Case Report
Traditional massage-induced Iliotibial Band Syndrome: A Case Report

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ABSTRACT
Iliotibial band (ITB) syndrome is commonly found among athletes, such as runners and cyclists. Anatomically, the iliotibial band is a part of the fascia lata, which is located in the deep fascia of the thigh. There are several theories regarding the etiology of iliotibial band syndrome, including friction, compression, and chronic inflammation. One of the articles in the literature reported that the cause of iliotibial band syndrome may be more of a compression issue than a friction issue. We report a rare case of iliotibial band syndrome induced by traditional massage after a history of chronic knee pain. Massage is a soft tissue manipulation of the body done by hands that is applied to the external tissues of the body. A 63-year-old female visited our Physical Medicine and Rehabilitation Department with pain in the lateral side of the right knee for four months after receiving traditional massage. The patient said the massage was very hard because of the pressure on the muscle. The Visual Analog Scale (VAS) of the pain was 7–8 according to the patient. The physical examination showed an antalgic gait, a positive Ober test, and a Noble compression test. We performed ultrasonography on the lateral right knee and found fluid effusion beneath the iliotibial band, confirming the diagnosis of iliotibial band syndrome. A pain intervention was performed with ultrasound-guided aspiration and an injection of steroids beneath the iliotibial band. We followed up with the patient two weeks after the procedure and the rehabilitation program of cryotherapy and ultrasound therapy. The pain was reduced greatly, and there was no need for further management.

Keywords: *Iliotibial band syndrome, traditional massage, ultrasound guided injection, intervention pain management, rehabilitation*

INTRODUCTION

The iliotibial band is a portion of the fascia lata located in the lateral thigh, and its related muscle functions are to extend, abduct, and laterally rotate the hip, as well as stabilize the knee.[1] Iliotibial band (ITB) syndrome is regarded as an overuse injury and is common in athletes, such as runners and cyclists.[2] The incidence of ITB syndrome in runners is up to 12% and up to 22% in military recruits.[3] There's always been a debate about the exact cause of ITB syndrome. There are several proposed causes, including friction of the iliotibial band, compression of the fat and connective tissue, and chronic inflammation of an adventitial bursa.[4] Fairclough et al. suggested that the cause of ITB syndrome might be more of a compression issue than a friction issue.[2, 5]

In Indonesia, patients tend to seek treatment from traditional healthcare practicioners before eventually seeking physicians. Multiple factors determined people's choice of healthcare providers, such as sociocultural beliefs, sociodemographic characteristics, availability and accessibility, and their related costs.[6] About 30.4% of households in Indonesia rely on traditional healthcare and tend to self-medicate.[6,7] According to the Indonesian Ministry of Health, massage is included in the category of traditional healthcare practitioners.[8] Massage is soft tissue manipulation of the body done by hands and includes friction, kneading, rolling, and percussion techniques that are applied to the external tissues of the body. It has been used as one of the therapies to reduce pain.[5,9] We present a case of traditional massage-induced ITB syndrome after chronic knee pain.

CASE REPORT

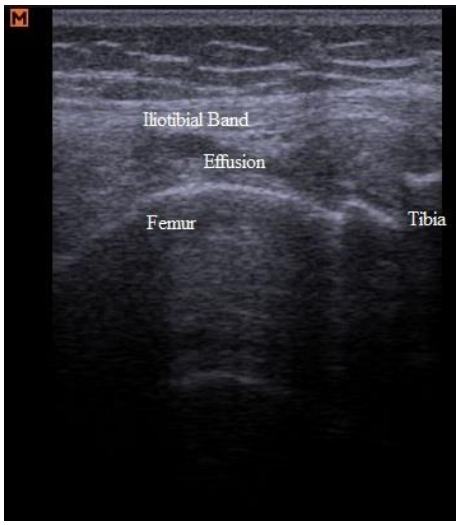
A 63-year-old female visited the Physical Medicine and Rehabilitation department in Primasatya Husada Citra Hospital after being referred from the Orthopedics department for a complaint of right knee pain. She has had a history of right knee pain for a year. There were no complaints about radiating pain or tingling sensations. Four months before going to the physician, she went to the traditional

massage practitioner to seek for help. After the massage, she felt that the pain moved to the lateral side of the right knee. Two months after the first massage, she went to have the second massage with the same practitioner. She felt that the pain was more severe after the massage, so she went to seek professional medical advice. She said that the massage was very hard on the muscles. The Visual Analog Scale (VAS) of the pain is 7-8, according to the patient.

From the physical examination, we found that she was walking with an antalgic gait, a positive Ober's test, and a positive Noble compression test. The x-ray of the knee shows a narrowing joint space and moderately multiple osteophytes, which concludes stage III knee osteoarthritis (OA) from the Kellgren-Lawrence classification of OA. From the sonography, we found that there was an effusion under the iliotibial band (Figure 1). We advised the patient to do RICE (rest, ice, compression, and elevation) and take oral pain medicine. We also suggested the patient to come back to the hospital if the pain is still not lessening. We have asked permission and patient consent to publish this case report, as this is a rare case of ITB syndrome induced by traditional massage.

On the 5th day after the first visit, the patient came back to the hospital with the same symptoms and said that the pain was not alleviated even after doing RICE and taking oral nonsteroidal anti-inflammatory medicine. We made the decision to aspirate the fluid under the iliotibial band and inject the corticosteroid under ultrasound guidance. Cryotherapy and ultrasound therapy were performed on the patient after the aspiration and corticosteroid injection.

a.



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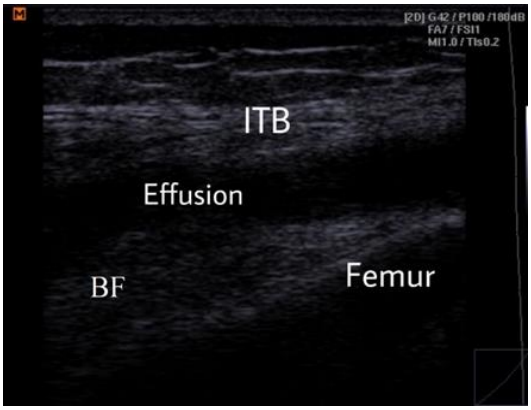


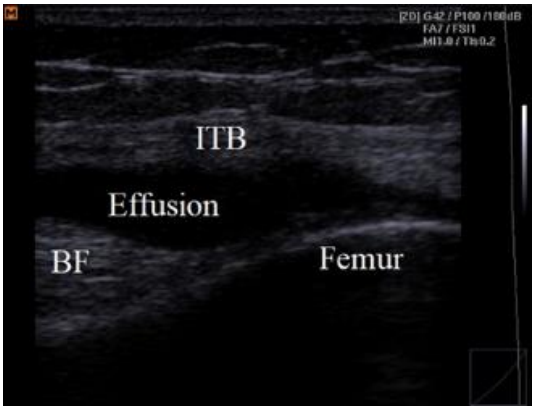
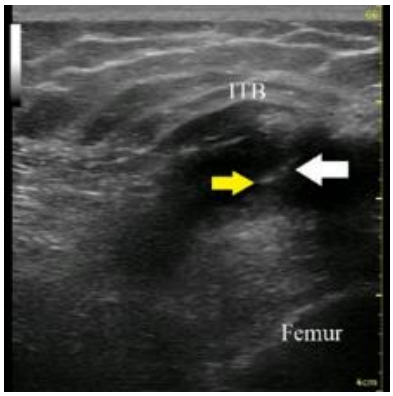


Figure 1. (a) Ultrasonography images show a fluid effusion beneath the iliotibial band and (b) on longitudinal images, the fluid effusion is seen between iliotibial band (ITB) and biceps femoralis (BF) and extends along to the proximal part under the iliotibial band (ITB)

a.

b.



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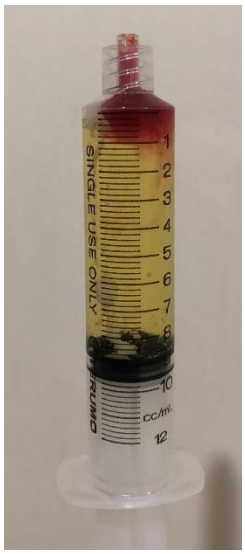

Figure 2. (a) ultrasonography shows a guided fluid aspiration under the iliotibial band (ITB), the white arrow indicates the needle, (b) ultrasonography shows a guided steroid injection, the white arrow indicates the needle and the yellow arrow indicates the injection of the steroid, (c) the 9 cc of clear yellow fluid aspiration

After the sterile procedures were done on the patient, we began the treatment by aspirating under the iliotibial band with the guidance of ultrasonography. The aspiration resulted in 9 ccs of clear yellow fluid as shown in figure 2 (c). After the aspiration procedures, we injected triamcinolone 20 mg into the ITB band guided by ultrasonography (Figure 2). Follow-up with the patient was done two weeks after the aspiration and corticosteroid injection. She was walking with a normal gait. The pain was greatly reduced after the medical treatment two weeks prior. The ultrasonography showed no fluid beneath the iliotibial band (Figure 3). We planed to continue the cryotherapy and ultrasound therapy for the patient to reduce inflammation.

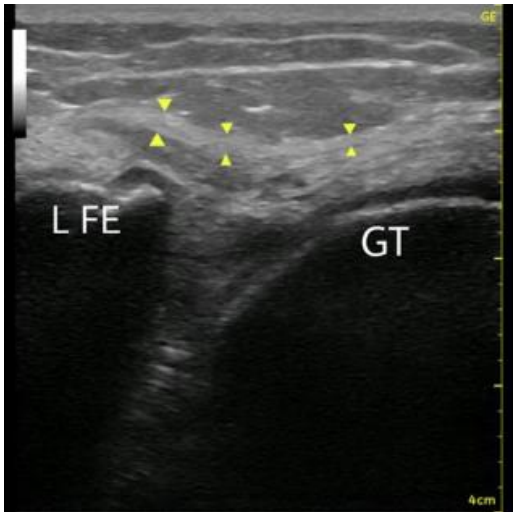

Figure 3. Ultrasonography image of illiotibial band (ITB) syndrome shown in yellow arrow and lateral femoral

DISCUSSION

Iliotibial band (ITB) syndrome is described as an overuse injury and one of the causes of lateral knee pain.[2,4,10] Anatomically, the iliotibial band is a part of the fascia lata located in the deep fascia of the thigh.[1] The proximal part of ITB contributes anteriorly to the tensor fascia lata, posteriorly to the gluteus maximus, and has fascia relations with the gluteus medius and with the femur through attachment to the lateral intramuscular septum.[5] The distal of the ITB is attached to the capsule of the knee joint and the Gerdy tubercle on the anterolateral tibia.[5] One of the functions of the iliotibial band is to stabilize the lateral knee.[1] It is also fundamental to postural function by enabling asymmetrical standing

(pelvic slouch) and an upward pull of the lower ITB, resulting in knee locking in hyperextension and creating rigid support pillars.[1]

Most people who are affected by ITB syndrome are athletes, with 12% to 52% of runners, up to 24% of road cyclists, and common in rowing, basketball, female soccer, and field hockey athletes.[11] The patient is a 63-year-old female with a positive Ober's and Noble test and no history of actively exercising, which is rare in the occurrences of ITB syndrome. Ober's test was performed by laying the patient on the unaffected side and holding the knee that was affected in 30° of flexion. It will result in a positive result if the examiner feels the involuntary extension of the affected knee during hip extension and adduction.[12] The Noble test is positive if there was pain after direct pressure to the ITB over the lateral femoral epicondyle at 30° of the affected knee flexion.[12]

The exact etiology of ITB syndrome has always been debatable and likely to be multifactorial. Several proposed causes of ITB syndrome are friction of the iliotibial band against the lateral epicondyle of the femur, compression of the fat and connective tissue deep into the iliotibial band, and chronic inflammation of an adventitial bursa underneath the iliotibial band.[4] The patient had a history of knee pain for a year and four months before she came to seek medical treatment. She went to the traditional healthcare practitioner to get a deep massage, or *urut* in Indonesian terms. She felt the pain move to the lateral side of the knee and went again to the traditional practitioner to get another *urut* two months after the first one. Some massage techniques include *effleurage* (rhythmic stroking and gradual compression), kneading (slow circular compression), *petrissage* (skin rolling and forceful technique), frictions (penetrating pressure through fingertips), *tapotement* (percussive massage), vibrations (trembling both hands in contact with the skin), and shaking (the muscle of the chest wall is grasped and shaken forcefully).[13] Fairclough et al. pointed out that ITB syndrome is more of a compression issue than a friction issue.[2] A review by Hutchinson et al. shows the magnetic resonance imaging (MRI) of the iliotibial band compresses against the lateral femoral

epicondyle when the knee is flexed 30° and increases tension in the posterior of the ITB, which leads to irritate the innervated fat between ITB and the bone.[14]

Massage has been practiced for thousands of years as one of the oldest modality therapies. [15] It has been found to reduce pain with moderate pressure on the body in patients with chronic fatigue, fibromyalgia, rheumatoid arthritis, low back pain, and knee osteoarthritis.[9] As suggested by Koren et al.[15], the definition of deep massage is still unclear but should be used to interpret the intention of the therapist to treat deep tissue using any form of massage. In Indonesia, a deep massage practiced by a traditional practitioner is called *urut.* In Malaysia, *urut* is a forceful massage technique.[16] The method of *urut* in Indonesia is the same as in Malaysia. From the reviews by Ernst[16], it was found that massage was considered a safe therapy but not devoid of adverse effects, which in a lot of cases are not reported. Another case report showed a traditional massage-induced traumatic rupture of hydronephrosis secondary to ureteral obstruction.[17] Vanichkulbodee et al. reported a patient presenting with delayed paraplegia after a massage-induced spinal epidural hematoma.[18] There was also a report of a dislocation fracture in C6-C7 in a 48-year-old male patient with ankylosing spondylitis after a traditional massage in Malaysia.[19] Ernst found that forceful techniques such as *urut*, shiatsu, and rolfing are more likely to be associated with adverse events.[16] This case report shows one of the adverse effects of the massage. The patient felt the pain was more intense than before, and the sonography showed an effusion under the iliotibial band after the massages she had, which is shown in Figure 1. A case report by Sharma et al. presents a hematoma in a 69-year-old female in the medial right thigh area after inpatient massage therapy.[20]

Ultrasonography images generally show an edematous swelling between the ITB and the lateral femoral epicondyle.[1] Commonly, magnetic resonance imaging (MRI) is considered a gold standard in diagnosing ITB syndrome and it can be found in an elevated fluid between the ITB and the lateral femoral epicondyle.[1] Both ultrasonography and magnetic resonance imaging (MRI) can be used to confirm the diagnosis of iliotibial band syndrome, but

ultrasonography is a more cost-effective imaging modality.[4] Ultrasonography can also be used as a guide in surgical intervention to release the iliotibial band and has minimal complications.[21] We use ultrasonography images as a confirmation of the ITB syndrome diagnosis rather than MRI because of the patient's cost limitations. Another reason we use ultrasonography imaging is became it allows for dynamic assessment of the ITB.[1]

In this case report, we aspirate the effusion under the iliotibial band, guided by ultrasonography. The fluid was 9 cc of clear yellow fluid. After negative aspiration, we injected 20 mg of triamcinolone beneath the iliotibial band and planned a program of cryotherapy and ultrasound diathermy on the iliotibial band area. Two weeks after the medical treatment, we followed up with the patient, and she was feeling no pain in the lateral knee. Ultrasonography of the patient after the treatment shows no fluid effusion, as shown in Figure 3. A case report by Hong et al.[22] showed successful treatment of an ultrasound-guided corticosteroid injection in an iliotibial band syndrome case. An ultrasound-guided injection, if done accurately, will result in significantly better clinical improvement than blind (landmark-guided) injections.[22] In a systematic review by Ellis et al.,[23] it was shown that a corticosteroid injection can reduce symptoms of ITB syndrome in the acute phase of presenting symptoms (below 14 days duration). A randomized controlled trial by Gunter et al.[24] presents beneficially local corticosteroid injections in runners with the recent onset of ITB syndrome.

Treatment of the ITB is commonly managed conservatively (non-surgically).[25] Research from Fredericson et al.[25,26] divided the treatment of ITB in runners into 3 stages: the acute phase with the purpose of decreasing local inflammation of the ITB; the subacute phase with the intention of achieving flexibility; and the recovery strengthening phase, which aims to strengthen the gluteus medius muscle, such as side-lying hip abduction, single-leg activities, and pelvic drops. A systematic review by Bolia et al.[27] suggests that conservative treatments can successfully decrease ITB Syndrome symptoms in athletes in 6 months. Conservative treatments for ITB syndrome in runners

generally consist of rest by decreasing the amount of exercise and training, stretching and superficial heat prior to exercise, and icing after exercise and training.[28] Foam rolling can also be used as one of the treatments for the tightness of the iliotibial band, but a randomized controlled study found that there was no significant effect on stiffness or tightness of the iliotibial band.[29]

Surgical treatments, such as release of the iliotibial band, bursectomy of the iliotibial band, and resection of the lateral synovial recess, can be considered if there is a recalcitrant ITB.[4] According to the review by Ungur et al.,[30] ultrasound therapy has anti-inflammatory and antioxidant effects and has been shown to have beneficial effects in reducing pain and improving joint function in patients with knee osteoarthritis.[30] Ultrasound also has the effect of phonophoresis, which increases the permeability of the skin and allows the transfer of various substances, such as local pain medicine, through the skin.[5] In a study by Bischoff et al.,[31] there was a significant improvement in pain in phonophoresis with the hydrocortisone group compared to the knee immobilization group. The cryotherapy can also be beneficial in alleviating chronic pain from degenerative diseases such as osteoarthritis, musculoskeletal diseases, and myofascial pain syndrome through the reduction of inflammation and oedema, oxidative stress, and nerve conduction velocity in pain fibers.[32] In a review by Garcia et al.,[33] cryotherapy is low-risk and fairly safe for the management of chronic pain.

CONCLUSION

In conclusion, this case documented a rare case of a traditional massage-induced iliotibial band syndrome, which is commonly suffered by athletes. Massage therapy generally has the effect of reducing pain but also has adverse effects, such as hematoma in one of the literatures. Apart from symptoms and physical examinations, ultrasonography can be one of the modalities for confirming the diagnosis of the iliotibial band syndrome and is more cost-effective and dynamic than magnetic resonance imaging (MRI). Other than confirming the

diagnosis, ultrasound can also be used as a modality or therapy in the treatment of the iliotibial band syndrome by the phonophoresis effect. Cryotherapy is also chosen as a treatment in this case report for its reducing inflammation effect. An ultrasound-guided corticosteroid injection can be one of the options in the treatment of ITB syndrome with persistent pain and can alleviate the symptoms of pain if done accurately.

DISCLOSURES

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Conflict of Interest

There is no conflict of interest from the authors

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Author Contribution

All authors have contributed to all processes in this case report, including preparation, data gathering and analysis, drafting and approval for publication of this manuscript.

REFERENCES

1. Flato R, Passanante GJ, Skalski MR, Patel DB, White EA, Matcuk GR. The iliotibial tract: imaging, anatomy, injuries, and other pathology. Vol. 46, Skeletal Radiology. Springer Verlag; 2017. p. 605–22.
2. Fairclough J, Hayashi K, Toumi H, Lyons K, Bydder G, Phillips N, et al. Is iliotibial band syndrome really a friction syndrome? Vol. 10, Journal of Science and Medicine in Sport. Sports Medicine Australia; 2007. p. 74–6.
3. Falvey EC, Clark RA, Franklyn-Miller A, Bryant AL, Briggs C, McCrory PR. Iliotibial band syndrome: An examination of the evidence behind a number of treatment options. Scand J Med Sci Sports. 2010;20(4):580–7.
4. Jiménez Díaz F, Gitto S, Sconfienza LM, Draghi F. Ultrasound of iliotibial band syndrome. Vol. 23, Journal of Ultrasound. Springer Science and Business Media Deutschland GmbH; 2020. p. 379–85.
5. Cifu DX, Eapen BC, Johns JS, Kowalske K, Lew HL, Miller MA, et al. Braddom's Physical Medicine and Rehabilitation. 6th Edition. Braddom's Physical Medicine and Rehabilitation. Elsevier; 2021.
6. Widayanti AW, Green JA, Heydon S, Norris P. Health-seeking behavior of people in Indonesia: A narrative review. Vol. 10, Journal of Epidemiology and Global Health. Atlantis Press International; 2020. p. 6–15.
7. Peltzer K, Pengpid S. Traditional health practitioners in Indonesia: Their profile, practice and treatment characteristics. Complement Med Res. 2019 Apr 1;26(2):93–100.
8. Indonesian Ministry of Heath. Keputusan Menteri Kesehatan Republik Indonesia Tentang Penyelenggaraan Pengobatan Tradisional. 2003 [cited 2022 Jul 20]. Available from: https://pelayanan.jakarta.go.id/download/regulasi/keputusan-menteri-kesehatan-republik-indonesia-no-1076-menkes-sk-vii

2003-tentang-penyelenggaraan-pengobatan-tradisional.pdf
9. Field T. Massage therapy research review. Vol. 20, Complementary Therapies in Clinical Practice. Churchill Livingstone; 2014. p. 224–9.
10. Jelsing EJ, Maida E, Finnoff JT, Smith J. The Source of Fluid Deep to the Iliotibial Band: Documentation of a Potential Intra-Articular Source. PM and R. 2014 Feb;6(2):134–8.
11. Geisler PR. Current clinical concepts: Synthesizing the available evidence for improved clinical outcomes in iliotibial band impingement syndrome. J Athl Train. 2021 Aug 1;56(8):805–15.
12. Pegrum J, Self A, Hall N. Iliotibial band syndrome. Vol. 364, The BMJ. BMJ Publishing Group; 2019.
13. Goats GC. Massage - the scientific basis of an ancient art: part 1. The techniques. Vol. 28, British Journal of Sports Medicine. 1994. p. 149–52.
14. Hutchinson LA, Lichtwark GA, Willy RW, Kelly LA. The Iliotibial Band: A Complex Structure with Versatile Functions. Vol. 52, Sports Medicine. Springer Science and Business Media Deutschland GmbH; 2022. p. 995–1008.
15. Koren Y, Kalichman L. Deep tissue massage: What are we talking about? Vol. 22, Journal of Bodywork and Movement Therapies. Churchill Livingstone; 2018. p. 247–51.
16. Ernst E. The safety of massage therapy. Vol. 42, Rheumatology. 2003. p. 1101–6.
17. Ismy J, Puteh Mauny M, Kuddah Y, Richard Handoko R, Azmi Fanany M, Paterasari B. Traditional massage therapy-induced traumatic rupture of hydronephrosis secondary to ureteral obstruction: a case report. JISCM [Internet]. 2021;1(2):39–40. Available from: https://jcmid.id/index.php/JCMID
18. Vanichkulbodee A, Issaragrisil S, Inboriboon PC. Massage-induced spinal epidural hematoma presenting with delayed paraplegia. American Journal of Emergency Medicine. 2019 Apr 1;37(4):797.e1-797.e4.
19. Abilash Kumar AK, Mohd QMQ, Ahmad ZAH, Towil B. Fracture-dislocation at C6-C7 level with quadriplegia after traditional massage in a patient with ankylosing spondylitis: A case report. Malays Orthop J. 2017 Jul 1;11(2):75–7.
20. Sharma I, Joseph DA, Kirton O. Traumatic complications of inpatient massage therapy: Case report and literature review. Trauma Case Rep. 2018 Dec 1;18:1–4.
21. Villanueva M, Iborra Á, Sanz-Ruiz P, Noriega C. Ultrasound-guided release for iliotibial band syndrome: A novel ultraminimally invasive surgical procedure. Knee. 2021 Jun 1;30:9–17.
22. Hong JH, Kim JS. Diagnosis of iliotibial band friction syndrome and ultrasound guided steroid injection. Korean Journal of Pain. 2013;26(4):387–91.
23. Ellis R, Hing W, Reid D. Iliotibial band friction syndrome-A systematic review. Vol. 12, Manual Therapy. 2007. p. 200–8.
24. Gunter P, Schwellnus MP. Local corticosteroid injection in iliotibial band friction syndrome in runners: A randomised controlled trial. Br J Sports Med. 2004 Jun;38(3):269–72.
25. Baker RL, Souza RB, Fredericson M. Iliotibial Band Syndrome: Soft Tissue and Biomechanical Factors in Evaluation and Treatment. PM and R. 2011 Jun;3(6):550–61.
26. Fredericson M, Wolf C. INJURY CLINIC Iliotibial Band Syndrome in Runners Innovations in Treatment. Vol. 35, Sports Med. 2005.
27. Bolia IK, Gammons P, Scholten DJ, Weber AE, Waterman BR. Operative Versus Nonoperative Management of Distal Iliotibial Band Syndrome—Where Do We Stand? A Systematic Review. Vol. 2, Arthroscopy, Sports Medicine, and Rehabilitation. Elsevier Inc.; 2020. p. e399–415.
28. Friede MC, Innerhofer G, Fink C, Alegre LM, Csapo R. Conservative treatment of iliotibial band syndrome in runners: Are we targeting the right goals? Vol. 54, Physical Therapy in Sport. Churchill Livingstone; 2022. p. 44–52.
29. Pepper TM, Brismée JM, Sizer PS, Kapila J, Seeber GH, Huggins CA, et al. The immediate effects of foam rolling and stretching on iliotibial band stiffness: A randomized controlled trial. Int J Sports Phys Ther. 2021;16(3):651–61.
30. Ungur RA, Ciortea VM, Irsay L, Ciubean AD, Năsui BA, Codea RA, et al.

Can ultrasound therapy be an environmental-friendly alternative to non-steroidal anti-inflammatory drugs in knee osteoarthritis treatment? Vol. 14, Materials. MDPI AG; 2021.

31. Bischoff C, Prusaczyk WK, Sopchick TL, Pratt NC, Goforth HW. Comparison of phonophoresis and knee immobilization in treating iliotibial band syndrome. Sports Medicine, Training and Rehabilitation. 1995 Apr 1;6(1):1–6.

32. Garcia C, Karri J, Zacharias NA, Abd-Elsayed A. Use of Cryotherapy for Managing Chronic Pain: An Evidence-Based Narrative. Vol. 10, Pain and Therapy. Adis; 2021. p. 81–100.