

Use of Osteopathic Manipulative Treatment for Iliotibial Band Friction Syndrome

Robert N. Pedowitz, DO

Abstract:

Iliotibial band friction syndrome (ITBFS) has long been recognized as one of the most common lower-extremity injuries in athletes, especially in long-distance runners. Conservative therapy, including rest, ice, heat, stretching, and the use of anti-inflammatory medications, has been effective in helping athletes return to full competition, but athletes still miss much time in their sports because of ITBFS. The author presents a case of a 30-year-old distance runner with ITBFS whose symptoms were reduced with the help of osteopathic manipulative treatment, specifically the counterstrain technique. This technique allows for relief of pain at a tender point by moving the affected body part into its position of greatest comfort, aiding in the reduction of proprioceptor activity. In the present case, the tender point was located from 0 to 3 cm (most commonly 2 cm) proximal to the lateral femoral epicondyle. There is no prior documentation of the osteopathic manipulation of this specific tender point. Thus, this case report reflects an initial identification of the distal iliotibial band tender point and a new therapeutic modality for ITBFS.

Iliotibial band friction syndrome (ITBFS) is an overuse injury caused by excessive friction between the iliotibial band and the lateral femoral condyle.¹ The friction commonly occurs as the iliotibial band, which lies anterior to the lateral femoral epicondyle in extension, passes posterior to the epicondyle during 30 degrees or more of knee flexion. The rubbing of the posterior fibers of the iliotibial band across the epicondyle during alternating extension and flexion movements creates a repetitive stress that can result in ITBFS.

Athletes with ITBFS typically complain of pain or tenderness over the lateral aspects of the knee, specifically at or near the lateral femoral epicondyle. Climbing or descending stairs or running downhill can aggravate the pain.² The pain can become so severe that the athlete will not be able to bend his or her leg beyond a certain point, leading to loss of strength and mobility, especially in the lateral area of the knee. The loss of strength and mobility, in turn, can result in the total cessation of athletic activity for various lengths of time, usually 4 to 6 weeks. The criteria for diagnosis include the patient's complaint of pain and the reproduction of pain during clinical examination.³

Iliotibial band friction syndrome is one of the most common injuries to the lower extremity of runners and other athletes. The syndrome accounts for almost 12% of all reported overuse injuries to runners.^{4,5} In a 9-week study of military recruits (N=1261) in South Africa,⁶ ITBFS accounted for the third highest incidence (0.08 injuries per 1000 training hours) of specific overuse injuries, after tibial bone stress reaction (0.33 injuries per 1000 training hours) and patellofemoral pain (0.22 injuries per 1000 training hours). In the South African study, 88 total days (an average of 5.12 days per injury) were lost because of ITBFS, representing 3.6% of all days lost due to overuse injuries and 0.97% of all total training days lost.⁶ In another study,⁷ 61 of 254 (24%) cyclists with complaints of cycling-related knee pain were identified as having ITBFS.

Iliotibial band friction syndrome has been described not only in runners, cyclists, and military recruits, but also in weight lifters, downhill skiers, soccer players, tennis players, football players, and athletes engaged in circuit training.^{8,9} With increasing numbers of people—both competitive athletes and members of the public—engaged in regular exercise (ie, recreational sports), it is reasonable to assume that the incidence of overuse injuries such as ITBFS will increase in the coming years.^{1,10}

Current treatment of patients with ITBFS consists of altering the activity responsible for the injury and controlling the inflammatory process, with the goal of reducing the risk of permanent damage from scarring.⁸ General preventive approaches include changing warm-up exercises and stride length to lessen the impact on the iliotibial band, using exercise equipment that places less stress on the iliotibial band, adding heel lifts for leg length discrepancies, and avoiding hills and banked surfaces during running. In addition, rest, ice, and nonsteroidal anti-inflammatory drugs (NSAIDs) can be effective treatments in the early stages of ITBFS.⁸

If no improvement in symptoms occurs during the first 48 hours of treatment, heat, whirlpool, and stretching exercises for the iliotibial band may be added to the treatment regimen. If this regimen fails and symptoms persist, cessation of activity may be necessary for 4 to 6 weeks.^{7,11} During this time, ultrasound therapy, muscle stimulation, iontophoresis, phonophoresis, and injection of corticosteroid medications in bursae or trigger points are treatment options.¹ If the patient remains symptomatic, surgery may have to be performed to resect a small piece of the posterior part of the iliotibial band that covers the lateral femoral epicondyle. In most cases, this surgical procedure allows for athletes to return pain-free to their activities.^{7,12}

While the current treatments have been effective in reducing symptoms of ITBFS, many athletes continue to miss large amounts of time from their sports because of the syndrome. Therefore, a new treatment modality that would offer the benefits of decreased absence from activity and greater reduction in pain and symptoms is desirable.

Report of Case:

The patient in the present case is a 30-year-old white man with no serious problems in his medical history. He is a former football player who began distance running a few years ago, completing his first marathon in October 2003. During his marathon training, the patient experienced discomfort in his left knee while running. The discomfort, which was felt in the upper lateral region of the left knee, inhibited his training routine by causing him to frequently rest for relief. He did not take any medications for the pain.

After an absence from athletic activity for 1 to 2 months, the patient gradually resumed running and training. However, the pain in his left knee continued, preventing him from running consistently.

In May 2004, the patient came to my office seeking medical relief of his symptoms. The physical examination revealed decreased flexion of the left knee to about 45 degrees. Also noted were increased fullness and tissue texture abnormalities in the left lateral knee, a left leg that was approximately 3 mm longer than the right leg, and a mild inflare of the right anterior superior iliac spine. After conducting a thorough medical examination, I concluded that the proper diagnosis was iliotibial band friction syndrome. I determined that, in addition to receiving the standard care of stretching, ice, heat, and NSAIDs, the patient should also make changes in his running shoes and in the training surface that he practiced on. Furthermore, I noted that the patient required additional treatment for his pain.

I proposed osteopathic manipulative treatment (OMT) for the patient's injury. I described to the patient an osteopathic manipulative (OM) technique called counterstrain. This technique, which was first described by Lawrence H. Jones, DO,^{13,14} in the 1960s, is a positional-release OM procedure that places the affected part of the body into the position of greatest perceived comfort through passive motion. By decreasing the tension and tenderness at specific tender points—which are small hypersensitive places throughout the body that were first described by Jones^{13,14}—counterstrain can help a patient experience tremendous relief of pain.

During my examination, I had concluded that the source of the patient's problem was located approximately 2 cm proximal to the lateral femoral epicondyle of the left knee. The pain was elicited upon palpation of this tender point, worsening at approximately 30 degrees of flexion. No prior treatment involving this tender point had been described in the osteopathic medical literature. I informed the patient that I planned to use the established OM procedure of counterstrain on a type of injury that had not previously been treated with that procedure or any other OM procedure. Therefore, both my proposed treatment position and protocol were new. The patient consented to treatment following this explanation. The following steps are an account of the counterstrain treatment protocol I established for patients with ITBFS.

1. Have the patient lay in the supine position.
2. Identify the tender point on the flexed (30 degrees) knee. This point should be approximately 2 cm (range, 0–3 cm) proximal to the lateral femoral epicondyle.
3. Ask the patient to rate the severity of pain on an ascending scale of 0 to 10 (0, least severe; 10, most severe). Record this number.
4. While monitoring the tender point with your finger (I have found it easiest to use my thumb), position the patient's knee into extension.
5. As you feel the tissue relax beneath your finger, position the patient's leg into slight abduction and external rotation. This step involves fine-tuning until the patient feels maximal relief. The goal should be a reduction in pain of at least 70–75%. For example, if the patient rates the pretreatment severity of pain as a 10, you would want him or her to rate the posttreatment severity of pain as a 3 or less.
6. While monitoring the tender point in the position of maximal comfort for the patient, hold the leg in this position for 90 seconds.
7. After this 90-second period, slowly position the leg and knee back to the neutral position. Monitor the tender point again in flexion. Do not allow the patient to initiate movement of the leg, as this can trigger the tender point again by reinitiating inappropriate proprioceptive firing.¹⁵
8. Ask the patient to again rate the severity of pain (0–10). Record these numbers and compare with the number obtained in step 3.
9. If the goal of 70–75% reduction in pain has not been attained, repeat steps 3 through 8. Again, record and compare the patient's pain ratings. No matter what the degree of improvement is after the second attempt, the treatment should not be repeated again until your next scheduled session with the patient.

In the present case, the above treatment protocol was used over a 2-week period on days 1, 3, 7, 11, and 14. I chose a 2-week treatment period, with OMT applied every 2 to 3 days, because this regimen is similar to the regimen I often use when performing manipulation for other somatic dysfunctions.

The patient was provided with a questionnaire to complete on each day—on both treatment and nontreatment days—during the 2-week treatment period. Twelve questions were listed, covering such topics as severity of pain, application of treatment modalities, type of athletic activity performed, and subjective responses concerning mood and ability to sleep and perform activities of daily living. The patient's responses to nine of these questions throughout the treatment period are presented below.

Table:
Iliotibial Band Friction Syndrome: Patient Questionnaire and Daily Responses Over 2-Week Treatment Period*

Question [‡]	Day of Treatment Period [†]													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. What is overall severity of pain?	1	1	1	1	0	1	2	2	1	1	1	1	0	0
2. What was time and severity of least pain?														
· Time [§]	...	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM
· Severity ^{//}	...	0	0	0	0	1	1	0	0	0	0	1	0	0
3. What was time and severity of greatest pain?														
· Time [§]	...	PM	PM	PM	PM	PM	PM	PM	PM	PM	PM	PM	PM	PM
· Severity ^{//}	...	2	2	2	0	2	2	2	1	1	1	1	0	0
4. Was stretching performed?	N	N	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y
5. Was ice or heat applied?	N	N	N	N	N	N	N	N	N	N	N	N	N	N
6. Were NSAIDs taken?	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N
7. What was type of athletic activity?	None	None	Walk ^{**}	Walk ^{**}	Walk	Walk	Walk	Walk	Walk	Walk	Run ^{**}	Walk	Walk	Run ^{**}
8. Was there pain with athletic activity?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
9. Was OMT helpful?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

[⌄]* NSAIDs indicates nonsteroidal anti-inflammatory drugs; OMT, osteopathic manipulative treatment

[⌄]† Counterstrain technique of osteopathic manipulative treatment was administered on days 1, 3, 7, 11, and 14

[⌄]‡ Questions 10, 11, and 12 (on patient's mood, time spent sleeping, and ability to perform daily activities) and the patient's responses to them are not shown in this table because the responses were ambiguous and did not contribute meaningful data

[⌄]§ On day 2, the patient reported the time of least pain as 6:00 am and the time of greatest pain as 4:00 pm. On day 3, the patient reported the time of greatest pain as 3:00 pm. Exact times of least or greatest pain for all other days were not reported

[⌄]// Pain was rated on a scale of 0 to 10, with 0 as the least severe and 10 as the most severe

[⌄]** On day 3, the patient reported walking 1.5 miles; day 4, "limited" walking; day 11, running 3 miles; day 14, running 1 mile. Distances walked by the patient on days 5 through 10, 12 and 13 were not reported

During each examination, the patient would report a pain rating of only 0 to 2, but this was always while he was at rest. He reported that, during athletic activity, the pain would frequently increase to a rating of 8 to 10. After receiving counterstrain treatment, the patient always rated his pain severity as 0. In addition, on each morning following a treatment day, his pain severity was still rated as 0.

The patient had two follow-up appointments after the 2-week treatment period. During the first follow-up appointment, on day 21, he reported that he had been feeling well and had returned to his normal, full running activity by day 18. He stated that, in the 3 weeks since initiation of counterstrain, he had been free of pain and feeling happier overall. He added that his ability to sleep at night had improved (secondary to pain relief and other nonspecified reasons), as had his ability to perform the regular activities of daily life. Moreover, the patient indicated his willingness to receive any form of OMT again, if indicated.

The patient admitted that his compliance with suggested regimens of stretching (compliance rate, 9 days of 14), ice (compliance rate, 0 days of 14), and NSAIDs (compliance rate, 2 days of

14) was not strong. He said he believed that the OMT he received played a significant role in a suddenly rapid recovery from an injury that had forced him into limited physical activity since October 2003.

At 10 weeks post-OMT initiation, the patient reported that he was still free of pain. He added that he was running and training without limitation.

Comment:

Since the founding of osteopathic medicine by Andrew Taylor Still, MD, DO, in 1874, the osteopathic medical profession has held to its recognition that the body has an innate capability to heal itself—with some external help—of many pathologic conditions. In light of this recognition, the profession has followed several principles,¹⁵ including the following:

The body is a unit—that is, an individual is not merely a collection of separate parts, but a whole person whose various components work together.

Structure and function are reciprocally interrelated.

The body possesses self-regulatory mechanisms.

The body has an inherent capacity to defend and repair itself. A physician's goal should be to remove obstacles to the body's optimal performance.

With these principles in mind, it is important to realize that the somatic system—the body's framework—is made of “skeletal, arthroidal, and myofascial structures, and related vascular, lymphatic, and neural elements.”¹⁶ Any impaired or altered function of these components is referred to as a somatic dysfunction by the osteopathic medical profession.¹⁶ Therefore, any limitation to function or mobility with resultant inflammatory changes that affect motor, neuronal, sensory, and lymphatic elements in the body—such as happens in patients with ITBFS—is considered a somatic dysfunction.

Osteopathic manipulative treatment involves a variety of OM procedures that may be used to relieve pain, restore range of motion, and enhance the body's natural capacity to heal.¹⁷ In line with the osteopathic medical profession's principles, OMT may be provided to a patient after the physician addresses the multiple interactions between structure and function and aids the self-regulation and self-healing of the body. Osteopathic manipulative treatment using the counterstrain technique can integrate structure and function, relieve pain, and restore range of motion in patients with ITBFS.

To summarize, the counterstrain procedure that I developed for treating patients with ITBFS involves the application of light pressure with a monitoring finger, usually the thumb, for approximately 90 seconds to the distal iliotibial band tender point. The leg is then moved to the position of greatest comfort, which should be opposite the position of greatest pain. This area of comfort is evident when further pressure on the tender point no longer elicits a pain response from the patient. Counterstrain treatment can be thought of as “folding the body segments around the tender point to achieve the necessary relaxation.”¹⁸ A subjective pain response should be gauged with the goal of attaining at least a 70–75% relief of pain.^{13,14,18}

The present case study demonstrates that counterstrain not only relieves the pain associated with ITBFS, it also allows for more effective healing of the damaged tissue while restoring the physiologic motion affected by the somatic dysfunction.¹⁹

Contraindications and Other Considerations:

Few contraindications have been noted with the counterstrain technique when applied to somatic dysfunctions other than ITBFS. Occasionally, there may be transient soreness of muscles lasting longer than a few hours following treatment, with the patient then reporting relief of pain.²⁰ Another consideration to be kept in mind when performing the counterstrain technique is that its use involves some subjectivity with regard to patient response.

Despite these minor impediments, the counterstrain technique, compared with other treatment modalities for ITBFS, has the advantages of being safe, specific, noninvasive, and nontraumatic. Thus, it has the potential to be useful for treating any patient, regardless of age, sex, pregnancy, or presence of acute trauma.^{18,19,20}

Need for More Research on Counterstrain:

There have been no documented studies of the effectiveness of OMT on sports-related injuries, such as ITBFS, and there has been only limited research on the use of counterstrain in specific patient populations. In one such counterstrain study, Ramirez et al¹⁸ evaluated the use of six tender points on the sacrum to diagnose low back pain in 14 patients who were subsequently treated with counterstrain. These tender points were not recognized by Jones^{13,14} in his initial work. Documentation of the points began with Ramirez et al.¹⁸ Unfortunately, the researchers made no mention of treatment outcomes in their study. Because of the current paucity of clinical data on the efficacy of counterstrain for specific somatic dysfunctions and patient populations, future studies that scientifically evaluate this OM procedure would be of great benefit to the osteopathic medical profession.

Future research into the efficacy of counterstrain needs to use comparison or control groups to quantify health improvements resulting from this OM procedure. The inclusion of such groups is crucial, because the modern practice of medicine is founded upon evidence-based studies. Healthcare practitioners, as well as members of the public, seek proof of the effectiveness of OM procedures. When conventional approaches to treating patients with ITBFS or other injuries do not alter the course of those injuries, research into new therapeutic modalities, including counterstrain, takes on added importance.

Iliotibial band friction syndrome is an injury in which severity can be graded accurately on the basis of patient symptoms. Because its pathology is an inflammatory process with pain as the main symptom,⁸ ITBFS is an “ideal” dysfunction for study of the effectiveness of counterstrain treatment.

Although only one patient was studied in this particular case, the results of the study—showing rapid recovery following treatment with counterstrain—are worth considering for a future, expanded trial. I propose a study that would include a large number of subjects randomly divided into both counterstrain-treatment and control groups. The study would evaluate the efficacy of counterstrain in decreasing pain and recovery time in patients with ITBFS.

Conclusion:

Iliotibial band friction syndrome is a common sports-related injury in which traditional therapies to reduce athletes' pain and expedite their return to normal activity have been relied upon. However, with the use of OMT—specifically counterstrain—as a treatment modality, an athlete can experience reductions in pain and be capable of returning to full activity in less than 3 weeks from initiation of treatment. This time to return to full activity compares with an average of 4 to 6 weeks of conventional therapy. The present case report also suggests that OMT has the potential to decrease the amount of medication prescribed to patients with ITBFS, as well as to improve patients' mood, ability to sleep, and overall quality of life.

Acknowledgments:

I would like to thank Kathryn Lambert, DO, for her support and advice in the field of sports medicine, and for serving as a mentor in family medicine while I was a resident at the University of Medicine and Dentistry of New Jersey–School of Osteopathic Medicine (UMDNJ–SOM) in Stratford. Her continued instruction and dedication provided me with the foundation to perform this case study.

References

1. [Safran MR, Fu FH. Uncommon causes of knee pain in the athlete. *Orthop Clin North Am.* 1995;26:547-559. \[Medline\]\(#\)](#)
2. [Magee DJ. *Orthopedic Physical Assessment.* 3rd ed. Philadelphia, Pa: WB Saunders Co; 1992:354-366,429.](#)
3. [Ekman EF, Pope T, Matine DF, Curl WW. Magnetic resonance imaging of iliotibial band syndrome. *Am J Sports Med.* 1994;22:851-854. \[Abstract/FREE Full Text\]\(#\)](#)
4. [Messier SP, Edwards DG, Martin DF, Lowery RB, Cannon DW, James MK, et al. Etiology of iliotibial band friction syndrome in distance runners. *Med Sci Sports Exerc.* 1995;27:951-960. \[CrossRefMedline\]\(#\)](#)
5. [Pinshaw R, Atlas V, Noakes TD. The nature and response to therapy of 196 consecutive injuries seen at a runners' clinic. *S Afr Med J.* 1984;65:291-298. \[Medline\]\(#\)](#)
6. [Jordaan G, Shwellnus MP. The incidence of overuse injuries in military recruits during basic military training. *Mil Med.* 1994;159:421-426. \[Medline\]\(#\)](#)
7. [Holmes JC, Pruitt AL, Whalen NJ. Iliotibial band syndrome in cyclists. *Am J Sports Med.* 1993;21:419-424. \[Abstract/FREE Full Text\]\(#\)](#)
8. [Shwellnus MP, Theunissen L, Noakes TD, Reinach SG. Anti-inflammatory and combined anti-inflammatory/analgesic medication in the early management of iliotibial band friction syndrome. A clinical trial. *S Afr Med J.* 1991;79:602-606. \[Medline\]\(#\)](#)
9. [Barber FA, Sutker AN. Iliotibial band syndrome. *Sports Med.* 1992;14:144-148. \[Medline\]\(#\)](#)
10. [Renstrom P, Johnson RJ. Overuse injuries in sports: a review. *Sports Med.* 1985;2:316-333. \[Medline\]\(#\)](#)
11. [Noble CA. Iliotibial band friction syndrome in runners. *Am J Sports Med.* 1980;8:232-234. \[Abstract/FREE Full Text\]\(#\)](#)
12. [Martens M, Libbrecht P, Burssens A. Surgical treatment of the iliotibial band friction syndrome. *Am J Sports Med.* 1989;17:651-654. \[Abstract/FREE Full Text\]\(#\)](#)
13. [Jones LH. Spontaneous release by positioning. *The DO.* 1964;4:109-116.](#)
14. [Jones LH. *Strain and Counterstrain.* Newark, Ohio: The American Academy of Osteopathy; 1981.](#)
15. [DiGiovanna EL, Schiowitz S, eds. *An Osteopathic Approach to Diagnosis and Treatment.* Philadelphia, Pa: Lippincott Williams & Wilkins; 1991:2-13,85-87,412.](#)
16. [Glossary of osteopathic medical terminology. In: *American Osteopathic Association 2000/01 Yearbook and Directory of Osteopathic Physicians.* 91st ed. Chicago, Ill: American Osteopathic Association; 2000:855-872.](#)
17. [Ward RC, ed. *Foundations for Osteopathic Medicine.* Baltimore, Md: Williams & Wilkins; 1997 : 809-813,1132.](#)
18. [Ramirez MA, Haman J, Worth L. Low back pain: diagnosis by six newly discovered sacral tender points and treatment with counterstrain. *J Am Osteopath Assoc.* 1989;89:905-914. \[Abstract\]\(#\)](#)
19. [Bailey M, Dick L. Nociceptive considerations in treating with counterstrain. *J Am Osteopath Assoc.* 1992;92:334-341. \[Abstract\]\(#\)](#)
20. [Schwartz HR. The use of counterstrain in an acutely ill in-house population. *J Am Osteopath Assoc.* 1986;86:433-442. \[Medline\]\(#\)](#)

