ORIGINAL ARTICLE

Outcome of Various Treatment Modalities in Calcaneal Spur and Plantar Fasciitis: A Review of 510 Cases

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ABSTRACT

Objective: To determine the most effective treatment regime for this common pathological condition.

Methods: This multi center cross sectional quasi-experimental study conducted from November 2007 till November 2014. Total 540 cases of painful heels treated and followed up in the out patient department. We collected data from Civil Hospital Karachi, Sindh Employees Social Security Institution Kulsum Bai Valika Hospital Karachi, Hamdard Medical Hospital Karachi, Aga Khan Hospital Karachi, Baqai Medical University Hospital, Govt. Hospital Sindh and private sector Hospitals. Due to associated risk factors, frequency and the different treatment modalities of calcaneal spur/plantar fasciitis and their out come.

Results:- Out of 956 patients of painful heel syndrome, 592 cases (61.9%) were due to plantar fasciitis/sub calcaneal plantar spur and the rest 364 patients (38%) were due to other etiological reasons.

Conclusion: We concluded that cortisone injections providing a rapid response to relieve the pain but this relief is temporary.

Key Words:- Plantar fasciitis, Calcaneal Spur, Treatment Modalities

INTRODUCTION

In adult patients plantar fasciitis is a common painful soft tissue disorder of the foot. The treatment was commenced after the diagnosis was made usually on clinical grounds involving unilateral or bilateral feet in which there is moderate to severe pain inside the heel or around it, usually lasts for months, Generally it is a self-limiting condition but its etiological causes often remain uncertain[1]. Pain is the predominant symptom complex[2].

A lot of male and female patients complain of an increase in the severity of pain associated with the first few steps taken on mobilization, specially early in the morning or following a period of 3 to 4 hrs of rest in bed[3]. Commonly pain is attributed to the presence of subcalcaneal/plantar spur when present, radiologically or due to plantar fasciitis of the sub-calcaneal/medial heel pain along with the tenderness of the plantar fascia[4], which may be increasingly thickened and tight. There are a number of etiological factors for the painful heel syndrome[5,6,7] ranging from trauma to tumour can be enumerated as a cause for heel pain [8]. There are no studies so far conducted on painful heel syndrome in Pakistan to reveal out the causative factors and the effect of different treatment modalities on this syndrome. Therefore this Quasi experimental study was designed to find out etiological factors and treatment out comes.

The patients with painful heel in this study were between 50-70 years with severe planter heel pain, particularly on first ambulation in the morning, and localized tenderness at the medial tuberosity of the calcaneus. About 60% of these revealed the presence of a prominent calcaneal spur on radiological examination. This occurs due to the repeated traction of the planter fascial origin. The planter fasciitis is most likely a degenerative process with micro tears of the planter fascial origin. The soft tissue of the heel is modified to provide cushioning, traction and protection to the underlying structures. The heel pad is a highly specialized structure designed to absorb shock. The average heel pad area is 23cm^2, while the average heel loading pressure is 3.3kg percm^2, which increases to

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6kg per cm^2 with running. The fat pad under the heel consists of arrangements of fibrous septa vertically and transversely in order to absorb and dissipate body weight pressure force. As the age advances the septal degeneration and fat atrophy predisposes the heel to suffer pain and injury. Repeated planter traction can result in chronic inflammation and traction osteophyte (spur) formation. Central heel pain is usually due to moderate traumatic periostitis associated with an atrophic fat pad and reduced cushioning[9].

METHODS

This quasi-experimental study was conducted in different hospital in different localities of Karachi from November 2007 to November 2014. All of these hospitals are catering patients from different sociodemographic strata.

All those patients who presented with a history of pain at or around their heels, irrespective of reason in the outpatient department attending to the above mentioned hospitals during study period.

We evaluated the patients complaining of pain, and the estimation, which was done on a Visual Analogue Scale and S.A.W. to guess the degree of pain ranging from 0 to 10, and the patients were encouraged to assess the intensity of pain themselves on every visit. Patients were advised to have symptomatic, conservative treatment comprising of NSAID's, massage, stretching and under water mobilization exercises (Hydrotherapy). The patients whose symptoms had settled and were pain free after one week were excluded from the study. Those who were unresponsive, they were properly counseled and were assigned into two groups according to patient's own preferences.

Group-1:-

In 340 patients who joined the group, 192 patients were of plantar fasciitis while 148 had calcaneal spur. These patients received symptomatic conservative

Treatment including mostly NSAID, and advised soft shoes which comes in contact with the plantar aspect of the foot to absorb shock and distribute pressure evenly. It also provides a dynamic perpetual massaging source to the plantar aspect of the foot with every step as and when the heel is loaded. We also recommend special calcaneal/heel pads to be fixed inside the shoes. Piroxicam/diclofenac gel was advised twice daily for external application along with gentle messaging of the foot and under water stretching exercises.

Group:-2

In this group 252 patients in whom most 154 cases were of planter fasciitis while 98 showed the presence of calcaneal spur. They complained of recurrent heel pain inspite of the above regimen.

Injection Triamcinolone acetonide or injection Methyl prednisolone acetate 1-2ml with 2c.c Lignocaine Hcl 2% was injected deep around the attachment of the plantar fascia at the point of maximal tenderness, under aseptic conditions. This injection was given into three points from the same skin puncture/injection track directing, the needle straight at 90 degrees to the spur, retrieving it half way and then injection at 45 degrees either side to get maximum response, going deep to the Plantar Fascia. The patients who were encouraged to use soft shoes, reduce weight, and avoid prolonged standing benefitted the most. We advised to both groups patients report back every 3 months or may be earlier for further follow up, excluded from the study SPSS 11.0 version was used for the statistical analysis.

RESULTS

We noticed that the total numbers of patients were 956 among which plantar fasciitis/sub-calcaneal spur was the most common cause of heel pain in 592 (61.9%) patients. Out of 592 patients, when 52 patients were lost to follow up at different stages, hence the result of 540 cases is presented. Now 364 remaining cases were found to be due to the following other etiological reasons hence they were excluded.

Among 540 patients of plantar fasciitis 606 feet were involved, when further 390 patients (72.2%) unilateral and 150(27.8%) were bilateral. There were 360(66.6%) females and 180(33.3%) were male patients having a 2:1 Female: Male ratio.

An age distribution was from 24 years to 66 years ±7.960 SD years. There was the highest surge in the respondent's age group at 30, 33, 42 and 48 years and the most of them were married, 460(85%) healthy patients with average height and body weight employed or doing sedentary jobs. By profession the patients were housewives 316 (58.5%).

Table 1: Over all frequency distribution and causes of painful heel Syndrome causes No. of cases Plantar fasciitis 390-32=358 Sub-calcaneal/plantar Spur 202-20=182

Other causes of painful heel syndrome 364			
Osteoporosis	21		
Fracture Calcaneum	13 Retro Calcaneal bursitis	16 Stress fracture Calcaeum	09
Giant cell tumor of tendon sheath	08		
Plantar warts	09		
Retroc	06		
Multiple myloma	08		
Hyper trophy of calcaneal fat paid	09		
Sub calcaneal bursitis	07		
Juvenile apophysitis	14		
Meduromycosts foot	06		
Calcification of plantar fascia	09		
Sero-negative arthritides	12		
Rheumatoid arthritis	11		
Abscess Heel	08		
Calcaneal osteomyelitis	09		
Reiter Syndrome	15		
Atrophy of calcaneal fat pad	09		
Heal Neuroma	08		
O.A.Ankle	20		
Foreign body heel	14		
T.B.Ankale	12		
Sinus tarsi Syndrome	18		
Haglud deformities	16		
Gout	12		
Posterior Calcaneal Spur	14		
Adventitious bursa	22		
Achilles tendonitis	12		
Tarsal and fracture talus	17		

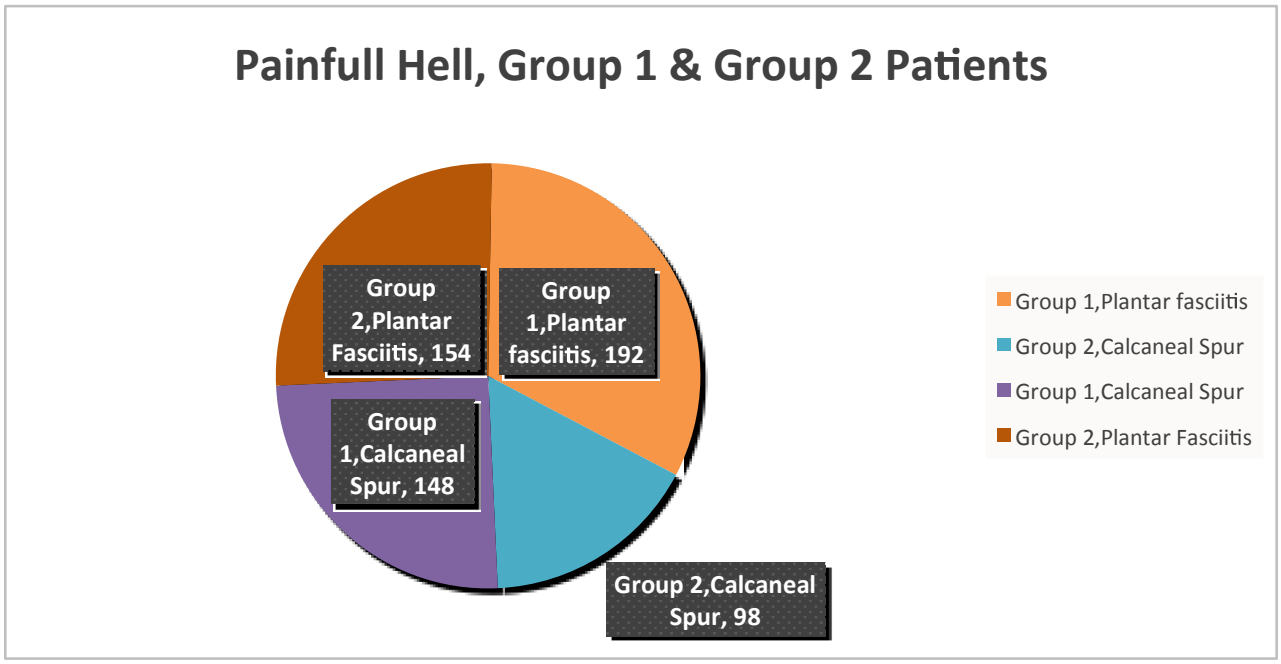
Teachers 102(18.9%) or those standing continuously for 6 hrs or more262 (48.5) were commonly involved. The majority 370(68.5%) was not doing any physical exercises. There were 62(11%) cases of flat feet, 45(8.3%) were having pes cavus and 5(0.9) cases of calcaneo valgus. There were 376 (69.6%) patients having dull pain lasting for 6 hrs or more while 190 (35.1%) had moderate type of pain. There were 195 (36.1%) who had pain recurrence of moderate to severe degree. During early morning initial 35-45 steps, excruciatingly pain full steps was the most common complaint in 68% cases. Diabetes mellitus was present in 96 (17.7%) of cases.

Most common complaint and clinical finding in plantar fasciitis/calcaneal spur in pain full and tenderness present at the medial border of the heel. Usually a strip or an areas of 2cm. x 4cm.of maximal tenderness in 92% of the cases. Tenderness and pain was also noted at the medial band of the plantar fascia in 73% of the cases, plus at the central slip by 68% while at the lateral slip only 23% showed the tenderness.

Injection cortisone gave an immediate satisfactory response to the patients but the effect lasted for a varying period of time when 66.4% remained symptom free while a repeat 2nd injection was necessary in 42% of the cases with in 4 months. In 32%of the patients a second injection was required with in 8 months, about 18.8% needed with in 8 months. Only 2% got a repeat with in a year.

On the contrary, the use of beaded special shoes gave very good response but this took an initial settling

period of about two and half months out of which the very first month may be the period of intolerance and shoe rejection followed by dependence and habituation. Continuous use of vibration, physiotherapy, ultrasonic therapy and massage resulted in long term alleviation of pain.



DISCUSSION

As diagnosing plantar fasciitis[10,11] and plantar spur[12,13] or any painful condition at or around the calcaneum (ankle or heel) still depends on history and a good clinical examination, while the investigation report of Blood analysis, Urine and X-Ray are usually normal. For further elucidation a few other relevant specialized tests as for example, DEXA or bone mineral densitometry, MRI, Ultra sound, Technetium 99, Nerve conduction tests, C.T. Scanning can be of special interest and these were useful modern tools in exploring and establishing the etiological causes of painful heel syndrome.

During observation we found retro calcaneal, sub-calcaneal and super fascial adventitious bursas are normally not demonstrable by ultra sonography in healthy individuals[14]. Swelling by exudation or accumulation of fluid facilitates its detection.

A complete Achilles tendon rupture can be diagnosed clinically and be reliably demonstrable on ultra sound examination[15].

A number of significant of patients of plantar heel pain may display abnormal sensorial function in the posterior tibial nerve and specifically with in the distribution of medial calcaneal nerve[16].

The state of affairs makes the diagnosis difficult and failure of conservative line of management call for unnecessary further investigation like EMG and surgical options[17]. Whatever evaluation and good clinical examination has got no match over investigations.

Average thickness of the plantar fascia in the symptomatic bands is about 2.72mm. It is possible that this thickness increases in pain full heel syndrome due to proliferation of the plantar fascia[18], and we have also noted clinically besides the presence of a localized tenderness in the bands. How ever there was a regression in the bulk usually after 4 weeks to 8 weeks following a kenacort injection. In all cases we have not measured the thickness of the plantar fascia through it is reported that following the kenacort/depo-medrol injection, it thickness decreases from 5.7=/-0.3 m.m.to 4.65=/-0.4 ($P < 0.01$), which is a significant change[19]. Reduced ankle dorsiflexion, increased body mass/weight and prolonged standing appear to be independent risk factor. In our study 48.5% cases gave history of standing for 6 hours or more. It is very interesting we noted the thickness of heel pad

increases with relation to age and weight, how ever it is elasticity is decreased that causes a subcalcaneal spur to become symptomatic[20], but in observation we watch in normal subject fat pad thickness was found more in males than females but it is no significant difference showed in the compressibility between sexes[21]. There were who come up with the histological finding of plantar fascia showing myxoid[22] degeneration with fragmentation and degeneration of the fascia and bone marrow vascular ectasia, thus labeling the whole processor as a degenerative on without inflammation. A few biopsies done in the study showed some degenerative changes in the fascia but as the numbers of biopsies were small, a detailed study is needed for its elaboration. Hence raising some serious question regarding the validity of coticosteroid therapy and the likely hood of its rupture. What ever may be the process of disease progression but in our study a short-term follow up and the application of corticosteroid gave a very satisfactory immediate response. There was no untoward reaction or complication or rupture on our study.

CONCLUSION

Calcaneal Spur/Plantar fasciitis is more common in middle age obese patients, who stand continuously for 6 hours or more and have a sedentary life style. The most important clinical outcome of painful heel is the reluctance to walk and hence inactivity. The majority of them would respond to conservative therapy alone, while a good number of patients get benefitted from local injection of triamcinolone. Rarely a surgical procedure is required.

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