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Acupuncture and Related Methods Applied in Sports Medicine: Exemplified by the Rupture of a Muscle Fiber

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ABSTRACT

In sports medicine, acupuncture and related techniques are gaining importance. Because of the extreme motion patterns that the supporting and locomotor system becomes exposed to, musculoskeletal and myofascial pain syndromes occur. They are accompanied by reflectory changes such as myosclerosis, painful limitations on the motion ability of the joints, and also dysfunctions hampering the course of routine motions and of relieving postures. There are various causes for such pain such as overstress of the supporting and locomotor apparatus. An efficient treatment for athletes requires an integrated therapy with consideration of myokinetic and arthromuscular conditions. Traditional Chinese Medicine is suitable because it establishes a link between functional chains and the Meridian channel system. Its application is exemplified by the case report of a common sports injury, the rupture of a muscle fiber.

Key Words: Acupuncture, Supporting System, Locomotor System, Musculoskeletal Pain, Myofascial Pain, Multi-Modal Therapy, Sports Injuries

INTRODUCTION

An obvious characteristic in the practice of sports medicine is the group of patients consisting of primarily performance-oriented people like competitive and recreational athletes, as well as children and youth athletes, wellness-conscious sportsmen, dancers, and musicians (e.g., pianists, violin players). These patients usually present because of acute pain symptoms of the locomotor system.

Prevention, rehabilitation, and medical care are important in addition to diagnostics and therapy. That is why the attending physician must be qualified in the fields of training methods and functional anatomy, as well as in the areas of sports medicine and reflectory medicine in order to evaluate the effectiveness of training methods and specific motion patterns. Performance-oriented patients demand a lot from their bodies (Figure 1).[1] They are always eager to quickly recover from a disruption of their abilities in order to exercise and compete. In such situations, acupuncture is a very effective method of treatment. It has numerous advantages: acupuncture provides an integrated approach, it is quickly effective, has few or no sideeffects, and it does not constitute doping.

METHODS

The main area of indication for the application of acupuncture and related methods is the supporting and locomotor apparatus with its interlinking of functional disorders and the arising reflectory changes. Patients primarily suffer from musculoskeletal and myofascial pain that emanates from muscles, tendons, ligaments, periosteum, and joints. Causes for these mostly acute pain syndromes can be the following factors:

- Microtrauma
- Montusion
- Distorsion
- Distension
- Physical stress due to incorrect exposure
- Excessive physical stress
- Degenerative changes.

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FIG. 1. Athletes are striving for high performance and therefore need a quickly effective therapy in the case of an injury.

These variations of pain are difficult to characterize because they do not belong to a certain type of innervation area or dermatome. They are frequently accompanied by reflectory changes such as myosclerosis, painful limitations of the motion capacity and motion ability of the joints, and dysfunctions hampering the course of routine motions and of relieving postures.

According to Traditional Chinese Medicine (TCM), mainly the 5 layers of the Biao are affected by these disorders; illnesses on the Biao result. The pain syndromes can be caused by Qi stagnation, Xue stasis (blood), Qi or Xue deficiency. When it comes to the search for root causes and a strategy for the prevention of sports-related injuries, the characteristics of muscular kinetics within specific motion patterns of various athletic activities play a major role.

Specific motion patterns are performed by myofunctional chains (Figure 2) or muscle loops,[2] e.g., the extensor and flexor loops. A given motion is harmonious when Qi and Xue flow equally and when agonist as well as antagonist work according to the Yin-Yang/Inside-Outside principle.

A temporary contraction of the operating musculature (specific motion pattern) is one of the most common disorders. If such a condition cannot be resolved, a limitation of the ideal contraction capacity ensues, increasing the probability of injuries. The contraction of a muscle and the effects on the antagonist as well as the joints involved lead to a disruption of the arthromuscular balance. This lays the foundation for possible implications like blocked joints, myogelosis, muscle strain, or tendon rupture.

Because of the many neural-reflectory links between the musculature, central nervous system, and joints, disruptions in one part of the supporting and locomotor apparatus can also influence the functioning of another. This complex task requires complex medical treatment. Since there are different approaches to diagnostics, therapy, and in particular, prevention, there must be a combination of orthodox and regulatory medical methods and those of TCM according to their concrete importance for a given case.

Case Report

The practical steps of applying acupuncture and related techniques are described by the example of the rupture of a muscle fiber (medial left gastrocnemius muscle). While preparing for the European Track and Field Championships (August 23, 1998), a then-27-year-old female athlete sustained an injury on August 5. Shortly after the start of a 200-meter race, she experienced sudden strong pain in her left calf and had to abort her run. On site, cryotherapy was conducted. She was treated the next morning.

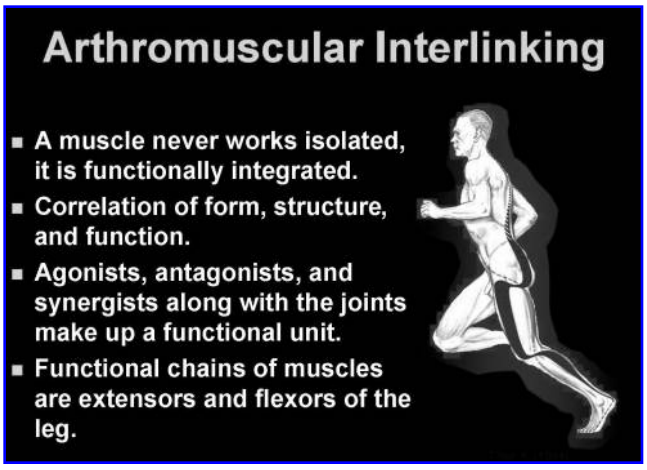

FIG. 2. Arthromuscular interlinking.[2]

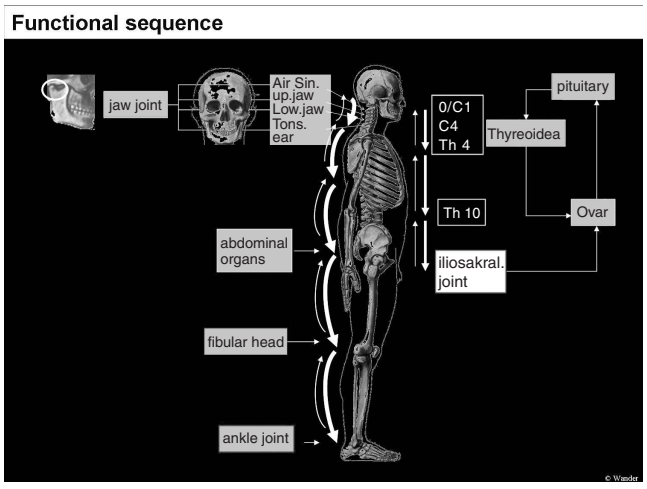

FIG. 3. Functional sequence.[3]

Anamnesis data suggested a summation of causes for the injury. Training methods led to an overuse injury. The preparatory sprint race took place after a week of intense training and after a relay completed earlier at the same track meet. Adverse bioclimatic and mental factors also played a role; throughout the competition, it was rainy, windy, and cool. Additionally, there was considerable mental tension because of the qualification goals to be achieved at that track meet.

Diagnostics

After clinical, functional, and the interference field diagnostics as well as TCM diagnostics, the following findings were established:

Clinically: pressure pain at the medial part of the medial left gastrocnemius muscle, light dehiscence palpable, no hematoma, no swelling.

Functionally: cervical spine and thoracic spine—free movement possible, sacroiliac joint without pathological findings, blocking of fibular head (left), upper ankle joint (both sides), and lower ankle joint (left) (Figure 3).

TCM finding: Qi stagnation, Xue stasis. For an objective perspective, sonography was conducted. The diagnosis from the sonography findings confirmed the tentative diagnosis: a 0.5 × 1.0 cm hematoma in the medial left gastrocnemius muscle (Figure 4).

Diagnosis

The rupture of a muscle fiber (medial left gastrocnemius muscle) was diagnosed. The TCM diagnosis: Biao illness and Meridian illness with stasis or stagnation of Xue and Qi in the channels, Bi-syndrome "Wind-Dampness-Cold" in the channel system, and disharmony of the functional circle SP and LR.

FIG. 4. Sonography findings immediately after the injury occurred.

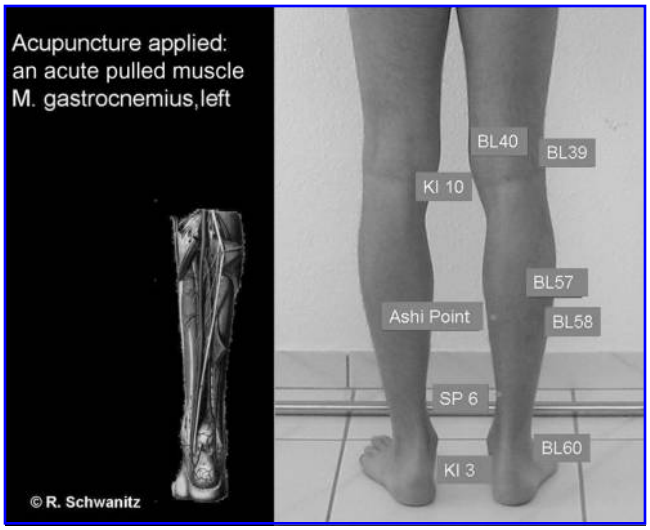

FIG. 5. Acupuncture of acute pulled medial left gastrocnemius muscle.

Therapy

Treatment on the first day after injury occurred included:

- Chirotherapy
- Acupuncture, taking into account functional correlation of corresponding Meridians
- "Master link" rule: Ashi points BL 40, 57, 58, 60, SP 6 contralateral, auricular acupuncture in the region, TF 3–6, of the triangular fossa (in close proximity to Shenmen) both sides (targeting the lower leg, located in the auricular area, Superior Antihelix Crus, in the zone between knee and ankle) (Figure 5)
- Simultaneously, the injured medial left gastrocnemius muscle (Figure 4) was moved with caution against resistance via postisometric relaxation (PIR); duration of treatment was 6-10 minutes.

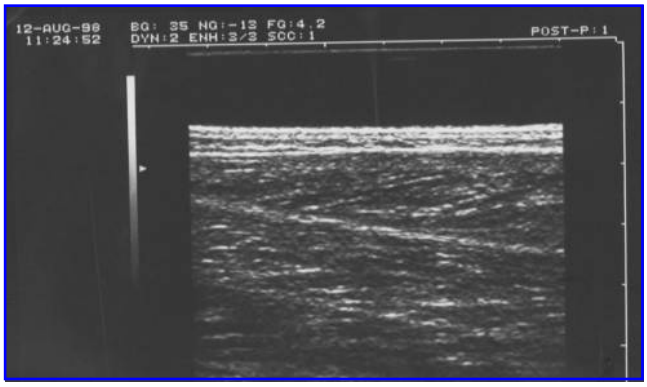

FIG. 6. Sonography findings on day 12 after successful therapy.

Afterward:
- Tape bond
- Cryotherapy
- No exercise.

The day after treatment, the athlete confirmed a decline of pain symptoms. Treatment was continued with the same acupuncture protocol. After that, electropuncture was applied ipsilateral BL 40 and SP 6. An immovable bandage with elastic gauze provided stability. At night, the same treatment was conducted and a heparin salve bond was applied overnight.

On day 4 after injury, acupuncture and PIR treatments were continued once a day. In addition, the lower leg in the area of the lesion was irradiated via laser (infrared laser 904 nm). On day 3 after the injury, a small hematoma appeared, which was treated with ultrasound 0.7 W/cm^2 for 5 minutes. Acupuncture treatment continued. Ultrasound and the application of tape continued until the seventh day after the injury occured.

On day 8, the athlete reported a significant amelioration. She did not have any pain during normal exercise. The sonography checkup that day confirmed the finding (Figure 6). After prior consultation with the athlete and her trainer, low-intensity training was allowed once a day. From days 9 to 15, training with higher-intensity areas could be conducted without any pain as well.

RESULTS

On August 24, 1998, the patient-athlete won a Silver Medal at the European Championships as the runner of the final leg in the 4 × 100-meter relay. In the course of later training units and competitions, even at times of high performance, there were no more constraints due to pain.

DISCUSSION

An efficient treatment for athletes requires an integrated therapy with consideration of myokinetic and arthromuscular conditions. Traditional Chinese Medicine is suitable because it establishes a link between functional chains and the Meridian channel system.

CONCLUSIONS

Acupuncture, combined with manual therapy, physical therapy, laser treatment, and neural therapy, is particularly effective and successful when applied in cases of acute disturbances of the supporting and locomotor apparatus. A prerequisite is a concerted, rapid, and timely treatment including movement and exercise. This requires the operational readiness of the physician as well as compliance of the patient.

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