



Ultrasonographic Evidence of the Regenerative Potential of Platelet Rich Plasma In Partial Tear of Achilles Tendon - A Case Report

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Abstract

A 34 years old, female presented with severe posterior heel pain of 6 years duration. On examination, there was swelling over posterior heel near insertion of Achilles tendon with grade 3 tenderness. A point of care ultrasound examination revealed partial thickness Achilles tendon tear near its insertion as there was discontinuity of fibers, hypo-echogenicity with increased thickness. As a conservative treatment modality intra-tendinous injection of (Platelet Rich Plasma) PRP was planned. USG guided intra-tendinous injection of PRP was given thrice (4weeks apart). The patient was followed up at 3 months and 6 months after last PRP injection and had no pain or tenderness, painless and full passive and active range of motion and remarkable improvement on USG as there was restoration of fibrillar pattern, normal echogenicity and reduction in thickness. Platelet Rich Plasma (PRP) is being investigated as a safe and a minimally invasive option owing to its regenerative potential. Ultrasound is being increasingly used to visualize and diagnose disorders of the Achilles tendon. PRP is a potential regenerative therapeutic modality to restore structural and functional integrity of damaged Achilles tendon.

Keywords: PRP, Achilles Tendon, Ultrasound.

Introduction

Pain of the Achilles tendon is a common affliction in athletes as well as sedentary individuals.⁽¹⁾ Tendinopathy may result from repetitive stress. Disorders of the vascular and neurological systems as well as certain rheumatologic diseases may also lead to such a condition. Achilles tendinopathy is characterized by weak and inelastic tissue and may lead to rupture as it may

fail to withstand sudden stress.⁽²⁾ 5 to 10 persons per 100,000 population get afflicted by Achilles tendon rupture each year and the incidence is increasing overall.⁽³⁾ Rest, immobilization and analgesics are mainstay of treatment. There is little consensus regarding conservative modalities, though Platelet Rich Plasma (PRP) is being increasingly investigated as a safe and a minimally invasive option owing to its

regenerative potential.⁽⁴⁾ PRP is hypothesized to invigorate revascularization of tissues. It has also been postulated to increase the concentration of growth factors which in turn can enhance tendon healing.⁽⁵⁾ Ultrasound is being increasingly used to visualize and diagnose disorders of the Achilles tendon as it is an accessible, radiation free, non-invasive tool and is reliable when performed by a Physiatrist. Portability of ultrasound makes it an ideal tool for evaluation of real time sports injuries also at the time of gameplay itself and can play a pivotal role in decision making on the spot by a dedicated team of professionals led by a Physical Medicine and Rehabilitation specialist.

Case Report

A 34yearsold, female, nursing officer by profession presented in our OPD with severe posterior heel pain [Pain on Visual Analogue Scale (VAS) of 9/10]of 6 years duration. She initially received treatment from an Orthopedician, suspecting arthritis of the ankle joint and was prescribed a short course of oral steroids with minimal relief in symptoms (VAS-7/10). She subsequently consulted in the Department of Rheumatology in a Government Hospital and was on regular treatment. She received Sulfasalazine on a regular basis and analgesics on as and when needed basis. However, there was no relief in symptoms (VAS-7/10). She

also received three local injections of Methylprednisolone acetate 4 months apart. Patient had some improvement initially (VAS-6/10), however, the condition deteriorated after 6 months of the last injection (VAS-9/10). The patient was referred to the Department of Physical Medicine and Rehabilitation. On examination, there was swelling over posterior heel near insertion of Achilles tendon with grade 3 tenderness. Ankle alignment and arches of foot were normal and there was no leg length discrepancy. There was no clinical evidence of retrocalcaneal bursitis. Range of motion was extremely painful. Thompson test was Negative. Footwear was also examined and it was found to be flat from the heel to the toe. The skeletal structure was normal with no joint involvement as discerned on a Radiograph of both ankle joints - Antero-Posterior and Lateral views done one week earlier except for posterior calcaneal spurs on both sides. Complete Blood Count with Erythrocyte Sedimentation Rate, C-Reactive Protein, Liver and Kidney function tests were normal. Rheumatoid factor and Anti-CCP were also negative. A point of care ultrasound examination revealed partial thickness Achilles tendon tear near its insertion as there was discontinuity of fibers, hypo-echogenicity with increased thickness.

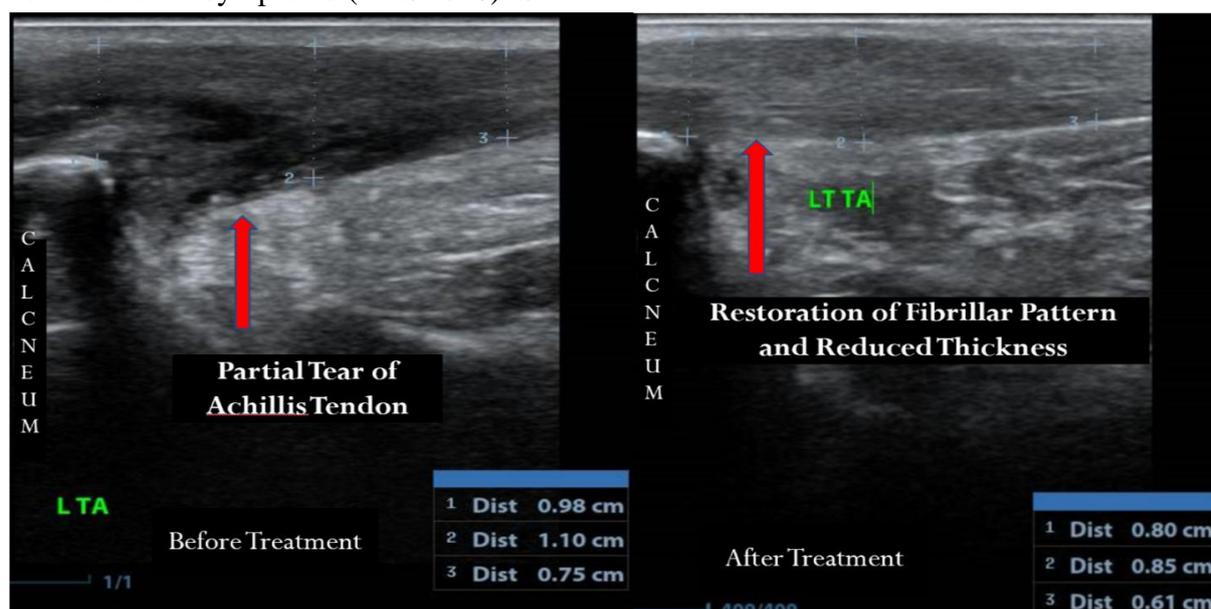


Figure-1 Ultrasonographic Structure of Achilles tendon before and after treatment

36-Item Short Form Health Survey (SF-36) score, a quality of life scale with 0 being worst score and 100 being excellent, was 24. The patient was initially treated with rest, analgesics and gentle exercises to prevent loss of motion and strength for three weeks with mild relief (VAS-7/10). As a conservative treatment modality intra-tendinous injection of PRP was planned. 2ml of PRP was prepared from 10ml of venous blood in a

centrifuge machine with 1000 revolutions per minute for 10 minutes. USG guided intra-tendinous injection of PRP was given thrice (4 weeks apart). An out of plane approach was used to minimize further injury to the tendon. A below knee cast was applied for a period of 15 days on all three occasions immediately following injection. Half an inch heel raise was advised following cast removal.



Figure-2 Footwear Prescription with Heel Raise

A home based eccentric exercise program was advised. Tablet Paracetamol and Capsule Tramadol were advised for pain relief on an SOS basis. At the end of 12 weeks, the patient reported significant relief in her symptoms. VAS was 1/10 on completion of PRP therapy and SF-36 score improved to 90. The patient was followed up at 3 months and 6 months after last PRP injection and had no pain (VAS-0/10) or tenderness, painless and full passive and active range of motion and remarkable improvement on USG as there was restoration of fibrillar pattern, normal echogenicity and reduction in thickness.

Discussion

Clinical diagnosis of partial tears of the Achilles tendon remains far from perfect. It is still debatable whether surgical or conservative management provides a more favorable result and, therefore, optimal treatment for such a condition remains elusive. Ultrasound is being increasingly used for diagnostic purposes. The Normal tendo-achilles is of uniform thickness of ≤ 0.50 cm in males and ≤ 0.40 cm in females. In Chronic Tendinopathy, USG shows, fusiform swelling, heterogeneous echo pattern, hypoechoic foci due to mucoid degeneration and thickening of the tendon, discontinuity of the fibers, focal

hypoechoic intra-tendinous areas, loss of fascicle organization, intra-tendinous focal calcification, partial or complete ruptures, and thickening of the hypoechoic paratenon with poorly defined borders, bursitis, and adhesions between the epitenon and paratenon. The contours of the tendon may be deformed with a bumpy appearance.^(6,7) Sanches M et al⁽⁸⁾ in case-control study and descriptive laboratory study concluded that operative management of tendons combined with the application of autologous platelet rich fibrin mattress preparation rich in growth factors may present new possibilities for enhanced healing and functional recovery. Filardo G⁽⁹⁾ et al treated a partial rupture of the Achilles tendon in a competitive athlete with platelet growth factors through multiple platelet-rich plasma injections with promising results. Our case also depicts excellent structural and functional recovery after PRP therapy although conflicting results exist in literature. De Vos RJ et al⁽¹⁰⁾ conducted a stratified, block-randomized, double-blind, placebo-controlled trial wherein 54 patients in the age group of 18 to 70 years with chronic tendinopathy 2 to 7 cm above the Achilles tendon insertion were injected either PRP or Saline(Placebo group) in addition to usual care consisting of eccentric exercises in both groups and concluded that a PRP injection compared with a saline injection did not result in a significant improvement in pain and activity.

Conclusion

PRP is a potential regenerative therapeutic modality to restore structural and functional integrity of damaged Achilles tendon. Conflicting results in literature warrant further well-designed studies. Ultrasound is an excellent tool to diagnose and monitor such conditions in experienced hands.

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