Endoscopic release of resistant plantar fasciitis

Mohamed Morsy, Mohamed Elsheikh

Department of Orthopedic Surgery; Alexandria University, Alexandria, Egypt

Correspondence to Mohamed Morsy, MD, Department of Orthopedics and Traumatology, Faculty of Medicine, El-Hadara University Hospital, Alexandria University, Alexandria, Egypt
Tel: +20 100 170 1563; fax: +035423957; e-mail: morsimoh@gmail.com

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Introduction
Plantar fasciitis is the most common cause of chronic heel pain with high discomfort up to being unable to bear weight on the heel. Several factors may contribute to plantar fasciitis, including rheumatic disorders, gouty arthritis, peripheral neuropathies, nerve entrapment, and local foot deformities such as pes planus. However, a large group of patients have idiopathic plantar fasciitis with no detectable cause. Plantar fasciotomy is currently the most common surgical treatment refractory fasciitis. Increasingly, surgeons are adopting an endoscopic approach to plantar fascial release to avoid the complications associated with the open procedure.

Patients and methods
A total of 32 patients with resistant plantar fasciitis preoperatively and after a 26 months follow-up time were examined. The endoscopic procedure was performed in all patients using medial and lateral portals. All patients were clinically assessed preoperatively and postoperatively with respect to the level of pain, function, gait, range of motion, and patient satisfaction to drive the modified American Orthopaedic Foot and Ankle Society (AOFAS) score.

Results
At the end of the follow-up period (AOFAS), ankle-hindfoot mean score improved significantly to 92.36 ± 5.2 points (range, 69–98 points, $P = 0.0001$). Twelve (37.5%) patients had excellent results, 16 (50%) patients had good results, two (6.25%) patients had fair results, and two (6.25%) patients had poor results.

Conclusion
Endoscopic plantar fascial release with calcaneal spur decompression (if present) is a minimal invasive, reliable technique and could be a viable alternative to more invasive procedures for management of resistant plantar fasciitis.

Keywords:
calcaneal spur, endoscopic release, plantar fasciitis

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Introduction

Plantar fasciitis is the most common cause of chronic heel pain with high discomfort up to being unable to bear weight on the heel. Several factors may contribute to plantar fasciitis, including rheumatic disorders, gouty arthritis, peripheral neuropathies, nerve entrapment, and local foot deformities such as pes planus [1,2]. However, a large group of patients have idiopathic plantar fasciitis with no detectable cause.

Apart from anteroposterior and standing lateral radiographs, sonography, ^{99m}Tc-methylene diphosphonate bone scan, and even MRI are recommended options for diagnosis and documentation [2–4].

Patients are initially treated conservatively with activity modification, nonsteroidal anti-inflammatory drugs, physical therapy, night splints, and orthotics. Corticosteroid injections and extracorporeal shock wave therapy are other nonoperative approaches to treatment [5,6]. In up to 90% of cases, plantar fasciitis can be successfully treated using these conservative measures [7]. If, however, the symptoms are not relieved with conservative measures after 6–12 months, operative intervention might be necessary. These operative decisions must be sensitive to the need to return to full activity as quick as possible.

Plantar fasciotomy is currently the most common surgical treatment for refractory fasciitis [7]. The traditional approach to plantar fascial release is an open surgical procedure, which can be associated with a prolonged recovery period, often requiring the patient to remain nonambulatory for a period of 4–6 weeks with a gradual return to full activity for an additional 8 weeks [8]. In addition, the plantar incision can lead to postoperative scarring that can, itself, cause chronic pain and limit function [7,8]. Increasingly, surgeons are adopting an endoscopic approach to plantar fascial release to avoid the complications associated with the open procedure; however, only limited studies have been conducted comparing the two procedures [9,10].

The purpose of the present study was to determine the results of endoscopic plantar release in refractory plantar fasciitis.

Patients and methods

Endoscopic surgical procedures were carried out on 32 patients (18 women, 14 men). The age of the patients ranged from 36 to 59 years (mean 47 ± 7.65years). Right heel was affected in 19 (60%) patients.

In all patients, preoperative clinical assessment showed localized tenderness over the plantar-medial calcaneal tubercle where the plantar fascia is inserted to the heel bone.

No patient had undergone any previous surgical procedure for heel pain. Plain film radiographs revealed calcaneal spur in 26 (81%) patients. Written informed consent was obtained from all patients and the study was approved by the local Ethical Committee.

In all patients presenting for surgery, a course of conservative management for at least 6 months had failed with symptoms affecting their ability to work or perform daily activities. This nonoperative treatment consisted of medical treatment, physiotherapy, heel supports, local steroid injections, and/or shock wave therapy. The mean duration of symptoms before surgery was 20.0±5.6 months (range, 12–27 months).

All patients were clinically assessed preoperatively with respect to the level of pain, function, gait, range of motion, and patient satisfaction to drive the modified American Orthopaedic Foot and Ankle Society (AOFAS) score [11].

The patients were operated on under general anesthetic and tourniquet control. They were positioned supine with the affected heel hanging off the end of the operation table. The procedure was performed in all patients using medial and lateral portals. The medial portal was located over a reference point that was immediately anterior and inferior to the inferior aspect of the medial calcaneal tubercles viewed on lateral projection. A 5 mm stab incision was performed, incising the skin only, then bluntly dissecting superior to the level of the plantar fascia. Care was taken to ensure that the dissection was superior to the fascia to avoid neurovascular injury. Arthroscopic trocar sheath was then introduced into this channel and advanced across the superior surface of the plantar fascia to the lateral aspect of the foot. A 5 mm incision was made over the trocar's tip, allowing the sheath to be passed through the skin, and then the trocar was removed, leaving the sheath in place. The endoscope was then introduced from the medial portal for visualization of plantar fascia. Under direct arthroscopic visualization, a motorized shaver was introduced from the lateral portal to remove any pathological adhesions and to clearly verify the plantar fascia. Once the entire pathologic tissues were removed, the endoscope was introduced laterally and the arthroscopic ablation device was introduced medially to sever the medial one-third of the fascia (Fig. 1).

Care was taken to perform only a medial one-third release to minimize the amount of destabilization of the longitudinal arch (Figs 2a and b). As the fascia was severed, the muscle of the flexor digitorum brevis was visualized. The calcaneal spur was then resected in 26 cases using an arthroscopic burr (Fig. 2c). The ankle and toes were maximally dorsiflexed and separation of the edges of the plantar fascia was seen, and the fat pad was visualized beneath the fascia to ensure complete removal (Fig. 2d). The incisions were closed with one suture and dressings were applied. Partial weight-bearing was allowed when tolerable with heel cushion for the first 2 weeks postoperatively.

All patients were reviewed postoperatively, and the modified AOFAS score was determined.

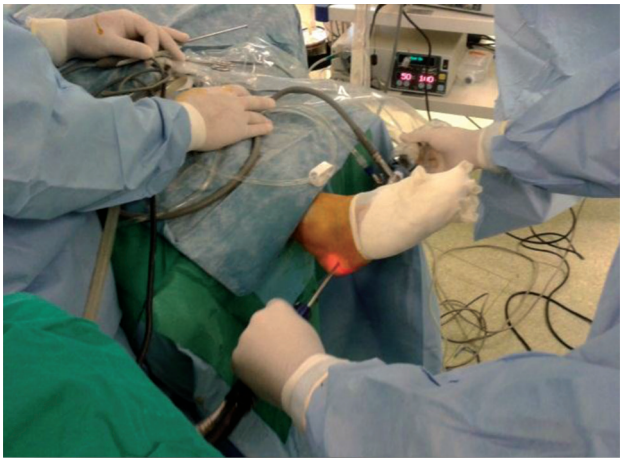
Results

The mean follow-up period was 26 months (range, 18–35 months). At the end of the follow-up period, the modified AOFAS [11] ankle-hindfoot mean score improved significantly to 92.36 ± 5.2 points (range, 69–98 points, P = 0.0001). Preoperatively, the mean score was 44.28 ± 5.98 points (range, 32–54 points).

Twelve (37.5%) patients had excellent results, 16 (50%) patients had good results, two (6.25%) patients had fair results, and two (6.25%) patients had poor results.

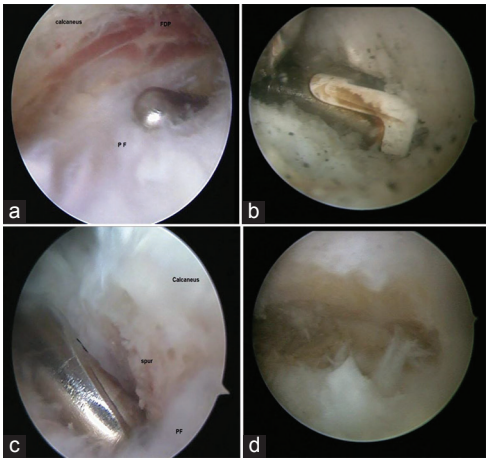
The mean score of pain improved from 15.3 points (range, 0–20 points) preoperatively to 36.04 ± 4.32

Figure 1



Patiant posion during endoscopy

Figure 2



(a) Endoscopic view of calcaneus and plantar fascia, . (b) The medial half of the plantar fascia was resected with the arthroscopic ablation device. (c) A heel spur was resected with an arthroscopic burr. (d) The fat pad was visualized beneath the fascia to ensure complete removal. FDB, flexor digitorum brevis; PF, plantar fascia.

points (range, 29–40 points) postoperatively. The mean score of function improved from 3.9 ± 1.68 points (range, 1–6 points) preoperatively to 8.2 points (range, 6–10 points) postoperatively.

Calcaneal spur was removed in 26 (81.25%) cases. However, there was no statistical significant difference in the postoperative outcome between them and the other cases ($P = 0.05$).

No patient developed any neurologic symptoms, reflex sympathetic dystrophy, or foot deformities. No patient required a revision surgery.

At the final follow-up, 28 (87.5%) of the 32 heels were considered by the patients to be much better or better as a result of the operation. The other four patients had a residual mild intermittent pain relieved by medication and one local steroid injection. Two of them complained of postoperative medial portal tract superficial infection that was significantly improved with antibiotic and daily dressings.

Discussion

Plantar fasciitis is the most commonly encountered foot disorder in podiatric clinics. Patients are initially treated conservatively with activity modification, nonsteroidal anti-inflammatory drugs, physical therapy, night splints, and orthotics. Corticosteroid injections and extracorporeal shock wave therapy are other nonoperative approaches to treatment. In up to 90% of cases, plantar fasciitis can be successfully treated using these conservative measures. If, however, the symptoms are not relieved with conservative measures after 6–12 months, operative intervention might be necessary [1,5,8].

Plantar fasciotomy is currently the most common surgical treatment for refractory fasciitis. The traditional approach to plantar fascial release is an open surgical procedure, which can be associated with a prolonged recovery period, often requiring the patient to remain nonambulatory for a period of 4–6 weeks with a gradual return to full activity for an additional 8 weeks. In addition, the plantar incision can lead to postoperative scarring that can, itself, cause chronic pain and limit function [8–10,12].

Increasingly, surgeons are adopting an endoscopic approach to plantar fascial release to avoid the complications associated with the open procedure [13,14].

Kinley *et al*. [9] in a prospective study, compared the results of conventional open and endoscopic techniques. Those patients in whom the endoscopic fasciotomy was performed had significantly less postoperative pain, returned to regular activities 4 weeks earlier, and had fewer complications postoperatively than those patients undergoing traditional heel spur surgery. The main advantage of the endoscopic method is the quicker recovery time of the patients compared with the standard open procedure.

In the present study, 32 patients with refractory plantar fasciitis after at least 6 months of conservative treatment were applied to endoscopic plantar fascial release.

All patients were allowed for partial weight-bearing when tolerated with heel cushion for the first 2 weeks postoperatively. The mean follow-up period was 26 months; the modified AOFAS ankle and hindfoot mean score improved significantly from 44.28 to 92.36 points. The mean score of pain improved significantly from 15.3 to 36.04 points and the mean score of function improved significantly from 3.9 to 8.2 points.

Twenty-eight (87.5%) patients were satisfied by the endoscopic procedure.

The results in the present series were comparable with those of previously published reports on endoscopic plantar fascial release. Hogan *et al*. [15] reported in their case series on 22 patients that the satisfaction rate with this procedure was 97.7%, and all patients reported at least a 50% improvement in pain after surgery. Ogilvie-Harris and Lobo [16] reported in their clinical study that the procedure effectively relieved heel pain in 89% of patients, relieved morning stiffness in 92%, and allowed 71% to return to unrestricted sports activity.

Brugh *et al.* [17] reported the occurrence of a statistical higher lateral column overload after open release of more than 50% of the medial fascia.

None of the presented patients had lateral column overload; only two cases complained of postoperative medial portal tract superficial infection, which was improved by medical treatment.

Calcaneal spur was removed in 26 (81.25%) cases. Although there were no statistical significant differences in the postoperative outcomes between them and the other cases, it has a positive psychological impact upon patients and improves their satisfaction.

Conclusion

Endoscopic plantar fascial release with calcaneal spur decompression (if present) is a minimal invasive, reliable technique and could be a viable alternative to more invasive procedures for management of resistant plantar fasciitis.

Acknowledgements

Conflicts of interest

There are no conflicts interest.

References

1 Bordelon RL. In: Mann RA, ed. Heel pain. *Surgery of the foot and ankle*. St Louis: CV Mosby; 1993. 837–847.

2 Kibler WB, Goldberg C, Chandler TJ. Functional biomechanical deficits in running athletes with plantar fasciitis. Am J Sports Med 1991; 19:66–71.

3 Tudor GR, Finlay D, Allen MJ, Belton I. The role of bone scintigraphy and plain radiography in intractable plantar fasciitis. Nucl Med Commun 1997; 18:853–856.

4 Kier R. Magnetic resonance imaging of plantar fasciitis and other causes of heel pain. Magn Reson Imaging Clin N Am 1994; 2:97–107.

5 Crawford F, Atkins D, Young P, Edwards J. Steroid injection for heel pain: evidence of short-term effectiveness. A randomized controlled trial. Rheumatology (Oxford) 1999; 38:974–977.

6 Kudo P, Dainty K, Clarfield M, Coughlin L, Lavoie P, Lebrun C. Randomized, placebo-controlled, double-blind clinical trial evaluating the treatment of plantar fasciitis with an extracoporeal shockwave therapy (ESWT) device: a North American confirmatory study. J Orthop Res 2006; 24:115–123.

7 Neufeld SK, Cerrato R. Plantar fasciitis: evaluation and treatment. J Am Acad Orthop Surg 2008; 16:338–346.

8 Conflitti JM, Tarquinio TA Operative outcome of partial plantar fasciectomy and neurolysis to the nerve of the abductor digiti minimi muscle for recalcitrant plantar fasciitis. Foot Ankle Int 2004; 25:482–487.

9 Kinley S, Frascone S, Calderone D, Wertheimer SJ, Squire MA, Wiseman FA. Endoscopic plantar fasciotomy versus traditional heel spur surgery: a prospective study J Foot Ankle Surg 1993; 32:595–603.

10 Brekke MK, Green DR. Retrospective analysis of minimal-incision, endoscopic, and open procedures for heel spur syndrome. J Am Podiatr Med Assoc 1998; 88:64–72.

11 Malviya A, Makwana N, Laing P. Correlation of the AOFAS scores with a generic health QUALY score in foot and ankle surgery. Foot Ankle Int2007; 28:494–498.

12 Barrett SL, Day SV. Endoscopic plantar fasciotomy: two portal endoscopic surgical techniques — clinical results of 65 procedures. J Foot Ankle Surg 1993; 32:248–256.

13 Reeve F, Laughlin RT, Wright DG. Endoscopic plantar fascia release: a cross-sectional anatomic study. Foot Ankle Int 1997; 18:398–401.

14 Barrett SL, Day SV, Pignetti TT, Robinson LB. Endoscopic plantar fasciotomy: a multi-surgeon prospective analysis of 652 cases. J Foot Ankle Surg 1995; 34:400–406.

15 Hogan KA, Webb D, Shereff M. Endoscopic plantar fascia release. Foot Ankle Int 2004; 25:875–881.

16 Ogilvie-Harris DJ, Lobo J. Endoscopic plantar fascia release. Arthroscopy 2000; 16:290–298.

17 Brugh AM, Fallat LM, Savoy-Moore RT. Lateral column symptomatology following plantar fascial release: a prospective study J Foot Ankle Surg 2002; 41:365–371.