started talking. She asked him, “Why are you here?” “I’ve got bad knees!” he proclaimed. “What about you?” She responded, “Luckily, I’m doing ok, but my husband over there, he pulled a hammy?” “Pulled a hammy?” The gentleman’s facial expression switched to confusion with the drop of a hat. He thought to himself, “What on earth is a hammy?”

*Hammy*, is slang for *hamstrings*, the muscle that covers the back portion of one’s thigh. It is comprised of three different muscles: biceps femoris, semitendinosus, and semimembranosus. On the front of the thigh sits the *quadriceps muscle*, formed by four muscles that work in unison to kick your knee forwards. The quadriceps are often injured by soccer or football players, while the hamstrings are more vulnerable during acceleration phases of running. Both sets of muscles play vital roles in ambulation (walking) but when used separately of one another, they also have key functions in life. For instance, something as simple as pulling the bed sheets up with your foot, while laying in bed, is primarily performed with the use of your hamstrings muscles. On the other hand, the “kicking motion,” which allows one to walk properly, is primarily performed by your quadriceps muscle.

Unfortunately, these muscles can be injured if they are overused, or overloaded. Muscle strains are basically small tears of the muscle belly. The tears can be graded on three levels, grades I and II being small or medium in size, with no permanent damage/defect. A grade III tear is a full muscle tear, nearly always at the myotendinous junction. The muscle is usually weaker at the junction where the muscle becomes a tendon, usually within 1-2 centimeters of its attaching point to the bone.

The idea that these types of injuries only take place in athletes is a myth, as many people can actually injure themselves while at work or doing basic exercises without proper warm-up and cool-down. One gentleman was carrying a heavy, awkward object up a narrow stairwell (you know you’ve found yourself in this predicament once or twice) when his leg gave way. The attachment of the muscle to the kneecap snapped.

This is called a quadriceps tendon rupture. More than likely, this is the type of injury that requires surgical repair, a situation where the doctor will suture the muscle down to the lower leg bone, possible drilling holes in the bone in order to create a strong point to anchor the muscle to. In recovering from this surgery, the patient will require weeks to months of rehabilitation in order to obtain full recovery. During the first few weeks after surgery, the patient will be required to wear a long leg brace to allow the muscle ample time to heal in its most relaxed state.

In the quadriceps tendon rupture, the lower portion of the muscle avulses (detaches) from the bone. It would be palpated (felt) as a divot in your thigh, assuming that the entire muscle detaches (there are instances when a few muscle fibers don’t detach and it will feel like the muscle is intact, but other symptoms like pain and weakness might lead you to believe otherwise.) Two other ways that this injury could happen are: during quick deceleration while running or while holding onto something heavy when leaning back, trying to slow it down. The reason for this is that the amount of load placed on the muscle during an *eccentric* muscle contraction is too large for the muscle to handle. 2

A much smaller version of the full muscle tear is a small muscle tear, more commonly known as a *pulled muscle*. The simple cause for this is poor stretching before and after exercises. Other causes include muscular fatigue, dehydration, or faulty biomechanics during activity. In looking at your calf muscle (gastrocnemius-soleus complex), it is often strained while bearing full weight on one leg, when the body

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weight is mostly in front of the lower leg. This places the calf at its weakest point with the greatest load. The quadriceps muscle is most susceptible to injury when understriding while slowing down momentum during running. Usually, the body is leaning back, thereby placing the muscle at a heightened load while simultaneously being in a fully stretched position. The hamstring muscle, on the other hand, is most vulnerable when taking too large of a stride when running and leaning forward. One would also be at high risk when planting the foot to place-kick a soccer ball or to punt a football. 2

Typically, *muscle strains* heal rather swiftly due to the tissues rich blood supply. This is assuming that the injury is in the muscle belly, and that the patient can take a break from vigorous activity in order to let the injury heal. Healthy blood helps oxygenate the tissues as well as rid the injury of unwanted toxins. Rest, Ice, Compression and Elevation (R.I.C.E.) are necessary to assist with the healing as well. Lastly, non-steroidal anti-inflammatory drugs may be in order to speed up the healing process.

Another injury that is quite commonly seen in all variations of the population is an irritation of the tendon that attaches the kneecap to the front of your lower leg. It is called *patellar tendonitis* or jumper's knee, most common in basketball players, especially in the middle aged population. It is an inflammation to the tendon, usually from excessive load on the front of the knee where the tendinous structure takes all the force from the ground up. It is not only seen in runners or basketball players, but in people that do frequent amounts of stairs, kneeling, and/or squatting. In the geriatric population, it could be a task as simple as getting up from the chair that sends a sharp pain into the front of the knee.

*Patellar tendonitis* is often characterized by a feeling of pain and tightness in the front of the knee. Swelling may be noted, however bruising or discoloration is less likely. Some of the other causes that could lead to patellar tendonitis include: sudden change in training methods, sudden increase in frequency or duration of training, quick transition from sport to another, poor baseline strength of the quadriceps muscle, and/or improper mechanics or technique during activities. Lastly, a poor quadriceps to hamstring muscle ratio could create a muscle imbalance that could also predispose one to any of the aforementioned injuries.1

In general, treating the above injuries vary, depending on the symptoms. For a recent injury, ice and compression are indicated. This would be for at least 2-3 days, depending on the severity. In severe injuries, seeing the doctor immediately is necessary. In the instances where surgery is required, the longer the patient waits, the greater the diffi-

culty in repairing the injured tissue. The time where an injury has its greatest capability to heal is just after the injury, when the tissue is still viable and rich in blood supply. For this reason, the old adage, "wait and see" is not always most appropriate.

Physical therapy is often indicated for any of the above injuries. For less severe injuries, an ice massage (using an ice cube with a towel) to rub back and forth along the tendon is effective. Ice massage is especially effective for patellar tendonitis. The therapist provides stretches and strengthening exercises that are customized to your body type and to your specific injury. Certain exercises that one may do on his/her own could exacerbate different injuries, thus demonstrating the importance of seeing a skilled medical practitioner.

It is important to see the physical therapist for at least one to two sessions in order for them to help the patient transition to a home exercise program. This allows you to do the exercises in your home environment. In many cases, the therapist will also be able to perform various manual techniques that may aid in the healing of your injury. One example of a manual technique would be a deep friction massage for the patellar tendon irritation on the tissue just below your kneecap. This massaging technique can help break up scar-like-adhesions that bind to the tissue and cause the patient to feel pain.

Hurting your leg, whether it be during a sporting event, while working in the garden, or while on the job, will never be easy to handle, but if handled properly, the recovery will go more smoothly. Rehabilitation definitely requires a proper mindset, but once finding that state of mind the healing process can be mitigated with proper therapy and good compliance of what your doctor asks you to do. So, hopefully it will be you taking your husband or wife to therapy while you're cheering them on from the waiting room. If it is you, and not them, do your best to approach it with the best attitude possible, in order to obtain your best possible result at achieving 100% return of that leg of yours.

#### Works Cited

1. Athletic Advisor "Injuries: Patellar Tendinitis" 4 June 2006 [www.athleticadvisor.com](http://www.athleticadvisor.com) 29 May 2009
2. Orchard, John. "Biomechanics of Muscle Strain Injury." *NZ Journal of Sports Medicine* 30 (2002) : 92-98.

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