ORIGINAL ARTICLE

USE OF PLATELET-RICH PLASMA INJECTION FOR THE TREATMENT OF CHRONIC PLANTAR FASCITIS

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ABSTRACT: Plantar fascitis is a common cause of heel pain and different treatment options exists. PRP (platelet rich plasma) derived from autologous blood containing high concentration of growth factors help in tissue healing. The use of PRP in the treatment of plantar fascitis is fairly recent an evolving concept. The purpose of our work was to study the effectiveness of PRP in the treatment of chronic plantar fascitis.

KEYWORDS: Plantar fascitis, plasma rich platelet.

INTRODUCTION: Plantar fascitis is one of the most common causes of heel pain, which can be difficult to treat in most chronic and severe forms. In advanced cases plantar fascitis, can be associated with heel spasm, ankle stiffness which can cause physical disability and loss of work days.[1]

There are various treatment methods of plantar fascitis which include orthoses, non-steroidal anti-inflammatory drugs, and steroid injections. However all have a lack of clinical evidence.

More invasive treatment consists of corticosteroid injections, Botulinium-A toxin injection, shock wave therapy and plantar fasiectomy.[2] All these have clinical success to a varying degree in severe cases, but carry risks of serious complications and permanent disability. PRP (Platelet-rich Plasma) which is derived from autologous blood and contains growth factors in high concentrations has been found to have promising effects in the treatments of plantar fascitis where other treatment measures have failed.[3] The use of PRP in the treatment of plantar fascitis is fairly new and an evolving concept. The purpose of our study was to finds out the effectiveness of PRP on chronic plantar fascitis.

PATHOPHYSIOLOGY: One of the most common causes of heel pain is chronic plantar fascitis. The incidence reaches a peak in people between the ages of 40 to 60 years.[4] There is no bias towards either sex.

The under lying cause of planter fascitis is essentially a degenerative tissue condition at the place where the plantar fascia originates at medial tuberosity of the calcaneum. In the acute form of the disease plantar fascitis is characterized by signs of inflammation which includes swelling and loss of function.

Inflammation however is not seen in chronic plantar fascitis rather a picture of tissue degeneration is seen. In fact a histological study shows no signs of inflammation in the affected areas.[5]

There is an abundance of macrophages, lymphocytes and plasma cells. There is tissue destruction and repair involving immature fibrosis and vascularization. The normal fascial tissue is replaced by an angio fibroblastic hyper plastic tissue which spreads itself throughout the surrounding area. This causes a viscous cycle of cystic degeneration and pain.[6] As mentioned before various treatment modalities exists for plantar fascitis. Steroid injections are a common method of treatment; however it is useful to a small degree. The repeated use of local steroid injections is associated with rupture of plantar fascia.

Therefore when neither restriction of activities nor other conservative treatment results in satisfactory outcome, patients get interested in treatment options other than surgery.

METERIALS AND METHODS: This study was conducted in the orthopedic department of KPC Medical College, Jadavpur, Kolkata between June 2011 to July 2012. 26 patients were selected from the orthopedic outdoor of KPC Medical College with symptoms of chronic plantar fascitis. The average follow up period was 11 months.

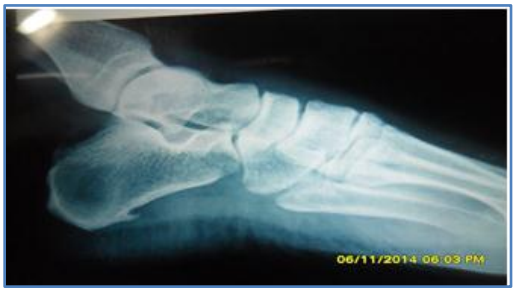

Fig. 1: X-ray of foot with calcaneum spur

INCLUSION CRITERION: Patients more than 20 years of age with plantar fascitis of more than 6 to 12 months duration who have no results with conservative treatments with VAS scores in the morning being higher than 5.

EXCLUSION CRITERION: Patients were excluded if they had received steroid injection within 4 weeks or had physical or occupational therapies for 4 weeks or had NSAIDS in 1 week.

OTHER EXCLUSION CRITERION; Patients having cardiovascular, renal or hepatic dysfunctions, patients having anemia that is hemoglobin below 10 gm% were excluded from the study. Patients having earlier injury or surgery to the sole were also excluded.

TECHNIQUE: 20 ml of blood was collected from the arm into a container with 5 ml of sodium citrate. A peripheral blood count was also sent at this time. The blood was placed in a centrifuge for 10 minutes at 200 RCG. Tubes were placed opposite to each other for balancing. Blood fractionated with platelet rich plasma on top and red cells at the bottom. The platelet poor plasma was discarded. Concentrated platelet was collected in a sterile syringe being careful not to draw up the red blood cells. The PRP was now ready to be injected.

Fig. 2: Vail containing fractionated blood

INJECTION TECHNIQUE: Initially sensorcain was infiltrated into the skin and subcutaneous tissue of the heel as field block. About 0.5cc was injected into the site of maximum tenderness. Then 5cc of platelet rich plasma was injected into the area of maximum tenderness using a 22g needle. A single skin portal was made and 5 penetrations of the plantar fascia were done.

Post injection the patient was kept in a sitting position without moving the foot for 30 minutes. The patient was then sent to the physiotherapy department to get stretching exercise. The patient was advised to perform limited mobilization for 2 days. Oral NSAIDS was not encouraged. After 48 hours the patients were asked to start standard stretching exercise for 2 weeks. This was followed by a strengthening exercise program. At 4 weeks the patients were allowed to do usual sporting or recreational activities. Any form of foot orthoses was discouraged.

OBSERVATION: Pain was evaluated using a visual analogue scale (VAS) at all-time points. The VAS score of Foot Function Index was used. The scale recorded the patients complain of pain using a scale of 0 to 10 where 0 is pain free and 10 worst possible pain. The scale was a 10 cm line beginning with 0 and ending with 10. The scale was marked at the line that corresponded with the patient's response.

VAS SCORE:

SCORE	RATING
0	No pain
1-3	Mild pain, little interference with ADL
4-6	Moderate Pain interfering with ADL
7-10	Severe Pain, unable to perform ADL

Fig. 3: DESKTOP CENTRIFUGE

RESULTS: Patients were followed up at 4, 8, 12, 26 & 52 weeks the average visual analogue scale before injection was 9.4 (Range 8-10) before injection 73% of patients had severe limitations of activities. The average post injection pain decreased to 1.01%, 20 patients were fully satisfied 4 patients were moderately satisfied and 2 patients were unhappy. Of these, one patient had recurrence of symptoms. 16 patients had no functional limitations post injections, 8 patients had minimal functional limitations. None experienced any complications of PRP.

DISCUSSION: Plantar fascitis is a very common condition for foot pain and many treatment options exists, in animal studies it has been found the addition of growth factors to ruptured tendons, results in increase of healing of tendons. In human studies it has been shown that injection of whole blood into the tendon decreases the pain. PRP is an ideal autologous biological blood derived product which when applied to various tissues releases high concentration of growth factors derived from platelets. This increases the healing of wounds, bones and tendons.[7] The other advantage of PRP is that it possess antimicrobial properties which helps in preventing infections. The body's natural healing process is thus stimulated once the platelets get activated and growth factors are released.[8]

Injections of PRP were found to be safe and did not affect any biomechanical function of the foot. Our early successful findings with injection of PRP indicate that it may become a very commonly used modality in the treatment of this difficult condition.

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