University of New England
DUNE: DigitalUNE

Case Report Papers | Physical Therapy Student Papers

12-2019

Combining A Comprehensive Physical Therapy Program And Electrocorpeal Shockwave Therapy For Plantar Fasciitis: A Case Report

Kathryn Piersiak

Follow this and additional works at: https://dune.une.edu/pt_studcrpaper

 Part of the Physical Therapy Commons

© 2019 Kathryn Piersiak

Title Page

Combining a Comprehensive Physical Therapy Program and Electrocorpeal Shockwave Therapy for Plantar Fasciitis: A Case Report

Kate Piersiak, ATC, is a Doctor of Physical Therapy (DPT) student at the University of New England, 716 Stevens Ave. Portland, ME 04103. Address all correspondence to Kate Piersiak at: kathryn.piersiak@gmail.com.

The patient signed an informed consent acknowledging the participation in this case report and allowing the use of their personal health information and recorded images. The patient received information on the university's policies regarding the Health Insurance Portability and Accountability Act.

The author acknowledges Kirsten Buchanan, PhD, PT, ATC, for case report for both conceptualization and editing, and Marissa Valle, PT, DPT for assistance of patient supervision. The author also acknowledges the patient for their willingness to participate in this case study.

Key Words: plantar fasciitis, hip strengthening, electroshock therapy, conservative treatment.

ABSTRACT

Background and Purpose: Plantar fasciitis (PF) is present in 2 million Americans a year, and in 10% of the population over a lifetime. Conventional physical therapy (PT) for PF has included strengthening of foot and hip musculature, and lower extremity stretching. Extracorporeal shockwave therapy (ECSW) has also been utilized with success in treatment of PF. While these two treatments have been used individually, their combined effect has not been studied. The purpose of this case report investigated a combined plan of care utilizing conventional PT, targeted hip strengthening, and ECSW.

Case Description: The patient was a 48-year-old female who presented with chronic PF. She was seen for 11 visits over 4 weeks. Initial deficits were found in strength, gait, tenderness to palpation, impaired ADLs, and functional tasks. She reported prior treatment of ECSW and PT, but no combination of both simultaneously. Treatment included traditional PT with a focus on intrinsic foot strengthening, hip strengthening, and taping.

Outcomes: From initial evaluation to re-evaluation, Lower Extremity Functional Scale (LEFS) improved from 31/80 to 53/80, pain decreased from 4/10 to 0/10, tenderness decreased from diffuse pain to point tenderness at the plantar fascia insertion. Manual muscle testing improved as follows: right gastrocnemius 4/5 to 4+/5, extensor hallucis left 4+/5 to 5/5 and right 3+/5 to 4/5, flexor hallucis left 4+/5 to 5/5 and right 3+/5 to 4/5. Her gait no longer demonstrated a Trendelenburg pattern.

Discussion: Traditional PT with a focus on hip strengthening combined with ECSW therapy was beneficial in treating a patient with PF. Future studies may want to consider investigating the most efficient hip and ECSW therapy protocols for maximum benefits.

Manuscript Word Count: 3,426

Introduction/Background and Purpose

Plantar fasciitis (PF) is defined as inflammation to the thick, fibrous connective tissue originating on the medial calcaneal tubercle extending to the metatarsal heads of the foot and passing over the superficial musculature of the foot.[1] This structure helps to stabilize the medial longitudinal arch (MLA) and it restores the arch during dynamic movements, aiding in reconfiguring the foot for efficient toe-off.[2] PF is present in about two million Americans a year and 10% of the population over a lifetime.[3] Rome et al also reported PF is present in both athletic and non-athletic populations and accounts for 15% of all adult foot complaints requiring professional care.[4]

Common symptoms of PF include pain, especially in the mornings or during weightbearing, tenderness to palpation over the medial calcaneal tubercle and discomfort with passive dorsiflexion of the first toe.[1] Physical examinations on patients with PF often include a pes planus or cavus foot, shortened Achilles tendon, overpronation or under pronation, limited ankle dorsiflexion, weak intrinsic muscles on the foot, and weak plantar flexor muscles.[1] Treatment typically is focused on decreasing inflammation, supporting the longitudinal arch, and stretching tight tissues such as the plantar fascia. Rest, cryotherapy, nonsteroidal anti-inflammatory drugs (NSAIDS), orthotics, night splints, application of tape, and intrinsic/extrinsic foot muscle strengthening are also utilized in conservative treatment of PF.

Extracorporeal shockwave therapy (ESWT) has been utilized with fair success in the treatment of PF. ESWT is a non-invasive modality that uses sound waves to create a controlled microtrauma to the impaired tissue. This stimulates a healing response and micro-vascularization. Furthermore, it induces the release of enzymes, affecting nociceptors, resulting in localized analgesia.[5] Saxena et al compared the use of ESWT, placebo ESWT, and endoscopic

plantar fasciotomy (EPF) on athletes who had PF. The study showed that EPF had a significantly better outcome with significantly lower post-EPF Visual Analogue Scale (VAS).[6] Post-treatment of both the ESWT and P-ESWT groups improved, but ESWT was not significantly better.[6] Hsu et al performed a study researching the effects of shockwave therapy on plantar fasciopathy from a biomechanical perspective. This particular study concluded that its effects on the specific foot biomechanics not only decreased the pain VAS but also improved gait in the affected foot three weeks following repetitive treatment.[7]

Hip strengthening protocols have recently shown improvement in distal PF signs and symptoms. This is important because proximal strength is often overlooked when treating distal lower extremity (LE) injuries. Santos et al. found that a combination of the two interventions showed meaningful improvement in strength and pressure pain threshold and an overall decrease in pain in patients with PF.[8] Research backs the importance of hip strengthening and its impact on the ankle, emphasizing this treatment intervention.[8] Furthermore, since the abductors and lateral rotators are involved in the alignment of the lower limbs, weakened muscles can lead to adduction and medial rotation of the hip and dynamic knee valgus, ultimately leading to pronation of the foot.[3, 5] This is considered a low risk factor for PF mentioned by Martin et al.[3] According to Kamonseki, the effect of targeted hip strengthening on PF is not yet fully understood.[5] There is evidence supporting PF with conservative, traditional PT interventions, electroshock therapy and more recent hip strengthening protocols individually, however, there is a lack of evidence investigating their combined effect. Therefore, the purpose of this case report was to investigate the recovery of a patient with PF while using a combined approach of conventional therapy, targeted hip strengthening, and electroshock therapy.

Patient History and Systems Review

The patient was a 48-year-old female presenting to the clinic with a diagnosis of right PF who signed informed consent acknowledging the participation in this case report and allowing the use of their personal health information for this case report. The patient had a history of bilateral bunion surgery, cancer and radiation to the salivary gland, thyroid removal, and ESWT to the right foot earlier in the year. One year prior, the patient reported going for a run and feeling a sharp pain in the heel. After an unsuccessful attempt to rest her heel, she saw the doctor, and was diagnosed with a heel spur. She was then referred to physical therapy. Two weeks later, her pain worsened with stretching, so she returned to the MD for a re-evaluation. Two months later the patient had an MRI which showed a torn plantar fascia. Treatment resulted in the patient wearing a boot, resting and returning to physical therapy for four months. The patient noted at this time she wasn't able to get past 75% on the Alter G (Fremont, CA) for 15 minutes due to pain. The patient continued to feel pain, and she returned to the doctor. The patient trialed ESWT earlier in the year and was told to rest after this treatment. After ESWT, the patient noticed an improvement in the distance she was able to walk, progressing from 0.5 to 2 miles at a time. However, one day after only making it two blocks from home, she reported continued sharp pain in her foot. She again returned to the doctor 1 week prior to initial evaluation and was referred to physical therapy.

The patient reported her pain as an aching/dull/throbbing sensation, which was occasionally sharp with walking. The pain was noted to radiate along the plantar surface of the foot and up the anterior and posterior lower leg. Additionally, the patient described an achy feeling around her heel and a recent increase in pain at the dorsum of the foot. The patient stated she had difficulty with weight bearing activities such as walking, ascending/descending stairs,

running, and standing on her feet. The patient reported taking thyroid medication and an unremarkable family history.

The patient reported having a good understanding of her case and current situation. She also understood that PF required lifelong management in order to decrease the risk of recurrence. The patient stated she found relief with electroshock therapy for a few weeks and was hopeful that with the second treatment in August, will help improve her prior level of function. The primary problem for this case was the recurrent and prolonged injury of the plantar fascia causing sharp pains on the plantar surface of the right foot limiting the patient's ability to participate in activities of daily living (ADL).

Potential differential diagnoses that were addressed included examination for fallen or high arches, posterior tibialis tendonitis, bone spurring, intrinsic foot muscle weakness, fractures, muscle weakness, and Achilles tendonitis. The plan for examination included manual muscle testing, arch analysis, testing navicular drop, range of motion testing, strengthening exercises, balance testing and LE functional testing. This patient remained a good candidate for this case report due to her complicated medical history, recurring pain in the right foot, and treatment with electroshock therapy with its impact on the physical therapy rehabilitation.

A complete systems review can be seen in Table 1.

Examination – Tests and Measures

The tests and measures performed along with results can be found in Table 2.

The Lower Extremity Functional Scale (LEFS) was administered in order to evaluate the impact of the patient's plantar fascia injury on their ability to perform everyday tasks or ADLs. The LEFS is a subjective outcome measurement out of a total of 80 points, with a higher score

demonstrating less difficulty. According to Mehta et al, the LEFS is a "reliable, valid, and responsive tool for assessing disability resulting from LE musculoskeletal conditions".[9]

The Numeric Pain Rating Scale (NPRS) is a numerical measure of pain intensity in patients with a scale ranging from zero to ten. Zero on the scale represents no pain, and a ten on the scale represents the worst possible pain. The NPRS has excellent evidence supporting the validity and sensitivity for the use of this scale in physical therapy practices.[10]

Palpation was performed over the lower limb, ankle and foot region in order to determine areas of tenderness, edema, sensitivity and inflammation. The results of palpation are listed in Table 2. Techniques for palpation were followed based off the palpation techniques published by Reighert.[11]

Range of motion (ROM) was measured using a standard goniometer based off the methods and procedures taught by Norkin and White. Measurements were taken in the ankle and phalanges.[12]

Manual Muscle Testing (MMT) was used to assess LE strength based off the methods and procedures of Kendall.[13] According to Bohannon, reliable assessments of strength may not be assumed but is possible to be achieved. It is understood that further studies need to be performed in order to assess the reliability of MMT across joints.[14]

Observational gait analysis (OGA) was briefly assessed while the patient was entering the clinic. The patient was assessed while walking in sneakers from the waiting area to the treatment table on a carpeted surface. Brief observations are listed in Table 2. Intra- and interrater reliability was found to be good, however a learning effect may need to be taken into consideration when looking at the results when interpreting follow-up measurements after a few days.[15]

Clinical Impression: Evaluation, Diagnosis, Prognosis

Following the initial examination, the patient's presentation was consistent with the diagnosis of PF. The functional deficits aforementioned impacted her ability to perform ADLs requiring walking or moving. She was unable to participate in any physical activity without pain including exercises at the gym or walking in the community. This in addition to pain with ADLs and difficulty ascending/descending stairs made her an excellent candidate for skilled physical therapy. The medical diagnoses were used according to the International Classification of Disease tenth edition (ICD-10) and included: M72.2: Plantar fascial fibromatosis, M79.671: Pain in right foot.

The patient's prognosis was determined to be good due to her willingness to participate, lack of comorbidities, medical diagnosis, and compliance with physical therapy. Conventional physical therapy has been shown to improve deficits caused by this particular injury, but this patient was also receiving electroshock therapy as an additional intervention. A study performed by Tae et al demonstrates the positive impacts of both conventional therapy and the shock therapy in relieving pain, improving gait, strength, and foot mechanics.[16]

Due to the nature and prognosis of the plantar fascia injury, there was no referral or consultation necessary. Additional testing/follow-up evaluations of outcomes were completed at re-evaluation. Further testing included continued strength testing of the core and hips after an intensive strengthening program had been implemented for about 6 weeks. The plan for interventions included manual therapy, soft tissue massage, cross friction massage, arch taping techniques, orthotics, knee, hip and core strengthening, balance activities, and functional activities.

See table 4 for short- and long-term goals.

Intervention and Plan of Care

After the initial evaluation (IE), a plan of care (POC) was created and appointments were scheduled for follow up treatment sessions. The patient attended 2-3 sessions per week lasting about an hour in length. The patient attended nine sessions total over the course of three weeks, the first being the IE. The patient demonstrated excellent compliance attending appointments, always making sure to reschedule if necessary. The patient emailed with any questions or concerns in terms of pain exacerbation or clarification on exercises. Communication was not only maintained through email, but also during sessions where the patient felt comfortable asking questions. The IE and subsequent daily notes were documented using electronic medical records (EMR), specifically WebPT.

Procedural interventions included manual therapy, stretching, therapeutic exercises, taping techniques, and pneumatic devices such as the Game Ready (Concord, California) for post treatment soreness and inflammation that may have occurred during the session. The patient reported compliance of her home exercise program (HEP) and demonstrated knowledge and proper technique when reviewed. All procedural interventions performed can be found in Table 3.

Manual therapy was utilized in the form of soft tissue massage (STM) to the gastrocnemius, soleus, plantar fascia, and muscles on the dorsum foot. This was intended to relieve hypertonicity and spasticity in areas that were overactive, ultimately hoping to improve the ROM deficits. Additionally, STM in the form of elevated retrograde massage was used to help decrease the edema and inflammation present around the plantar fascia insertion site. The ultimate purpose of the STM was to perform a myofascial release of the plantar fascia itself.

Piper et al. has supported the use of myofascial release to the gastrocnemius, soleus and plantar fascia establishing its effectiveness.[17]

The patient was instructed in gentle stretching to the plantar fascia with the patient's ankle remaining in a neutral position and extending the great toe. The patient was educated in the techniques of pain free gentle stretching. Stretching activities were performed in patients with PF with positive outcomes, supporting the use through this case study.[18] Due to the patient presenting with hypertonicity in the gastrocnemius, the patient was stretched in a long sitting position with a strap and progressed to standing on a wedge. Care was taken to keep the plantar fascia on slack initially to allow for healing.

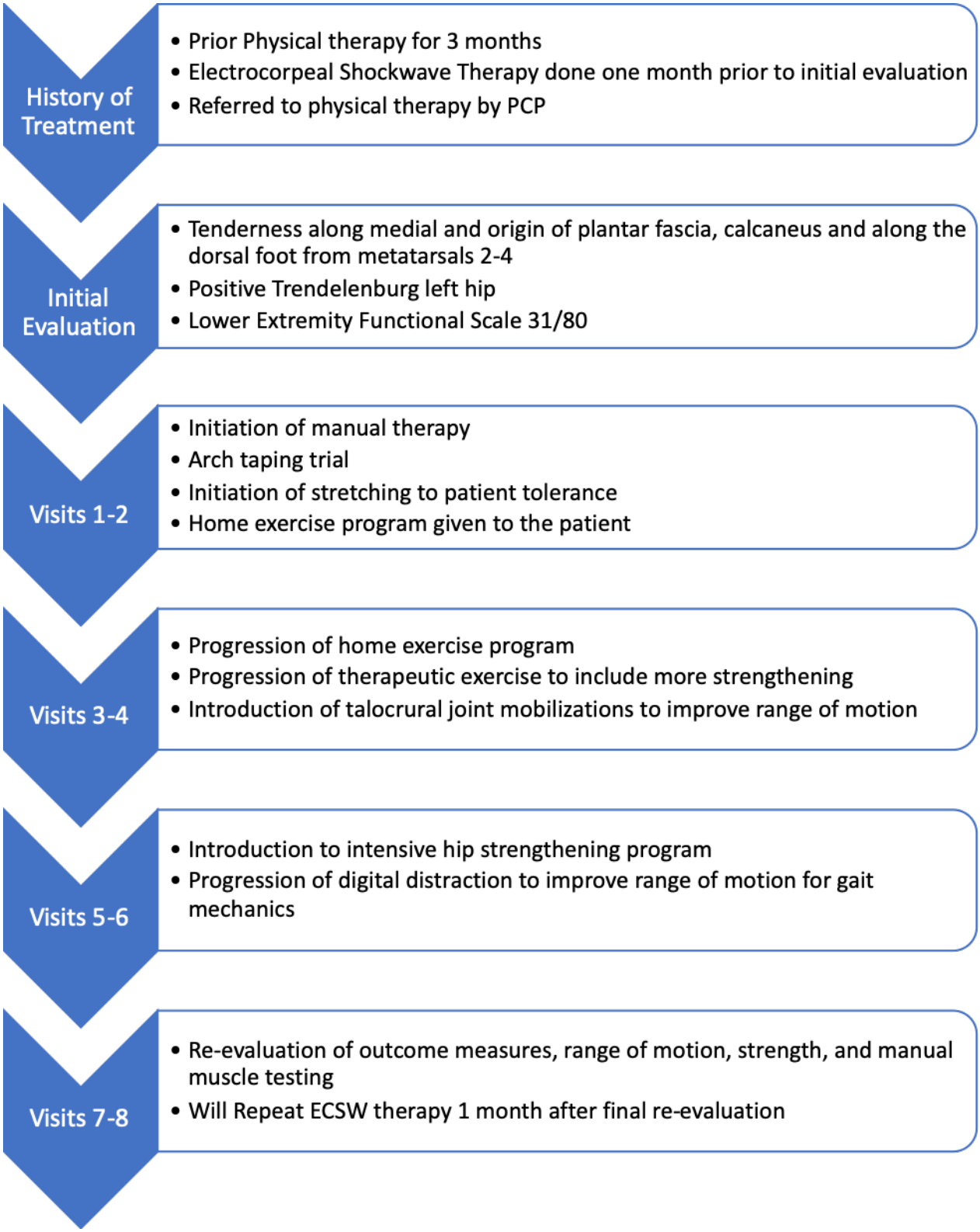
Therapeutic exercise was utilized in order to target the intrinsic strength of the muscles supporting the MLA and other bones in the foot. The intrinsic muscles of the foot are used to support the arch along with the plantar fascia and fatigue can be a factor with PF. Due to the patient's presentation of a low arch, significant navicular drop and suspected weakness of the intrinsic muscles, a strengthening protocol was utilized. Headlee et al also performed a study that revealed increased navicular drop after fatiguing the intrinsic foot muscles.[19] Intrinsic strengthening exercises included arch doming, towel scrunches, and marble pick-ups.

Taping was utilized to provide extra support to the navicular bone and foot structure in order to help create an arch. The leukotape, with a white stretch tape base, was placed on the mid-lateral aspect of the dorsum of the foot, with about 1-inch anchor. From there, the physical therapist applied 20% force to the tape, pulling it directly up over the navicular bone, and up over the top of the foot, crossing to the lateral malleolus. The effectiveness of biomechanically controlling tensile forces generated through the plantar fascia through the utilization of taping techniques was supported by Hunt et al's study.[20]

The patient progressed through manual therapy, stretching, and therapeutic exercises. Initially, the patient presented with functional deficits in the foot, but as further testing was performed on the calf, knee, hip and core other deficits became apparent. When the patient tolerated one or two treatment sessions with no exacerbations of pain or symptoms, she progressed to include more intensive activities. If she presented with an increase in pain or symptoms, the manual therapy and therapeutic exercises were adjusted accordingly. Understanding that weak gluteal muscles contribute to improper foot mechanics, it was important to incorporate proximal strengthening activities as well

.

252 **TIMELINE**



253

254

OUTCOMES

Over the course of nine sessions, the patient reported a general decrease in pain, however, symptoms did not completely resolve. Final outcomes included an improvement on the LEFS from 31/80 to 53/80. Additionally, the NPRS pain at best, current, and worst improved. Worst remained the same at a 7/10, current pain decreased from a 4/10 to 2/10, and pain at best improved from a 2/10 to 0/10. Palpation tenderness improved initially from tenderness along medial and origin of plantar fascia, and calcaneus and mild tenderness along dorsal foot from metatarsals 2-4 to only being present over the plantar fascia insertion. Ankle and toe range of motion remained within functional limits from initial evaluation to re-evaluation. Dorsiflexion and plantarflexion manual muscle testing remained 5/5 bilaterally. Right gastrocnemius strength improved from a 4/5 to a 4+/5, and remained 5/5 from pre and post testing on the left. Extensor hallucis strength improved from left 4+/5 to 5/5 and right 3+/5 to 4/5. Flexor hallucis strength improved from left 4+/5 to 5/5 and right 3+/5 to 4/5. The patients gait evaluation no longer demonstrated a positive Trendelenburg on the left side upon re-evaluation.

DISCUSSION

The case report describes a comprehensive PT program combining the effects of a comprehensive PT program and ESWT for the treatment of a patient with PF. Due to the chronicity of PF, it often is a difficult diagnosis to treat. ESWT has been utilized with fair success in the treatment of PF.[5] A study researching the effects of ESWT on PF from a biomechanical perspective was performed and concluded that its effects on foot biomechanics not only decreased the pain on VAS, but also improved gait in the affected foot three weeks following repetitive treatment.[7] Individually, there is research upholding hip strengthening and its impact on the foot and ankle to improve foot/gait mechanics, there is research supporting the

use of conventional physical therapy on PF, and there is limited research on ECSW therapy. However, there is limited research on the combined effects of a hip strengthening program intertwined with conventional physical therapy and shockwave therapy. This particular case report was able to look at the impact of all these interventions in one combined treatment on a patient diagnosed with PF.

Based on the outcome measures, the patient appeared to improve from the interventions applied. These findings suggest that patients with PF may benefit from a combined comprehensive physical therapy that includes targeted hip strengthening and shockwave therapy.

One limitation that presented itself during this case report was the duration of physical therapy sessions. While the patient was initially complaint in attending, after returning from a vacation later in the summer, she felt as though her progress had plateaued and opted for a break to see how she could function with only a HEP. While she did hip strengthening as part of her HEP, it may have been more effective with regular PT visits. Conversely, a study by De Carlo et al indicated that patients undergoing ACL reconstruction and following a rehabilitation protocol did not require a high number of physical therapy visits to achieve a favorable outcome.[21] Although this study was about patients undergoing an ACL reconstruction, the concept about less visits may carryover indicating that a lack of visits may not have impacted the outcomes after all.

Strengths in this case study included the diligence of adhering to the HEP and that the patient was able to make improvements within the first few weeks of treatment.

In conclusion, a comprehensive physical therapy program including targeted hip strengthening and ECSW therapy for a patient with PF resulted in increased functional abilities, increased strength, and a decrease in pain. While the patient was attending PT sessions, success

may have benefitted from the patient's compliance when showing up on time, performing her home exercise program routinely, and providing adequate feedback in order to progress appropriately throughout the treatment interventions. While there is limited research about ECSW therapy for the treatment of PF, when combined with conventional therapy, there was a positive outcome in results. Additional research is necessary to determine the effectiveness of targeted hip strengthening and ESWT specifically for chronic cases of patients with PF.

REFERENCES

1. Schwartz EN, Su J. Plantar fasciitis: a concise review. *Perm J*. 2014;18(1):e105–e107. doi:10.7812/TPP/13-113
2. Sonu P, Aman. Physiotherapy treatment in plantar fasciitis: a case report. *Indian J Physiother and Occup Ther.* 2015;9(1):54-58. doi: 10.5958/0973-5674.2015.00012.X
3. Martin RL, Davenport TE, Reischl SF, et al. Heel pain-plantar fasciitis: revision 2014. *J Orthop Sports Phys Ther.* 2014;44(11):A1-A23. doi: 10.2519/jospt.2014.0303
4. Rome K, Howe T, Haslock I. Risk factors associated with the development of plantar heel pain in athletes. *The Foot.* 2001;11:119-125. doi: 10.1054/foot.2001.069
5. Kamonseki DH, Gonçalves GA, Yi LC, Júnior IL. Effect of stretching with and without muscle strengthening exercises for the foot and hip in patients with plantar fasciitis: a randomized controlled single-blind clinical trial. *Man Ther*. 2016;23:76-82. doi: //doi.org/10.1016/j.math.2015.10.006
6. Saxena A, Fournier M, Gerdesmeyer L, Gollwitzer H. Comparison between extracorporeal shockwave therapy, placebo ESWT, and endoscopic plantar fasciotomy for the treatment of chronic plantar heel pain in the athlete. *Muscles Ligaments Tendons J.* 2012;2(4):312-316
7. Hsu W-H, Lai L-J, Chang H-Y, Hsu RW-W. Effect of shockwave therapy on plantar fasciopathy: A biomechanical prospective. *Bone & Joint Journal*. 2013;95-B(8):1088-1093. doi:10.1302/0301-620X.95B8.31497
8. Dos Santos B, Amaral Corrêa L, Teixeira Santos L, Meziat Filho NA, Lemos T, Calazans Nogueira LA. Combination of hip strengthening and manipulative therapy for the

346 treatment of plantar fasciitis: a case report. *J Chiropract Med.* 2016;15(4):310-313. doi:
347 10.1016/j.jcm.2016.08.001
348 9. Mehta SP, Fulton A, Quach C, Thistle M, Toledo C, Evans NA. Measurement properties
349 of the lower extremity functional scale: a systematic review. *J Orthop Sports Phys Ther*.
350 2016;46(3):200-216. doi:10.2519/jospt.2016.6165
351 10. Ferreira-Valente MA, Pais-Ribeiro JL, Jensen MP. Validity of four pain intensity rating
352 scales. *PAIN*®. 2011;152(10):2399-2404.
353 http://www.sciencedirect.com.une.idm.oclc.org/science/article/pii/S0304395911004453.
354 doi: //doi-org.une.idm.oclc.org/10.1016/j.pain.2011.07.005
355 11. Reighert B. *Palpation techniques surface anatomy for physical therapists*. Stuttgart,
356 Germany: Georg Thieme Verlag; 2007.
357 12. Norkin C, White D. *Measurements of Joint Motion*. Philadelphia, PA: F.A. Davis
358 Company; 2009.
359 13. Kendall F, McCreary E, Provance P, Rodgers M, Romani W. *Muscles testing and*
360 *function with postures and pain.* 5th edition. Baltimore, MD: Lippincott Williams and
361 Wilkins; 2005.
362 14. Bohannon RW. Reliability of manual muscle testing: a systematic review. *Isokinetics*
363 *Exerc Sci*. 2018;26(4):245-252.
364 http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=133500478&site=eho
365 st-live&scope=site. doi: 10.3233/IES-182178
366 15. Koyama S, Tanabe S, Itoh N, et al. Intra- and inter-rater reliability and validity of the
367 tandem gait test for the assessment of dynamic gait balance. *Eur J Physiother*.
368 2018;20(3):135-140.

http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=132024255&site=ehost-live&scope=site. doi: 10.1080/21679169.2017.1414304

16. Tae K, Sea B, Gye K, Kyung K. The effects of extracorporeal shock wave therapy on stroke patients with plantar fasciitis. *J Phys Ther Sci*. 2015;27(2):523-526. doi:10.1589/jpts.27.523
17. Piper S, Shearer HM, Côté P, et al. The effectiveness of soft-tissue therapy for the management of musculoskeletal disorders and injuries of the upper and lower extremities: a systematic review by the ontario protocol for traffic injury management (OPTIMa) collaboration. *Manual Therapy*. 2016;21:18-34. doi:10.1016/j.math.2015.08.011
18. Özer D, Köksal A, Öner A, Kaygusuz MA. Effectiveness of plantar fascia-specific stretching exercises in plantar fasciitis. *Medical Bulletin of Haseki/Haseki Tip Bulteni*. 2015;53(4):295-298. doi:10.4274/haseki.2479
19. Headlee DL, Leonard JL, Hart JM, Ingersoll CD, Hertel J. Fatigue of the plantar intrinsic foot muscles increases navicular drop. *J Electromyogr Kinesiol*. 2008;18(3):420-425. doi:S1050-6411(06)00170-2
20. Hunt GC, Sneed T, Hamann H, Chisam S. Biomechanical and histological considerations for development of plantar fasciitis and evaluation of arch taping as a treatment option to control associated plantar heel pain: a single-subject design. *Foot*. 2004;14(3):147-153. http://search.ebscohost.com.une.idm.oclc.org/login.aspx?direct=true&db=ccm&AN=106609092&site=ehost-live&scope=site
21. De Carlo MS, Sell KE. The effects of the number and frequency of physical therapy treatments on selected outcomes of treatment in patients with anterior cruciate ligament

reconstruction. *J Orthop Sport Phys*. 1997;26(6):332-339. http://search.ebscohost.com.une.idm.oclc.org/login.aspx?direct=true&db=ccm&AN=107244042&site=ehost-live&scope=site. Accessed October 22, 2019.

TABLES and FIGURES (Max of six total)

Table 1: Systems Review

Cardiovascular/Pulmonary	Edema present in R medial proximal arch
Musculoskeletal	Bunion surgery, have since returned Gross strength impairments of right hip, ankle, great toe Gross range of motion impairments of the right great toe
Neuromuscular	Intact
Integumentary	History of cancer and radiation to salivary gland – not currently active
Endocrine	Cancer and radiation to salivary gland Thyroid removal Continued follow up with MD for check-ups
Communication	Intact
Affect, Cognition, Language, Learning Style	Intact

R = Right, MD = doctor

Table 2: Tests and Measures

Tests & Measures	**Initial Evaluation Results**	**Discharge Evaluation Results**
Lower Extremity Functional Scale	31/80	53/80
Numeric Pain Rating Scale (0-10)	Best: 2/10 Current: 4/10 Worst: 7/10	Best: 0/10 Current: 2/10 Worst: 7/10
Palpation	Tenderness along medial and origin of plantar fascia, and calcaneus Mild tenderness along dorsal foot from metatarsals 2-4	Tenderness over plantar fascia insertion
Range of Motion		
Ankle	Within functional limits	Within functional limits
Toe	Within functional limits	Within functional limits
Manual Muscle Testing		
Ankle		
Dorsiflexion	5/5 Bilaterally	5/5 Bilaterally
Plantarflexion	5/5 Bilaterally	5/5 Bilaterally
Gastrocnemius	L: 5/5 R: 4/5	L: 5/5 R: 4+/5
Toes		
Extensor Hallucis	L: 4+/5 R: 3+/5	L: 5/5 R: 4/5
Flexor Hallucis	L:4+/5 R: 3+/5	L: 5/5 R: 4/5
Gait	Positive Trendelenburg on left side	Normal gait pattern

L = left, R = right

Table 3: Procedural Interventions	**Initial Evaluation**	**Rx Day 1**	**Rx Day 2**	**Rx Day 3**	**Rx Day 4**	**Rx Day 5**	**Rx Day 6**	**Rx Day 7**	**Rx Day 8**
Manual Therapy									
STM Gastroc/Soleus	x	x	x	x	x	x	x	x	x
Great Toe Extension Stretch	3 x 30”	3 x 30”	3 x 30”	3 x 30”	3 x 30”	3 x 30”	3 x 30”	3 x 30”	3 x 30”
Arch Tape	x		x	x	x	x	x	x	
Retrograde Massage					Foot elevated on wedge	Foot elevated on wedge	Foot elevated on wedge	Foot elevated on wedge	Foot elevated on wedge
TC A-P Mobs Grade 2					Supine	Supine	Supine	Supine	Supine
Digital Distraction					Foot elevated on wedge	Foot elevated on wedge	Foot elevated on wedge		
Therapeutic Exercise									
Upright Bike			8 mins	10 mins		Recumbent bike 10 mins	10 mins	10 mins	10 mins
Ice Foot Roll			2 mins	2 mins	2 mins	2 mins	2 mins	2 mins	2 mins
Towel Scrunches		2 mins							
Ankle 4 Way with TheraBand		3 x 10 green band	3 x 10 green band	3 x 10 green band	3 x 10 green band	3 x 10 green band	3 x 10 green band	3 x 10 green band	3 x 10 green band
Arch Dome									1 x 15
Great toe stretch		3 x 30” with towel	3 x 30” with strap, foot neutral	3 x 30” with strap, foot neutral	3 x 30” with strap, foot neutral	3 x 30” with strap, foot neutral	3 x 30” with strap, foot neutral	3 x 30” with strap, foot neutral	3 x 30” with strap, foot neutral
Runner Stretch with bent knee		3 x 30”	3 x 30”	3 x 30”	3 x 30”	3 x 30”	3 x 30”	3 x 30”	3 x 30”
MFR Stick			2 mins-calf	2 mins-calf	2 mins-calf	2 mins-calf and anterior tibialis	2 mins-calf	2 mins	2 mins

Marble Pick up			2 mins	2 mins		3 mins	3 mins	3 mins	3 mins
Lateral walk with TheraBand						25 feet x 2 red band		25 feet x 2 red band	25 feet x 2 red band
SLS balance on Airex						3 x 30”	3 x 30”	3 x 30”	3 x 30”
Clamshells with TheraBand						3x10-red B	3x10-red B	3x10-red B	3x10-red B
Modalities									
Game Ready	10 mins	10 mins	10 mins	10 mins	10 mins	10 mins		10 mins – Cold pack	10 mins – cold pack

433 Rx = treatment, STM = soft tissue massage, gastroc = gastrocnemius, TC = talocrural, A-P = anterior-posterior, MFR = myofascial
434 release, SLS – single leg stance, “ = seconds, B = bilateral, mins = minutes,

435 Table 4: Short- and Long-Term Goals

Short Term Goals	**Long Term Goals**
The patient will be independent with HEP	The patient will demonstrate equal strength bilaterally to improve proper foot mechanics for ambulation
The patient will demonstrate pain-free walking < 5 minutes to perform light ADLs	The patient will tolerate 30 minutes of pain-free walking to improve community interaction
The patient will demonstrate improved strength by ½ grade to improve foot support and push off	The patient will report 0/10 on the Visual Analog Scale in order to fully participate in ADLs at home
The patient will demonstrate reduced pain to 1/10 at foot and calf for standing 1 hour to complete work tasks.	The patient will run without pain for 1 mile in order to return to previous physical activity

436 HEP = home exercise program, ADLs = activities of daily living

437

438

439

440

441

442

443

444

445

446

447

448

449

450

451 **CARE Checklist**

452

CARE Content Area	Page
1. **Title** – The area of focus and "case report" should appear in the title	2
2. **Key Words** – Two to five key words that identify topics in this case report	2
3. **Abstract** – (structure or unstructured) a. Introduction – What is unique and why is it important? b. The patient's main concerns and important clinical findings. c. The main diagnoses, interventions, and outcomes. d. Conclusion—What are one or more "take-away" lessons?	3
4. **Introduction** – Briefly summarize why this case is unique with medical literature references.	3-4
5. **Patient Information** a. De-identified demographic and other patient information. b. Main concerns and symptoms of the patient. c. Medical, family, and psychosocial history including genetic information. d. Relevant past interventions and their outcomes.	5-6
6. **Clinical Findings** – Relevant physical examination (PE) and other clinical findings	8
7. **Timeline** – Relevant data from this episode of care organized as a timeline (figure or table).	12
8. **Diagnostic Assessment** a. Diagnostic methods (PE, laboratory testing, imaging, surveys). b. Diagnostic challenges. c. Diagnostic reasoning including differential diagnosis. d. Prognostic characteristics when applicable.	5-8
9. **Therapeutic Intervention** a. Types of intervention (pharmacologic, surgical, preventive). b. Administration of intervention (dosage, strength, duration). c. Changes in the interventions with explanations.	9-11
10. **Follow-up and Outcomes** a. Clinician and patient-assessed outcomes when appropriate. b. Important follow-up diagnostic and other test results. c. Intervention adherence and tolerability (how was this assessed)? d. Adverse and unanticipated events.	13
11. **Discussion** a. Strengths and limitations in your approach to this case. b. Discussion of the relevant medical literature. c. The rationale for your conclusions. d. The primary "take-away" lessons from this case report.	13-15
12. **Patient Perspective** – The patient can share their perspective on their case.	6
13. **Informed Consent** – The patient should give informed consent.	1, 5