

Pain at the Side of the Knee: Iliotibial Band Friction Syndrome

Description

Iliotibial band friction syndrome is an overuse injury of the iliotibial band, the broad tough band of fibers that runs down the outside of the thigh passing the knee. This injury is caused by the fibres of the band rubbing on the femur bone, just above the knee joint where there is a bony prominence (*figure 1*). The iliotibial band is an extension of the tensor fascia lata muscle which is located at the side of the hip. Risk factors are bow legs, over pronation, worn out shoes and running on cambered surfaces. These factors all cause extra tension on the iliotibial band which leads to more friction. A weakness of the hip and buttock muscles can also contribute because the opposite side of the pelvis will dip down more also pulling on the iliotibial band (*figure 1*). A tight iliotibial band and sharp increase in the amount of training can also contribute to this injury.

Symptoms

The symptoms are pain and swelling located at the side of the knee (the outside) and the pain can sometimes radiate up the outside of the thigh. Players tend to have more pain while jogging than while playing tennis. The pain usually starts after a fixed distance (2 to 3km) and will force the player to reduce the speed or walk.

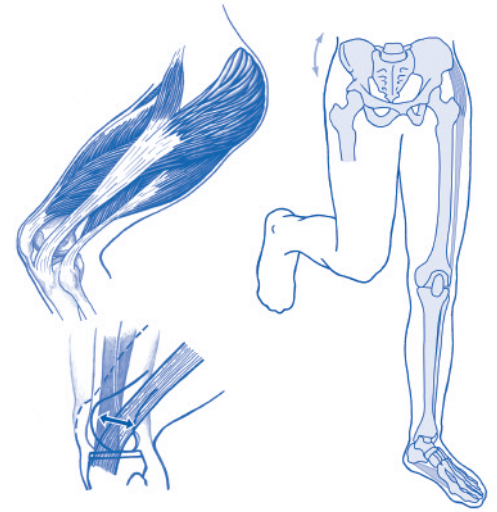


figure 1. Iliotibial band friction syndrome

First Aid

- It is advisable to modify activities (reduce playing and training but you do not have to stop altogether), use ice to cool the area, stretch the thigh and hip muscles and make sure that the shoes are not worn and offer good support.
- Cooling can also be done by performing ice massage. To do this use an ice cube or a paper cup with ice. Rub the ice on the painful area for ten to fifteen minutes. If using a cool pack be sure to place a towel between the cool pack and the skin to prevent freezing injury.

Immediate and effective first aid is essential for a speedy recovery. Have a (sports) physician examine the injury if it looks serious or if there is any doubt. In some cases the player will be referred to a (sports) physiotherapist.

How to Ensure the Best Recovery

- Pain is an important signal. If pain occurs do not play or train through the pain, because this will delay recovery.
- Rehabilitation progresses in three steps, from light to demanding. Here is a list with descriptions and tips for doing these exercises.

Stage 1. Improvement of Normal Function

- Stretching the muscle (tensor fascia lata) at the side of the hip together with the iliotibial band will reduce the tension or decrease the amount of friction (*figure 2*). Stand with the left leg crossed behind the right. Bend your body as far as possible to the right. Reach up with your left arm past your left ear and then over your head to the right to give an extra stretch. Hold the stretch for fifteen to twenty seconds and then rest for fifteen to twenty seconds. Repeat this three times on both sides.
- Strengthen the buttock muscles (gluteus medius, *figure 3*). Use a step (20 to 30cm) or stand on the stairs. Stand with one foot on the step and keep the other foot on the ground. The thigh of the leg up on the step should now be horizontal with the floor. Lift the front foot up off the step and concentrate on keeping your balance. Stop your pelvis from dipping to the side or wobbling. Hold the foot up for three seconds and then lower it slowly. Perform ten to fifteen repetitions on each leg. You can make it more difficult by using ankle weights.
- Strengthening the hip muscles (abductors, *figure 4*). Lie on your right side with your legs straight. Contract the muscles in the thigh and pull your toes up. Lift the left leg, keeping the knee straight, until the foot is 20 to 30cm off the ground. Hold the leg in this position for three seconds and then lower it slowly. Perform this exercise slowly and build up to three sets of fifteen repetitions. Perform this exercise for the other leg too. To make it harder support yourself, using your elbows and ankles, so that your body does not touch the ground (*figure 5*) or use an ankle weight.

Stage 2. Returning to Training

When you can perform all the exercises in stage 1 easily and without problems it is time to think about playing again. Here are some exercises to help during this stage.

- Strengthening the thigh muscles: Half squats. Stand with the feet shoulder-width apart. Bend the knees while keeping your back straight. Hold your arms out in front of you. Do not bend the knees further than 90 degrees or allow the knees to go further forward than the toes. Build up to three sets of fifteen repetitions.
- Strengthening the thigh muscles: Single leg step. Stand on the involved leg facing sideways on a step leaving the other leg hanging over the edge. Bend the involved leg and point the toes of the other foot towards the ceiling. Touch the step below you with the heel of the other leg and then straighten the involved leg. Start with one to two sets of ten to fifteen repetitions and build up to three sets of fifteen repetitions.
- Make small quick steps on the spot, shifting support between the left and right leg.
- Strengthening the thigh muscles: Lunges. Place the feet shoulder-width apart. Bend the leg until the knee is bent at a 90-degree angle. Do not let the knee protrude in front of the foot. Keep your back straight. Bend further into the knee and then step backwards. You can make the exercise more difficult by holding a weight or by performing the exercise more quickly. Build up to two to three series of ten to fifteen repetitions.

Stage 3. Return to Play

In the event of a mild injury, there is no need to stop playing tennis altogether, as long as you adapts your game to the restrictions imposed by the injury. In general continuous jogging is worse for iliotibial band friction syndrome than playing tennis.

- Adapt your training program, allowing you to start off hitting the ball from an area measuring two square meters (approx. two square yards). In this way you can continue practicing your footwork (taking small steps, positioning yourself correctly to hit the ball) without putting excess strain on the knee.
- Initially, you should limit activities that will put excess strain on the knee, such as sprints, jumping exercises, low volleys, intensive left-right exercises and serve and volley training.
- If the adapted training goes well you can gradually start doing more exercises, and increasing the distance you have to run to reach the ball (tennis drills from corner to corner)
- After this, low volleys and smash hits can be added to the training program
- If this goes well then you can start running again. Start slowly with a warming-up after which you can do several interval accelerations. Do some turning and twisting movements while running. If this goes well you can progress to several short sprints.
- After this jump training should be included such as: hopping, bounding and sideways jumps.
- Do not increase your running time or distance by more than 10% each week

Preventing Re-injury

Unfortunately it is not always possible to prevent recurrence of iliotibial band friction syndrome. The risk can be reduced following this advice:

- Be sure to perform a thorough warming-up and cooling down which should last at least ten minutes. Pay attention to stretches, especially the stretch for the tensor fascia lata muscle and the iliotibial band (figure 2).
- If you ride a bike make sure that the saddle is not too high or too far back.
- Increase the intensity and the extent of the exercise gradually in order to avoid straining. This is especially important if you are planning to run hilly routes.
- Wear properly fitting tennis shoes when playing tennis, and properly fitting trainers when working out. It is essential for the shoes to be adapted to your weight and to the surface you will be playing on.
- If you have knock knees, bow legs, flat feet or high arches consult a shoe expert or podiatrist to see whether shoe orthotics are needed.
- If you run on a cambered surface the downside leg is put under extra strain – be sure to change direction regularly to even out the load.

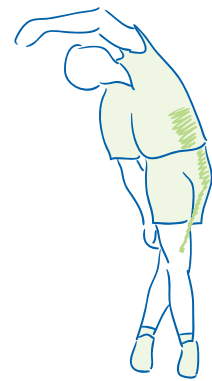


figure 2. Stretch for the tensor fascia lata muscle and the iliotibial band

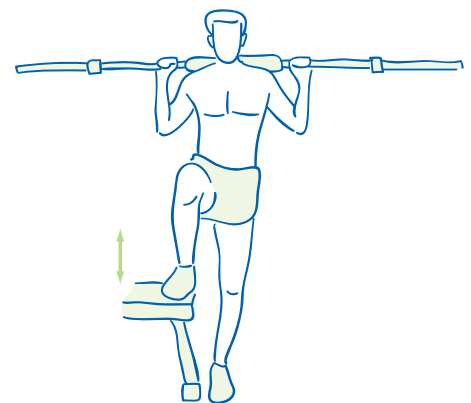


figure 3. Strengthening the buttock muscles

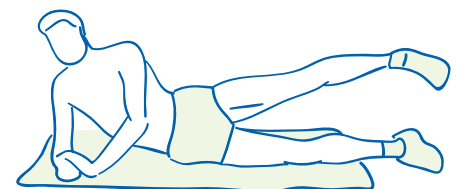


figure 4. Strengthening the hip muscles (light)

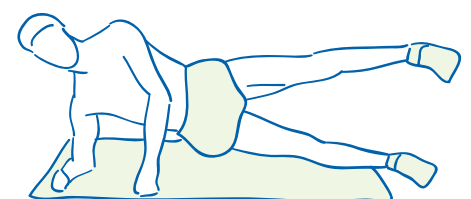


figure 5. Strengthening the hip muscles (hard)