CASE REPORT

Plantar Fascia Rupture in a Professional Soccer Player

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Abstract : We report the case of a 29-year-old male professional soccer player who presented with symptoms of plantar fasciitis. His symptoms occurred with no remarkable triggers and gradually worsened despite conservative treatments including taping, use of insoles, and physical therapy. Local corticosteroid injection was given twice as a further intervention, but his plantar fascia partially ruptured 49 days after the second injection. He was treated conservatively with platelet-rich plasma, and magnetic resonance imaging showed regenerative change of the ruptured fascia. Five months after the rupture, he returned to his original level of training. If professional athletes find it difficult to refrain from athletic activity, as in the present case, the risk of rupture due to corticosteroid injection should not be overlooked. J. Med. Invest. 61 : 413-416, August, 2014

Keywords **:** *plantar fascia rupture, professional soccer player, corticosteroid injection, PRP*

INTRODUCTION

The plantar fascia is one of the most important structures to maintain the plantar arch of the foot. Plantar fasciitis is a well-known disorder with the most common complaint being first step pain in the morning (1-3). In athletes, particularly runners, pain is often seen at the start of training. If the disease progresses, pain may continue throughout the activity and may be refractory. For athletes, pain due to plantar fasciitis may become a serious problem, especially in professional athletes, as refractory fasciitis can reduce performance because of the need to limit physical activity. Therefore, corticosteroid injection or other interventions are occasionally necessary for treatment.

On the other hand, plantar fascia rupture is not a common disease. Plantar fascia rupture was first described by Leach *et al.* in 1978 (4, 5), and many cases of plantar fascia rupture are known to occur in patients with prior plantar fasciitis. Among the therapies for plantar fasciitis, corticosteroid injection appears to be a risk factor for rupture (6-8). Here we report a case of plantar fascia rupture in a professional soccer player after corticosteroid injections.

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CASE REPORT

The patient was a 29-year-old male professional soccer player. He experienced slight pain in his left

heel while playing soccer, with no remarkable triggers. He consulted our hospital because the pain gradually worsened, and magnetic resonance imaging (MRI) showed hyperplasia of the plantar fascia insertion at the calcaneus (Fig. 1). He continued playing soccer while receiving conservative treatments including taping, insoles, and physical therapy. However, as his pain did not improve, an injection of betamethasone acetate (2 mg)/betamethasone sodium phosphate (0.66 mg) (Rinderon®) was given 2 months after his first visit to the hospital.

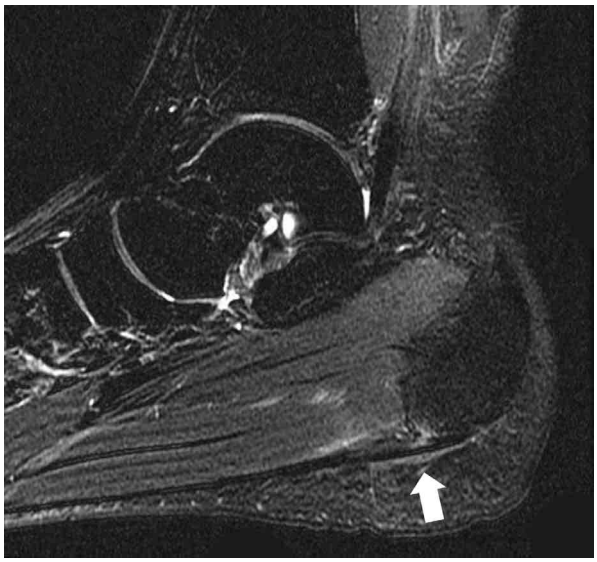

Figure 1 : T2-weighted fat-saturated image at first presentation shows hyperplasia of the plantar fascia insertion at the calcaneus (arrow).

Four months after the first injection, he developed severe pain in his left heel while playing soccer. MRI revealed abnormal findings at the plantar fascia insertion and in the fat pad below the plantar fascia (Fig. 2). Because the pain interfered in activities of daily living, a second injection of the same corticosteroid was given. After the second injection, his pain gradually improved and he returned to soccer.

Then, 49 days after the second injection, when changing direction while playing, he experienced sudden severe pain in his left heel. He consulted our hospital 2 days later because the severe pain had not subsided and he could not walk normally. The plantar part of his heel was swollen with severe tenderness. Passive dorsiflexion of the metatarsophalangeal joint of the great toe caused severe pain. Although plain X-ray showed no abnormal findings, MRI showed rupture of the medial plantar fascia (Fig. 3). Partial rupture of the plantar fascia was diagnosed, and the patient was treated conservatively. Specifically, in the 2 weeks after the injury, he walked with partial weight bearing using crutches, and after local pain subsided, he walked with full weight bearing using rocker bottom shoes. Platelet-rich plasma (PRP) therapy was performed at 4 and 8 weeks after the injury in anticipation of early tissue regeneration. The PRP was prepared using Cell-Cure PRP14 kit (Cellproduce, Chiba, Japan). Briefly, 20 ml of venous blood was drawn into 2 kit tubes and then centrifuged at 1800 g for 10 minute. A final volume of 2 ml of pure PRP was obtained and

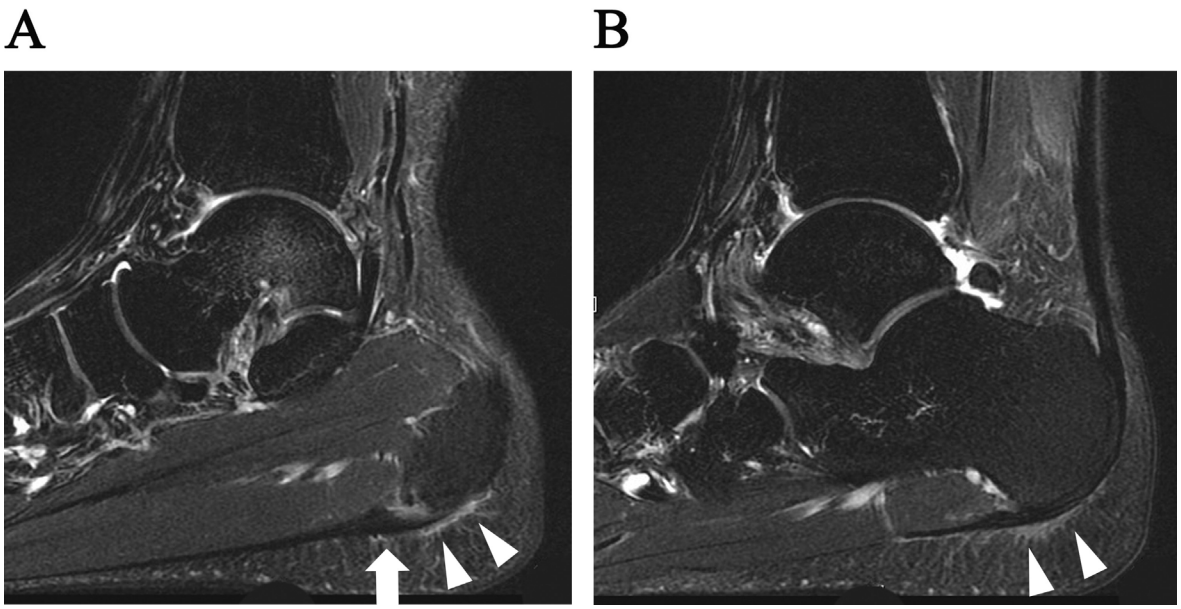

Figure 2 : T2-weighted fat-saturated images just before the second corticosteroid injection shows (A) hyperplasia of the plantar fascia insertion (arrow) and (A, B) a high-intensity zone in the fat pad below the plantar fascia (arrowhead).

Figure 3 : Proton density fat-saturated image 2 days after the rupture shows disruption of the plantar fascia insertion (arrow) and a widely spread high-intensity zone (arrowhead).

Figure 5 : Proton density fat-saturated image 5 months after the rupture shows a clear outline of the repaired fascia (arrow).

injected into the tear area under ultrasound guidance. Gradual repair of the ruptured fascia was confirmed on MRI (Figs. 4, 5). The pain during normal daily living disappeared about 2 months after the injury and he started jogging 1 month later. Athletic rehabilitation progressive gradually and he returned to his original level of training 5 months after the rupture.

Figure 4 : Proton density fat-saturated image 3 months after the rupture shows continuity of the ruptured fascia (arrow).

DISCUSSION

Plantar fasciitis is a common intractable injury in athletes caused by overuse. There are three key points about the present case. The first was that since our patient is a professional soccer player, it was difficult for him to refrain completely from athletic activities. Despite persistent moderate or severe heel pain, for which he used taping, insoles, heel pads, and anti-inflammatory drugs, and underwent physical therapy, soccer was his livelihood, so he continued to train and play. Many professional athletes are likely to continue their athletic activities if their pain is tolerable. In our patient, this continued activity exacerbated his injury to a more intractable state requiring further intervention.

The second factor was that corticosteroid injections were administered as further therapy. Local corticosteroid injection to the plantar fascia insertion is frequently performed as a next-step therapy for intractable plantar fasciitis (7, 9). Although the benefits of corticosteroid injection are well documented, complications such as rupture caused by degenerative change or weakening of the injected part have also been reported (6, 8, 9). Kim *et al.* showed that only 2.4% of their patients receiving corticosteroid developed a subsequent rupture and they concluded corticosteroid injection to be a safe and effective form of treatment with minimal complications (7). However, several studies have reported that multiple injections may increase the risk of rupture (5-8). In our case, the patient received 2 injections within

a 4-month period. We suspect that these injections might have had some kind of adverse effect on the rupture.

The third factor is that PRP therapy was performed to repair the ruptured fascia. PRP has become a common treatment option for not only chronic plantar fasciitis, but also a variety of orthopedic inflammatory conditions (10-16). The efficacy of PRP is thought to be due to various growth factors jumpstarting the regenerative process in degenerative conditions. On the other hand, no studies have reported the use of PRP for healing a ruptured plantar fascia, although a few studies have suggested that PRP is effective for healing Achilles tendon rupture (17, 18). In our case, MRI revealed gradual repair of the ruptured fascia after PRP treatment performed at 4 and 8 weeks after injury. Of course, as this is a single case, it is difficult to prove that PRP treatment alone accelerated healing of the ruptured plantar fascia.

Finally, although our patient returned to his original level of training, his progress should be followed up carefully to monitor recurrence of pain or re-rupture.

CONFLICT OF INTEREST

We have no conflict of interests to disclose.

REFERENCES

1. La Porta GA, La Fata PC : Pathologic conditions of the plantar fascia. Clin Podiatr Med Surg 22 : 1-9-v, 2005
2. Glazer JL : An approach to the diagnosis and treatment of plantar fasciitis. Phys Sportsmed 37 : 74-79, 2009
3. Lee S-J, Kang J-H, Kim J-Y, Kim J-H, Yoon S-R, Jung K-I : Dose-related effect of extracorporeal shock wave therapy for plantar fasciitis. Ann Rehabil Med 37 : 379-388, 2013
4. Leach R, Jones R, Silva T : Rupture of the plantar fascia in athletes. J Bone Joint Surg Am 60 : 537-539, 1978
5. Saxena A : Plantar Fascia Ruptures in Athletes. Am J Sports Med 32 : 662-665, 2004
6. Lee HS, Choi YR, Kim SW, Lee JY, Seo JH, Jeong JJ : Risk Factors Affecting Chronic Rupture of the Plantar Fascia. Foot Ankle Int 25 : 2013
7. Kim C, Cashdollar MR, Mendicino RW, Catanzariti AR, Fuge L : Incidence of plantar fascia ruptures following corticosteroid injection. Foot Ankle Spec 3 : 335-337, 2010
8. Louwers MJ, Sabb B, Pangilinan PH : Ultrasound evaluation of a spontaneous plantar fascia rupture. Am J Phys Med Rehabil 89 : 941-944, 2010
9. Kayhan A, Gökay NS, Alpaslan R, Demirok M, Yılmaz İ, Gökçe A : Sonographically guided corticosteroid injection for treatment of plantar fasciosis. J Ultrasound Med 30 : 509-515, 2011
10. Shetty VD, Dhillon M, Hegde C, Jagtap P, Shetty S : A study to compare the efficacy of corticosteroid therapy with platelet-rich plasma therapy in recalcitrant plantar fasciitis : a preliminary report. Foot Ankle Surg 20 : 10-13, 2014
11. Kim E, Lee JH : Autologous platelet-rich plasma versus dextrose prolotherapy for the treatment of chronic recalcitrant plantar fasciitis. PM R 6 : 152-158, 2014
12. Vannini F, Di Matteo B, Filardo G, Kon E, Marcacci M, Giannini S : Platelet-rich plasma for foot and ankle pathologies : a systematic review. Foot Ankle Surg 20 : 2-9, 2014
13. Martinelli N, Marinozzi A, Carnì S, Trovato U, Bianchi A, Denaro V : Platelet-rich plasma injections for chronic plantar fasciitis. Int Orthop 37 : 839-842, 2013
14. Ragab EMS, Othman AMA : Platelets rich plasma for treatment of chronic plantar fasciitis. Arch Orthop Trauma Surg 132 : 1065-1070, 2012
15. O'Malley MJ, Vosseller JT, Gu Y : Successful use of platelet-rich plasma for chronic plantar fasciitis. HSS J 9 : 129-133, 2013
16. Kumar V, Millar T, Murphy PN, Clough T : The treatment of intractable plantar fasciitis with platelet-rich plasma injection. Foot (Edinb) 23 : 74-77, 2013
17. Lyras DN, Kazakos K, Georgiadis G, Mazis G, Middleton R, Richards S, O'Connor D, Agrogiannis G : Does a single application of PRP alter the expression of IGF-I in the early phase of tendon healing? J Foot Ankle Surg 50 : 276-282, 2011
18. Parafioriti A, Armiraglio E, Del Bianco S, Tibalt E, Oliva F, Berardi AC : Single injection of platelet-rich plasma in a rat Achilles tendon tear model. Muscles Ligaments Tendons J 1 : 41-47, 2011