



Part V: Patellofemoral Syndrome (knee cap pain)

Patellofemoral Syndrome is one of the most common causes of knee pain in runners. It is also a very common problem for women of **all** ages and activity levels due to poor tracking of the knee cap. The pain can be located under and around the knee cap. It can be a sharp or dull pain. It is generally made worse by walking downstairs, walking downhill, prolonged sitting, and squatting. A grinding or clicking may be felt. The pain is caused by tissue overload. This overload may be due to training errors such as excessive hill work, stairs, or too much distance. The patellofemoral syndrome caused by repetitive overuse in the presence of underlying poor alignment of the legs can be effectively treated.

A physician or physical therapist can examine the knee with particular attention to the biomechanics of the knee cap. The knee cap should have a resting position in the center of its groove in the thigh bone (femur). The knee cap is a “floating bone” that is attached by a tendon to the lower leg (tibia). The purpose of the knee cap is to transmit power from the quadriceps to the lower leg. The knee cap glides up and down a groove in the femur as the knee bends and straightens. If the knee cap is laterally displaced there may be a tight lateral retinaculum (restraining tissue on the outside of the knee cap) and a relatively weak vastus medialis (one of the quadriceps muscles that pull the knee cap inward). This combination allows the knee cap to “float” to the outside of the knee. Because the knee cap is no longer traveling symmetrically in its groove there is painful irritation of the knee cap. Eventually, roughening of the smooth underside of the knee cap may occur.

Common factors in patellofemoral syndrome:

1. Tight soft tissues on the outside of the knee.
2. Weak and uncoordinated vastus medialis (one of the 4 quadriceps muscles).
3. Weak hip musculature.
4. Lack of flexibility. Tight iliotibial band (ITB), calf, hamstrings or vastus lateralis muscles.
5. Over-pronation of the feet.

Treatment

1. Taping of the patella to hold the knee cap in a pain free position and to simultaneously stretch the soft tissue on the outside of the knee. This technique can be self applied and easy to learn. The tape can be purchased at a physical therapy clinic.
2. Quadriceps strengthening which is pain free and concentrates on the timing and coordination of the vastus medialis. A biofeedback machine is used to specifically train the muscles to function correctly.

3. Strengthening of the hip muscles so that the knee is positioned directly over the foot when standing on each leg. These exercises can be done at home and practiced on stairs and hills.
4. Stretching using techniques for leg muscles and the IT Band to gain flexibility and mobility of the knee cap. These are different than the stretches used to warm up before exercise.
5. Orthotics to control and slow down the rate of pronation so that the knee can stay over the foot.
6. Functional retraining of running, jumping, stair climbing or any other painful activity.
7. Anti-inflammatory medication (prescribed or over the counter) to reduce inflammation and resulting pain so that progress can be made with **active** rehabilitation. This condition worsens with too much rest.
8. Ice packs for 15 minutes at least twice a day.

For patients and athletes to return to their desired level of activity, their post injury strength and flexibility often need to **exceed** the preinjury level. It makes sense that the previous level of fitness was inadequate to withstand the mechanical loads of the desired activity. To safely rehabilitate, the person must first modify activities and reduce the exercises to a pain free level in the patellofemoral joint. Eventually the exercises must be progressed to replicate the athletic and everyday forces on the knee. When treatment consists only of rest and medication, the pain will reoccur. Stretching, strengthening exercises and sometimes orthotics must be used to re-balance the patella.

Next week: Part VI --More Knee Injuries