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Original Article

Treatment of chronic plantar fasciitis with extra corporeal shock wave therapy: ultrasonographic morphological aspect and functional evaluation☆

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ABSTRACT

Objective: This paper has the purpose to analyze prospectively the treatment results in patients with chronic plantar fasciitis resistant to conservative treatment who underwent extracorporeal shock wave therapy (ESWT).
Methods: We evaluated 30 patients (36 feet); 16 (53.3%) patients were male and 14 (47.7%) female with mean age of 48.7 y.o., varying from 33 to 78 y.o.; 16 (53.3%) present the problem on the left side, 14 (46.7%) on the right ones and 6 (20%) bilateral; the symptomatology varied from 6 to 60 months, with the average of 13.58 months. These patients were submitted to a weekly ESWT session for 4 consecutive weeks. We measured the plantar fascia thickness millimeters with ultrasound and we applied American Orthopaedic Foot and Ankle Society (AOFAS) scale for ankle and hindfoot, and Roles & Maudsley scales in pre ESWT, after one, three and six months after and decrease in the plantar fascia thickness by the ultrasound ($p = 0.011$) along the different moments studied.
Results: We observed improvement of the evaluated criteria ($p < 0.001$) and plantar fascia thickness by ultrasound ($p = 0.011$) at different time points studied.
Conclusion: The ESWT can be considered an important tool in the primary or adjuvant treatment of the chronic plantar fasciitis when associated with conventional therapies. This methodology is safe, non-invasive and provides precocious rehabilitation and return to regular activities considering the results of the statistical analysis. This resource provides decrease in the thickness of the plantar fascia.

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Tratamento da fasciíte plantar crônica pela terapia de ondas de choque: avaliação morfológica ultrassonográfica e funcional

Palavras-chave:
Fasciíte plantar
Ondas de choque de alta energia/uso terapêutico
Ultrassonografia
Avaliação
Morfologia

RESUMO

Objetivo: Este trabalho teve como objetivo analisar prospectivamente os resultados do tratamento com terapia de ondas de choque (TOC) em pacientes portadores de fasciíte plantar crônica resistente ao tratamento conservador.

Métodos: Obtivemos 30 pacientes (36 pés), 16 (53,3%) do sexo masculino e 14 (47,7%) do feminino, cuja idade, em média, foi de 48,37 anos, com variação de 33 a 78 anos; 16 (53,3%) apresentavam a afecção no pé esquerdo, 14 (46,7%) no direito e seis (20%) bilateralmente; a sintomatologia variou de seis a 60 meses, com média de 13,58 meses. Os pacientes foram submetidos a uma sessão semanal de TOC por quatro semanas consecutivas. Mensuramos a espessura da fáscia plantar em milímetros pelo ultrassom e usamos a escala da American Orthopaedic Foot and Ankle Society (AOFAS) para tornozelo e retropé e a escala de Roles & Maudsley nos momentos pré-TOC, após o primeiro, o terceiro e o sexto meses após a aplicação.

Resultados: Observamos melhoria dos critérios avaliados ($p < 0{,}001$) e da espessura da fáscia plantar pelo ultrassom ($p = 0{,}011$) nos diferentes momentos estudados.

Conclusão: A TOC pode ser considerada importante instrumento no tratamento primário ou adjuvante da fasciíte plantar crônica, quando aliada às terapias convencionais. Essa metodologia é segura, não invasiva e promove reabilitação e retorno precoces às atividades habituais pelos resultados das análises estatísticas. Proporciona também redução da espessura da fáscia plantar.

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Introduction

Plantar fasciitis is characterized as a degenerative condition of the proximal plantar aponeurosis. The site most frequently involved is at the medial tuberosity of the calcaneus. The pathological findings from this nosological entity include degenerative tissue changes characterized by fibroblastic proliferation and presence of inflammatory tissue.[1–3] It is now accepted that this fasciopathy should be classified as a type of enthesopathy, even though its physiopathology is poorly understood.

Several therapeutic options have been described, among which conservative treatment is taken to be the preferred method. Satisfactory results have thus been achieved in around 90% of the patients.

Use of anti-inflammatory medications, analgesics and local infiltration of corticoids and platelet-rich plasma (PRP) is recommended. Furthermore, use of insoles, heel supports, splints and nighttime braces, along with physiotherapy, is also recommended, with the aim of aiding in achieving remission of the inflammatory and painful condition.[4–6]

More recently, some studies have demonstrated that application of a dehydrated human amniotic membrane (dHAM) is effective. Other studies have demonstrated similar efficacy through application of high molecular weight hyaluronic acid. Changes to lifestyle habits, such as weight reduction and use of appropriate footwear, and also postural changes during work,[7–10] are further recommendations.

The other 10% of the patients, whose condition is not resolved through conservative treatment, can be considered to be cases of recalcitrant fasciopathy. In these cases, surgical treatment may be useful, in order to achieve open or endoscopic release of the plantar fascia,[11] with excision of the diseased tissue. In some specific cases, simultaneous nerve decompression is indicated.

In an attempt to avoid an invasive procedure, there have been many studies on shockwave therapy in chronic cases. This technique has been shown to be effective for improving the symptoms and quality of life of patients with this condition. The basic idea of shockwave therapy is to stimulate the tissue regeneration process in the bones and tendons.[12,13] Its efficacy is noted especially in the tissues surrounding the bone and tendons, and also at the bone-tendon interface (enthesis). Release of free radicals, nitric oxide (NO) and substance P at the application site, along with inhibition of the enzyme COX II, produces an anti-inflammatory effect. In experiments on tissues subjected previously to shockwave therapy, analysis under a microscope has demonstrated intensely increased neovascularization and angiogenesis.

The present study was conducted with the aim of prospectively analyzing the results from shockwave treatment on patients with recalcitrant fasciopathy, using validated evaluation methods.

Materials and methods

Firstly, a research projected was designed and submitted for assessment by the Scientific Committee of Hospital IFOR. This was duly approved.

This was a prospective study in which patients with chronic plantar fasciitis that had not responded satisfactorily to conservative therapeutic measures were evaluated. Traditional

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