The Iliotibial Band Friction Syndrome

C.P. Ross Ph.D., D.C.,COHS, FRSH.[1] and P.R. Saunders Ph.D., N.D., DHANP.[2]

Introduction

The iliotibial band (ITB) is the lateral portion of the deep fascia of the thigh which extends from the iliac crest to the lateral tibial tubercle, known as Gerdy's tubercle.[1] It is described as an extremely strong, thickened strip of fascia lata which receives tendinous reinforcements from the tensor fascia lata and the lateral fibres of gluteus maximus and serves to support the knee on its lateral aspect.[2] According to Schafer, since the ITB crosses both the hip joint and the knee joint, its affect on the knee is dictated by the position of the hip. When flexed, the knee depends upon muscular support laterally by the ITB and biceps femoris; medially by sartorius, gracilis, semimembranosis and semitendinosis, anteriorly by quadriceps femoris; and posteriorly by popliteus. The ITB locks the knee into extension thereby providing maximum stability with minimal effort. It has been suggested that the ITB appeared phylogenetically with the development of upright posture.[3] Iliotibial Band Friction Syndrome (ITBFS) occurs as a result of friction generated between the distal ITB and the lateral femoral condyle. Successive flexion /extension of the knee induces this "over use or misuse syndrome" as the ITB moves from its anterior position in relation to the femoral condyle during knee extension to a posterior position in flexion.[4] It has been suggested that the discomfort experienced in the ITBFS may originate from contracture of the ITB itself, its insertion into Gerdy's tubercle, the bursa overlying the lateral femoral condyle or the periosteum.[5] The Prevalence of ITBFS in distance runners as compared to "racquet sport" athletes support the proposed mechanisms of injury as being a sustained low grade inflammatory reaction due to friction generated by repetitive flexion/extension of the knee.

1.Vice-President Academic, Canadian College of Naturopathic Medicine, 2300 Yonge Street, Toronto, Ontario M4P 1E4.
2.Chief Naturopathic Medical Officer, Canadian College of Naturopathic Medicine, 2300 Yonge Street, Toronto, Ontario M4P 1E4.

Clinical Presentations

Mr. R. presented to my clinic with pain on the lateral aspect of the right knee. His right thigh contained multiple trigger points throughout the fleshy portion of the quadriceps muscle. The hamstring muscles were all tested to be hypertonic. This individual relayed information in their clinical history that they had increased rapidly their running distance. The running distance was increased from a comfortable 5 kilometre jog to a strenuous 10 kilometre run. The reason for the increase was so that the patient may participate in a community marathon.

Clinical Explanation

Pain on the lateral knee around the cartilage line, as well as pain in the area of the greater trochanter after prolonged running activities which is relieved by rest is diagnostic of ITBFS.[6] The discomfort becomes limiting at a constant distance for each individual. As a rule, runners can usually complete one to two kilometres without pain after which the discomfort builds rapidly, forcing the runner to stop and walk back. Smooth, even paced running especially down grades, or using excessive stride lengths, aggravate ITBFS. Prolonged walking on the other hand, does not cause onset of symptoms as a rule, although walking downhill may be uncomfortable.

There is rarely a history of direct trauma or twisting injury in ITBFS. The onset of symptoms commonly coincides with the modification in one's training program,

with an increase in distance being the most frequent stimulus. In addition, increased speed, frequency of workouts and changing to hilly terrain, pronated ankles and excessive wear on the outer sole of a shoe, have been implicated as causes of ITBFS.

Pain experienced in ITBFS is most severe during the heel strike phase of deceleration and is relieved by a "stiff legged" or full knee extension gait.[1] According to this author, pain is generated due to the lack of ligamentous stability in the non-fully extended knee and it is during this time that the knee integrity is maintained by muscular forces.

Repetitive flexion/extension of the knee especially on hilly terrain would put an added strain on these muscle groups resulting in the formation of trigger points and contractures of the hamstrings, triceps surae and ITB. These in turn, would lead to aberrant leg control and the characteristic semi-flexed knee posture at heel strike, associated with ITBFS.

Diagnostic Findings

On palpation, the ITB feels tight and rigid with tenderness along its distal end (over lateral femoral condyle), and perhaps also the hip.[6] Ligamentous and meniscal tests will be negative, however single or multiple trigger points will be elicited in the lateral distal thigh (across ITB above the joint line). Gerdy's tubercle will be surprisingly painful.[1] Palpation of the lateral femoral epicondyle during flexion/extension may result in a "creak sign" as the ITB rubs over the femoral prominence.

An accurate diagnosis of ITBFS would include positive findings in the following tests. Firstly, instruct the patient to jog to locate the point of pain immediately prior to examination. This will help localize the focal point of irritation. Secondly, ask the patient to support their weight on the affected leg while maintaining 30 degrees of knee flexion. The ITB will be brought into direct contact with the prominent lateral femoral epicondyle and the pain will ensue.

Thirdly, the patient sitting or supine, apply pressure 1-2 cm proximal to the lateral femoral condyle while the knee is in 90 degrees of flexion. Instruct the patient to slowly extend their leg. Pain experienced during running will be reproduced at 30 degrees of flexion. Lastly, with the patient in a lateral recumbent position, have the affected leg abducted to 20 degrees several times. This maneuver puts considerable tension on the gluteus maximus and tensor fascia lata muscles which will elicit discomfort. In addition, Ober's tests should be performed to rule out contracture of the ITB as a cause of pain. Radiographic analysis of the knee joint is typically unremarkable.

Differential Diagnoses

Degenerative Joint Disease of the knee
Lateral meniscus involvement (cystic or torn)
Capsular ligamentous sprain and avulsion
Discoid meniscus
Stress reaction
Pseudogout (calcium pyrophosphate)
Chondromalacia
Osteonecrosis (lat. tibia, femur)
Popliteus tendinitis

Treatment

Schafer recommends treating ITBFS as an acute sprain with initial cryotherapy and adequate rest with ingestion of a non-steroidal anti-inflammatory to help relieve the inflammatory process. Trigger points should be treated using cross fibre friction massage for several minutes as recommended by Simons.[7] Treatments may be concluded by interferential current therapy to achieve analgesia, followed by functional muscle stimulation for muscle reeducation. Bilateral passive and active stretching exercises for the tensor fascia lata, hamstrings and quadriceps should be prescribed. Care must be taken to avoid exercises which may strengthen the quadriceps. Chiropractic manipulation restricted to the Lumbar spine in order to relieve subluxations in the area are performed. Sacro-iliac mobi-

lization and manipulation are executed relative to the pelvic unleveling that has ensued. Training should be modified to include non-percussive exercise such as cycling and swimming with ice massage of the affected areas following the activity.[1]

Surgical release of the ITB or removal of the lateral femoral epicondyle have been used with some success when conservative treatment fails. However, return to full and normal lower limb mechanics may not be achieved.

Naturopathic Treatment:

Naturopathic treatment of ITBFS acutely would include bromelain, 500 mg qid between meals to reduce inflammation, ascorbic acid 4g qd[8] and glucosamine sulfate 500 mg qid[9] to reduce inflammation and promote tissue repair. Chronic treatment includes selenium 140-200 mg, alpha-tocopherol 400 IU[10,11] and pyridoxine 100-250mg[12] to reduce serotonin levels and increase of glutathione peroxidase. Local acupuncture points are GB 34, 33 and 31, eyes of the knee, and ST 34 and 36. Homeopathy would begin with Arnica montana to reduce stiffness. Anti-inflammatory botanicals include *Salix alba*, a source of salicylic acid, *Harpogophytum procumbens, Yucca* spp, orally and topically slightly warmed *Ricinus communis* oil during rest periods. Although this case presented with very local pain, in some individuals removal of food sensitivities from the diet can be beneficial.

Implications

Iliobitial band friction syndrome occurs as a result of friction generated between the distal iliotibial band and the lateral femoral condyle. To prevent reoccurrence of ITBFS the gait mechanics of the individual including footwear and terrain must be fully evaluated.

Clinical success can only be achieved through the analysis of all contributing factors. Although this condition is one of mechanical dysfunction and anatomical restriction, it certainly responds well to a whole myriad of treatment.

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