REVIEW ARTICLE

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Comparing Different Treatment Options for Plantar Fasciitis, A Review Article

Seyed Sadegh Shirdel, Mohsen Chamanara[2], Hossein Meskar[3], Abolfazl Firouzian[3], Majid Sadeghi[4], Amirsaleh Abdollahi[5]

[1]*Orthopedic Research Center, Mazandaran University of Medical Sciences, Sari, Iran*
[2]*Toxicology Research Center, Aja University of Medical Sciences, Tehran, Iran*
[3]*Department of Anesthesiology, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran*
[4]*Burn Care Nurse, Zarreh Hospital, Mazandaran University of Medical Sciences, Sari, Iran*
[5]*Student Research Center, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran*

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Abstract

Introduction: Plantar fasciitis is a prevalent condition characterized by chronic heel pain, primarily caused by inflammation of the plantar fascia. The condition significantly impairs daily activities and quality of life, presenting a challenge for healthcare providers. Numerous treatment modalities, ranging from conservative measures to invasive interventions, have been explored to manage the symptoms and promote healing. However, the effectiveness of these treatments, especially when combined, requires further evaluation. **Methods:** This review extracted data from existing studies comparing the effectiveness of corticosteroid injections (CSI) alone versus their combination with needling techniques (such as dry needling and percutaneous needle electrolysis) for chronic plantar fasciitis. The literature was assessed through systematic reviews, randomized controlled trials, and clinical studies that evaluated pain relief, functional recovery, and long-term outcomes. Studies on adjunctive treatments like extracorporeal shockwave therapy (ESWT) were also considered to provide a broader comparison. **Results:** Corticosteroid injections provide significant short-term pain relief but are limited in their long-term efficacy, with potential complications like tissue atrophy. Dry needling and other needling therapies, when used in combination with CSI, have shown improved long-term outcomes in terms of pain reduction and functional recovery. ESWT consistently outperformed other treatments in long-term studies for both pain management and functional improvement. Combining treatments appears to yield enhanced results, although conclusive evidence on optimal treatment protocols remains insufficient. **Conclusion:** Chronic plantar fasciitis requires a multi-faceted treatment approach. While corticosteroid injections remain a common short-term solution, combining them with needling techniques may offer superior long-term benefits. Extracorporeal shockwave therapy also shows promise for sustained relief. Further research is needed to establish optimal treatment protocols and to better understand the combined effects of these interventions. An individualized treatment strategy that addresses both symptoms and underlying causes is essential for improving patient outcomes.

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Correspondence:
Amirsaleh Abdollahi
Student Research Center, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran
E-mail: amirsalehabdellahi@gmail.com

INTRODUCTION

Chronic plantar fasciitis is a prevalent and debilitating condition that poses a significant challenge to healthcare systems, affecting a large number of individuals with persistent heel pain and reduced function. The condition is caused by inflammation of the plantar fascia, a thick band of tissue that connects the heel bone to the toes. It is commonly associated with factors such as excessive stress or repetitive use of the feet, high-impact activities, poor foot mechanics, and being overweight, all of which contribute to microtears and inflammation in the fascia. Despite various treatment options, a comprehensive understanding of their effectiveness remains essential for optimizing patient outcomes and management strategies. Plantar fasciitis is primarily diagnosed through physical examination and patient history, with imaging techniques such as X-rays or MRIs sometimes employed to rule out other potential causes of heel pain (1).

The most common symptom of plantar fasciitis is heel pain, especially with the first steps in the morning or after periods of rest. The pain can worsen with prolonged standing or walking but may improve with movement, only to return later in the day (2). Conservative treatments such as rest, ice therapy, stretching exercises, orthotics, and nonsteroidal anti-inflammatory drugs (NSAIDs) are typically recommended. In more severe cases, physical therapy and night splints are utilized to support healing (3). Corticosteroid injections are another common intervention aimed at reducing inflammation and providing relief from pain. However, the effectiveness of corticosteroid injections can vary, and their long-term benefits are limited, making them a short-term solution rather than a cure (4).

The literature suggests that combining corticosteroid injections with other treatments, such as needling, may enhance outcomes for patients with chronic plantar fasciitis. Needling, either as a standalone therapy or in combination with corticosteroid injections, has shown potential to improve the treatment's effectiveness by addressing underlying tissue damage and promoting healing (5). Despite this, the evidence for combining these two approaches remains limited, and further research is needed to understand their comparative effectiveness in both the short- and long-term management of plantar fasciitis (6).

This study aims to evaluate the impact of corticosteroid injections alone versus their combination with needling in improving patient outcomes, including pain relief, functional recovery, and overall quality of life. By comparing these two treatment modalities, we seek to contribute valuable insights into optimizing treatment protocols for chronic plantar fasciitis, ultimately enhancing patient care and decision-making. Given the multifactorial nature of plantar fasciitis, including issues such as biomechanical abnormalities, the integration of needling with corticosteroid injections could provide a more comprehensive approach to treatment (7). This could potentially lead to better long-term results and reduce the need for repeated injections or invasive procedures (8).

While corticosteroid injections are effective in reducing inflammation and alleviating pain, their long-term benefits are often limited. In some cases, patients experience a recurrence of symptoms, and repeated injections may lead to side effects such as fat pad atrophy and an increased risk of plantar fascia rupture (9). Additionally, corticosteroid injections alone do not address the underlying causes of the condition, such as poor biomechanics or improper footwear. These factors underscore the importance of a multifaceted approach that not only provides immediate relief but also addresses the root causes of plantar fasciitis for sustained recovery (10).

Recent studies indicate that combining needling with corticosteroid injections may provide more lasting relief by promoting tissue healing and improving tissue flexibility (11). Needling techniques, including dry needling and needling with corticosteroid administration, are thought to stimulate tissue regeneration, reduce inflammation, and improve overall function (12). However, there is still a lack of comprehensive evidence comparing the efficacy of corticosteroid injections alone versus their combination with needling in terms of long-term functional improvements and pain reduction (13). This gap in the literature highlights the need for further investigation to establish optimal treatment strategies for chronic plantar fasciitis.

In conclusion, chronic plantar fasciitis remains a challenging condition that requires a nuanced approach to treatment. While corticosteroid injections provide effective short-term relief, their long-term efficacy is limited, and additional interventions, such as needling, may enhance outcomes. This study seeks to fill the gap in the literature by comparing the effectiveness of corticosteroid injections alone and in combination with needling, providing valuable insights into optimizing patient care for those suffering from chronic plantar fasciitis.

TREATMENT OPTIONS

The treatment of plantar fasciitis is typically multi-faceted, as no single intervention has proven universally effective for all patients. The management of plantar fasciitis primarily focuses on alleviating symptoms, addressing the underlying causes, and improving functional outcomes. Below, we outline several common

treatment options for plantar fasciitis, ranging from conservative measures to more invasive interventions (14).

Conservative Treatments

The initial approach to plantar fasciitis often involves conservative measures. These treatments aim to reduce pain and inflammation, improve flexibility, and correct any contributing factors such as abnormal foot mechanics. Common conservative treatments include:

Rest and Activity Modification: Avoiding activities that exacerbate symptoms, such as running or prolonged standing, is critical for allowing the fascia to heal. Weight-bearing activities may be replaced with low-impact exercises like swimming or cycling.

Ice Therapy: Applying ice to the affected area for 15–20 minutes several times a day can help reduce inflammation and provide temporary pain relief.

Stretching and Strengthening Exercises: A regimen of calf and plantar fascia stretches is often recommended to increase flexibility and reduce tension on the plantar fascia. Strengthening exercises focusing on the intrinsic muscles of the foot and lower leg can help improve overall foot mechanics (15).

Foot Orthotics: Custom or over-the-counter orthotic insoles may provide additional support, alleviate pressure on the plantar fascia, and correct biomechanical abnormalities such as overpronation.

NSAIDs (Nonsteroidal Anti-inflammatory Drugs): Over-the-counter pain relievers such as ibuprofen can help reduce inflammation and alleviate pain. However, these should be used sparingly, as long-term use may have side effects.

Physical Therapy

Physical therapy is a cornerstone of non-invasive treatment for plantar fasciitis. A physical therapist can design a tailored program that includes stretching exercises for the plantar fascia and Achilles tendon, strengthening exercises for the foot and lower leg, and modalities such as ultrasound therapy or soft tissue mobilization to reduce pain and inflammation (16).

Manual Therapy: Techniques such as deep tissue massage, myofascial release, and joint mobilizations can help address soft tissue tightness and improve foot function.

Eccentric Loading: A type of exercise where the muscle is lengthened under load, such as calf raises, has been shown to be effective for improving tendon healing in cases of tendinopathy, including plantar fasciitis.

Night Splints

Night splints are used to maintain the foot in a dorsiflexed position during sleep, which helps to gently stretch the plantar fascia and Achilles tendon. This may reduce morning pain and stiffness, which are hallmark symptoms of plantar fasciitis. Night splints are typically recommended for patients who experience significant pain upon waking.

Corticosteroid Injections

Corticosteroid injections are one of the most commonly used interventions for plantar fasciitis. These injections are aimed at reducing inflammation and alleviating pain by delivering a potent anti-inflammatory medication directly to the affected area. While corticosteroids can provide quick relief, their long-term benefits are limited. Repeated injections are associated with potential complications, including thinning of the fat pad beneath the heel, which could increase the risk of plantar fascia rupture and heel fat pad atrophy (17). As such, corticosteroid injections are generally considered a short-term solution and are not recommended for long-term management.

Needling Therapies

Recent advancements in the treatment of chronic plantar fasciitis have introduced needling therapies as potential adjuncts to conventional treatments. Two primary needling approaches include:

Dry Needling: This involves the insertion of thin needles into the fascia to stimulate healing and reduce tissue tension. It is believed to trigger a local inflammatory response, which in turn may promote tissue regeneration. Dry needling has shown promise in alleviating pain and improving function in patients with chronic plantar fasciitis (18).

Percutaneous Needle Electrolysis (PNE): This technique involves using an electric current in combination with needling to promote tissue healing. Early evidence suggests that PNE may enhance the regenerative capacity of the tissue, although more research is needed to confirm its long-term effectiveness (19).

Combining needling with corticosteroid injections may offer enhanced therapeutic benefits. Needling can stimulate tissue repair, while corticosteroid injections reduce inflammation and pain, providing a more comprehensive approach to treatment (20). However, studies comparing the two approaches are still limited, and the optimal treatment protocol remains unclear.

Platelet-Rich Plasma (PRP) Therapy

PRP therapy involves the injection of a concentration of platelets derived from the patient's own blood into the injured tissue. The platelets contain growth factors that can promote tissue healing. Several studies have shown that PRP may be effective in treating chronic plantar fasciitis, particularly in cases where conservative treatments have failed (16). Although PRP is considered a promising treatment, it is more

expensive and requires further studies to better define its efficacy compared to other modalities such as corticosteroid injections.

Surgical Intervention

Surgical options for plantar fasciitis are generally reserved for patients who have not responded to conservative treatments after 6–12 months. Surgical interventions may involve:

Plantar Fascia Release: A procedure in which part of the plantar fascia is cut to relieve tension and reduce pain. This can be done through open surgery or minimally invasive techniques (16-19).

Fasciotomy: A more radical procedure where the fascia is partially or completely released, often in conjunction with heel spur removal.

While surgery is effective for some patients, it carries risks such as infection, nerve damage, and complications from anesthesia. Post-surgical rehabilitation is often extensive, and not all patients achieve the desired outcome (19-22).

DISCUSSION

Plantar fasciitis (PF), a common cause of heel pain, continues to challenge clinicians in terms of effective treatment approaches. Numerous interventions have been explored, from conservative methods such as physical therapy to more invasive techniques like corticosteroid injections, dry needling, and extracorporeal shockwave therapy (ESWT). In this discussion, we will review and compare the findings from several systematic reviews and randomized controlled trials (RCTs) to better understand the efficacy of these treatment modalities for PF (27-29).

Corticosteroid injections (CSI) have long been a mainstay in the treatment of plantar fasciitis due to their anti-inflammatory properties. Whittaker et al. conducted a systematic review and meta-analysis to assess the effectiveness of corticosteroid injections for PF. The analysis of 47 randomized trials involving 2,989 participants indicated that CSI provided superior pain relief compared to autologous blood injections and foot orthoses in the short term (0 to 6 weeks). However, no significant differences were observed in the medium term (7 to 12 weeks). In the long term (13 to 52 weeks), CSI was found to be less effective than other interventions like dry needling and platelet-rich plasma (PRP) injections (22).

Despite the initial effectiveness, the long-term benefits of CSI remain limited. This is supported by the findings from Sousa Filho et al., who compared CSI with dry needling (DN) for musculoskeletal conditions. In their review, CSI demonstrated better short- and medium-term outcomes for pain reduction in PF but was less effective than DN in the long-term (22). The loss of efficacy over time points to the potential drawbacks of CSI, including the risk of tissue atrophy and the lack of addressing the underlying biomechanical causes of PF.

Dry needling (DN), a minimally invasive technique involving the insertion of needles into the affected tissue, has gained attention as an alternative or adjunct to traditional treatments like CSI. In a randomized controlled trial by Uygur et al., DN was compared with CSI in 98 PF patients who had failed non-surgical treatments. The results showed that DN provided significant improvements in foot function scores at both 3 weeks and 6 months, while CSI only led to short-term relief (23).

This finding is consistent with other studies suggesting that DN may provide more durable relief than CSI. Dry needling works by stimulating the healing of damaged tissues and promoting muscle relaxation. Furthermore, a systematic review by Sousa Filho and colleagues found that DN was more effective than CSI for pain reduction and disability improvement in long-term follow-ups, particularly for PF and other musculoskeletal conditions (22). This suggests that DN may offer a more sustainable treatment for PF compared to the diminishing effectiveness of CSI over time.

Another promising treatment for PF is extracorporeal shockwave therapy (ESWT), a non-invasive procedure that uses high-energy sound waves to stimulate tissue healing. Li et al. conducted a meta-analysis evaluating ESWT and several other treatments for PF, including CSI, PRP, and ultrasound therapy. Their findings showed that ESWT consistently outperformed placebo and was more effective than CSI in reducing pain in both short- and long-term follow-ups (24).

Moreover, ESWT ranked first in terms of overall effectiveness based on the cumulative ranking curve (SUCRA), suggesting that it may be one of the most effective treatments for PF. While CSI and dry needling are effective in the short term, ESWT appears to provide superior long-term pain relief and functional recovery, making it a potentially valuable addition to the treatment arsenal for PF.

PRP, a treatment involving the injection of a patient's own concentrated platelets into the affected tissue to promote healing, has also been explored for PF. However, the evidence for PRP is mixed. Li et al. found that PRP, along with botulinum toxin type A (BTX-A), was less effective than ESWT or CSI in reducing pain and improving function for PF (15). Other studies, including Al-Bulushi et al.'s systematic review, have also highlighted that treatments like PRP and botulinum toxin tend to have lower efficacy compared to newer minimally invasive techniques like ESWT or dry needling (25).

While PRP remains a promising treatment for some musculoskeletal conditions, its lack of superiority over

other interventions in treating PF indicates that further research is needed to establish its role in clinical practice.

The literature suggests that combining interventions may offer enhanced outcomes for PF. For example, studies have explored the combination of CSI with dry needling to address both pain and tissue damage. While some studies suggest that such combinations may yield better results, the evidence is still insufficient, and more research is needed to determine the optimal combination of treatments (26).

Additionally, the long-term success of any treatment for PF is often influenced by addressing the underlying biomechanical factors that contribute to the condition. Interventions like custom foot orthotics, physical therapy focusing on strengthening and stretching, and lifestyle modifications (e.g., weight management, footwear adjustments) are important considerations that should accompany more direct treatments like CSI, dry needling, or ESWT.

One common limitation across many studies is the variability in treatment protocols, including differences in the number of injections, duration of therapy, and follow-up periods. These inconsistencies make it challenging to draw definitive conclusions on the best approach for PF. Future studies should aim to standardize treatment protocols and consider longer follow-up periods to evaluate the sustainability of results.

Furthermore, many of the studies reviewed had varying risk of bias, which affects the reliability of their findings. More high-quality, large-scale randomized controlled trials with low risk of bias are needed to provide more robust evidence on the effectiveness of these treatments.

While corticosteroid injections remain a widely used treatment for plantar fasciitis, their long-term efficacy is limited, and alternative therapies like dry needling and ESWT show promise for sustained relief. Dry needling may offer superior long-term outcomes compared to corticosteroid injections, while ESWT consistently ranks as one of the most effective treatments for PF. However, the best approach may involve combining different modalities to address both the symptoms and underlying causes of the condition. Further research is needed to refine treatment protocols and provide more definitive guidance for clinicians managing plantar fasciitis.

CONCLUSION

Chronic plantar fasciitis remains a challenging condition, requiring a multifaceted and individualized treatment approach. While conservative measures like rest, stretching, and orthotics provide initial relief, more invasive treatments such as corticosteroid injections, dry needling, and extracorporeal shockwave therapy (ESWT) show promise for both short- and long-term pain management. The combination of corticosteroid injections with needling techniques may offer enhanced benefits, though further research is needed to determine the most effective treatment protocols. Despite these advancements, surgery should remain a last resort for patients who do not respond to conservative or minimally invasive treatments. Ultimately, effective management of plantar fasciitis hinges on tailoring interventions to each patient's specific needs and addressing the underlying causes of the condition, ensuring long-term functional recovery and quality of life.

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