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Muscle strains – the most common injury in basketball
Faster healing using shockwave therapy

Statistics show that, in addition to injuries of the ankle and knee joints, muscle strains in the lower limbs are the most common injuries in basketball.

Extracorporeal shockwave therapy is an excellent healing method for a number of indications in orthopaedics and for wound healing. It is the treatment of choice for chronic disorders of the joints and soft tissues, such as persistent pain in the shoulder and arm, e.g. tennis elbow, or of the Achilles tendon and the foot, such as a heel spur.

For all these indications a positive effect is achieved in most cases only after a few weeks and after about 4–6 treatments. The special feature of the present case studies is the treatment of acute sports injuries, such as thigh and calf muscle strains, that were sustained during a major basketball event, the European MaxiBasketball Championship. This championship is a 10-day event in which men and women over 30 years of age compete in a tournament for trophies and medals. In general, all participants have to compete in 5 to 6 games, i.e. with the corresponding stresses every second day. If this results in an injury in the first few days, the tournament is normally over for the player because complete healing in such a short time is barely possible. Previously, the RICE rule was always applied (rest, ice, compression and elevation) with all sporting activity stopped immediately; otherwise, the injury to the muscle can worsen. A break from sports of 4 to 6 weeks is the rule and only then is a full load possible again.

As a result, treating acute injuries with the aim of restoring the patient to peak performance in a few days is a big challenge. Our own studies have shown that treatment with extracorporeal shockwaves significantly improves and accelerates the self-healing powers of the body, leading to more rapid healing of the patient.

Extracorporeal shockwaves trigger an extensive cascade of reactions, referred to as mechanotransduction, by activating mechanoreceptors in the cell membrane. These reactions include the release of endorphins (pain relief) and reactive oxygen species as well

as influencing cells by migration, gene expression and enzyme activation.

With the use of four examples, it was demonstrated that acute thigh and calf muscle strains can be treated very well. The success of the treatment relies on the pulses reaching the pain point accurately, providing short-term relief from the pain experienced with acute injury. The applied energy must be selected so that a patient is always below their pain threshold, which requires adjustment for each individual. Usually, the pain induced during therapy becomes weaker after about 500 pulses, with the result that the point with the greatest sensitivity needs to be isolated again and adjusted under certain circumstances. Constant monitoring is necessary, and the pain must always be bearable. The treatment is performed at 2000 pulses per treatment session, and two to three sessions are required. In these acute cases, a patient has one session a day rather than the usual frequency of once a week.

The newly developed Wide Focus technology describes a shockwave that is concentrated within an energy channel that penetrates deep into the tissue. The use of applicators with varying dimensions enables the diameter and penetration depth of the Wide Focus technology to be adjusted. The high penetration depth is achieved by very high energies that can be very well tolerated by the patient thanks to the various Vario modes (inverted triangle, pulse).

The new device Likawave Vario 3i from Likamed with its VARIO LOGIC Technology (VLT) shows these benefits. It is also a true innovation with its intelligent cell-protective mode in which the intensity and frequency can be dynamically varied between defined limits during treatment in a programmed cycle. The application can be modified for each patient depending on their pain perception, enabling ideal responsivity. The body cells reached with the different therapies are protected. At higher frequencies and energies, the therapy is more efficient, while the patient can briefly recover during the therapy when these parameters are at their minimum. This optimal energy and frequency range is so important because shockwave therapy is virtually ineffective at low energies and at higher energies cells can even start to be destroyed. The Vario mode of the Likawave Vario 3i has been designed precisely for this mid-range energy and frequency, which is modified for each therapy and patient.

Patients usually benefit from this very gentle process with a reduction in pain, generally immediately. Treatment with the Likawave Vario 3i is generally found to be pleasant and well-tolerated, even when applying higher energies, so healing can begin more quickly and

treatment is much more efficient, as is clearly demonstrated in these applications for muscle strains. This is the only way to understand how acute injuries can be healed in just a few days, something that is of great importance for athletes competing in a multi-day basketball tournament.

In conclusion, the first application of the Vario mode in shockwave therapy has proven to be very effective with a positive effect on patient healing. They tolerate higher energy without experiencing any pain, which is beneficial for the healing and regeneration process. Acceptance of the Likawave Vario 3i unit was considerably greater among all patients. With some other ESWT devices a diffuse internal pain develops, a symptom that was not observed with the Likawave Vario 3i. The use of shockwave therapy for acute muscle injuries is an entirely new indication and thus a true innovation for the treatment of muscle strains.

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