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## **Physiotherapeutic treatment in patients with heel spurs**

### **Postępowanie fizjoterapeutyczne u osób z ostrogą piętową**

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#### **Streszczenie**

Ostroga piętowa jest zaburzeniem wynikającym z nieprawidłowości biomechanicznych stopy. Problem dotyczy osób w różnym wieku i powstaje na skutek powtarzanych mikrourazów w obrębie przyczepu ścięgna mięśnia zginacza krótkiego palców. Głównym powodem podejmowania przez pacjentów leczenia są dolegliwości bólowe. Istnieje wiele zachowawczych metod leczenia ostrogi piętowej i związanych z nią dolegliwości wynikających z zapalenia rozciągna podeszwowego stopy. Do najbardziej skutecznych zalicza się: kinezyterapię, fizykoterapię, terapię manualną oraz plastrowanie dynamiczne. Dostępne badania wskazują na skuteczność terapii z zastosowaniem: ćwiczeń rozciągających, ultradźwięków, laseroterapii nisko

i wysokoenergetycznej, fali uderzeniowej, wibroakustycznej, rozluźniania mięśniowo-powięziowych punktów spustowych oraz plastrowania terapeutycznego.

### **Abstract**

The heel spur is a disorder resulting from biomechanical abnormalities of the foot. The problem affects people of different ages and arises as a result of repeated micro-injuries within the flexor digitorum brevis. The main reason for treating patients is pain. There are many conservative methods of treatment of heel spurs and related complaints resulting from inflammation of the plantar foot aponeurosis. The most effective include: kinesitherapy, physiotherapy, manual therapy and dynamic slicing. Available research indicate the effectiveness of the therapy with the use of: stretching exercises, ultrasounds, low and high-energy laser therapy, shockwave, vibroacoustics, relaxation of myofascial trigger points and therapeutic tapering.

**Słowa kluczowe: zapalenie rozciągna podeszwowego stopy, fizykoterapia, punkty spustowe, stretching**

**Key words: plantar fasciitis, physical therapy, trigger points, stretching**

### **Admission**

Heel spur is a condition that is caused by multiple etiological factors. One of the basic causes, predisposing to the development of the disorder is overweight and obesity. Too much weight on the affected disorder of the longitudinal arch and the lateral feet,

leading to changes in the biomechanical structure and abnormal pressure distribution of the plantar aspect of the foot on the ground. In addition, there is a high incidence among heavy athletes, as well as women regularly wearing high-heeled shoes. These are, of course, the cause of which indirectly affect the development of heel spurs, since the direct cause of the disorder are biomechanical changes in the musculoskeletal system and abnormal gait pattern. Heel spur is formed as a result of the gradual accumulation of microdamage under tendons. This is followed by reacting the same recovery as a result of which the formation of calcifications within the distal tendon attachment. Heel spur is located at the site of attachment of the tendon flexor short fingers. Rate Plantar fasciitis is caused by the generation of bone growths around the lower surface of the heel spur, which is directed towards the plantar fascia, and the tissue surrounding it, which results in an inflammatory reaction in the fascia. This clinical picture in most cases is associated with pain in the area of the calcaneus, in particular at the moment of their first steps after getting out of bed or stayed long in the rest position. Of great importance in the treatment of inoperable calcaneal spur plays physiotherapy.

### **Kinesitherapy**

Irregularities within the plantar fascia feet very often accompanied by increased muscle tone group back of the leg. This situation is the cause of traffic restrictions dorsiflexion in the ankle and great toe extension. Plays a key role physiotherapy, and in particular the use of a stretching exercise. The systematic implementation of this type of exercise is to restore proper muscle tone and proper foot function recovery. Stretching is a kind of exercise in which there is an isometric muscle contraction and subsequent relaxation. The next phase is stretching muscles undergoing exercise. The use of activity designed to stretch the muscles is recommended both in extensive athletes exposed to repetitive overload as well as in patients receiving long-term sitting position. The positive effects of stretching involve both prevention and treatment of heel spurs conservative. The main effects of exercise are:

- increasing the flexibility and extensibility of collagen fibers,

- preventing, reducing muscle contractures and improve the ranges of motion in the joints,
- a decrease in muscle disbalance [3, 4].

Contorted stretch the muscle can also be obtained by poisometric muscle relaxation (PIR). The method is a three-step waveform. In the case of hyperactivity gastrosoleus, the patient should be placed in a position lying ahead with his feet off the table placed rehabilitation. The first phase is a magnified by the therapist muscle until the subject feels the light pulling or discomfort. In the second phase, stop motion in this position and instruct the patient to oppose the resistance of the therapist with the force of approx. 20%, as if to make a move plantar flexion foot, without changing its position. At this point, there is a isometric gastrosoleus. This position should be maintained for 8 seconds and then in the third stage have the patient. to stop the resistance, and relaxed muscle. At the same time, the therapist intensifies stretch the muscle, by increasing the range of motion dorsiflexion. Steps must be repeated several times, each time increasing the range of motion [5, 6, 7].

### **Musculoskeletal therapy and self-therapy Trigger points**

Preferred results in the conservative treatment of the calcaneal spur brings needle therapy dryness. The therapy can be used for the treatment of myofascial trigger points. Trigger points are places with increased sensitivity, located at an excessively tight bands of muscle or fascia. Due to the nature of latent or active, discomfort in the form of radiating projecting pain and tenderness may occur under the influence of pressure or in the second case the performance of the activity and rest. Trigger points are palpable by the therapist as a bead located in the muscles, which are characterized by excessive tension and overload. The essence of dry needling, in the case of this therapy is hypersensitive to locate the nerve endings sites within the trigger point. The stimulation of nerve endings that results in the pulse, which is then sent to the cells of the spinal cord, as a result of reaching excessively tight muscle fibers teased bandwidth. This pulse is responsible for the unconditional call reflex in the form of muscle contraction. As a result, loosening muscle tissue reacts, thereby also reduce the pain felt. The benefits of using dry needletherapy in the treatment of myofascial trigger points

are: reduction of pain and increase range of motion in the joints [8, 9]. This pulse is responsible for the unconditional call reflex in the form of muscle contraction. As a result, loosening muscle tissue reacts, thereby also reduce the pain felt. The benefits of using dry needletherapy in the treatment of myofascial trigger points are: reduction of pain and increase range of motion in the joints [8, 9]. This pulse is responsible for the unconditional call reflex in the form of muscle contraction. As a result, loosening muscle tissue reacts, thereby also reduce the pain felt. The benefits of using dry needletherapy in the treatment of myofascial trigger points are: reduction of pain and increase range of motion in the joints [8, 9].

There are many manual techniques used to reduce the activity of trigger points in the case of inflammation of the plantar fascia of the foot. One of the ways is easily accessible self-therapy, which uses furling, tennis ball or other, harder depending on your preferences, for example. The ball Lacrosse. The use of treatment using the w / w gear improves the hydration and elasticity of the fascia, and stimulates the proprioceptive system. Looking for a suitable utensil yourself, pay attention to its hardness. In the case of structures heavily strained, tender recommended to use softer balls, so that the pain was bearable. In people with high pain threshold, where the applied stimulus seems to be too intense, it is proposed to gear with greater hardness. The essence of self-therapy myofascial trigger points is to locate excessively tight, restricted or painful areas of the plantar fascia of the foot. Then a rolling, first in a seated position, relieving lower limbs, gradually increasing the pressure until the standing position and full load. Rolling should be carried out at a slow pace along the plantar fascia. Facing the painful area or contorted worth staying in this place and by stimuli lead to oppression of its loosening. It is assumed that felt relaxation and comfort improvement within the band of muscle occurs after the expiry of approx. 30 seconds. When the tissue at a particular location is too painful, should focus on loosening areas located in their neighborhood. The day after self-therapy carried out, the reaction of a feeling of relaxation as well as pain in this area. It is recommended that systematic relaxation of tissues, preferably at 24- 48 hours [10].



Fig. 1. Self-therapy technique using a furling.

### **Elastic therapeutic tape**

Worth mentioning a form of conservative treatment of heel spurs is the use of dynamic slicing. By appropriately applying the patches can achieve the expected change in mechanical and sensory structures, to allow the reconstruction and reorganization of the body work. Local impact of patches applied either brings many benefits, one of which is to increase the space between the fascial, resulting in improvements to the lymph flow and normalization of muscle tone. In addition, it achieved positive results such as: improvement of microcirculation and proprioception, as well as the elimination of pain. An example of the method of application tape therapeutic inflammation of the plantar fascia is the use rate correction and ligamentous. The first consists in adhering a base strip at the base of the distal phalanges, and then applied to the stretched by approx. 50% of the tape along the extension of the plantar fascia rate, reaching up to the Achilles tendon. At this point the tape should be slotted lengthwise into two equal parts. Each of the "tails" tapes should be stretched by 50 to 75%, and taken along the side edges of the head of the medial and lateral gastrocnemius, respectively, ending with the medial condyle and lateral femoral bases with a voltage of 0%. The administration of a therapeutic tape should be carried out in the intermediate setting rate, preferably in a

prone position with his feet protruding beyond the table and physiotherapy. The second technique used a method patches ligament, which involves applied tape stretched by approx. 25 to 50% transversely with respect to the axis of the foot, at the site of an appreciable pain. In the case of inflammation of the plantar fascia foot trailer is a typical location flexor short fingers, that is, the lower area of the heel spur. Tape base voltage of 0% should be mounted in the area of the lateral malleolus and medial [11, 12, 13].



Fig. 2. Slices of a dynamic application example used in the case of inflammation of the plantar fascia of the foot.

### **Physiotherapy**

It is important in the fight against pain resulting from inflammation associated calcaneal spur is physical therapy. One of the recommended treatments are ultrasounds. The benefits of treatment using ultrasound are to relieve pain, reducing excessive muscle tone, improvement of microcirculation, inhibition of inflammation and to accelerate the processes of tissue absorption [14, 15]. Another recommended a conservative treatment of calcaneal spur surgery is low and high energy laser. The positive benefits of use of the technique of contact. Treatment parameters are always selected individually. The main effects of laser therapy include relief of pain and accelerate tissue regeneration [16]. One of the most modern forms of therapy is the

treatment of shock wave. During the procedure used for acoustic waves in the high pressure and the ankle, which is released in a relatively short time. Effective to use the parameters: frequency of 4 Hz size, number of strokes 2000, an energy density equal 0,4 mJ / mm<sup>2</sup>. Treatment of shock wave brings many benefits, such as improving tissue metabolism, increase collagen production, reduce muscle tension and analgesic effect [17]. Of great importance in the treatment of therapy also has a vibroacoustic emitting mechanical micro vibration. Studies show the effectiveness of treatment using the parameters: frequency of mode 2 and 4 having a value from 38- 9730 Hz. Vibroacoustic therapy has primarily analgesic effect,

### **Summary**

Heel spur is a condition which affects both people intensely athletes and people with limited physical activity and obesity. Improper loading and impaired function of the foot lead to the formation in the area of the tumor heel bone spurs. Such a situation leads to irritation and produce inflammation of the plantar fascia around the foot. The main cause of the problem and take the patients therapy is feeling pain. One of the basic methods of conservative treatment of calcaneal spur is physiotherapy. Of particular importance are stretching the back muscle group of the lower limbs. Also it brings positive effects of therapy using muscle relaxation postisometric performed by the therapist. To restore normal biomechanical function of the foot and to normalize muscle tone, it is used in rehabilitation therapy, myofascial trigger points and with the use of self-therapy balls. In addition, important in reducing the pain is physical therapy. Especially effective it is to carry out a series of treatments in the field: sonotherapy, laser shock wave and vibroacoustics. Complementary element w / w therapies is elastic therapeutic tape, preferably acting on the musculo-fascial. Especially effective it is to carry out a series of treatments in the field: sonotherapy, laser shock wave and vibroacoustics. Complementary element w / w therapies is elastic therapeutic tape, preferably acting on the musculo-fascial. Especially effective it is to carry out a series of treatments in the field: sonotherapy, laser shock wave and vibroacoustics. Complementary element w / w therapies is elastic therapeutic tape, preferably acting on the musculo-fascial.

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