Quadriceps Strain

Muscle strains are quite common, especially in those who actively participate in sports. There are three sets of muscles in the thigh: the quadriceps muscles along the front, the hamstring muscles along the back and the adductor muscles that are on the inside. The hamstrings and quadriceps work together to straighten and bend the leg, while the adductor muscles pull the legs together.

The quadriceps and hamstrings are particularly at risk for a strain because they cross along the knee and hip joints. They are commonly used in high-speed activities, such as running, long jump, hurdling, football, soccer and basketball. If the force applied to the muscle is more than the muscle fibres can take, there is a risk the fibres will split under the load.

A muscle strain is a separation or tear of the muscle fibres. The tear could be small, as in cases of a grade I muscle strain, or medium (grade II), or a full rupture of the muscle (grade III). Fortunately grade III quadriceps muscle tears are rare, and most injuries are grade I muscle strains.

Quadriceps Strain Anatomy

The quadriceps are comprised of four muscles: rectus femoris, vastus lateralis, vastus intermedius, and vastus medialis. The term quadricep literally means “hour heads”. The quadriceps run along the front of the thigh from the hip to the knee. They attach around the pelvis, and at the knee the quadriceps attach to the patella (kneecap).

On the opposite side of the leg you have the hamstring muscle group, comprised of three muscles, and this functions in the opposite manner to the quadriceps, making them antagonists.

How to Treat a Quadriceps Strain:

1. **Rest and Recover**
   Take a break from any of those activities that caused the strain to happen in the first place. It might be necessary for you to use crutches to avoid placing a lot of weight on the leg that was injured if the tear is bad. If not, gently using the leg is fine (e.g. walking) but avoid any jumping or running until your therapist gives you the go-ahead.

2. **Ice and/or Heat**
   Apply ice to the affected area for 5-10 minutes at a time three to five times per day. Make sure to wrap the ice in a thin towel to prevent any ice burn from occurring. The ice will help to alleviate pain and swelling in the injured muscle. Adding compression to the area can also help. If you do not find ice helps, you can try heat instead. Heat will help stimulate fresh blood flow to the area delivering nutrients. Some people find contrast bathing (ice and heat alternated) very useful.

3. **Elevation**
   To help keep the swelling at a minimum, keep your leg propped up higher than your heart level. The more you can stay off the leg, the better it is going to be for the healing process.

4. **Physical Therapy**
   As the pain and swelling decreases, you can use physical therapy to help you improve your strength and range of movement. Make sure the muscle is at full strength before you return to any sporting activity to prevent additional injury. Therapists will use soft tissue techniques as well as rehab exercises to help you recover. Some therapists will also use ultrasound and Laser to speed up tissue repair.

5. **Check Biomechanics and Technique**
   It may be that your leg biomechanics are not good, or you have a muscle imbalance in the leg. Sometimes it can be due to poor technique in a sport, or your gait. In either cases, seek a biomechanical assessment from your therapist or talk to your coach about your technique in case there is something you are doing which could be improved.

Tips:

- Tight muscles are prone to strains. Follow a daily program of stretching exercises throughout the year.
- Since the hamstrings and quadriceps work together, if one isn't as strong as the other, the weaker muscle can get strained.
- If the muscles are weak, they aren't able to handle the stress of exercise and are prone to injury.
- Fatigue will reduce the energy-absorbing capabilities in the muscle, which leaves them open to injury.
- Make sure to warm up before engaging in any sporting activity.