

Extracorporeal Shock Wave Therapy and Ultrasound Waves Effectively Reduce Symptoms of Chronic Calcaneal Spur

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Letter to Editor

Calcaneal spur occurs when calcium deposits build up on the underside of the heel bone, the process that usually continues for many months. Chronic calcaneal spur is a vested disease commonly appearing in adults and it leads to the inflammatory of the plantar fasciitis, disability and as a result to the limitation of social and professional activities. Among main causes of the plantar fasciitis, there are: an inflammation of the Achilles tendon bursitis, fatigue fractures of the calcaneal tuberosity, obesity, running and jumping, work in a standing position, lifting heavy objects, flat feet, rheumatic changes. The treatment of calcaneal spur is primarily conservative, it includes kinesiotherapy, orthoses, corticosteroid therapy, and electrotherapy, but their efficacy remains controversial. Surgery is also a line of treatment, however different (more invasive) from a conservative treatment in people suffering from calcaneal spur. Despite on this, in this publication we don't compare which treatment line is more effective for the symptoms of calcaneal spur, because the goal of this study was to compare the efficacy of the extracorporeal shock wave therapy and ultrasound waves in reducing the painful symptoms in people with calcaneal spur. Numerous studies show, that electrotherapy, such as ultrasound waves and extracorporeal shock wave therapy are used on pain in patients suffering from calcaneal spur.

Boerner et al., compared the analgesic efficacy of the 0.8 W/cm² and 1.2 W/cm² doses during 10 ultrasound wave treatments performed 5 times a week. The results showed that a less dose decreased the pain in the patients with calcaneal spur [1]. Lizis and Husar also confirmed the analgesic efficacy of the 0.8 W/cm² dose after 10 ultrasound wave treatments performed 5 times a week, because a very significant decrease of pain remained for 6 weeks after the treatment [2].

Zanon et al. evaluated the analgesic efficacy of the 2 W/cm² dose for 15 treatments performed three times a week. It turned out that the ultrasound wave topical application of high power did not decrease the pain in chronic plantar fasciitis inflammation associated with calcaneal spur [3]. The cited authors studies' results showed that the patients had better reactions to less doses of ultrasound wave, because of the patients' effective decrease of pain and their faster taking normal daily activities.

The researchers also explored the analgesic efficacy of shock wave therapy in calcaneal spur associated with plantar fasciitis. Gerdesmeyer

et al., treated chronic (as it lasted longer than 3 months) plantar fasciitis with shock wave therapy. The patients altogether got 6000 impulses of shock waves, energy flux density 0.16 ml/mm² during 3 treatments, once a week. The after treatments' results showed that as pain as plantar fasciitis subsided [4]. Yalcin et al. studied the shock waves' influence on pain and the calcaneal spur size which was evaluated on the basis of X-ray made before and after the treatment. For this purpose the patients altogether got 10000 impulses of shock waves, energy flux density from 0.05 to 0.4 mJ/mm² during 5 treatments, once a week. After the treatment it turned out that there were no radiology changes in the calcaneal bone, the spur did not get smaller, but the pain significantly decreased [5].

The researchers also studied the shock waves' influence on the changes in thickness and soreness of plantar fasciitis during the inflammation associated with calcaneal spur. For this purpose Hammer et al. used altogether 9000 impulses of shock waves, energy flux density 0.2 mJ/mm² at 3 sessions of shock wave therapy, once a week for three weeks. With the help of ultrasonograph they measured the plantar fasciitis' thickness of 2 cm distal to the tuberosity of the calcaneus before the therapy, 6, 12 and 24 weeks after the therapy, and compared them with the plantar fasciitis of a healthy foot. It turned out that 6 weeks after the shock wave therapy the plantar fasciitis thickness of the ill foot and its pain significantly decreased, that caused the locomotion improvement [6].

In their next research Lizis and Hudakova compared the shock waves' and the ultrasound waves' influences on the improvement of the feet health status of the patients with calcaneal spur, whose heel spur pain lasted longer than 6 months. The patients treated with shock waves got the altogether dose of 7000 impulses of shock waves, energy flux density 0.4 ml/mm² during 5 treatments performed once a week for 5 weeks. The patients treated with ultrasound waves got the dose of 0.8 W/cm² during 10 treatments performed three times a week. In both groups the authors noted the significant improvement in the feet health status. However, the patients treated with ESWT had significantly greater pain decrease and life quality improvement, and those benefits were still present 3 months after the treatment [7]. The shock waves' and the ultrasound waves' analgesic effectiveness in patients with calcaneal spur were also compared. Krukowska et al. treated the patients with 2000 impulses of shock waves during 2 weeks in 4 sessions, once every 3 days. The patients treated with ultrasound waves got the dose of 1.5 W/cm² during 10 sessions performed 5 times

a week for 2 weeks. After the treatment it turned out that both methods decreased pain, but the shock waves therapy demanded less sessions to get the analgesic effects, thanks to which the treatment costs are low [8].

The described results show, that different doses of ultrasound waves as of shock waves used by different authors significantly decrease pain and improve the patients' suffering from calcaneal spur associated with plantar fasciitis inflammation, quality of life. However, two comparison researches prove that shock waves are more effective in decreasing pain than ultrasound waves. It is necessary to point out that health effects depend on different factors, such as: the advancement of the disease process, the number of therapeutic doses, their frequency or intensity, or the use of pharmacological analgesia. The applied therapeutic doses are safe for the patients, as in the discussed researches the authors noted no adverse events during the treatments as well as the patients declared any intensification of pain. From the economic point of view, these methods are cheaper than the surgical treatment, and the time of returning to a normal social and professional life is also shorter than after an operation.

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