

Myofascial Release Exercises in the Treatment of Plantar Fasciitis: A Traditional Review

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Abstract – Plantar fasciitis, a major problem in orthopaedics, affects individuals with different demographic characteristics and activity levels. Characterised by excruciating heel pain, especially during weight-bearing activities, this condition often impairs mobility and reduces quality of life. Myofascial release exercises show promise by offering a non-invasive and patient-centred approach to address the multifaceted nature of plantar fasciitis. By further examining the therapeutic effects of these exercises and elucidating their mechanisms of action, clinicians and researchers can pave the way for more effective and personalised management strategies for individuals struggling with this debilitating condition. To this end, the aim of this review is to examine the effects of myofascial release exercises on plantar fasciitis. Myofascial release exercises play a crucial role in the management of plantar fasciitis by addressing the underlying soft tissue restrictions and biomechanical imbalances that contribute to the condition. These exercises target the myofascial system including muscles, fascia and associated connective tissues, aiming to remove adhesions, improve tissue elasticity and restore optimal biomechanical function. Myofascial release exercises that address these factors offer a comprehensive and holistic approach to the treatment of plantar fasciitis with the potential to relieve pain, increase mobility and improve functional outcomes. While traditional treatment methods provide symptomatic relief for many individuals, they may not address the underlying soft tissue restrictions and biomechanical imbalances that contribute to the condition. Myofascial release exercises offer a promising adjunctive treatment for plantar fasciitis by targeting the myofascial system, improving tissue elasticity and restoring optimal biomechanical function.

Keywords – Plantar Fasciitis, Rehabilitation, Myofascial Release, Treatment, Self-Myofascial Release.

I. INTRODUCTION

Plantar fasciitis, which constitutes an important problem in the field of orthopaedics, affects individuals with different demographic characteristics and activity levels. Characterised by excruciating heel pain, especially during weight-bearing activities, this condition often impairs mobility and reduces quality of life [1]. Traditional treatment approaches, while effective in alleviating symptoms for some, may fail to address the underlying biomechanical and soft tissue dysfunctions that contribute to plantar fasciitis [2-4]. In recent years, a growing body of research has focused on exploring alternative treatment modalities to complement traditional interventions [5, 6]. Among these methods, myofascial release exercises have emerged as a promising way to treat plantar fasciitis [7, 8].

The concept of myofascial release exercises stems from the understanding that the myofascial system, consisting of muscles, fascia and associated connective tissues, plays a crucial role in maintaining musculoskeletal health and function. Myofascial release techniques cover a spectrum of manual therapy and exercise-based interventions aimed at removing adhesions, restoring tissue mobility and optimising biomechanical alignment. These exercises target not only the area of pain, but also the interconnected network of muscles and fascia that may contribute to dysfunctional movement patterns. Myofascial release exercises that address underlying soft tissue restrictions and imbalances offer a holistic approach to the treatment of plantar fasciitis, with the potential to provide long-term relief and functional improvements[9].

As our understanding of the pathophysiology of plantar fasciitis continues to evolve, the complex interplay between mechanical, structural and inflammatory factors is increasingly recognised. While traditional treatment modalities such as rest, orthotics and NSAIDs remain cornerstone interventions, adjunctive therapies targeting the root causes of the condition are needed [10]. Myofascial release exercises show promise in this regard, offering a non-invasive and patient-centred approach to address the multifaceted nature of plantar fasciitis [11]. By further examining the therapeutic effects of these exercises and explaining their mechanisms of action, clinicians and researchers may pave the way for more effective and personalised management strategies for individuals struggling with this debilitating condition.

To this end, the aim of this review is to examine the effects of myofascial release exercises on plantar fasciitis.

II. PATHOPHYSIOLOGY OF PLANTAR FASCIITIS

Plantar fasciitis is a complex orthopaedic condition characterised by inflammation and degeneration of the plantar fascia, a thick band of connective tissue covering the sole of the foot. Although the exact etiology of plantar fasciitis is multifactorial, several basic mechanisms contribute to its development and progression. Microtrauma and repetitive stress on the plantar fascia, usually from activities such as running, jumping or prolonged standing, can lead to the formation of micro-tears and degenerative changes within the tissue. This microtrauma triggers an inflammatory response characterised by the release of pro-inflammatory cytokines, chemokines and growth factors, further exacerbating tissue damage and pain [12].

Biomechanical abnormalities and structural factors also play an important role in the pathophysiology of plantar fasciitis. Individuals with excessive foot pronation, high arch (pes cavus) or tight calf muscles may experience abnormal loading of the plantar fascia, predisposing them to injury and dysfunction [13]. In particular, excessive pronation can lead to overstretching and straining of the plantar fascia during weight-bearing activities, increasing the risk of micro-tears and inflammation. Furthermore, factors such as obesity, inappropriate footwear, and sudden changes in activity level can exacerbate biomechanical imbalances and contribute to the development of plantar fasciitis [14].

In addition to mechanical and structural factors, emerging evidence suggests that genetic predisposition and systemic conditions have a potential role in the pathogenesis of plantar fasciitis. Genetic factors may influence an individual's susceptibility to develop plantar fasciitis; certain genetic polymorphisms predispose individuals to altered biomechanics and tissue remodelling processes [15]. Furthermore, systemic conditions such as diabetes, rheumatoid arthritis and autoimmune disorders have been associated with an increased risk of plantar fasciitis, possibly due to alterations in tissue healing and inflammatory responses [16]. Understanding the multifaceted nature of the pathophysiology of plantar fasciitis is essential for developing targeted treatment approaches that address the underlying causes of the condition and promote optimal healing and recovery.

III. CURRENT TREATMENT METHODS

Management of plantar fasciitis typically involves a multifaceted approach aimed at relieving pain, reducing inflammation, promoting tissue healing and addressing the underlying biomechanical factors contributing to the condition. Traditional treatment methods form the basis of care, with a focus on conservative interventions before considering more invasive options. Rest and activity modification are often recommended to reduce stress on the plantar fascia and allow tissue healing. In addition, the application of ice therapy can help relieve pain and inflammation, especially during acute exacerbations of symptoms [10].

Non-steroidal anti-inflammatory drugs (NSAIDs) are often prescribed to relieve pain and reduce inflammation associated with plantar fasciitis. These drugs act by inhibiting the production of prostaglandins, inflammatory mediators involved in the pain response. While NSAIDs can provide symptomatic relief for many individuals, they are often used as adjunctive therapy and may not address the underlying biomechanical factors contributing to the condition. Corticosteroid injections may also be considered for individuals with persistent symptoms, particularly those who do not respond to conservative treatments. These injections provide short-term relief of symptoms by delivering robust anti-inflammatory drugs directly to the site of pain [17].

Physical therapy plays a crucial role in the management of plantar fasciitis, with a focus on improving flexibility, strength and biomechanical alignment. Therapeutic exercises targeting the calf muscles, Achilles tendon and intrinsic foot muscles can help restore optimal function and reduce stress on the plantar fascia. In addition, manual therapy techniques such as massage, stretching and joint mobilisations can be used to release tight muscles and fascia, increase tissue mobility and promote healing. Specialised orthotic devices, including arch supports and heel cups, may also be prescribed to provide additional support and cushioning to the foot and thus reduce the strain on the plantar fascia [18]. Overall, a comprehensive treatment approach that combines conservative interventions with targeted rehabilitation strategies offers the highest chance of success in managing plantar fasciitis and facilitating long-term recovery [19].

IV. THE ROLE OF MYOFASCIAL RELEASE EXERCISES

Myofascial release exercises play a crucial role in the management of plantar fasciitis by addressing the underlying soft tissue restrictions and biomechanical imbalances that contribute to the condition. These exercises target the myofascial system including muscles, fascia and associated connective tissues, aiming to remove adhesions, improve tissue elasticity and restore optimal biomechanical function. Addressing these factors, myofascial release exercises offer a comprehensive and holistic approach to the treatment of plantar fasciitis with the potential to relieve pain, increase mobility and improve functional outcomes [7, 8, 20-22].

One of the primary mechanisms by which myofascial release exercises benefit individuals with plantar fasciitis is to release fascial adhesions and restore tissue mobility [23]. Techniques such as foam rolling,

massage and stretching target the plantar fascia and surrounding soft tissues, helping to split adhesions and scar tissue that may have formed as a result of repetitive stress and microtrauma [24]. By restoring tissue mobility, these exercises can relieve pain, improve range of motion, and promote healing of the affected area [23].

Furthermore, myofascial release exercises can help correct muscle imbalances and dysfunction in the lower limbs that may contribute to abnormal loading of the plantar fascia [25]. Tightness or weakness in the calf muscles, hamstring muscles and intrinsic foot muscles can alter biomechanics and increase stress on the plantar fascia during weight-bearing activities. Myofascial release exercises through targeted stretching, strengthening and neuromuscular retraining exercises can address these imbalances, restore muscle balance and optimise biomechanical alignment [26]. By promoting proper muscle recruitment patterns and movement mechanics, these exercises reduce tension on the plantar fascia and facilitate more efficient and pain-free movement.

Mechanisms of Effect

Several mechanisms may underlie the therapeutic effects of myofascial release exercises on plantar fasciitis. These include the following:

- 1. Release of Fascial Adhesions:** Myofascial release techniques such as foam rolling, massage and stretching can help break adhesions in the plantar fascia and surrounding tissues, thereby increasing tissue mobility and reducing pain [24].
- 2. Improved Tissue Excitability:** By applying continuous pressure and stretching techniques to the plantar fascia and calf muscles, myofascial release exercises can improve tissue excitability, allowing greater range of motion and less tension [27].
- 3. Improved Blood Flow and Recovery:** Myofascial release exercises promote blood flow to the affected area, facilitating the delivery of oxygen and nutrients necessary for tissue repair and regeneration [28].
- 4. Correction of Muscle Imbalances:** Myofascial release exercises can address muscle imbalances and dysfunction in the lower extremities that may contribute to abnormal loading of the plantar fascia. By restoring muscle balance and alignment, these exercises can reduce stress on the plantar fascia and promote optimal biomechanics [26].

Clinical Evidence

Numerous studies investigating the efficacy of myofascial release techniques in the treatment of plantar fasciitis have provided valuable information on their therapeutic benefits and clinical application. A systematic review evaluated the effectiveness of manual therapy techniques targeting the plantar fascia and calf muscles, including myofascial release, in individuals with plantar fasciitis. The review revealed that manual therapy interventions were associated with significant improvements in pain, functional outcomes and patient-reported measures compared to conventional treatments alone. In particular, myofascial release techniques were effective in reducing pain and improving function, highlighting its potential as a valuable adjunctive treatment for plantar fasciitis [29].

Furthermore, a randomised controlled trial compared the effectiveness of myofascial release therapy and traditional stretching exercise in individuals with plantar fasciitis. The study revealed that participants who received myofascial release therapy experienced greater improvement in pain, functional status, and quality of life compared to those who received traditional stretching therapy. These findings underline the therapeutic benefits of myofascial release techniques in reducing pain and improving function in individuals

with chronic plantar fasciitis and suggest that they may offer a promising alternative to conventional treatment approaches [22].

In addition to manual therapy interventions, emerging evidence supports the efficacy of self-administered myofascial release techniques in the treatment of plantar fasciitis. A prospective clinical trial evaluated the effectiveness of a home-based myofascial release programme in individuals with acute plantar fasciitis. Participants were instructed to perform self-massage and stretching exercises targeting the plantar fascia and calf muscles five times daily for two weeks. The study revealed that participants who adhered to the myofascial release programme experienced significant reductions in pain and improvements in function compared to those in the control group, highlighting the potential for self-administered myofascial release techniques to complement traditional treatment approaches and improve outcomes in individuals with plantar fasciitis [30].

Overall, clinical evidence suggests that myofascial release techniques, whether practised by a therapist or as self-care, may be effective in reducing pain, improving function and enhancing quality of life in individuals with plantar fasciitis. These findings support the integration of myofascial release interventions into comprehensive treatment plans for plantar fasciitis, offering patients a non-invasive and patient-centred approach to manage their symptoms and promote long-term recovery [31].

Clinical Practice

The incorporation of myofascial release exercises into the treatment of plantar fasciitis can be implemented through a multimodal approach. This may include a combination of manual therapy techniques, therapeutic exercise, stretching and patient education. By focusing on identifying and correcting biomechanical deficiencies that contribute to plantar fasciitis, physiotherapists and healthcare providers can tailor treatment plans to meet individual patient needs.

V. CONCLUSION

Plantar fasciitis is a debilitating condition that can significantly impact quality of life and functional mobility. While conventional treatment modalities provide symptomatic relief for many individuals, they may not address the underlying soft tissue restrictions and biomechanical imbalances that contribute to the condition. Myofascial release exercises offer a promising adjunctive treatment for plantar fasciitis by targeting the myofascial system, improving tissue elasticity and restoring optimal biomechanical function. Further research is needed to clarify the long-term effects and optimal dosage of myofascial release exercises in the treatment of plantar fasciitis. However, integrating these exercises into clinical practice has the potential to improve outcomes and enhance the overall management of this common orthopaedic condition.

REFERENCES

1. Buchbinder, R., *Plantar fasciitis*. New England Journal of Medicine, 2004. **350**(21): p. 2159-2166.
2. Young, C., *Plantar fasciitis*. Annals of internal medicine, 2012. **156**(1): p. ITC1-1.
3. Scher, D., P. Belmont, and B. Owens, *The epidemiology of plantar fasciitis*. Lower Extremity Review, 2010.
4. Im Yi, T., et al., *Clinical characteristics of the causes of plantar heel pain*. Annals of rehabilitation medicine, 2011. **35**(4): p. 507-513.
5. Abdelmowla, R. and E. Abd-Elmageed, *Plantar fasciitis: patients' outcomes after 12-week Exercises Rehabilitation program*. 2021, EJH.
6. Chhabra, M. and K.B. Singh, *Current concepts in rehabilitation of plantar fasciitis*. Acta Scientific Orthopaedics (ISSN: 2581-8635), 2021. **4**(7).
7. Kuhar, S., K. Subhash, and J. Chitra, *Effectiveness of myofascial release in treatment of plantar fasciitis: A RCT*. Indian J Physiother Occup Ther, 2007. **1**(3): p. 3-9.
8. AM, H., B. Kage Vijay, and C. Basavaraj, *Comparison of myofascial release and positional release therapy in plantar fasciitis—A clinical trial*. Physiotherapy and Occupational Therapy, 2010. **4**(4): p. 8.

9. Duncan, R., *Myofascial release*. 2021: Human Kinetics.
10. Martinelli, N., C. Bonifacini, and G. Romeo, *Current therapeutic approaches for plantar fasciitis*. Orthopedic Research and Reviews, 2014: p. 33-40.
11. Ajimsha, M., D. Binsu, and S. Chithra, *Effectiveness of myofascial release in the management of plantar heel pain: a randomized controlled trial*. The Foot, 2014. **24**(2): p. 66-71.
12. Dyck Jr, D.D. and L.A. Boyajian-O'Neill, *Plantar fasciitis*. Clinical Journal of Sport Medicine, 2004. **14**(5): p. 305-309.
13. Buchanan, B.K. and D. Kushner, *Plantar fasciitis*. 2017.
14. Urse, G.N., *Plantar fasciitis: A review*. Osteopathic Family Physician, 2012. **4**(3): p. 68-71.
15. Rabadi, D., et al., *Immunopathogenesis, early Detection, current therapies and prevention of plantar Fasciitis: A concise review*. International immunopharmacology, 2022. **110**: p. 109023.
16. Carroll, P., et al., *Plantar fibromatosis: pathophysiology, surgical and nonsurgical therapies: an evidence-based review*. Foot & ankle specialist, 2018. **11**(2): p. 168-176.
17. Hasegawa, M., et al., *Current concepts of minimally invasive treatment options for plantar fasciitis: a comprehensive review*. Current Pain and Headache Reports, 2020. **24**: p. 1-11.
18. Fraser, J.J., N.R. Glaviano, and J. Hertel, *Utilization of physical therapy intervention among patients with plantar fasciitis in the United States*. journal of orthopaedic & sports physical therapy, 2017. **47**(2): p. 49-55.
19. AM, D.L., *Effectiveness of different physical therapy in conservative treatment of plantar fasciitis: systematic review*. Revista espanola de salud publica, 2014. **88**(1): p. 157-178.
20. Tamboli, U. and C. Patil, *Effect of myofascial release with lower limb strengthening on plantar fasciitis*. International Journal of Physical Education, Sports and Health, 2021. **8**(1): p. 27-31.
21. Tandell, H.I. and Y.U. Shukla, *Effect of myofascial release technique in plantar fasciitis on pain and function-An evidence based study*. International Journal of Science and Healthcare Research, 2021. **6**(2): p. 332-7.
22. Hemlata, N.K., et al., *Comparison of The Effectiveness of Myofascial Release Technique and Stretching Exercise on Plantar Fasciitis*. Physiotherapy and Occupational Therapy, 2019. **12**(2).
23. Barnes, M.F., *The basic science of myofascial release: morphologic change in connective tissue*. Journal of bodywork and movement therapies, 1997. **1**(4): p. 231-238.
24. Behm, D.G. and J. Wilke, *Do self-myofascial release devices release myofascia? Rolling mechanisms: a narrative review*. Sports Medicine, 2019. **49**(8): p. 1173-1181.
25. Zhang, Q., et al., *The Immediate Effects of Self-Myofascial Release on Flexibility, Jump Performance and Dynamic Balance Ability*. Journal of Human Kinetics, 2020. **75**(1): p. 139-148.
26. Devereux, F., et al., *Effects of myofascial trigger point release on power and force production in the lower limb kinetic chain*. The Journal of Strength & Conditioning Research, 2019. **33**(9): p. 2453-2463.
27. Kalichman, L. and C.B. David, *Effect of self-myofascial release on myofascial pain, muscle flexibility, and strength: A narrative review*. Journal of bodywork and movement therapies, 2017. **21**(2): p. 446-451.
28. Ketelhut, S., et al., *Acute self-myofascial release modulates cardiac autonomic function and hemodynamic parameters at rest and reduces cardiovascular stress reaction*. European journal of applied physiology, 2024. **124**(5): p. 1535-1545.
29. Mirza, W.N., F.S. Syed, and F.F. Liaquat, *Effectiveness of Myofascial Release Techniques in the Management of Plantar Fasciitis: A Meta-Analysis*. Allied Medical Research Journal, 2023. **1**(2): p. 161-175.
30. Hameed, F.S. and S. Srivastava, *Effect of Self Myofascial Release Using Foam Roller Versus Tennis Ball in Subjects with Plantar Fasciitis: A Comparative Study*. Indian Journal of Public Health Research & Development, 2020. **11**(2).
31. Digiovanni, B.F., et al., *Plantar fascia-specific stretching exercise improves outcomes in patients with chronic plantar fasciitis: a prospective clinical trial with two-year follow-up*. JBJS, 2006. **88**(8): p. 1775-1781.