

## Iliotibial Band Friction Syndrome Is Frictionless

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**Iliotibial band syndrome** (ITBS) is the most common cause of lateral knee pain in runners.<sup>1</sup> It is described as an overuse injury caused by repetitive friction of the iliotibial band over the lateral femoral epicondyle, with the maximal zone of impingement at about 30 degrees of knee flexion.<sup>1</sup> But if it is found that the ITB does not move anteroposteriorly over the epicondyle, how can friction occur? Rather than friction, it has been determined that at 30 degrees of knee flexion there is internal rotation of the tibia and the ITB is compressed against the lateral epicondyle; while with knee extension, the band is pulled laterally away from the epicondyle.

The ITB is anchored to the distal femur by fibrous strands, which prevents the purported antero-postero movement. Deep to the distal portion of the band is a layer of richly innervated and vascularized fat. Pain may be caused by fat compression beneath the tract instead of friction during flexion and extension. The idea that there is a forward and backward movement of the ITB over the epicondyle is really an illusion due to changing tension in its anterior and posterior fibers.<sup>2</sup>

In a study by Fairclough, et al., published in the *Journal of Anatomy*,<sup>3</sup> magnetic resonance scans and gross and microscopic anatomy were evaluated in 15 cadavers, six asymptomatic volunteers and two athletes with acute ITB syndrome. Between the ITB and lateral epicondyle, there is adipose tissue containing many blood vessels and nerves (even Pacinian corpuscles that when hypertrophied, become associated with pain) and are more likely affected by compression than a friction movement. The MR scans showed that at 30 degrees of knee flexion, the ITB is drawn medially toward the epicondyle (due to passive tibial rotation) and the vastus lateralis, which, due to an increase in tension, moves the fat deep to the ITB and adds to the compression.



So, the ITB is really moving in a medial-lateral direction. The fatty tissue may be normally acting as a brace to reduce bending stresses on the bone and also convert tensile to compressive loading on the lateral side of the joint.<sup>1</sup> Fatty tissue is often found at many tendon and ligament entheses,<sup>4</sup> and may be the cause of the local edema.

The authors found no bursa in the area; it is possible that the swelling is really due to the irritation of the fatty tissue, rather than a bursitis. It was also found that there were two separate types of tissues at the distal ends - "tendinous" type was found proximal to the lateral femoral epicondyle and a "ligamentous" type was identified between the epicondyle and Gerdy's tubercle.<sup>3</sup> The

tendinous part of the ITB, therefore, does not cross the knee joint, indicating that the tensor fascia latae muscle has no effect on the knee joint and actually exerts most of its effect by tensing "the fascial envelope around the thigh to promote optimal muscle function on the hip joint."<sup>2</sup>

The ITB is really not a separate band. It is a thickening of the fascia lata that covers the whole thigh. The ITB is also continuous with the lateral intermuscular septum, which is anchored to the linea aspera of the femur. So, the ITB is really a [fascial structure](#). There are fibrous bands that attach from the ITB to the distal femur and to the lateral epicondyle. These strands pass through to the periosteum and have been likened to a tendon enthesis. The ITB is therefore anchored at the distal end and would not rub over the lateral epicondyle in overuse injuries.

This information questions the use of surgery, breaking down adhesions around the epicondyle or even stretching the distal area. In order for stretching of the area to be therapeutic, "the fascia lata, the lateral intermuscular septum and the distal fibrous bands anchoring the ITB to the femur would all need to be stretched for the ITB to be lengthened."<sup>2</sup> Probably the effect of stretching is the stretch of the hip abductors occurring during the ITB stretch, indicating that the primary problem is at [the hip](#) and the pain at the lateral epicondyle area is only secondary.

It has been found that hip abductor weakness is related to the ITBS.<sup>5</sup> Therefore, hip ranges of motion and the myofascia should be evaluated for possible weakness and adhesions. This represents another instance of a proximal problem in the kinetic chain affecting a distal area, which is routinely found in the use of fascial manipulation.

### References

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