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Innovation in shockwave therapy with the VARIO LOGIC technology (VLT) in the LiKAWAVE VARIO 3i from Likamed

Shockwaves were first used in medicine in the 1980s as a non-invasive procedure for lithotripsy. Since then, the range of applications exploiting this mechanism of action has been extended to include the treatment of calcium deposits in the shoulder, salivary gland stones and gallstones, and heel spurs. By changing the therapeutic parameters, many other indications have been added in recent years. They range from the treatment of sports injuries, pseudarthrosis and poorly healing wounds to acupuncture using shockwaves and cosmetic skin treatments, such as treatment to tighten and restore connective tissue, e.g. to reduce the appearance of cellulite.

A different biochemical mechanism is behind these changes in application and therapies. Our own studies have shown that a comprehensive cascade of reactions referred to as mechanotransduction is triggered by activating mechanoreceptors in the cell membranes. These reactions include the release of endorphins and reactive oxygen species as well as influencing cells by migration, gene expression and activation of enzymes such as collagenase, elastase and hyaluronan synthase. These enzymes play a significant role in tightening and regenerating the skin, which affects the connective tissues.

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).

Likamed exploits this technology with the VARIO LOGIC Technology (VLT) for the Likawave Vario unit and particularly the new LiKAWAVE VARIO 3i, making it a genuine innovation.

The special feature of this technology developed by Likamed is an 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. This technology has been further improved in the new LiKAWAVE VARIO 3i.

It uses an innovative invert technology, which is based on a reversal of the pulse relationship of existing Vario modes: a higher pulse power is linked with lower pulse density and a lower pulse power is linked with a higher pulse density. The inversion increases the usable energy spectrum for a wide range of indications, further increasing the success rate of the LiKAWAVE VARIO 3i.

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 range, which is modified depending on the therapy and patient and efficiently applied. Patients usually benefit from this very gentle process with a reduction in pain, generally during the treatment itself. 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. This is particularly noticeable with acute sports injuries. Patients with strains in thigh and calf muscles could return to training virtually pain-free after four days.

The very gentle method behind these therapies can also be transferred to and successfully applied in cosmetics for skin improvement and skin regeneration. Another innovation of the LiKAWAVE VARIO 3i provides further support for gentle use of shockwave therapy. The high-energy Wide Focus technology emits a broader focus instead of the usual, very point-form focus volume. Conventional point-form focused sources have the disadvantage of a locally restricted therapy zone, which has virtually no significant therapeutic energy in the close and far focus ranges. In contrast, the new, modified LiKAWAVE VARIO 3i Wide Focus pulse source emits a large effective energy volume. The familiar problems of accuracy are now finally a thing of the past.

In cosmetics tightening and restoring connective tissue is particularly important for improving the appearance of the skin. The targeted use of shockwave therapy with the LiKAWAVE VARIO 3i boosts metabolism and circulation, which can increase the number of collagen fibres, tighten the connective tissue and make the skin appear smoother. We were able to demonstrate an

impressive reduction in wrinkles in the skin, particularly in combination with the application of hyaluronic acid. Additional applications include tightening skin affected by cellulite, reducing scar tissue and reducing stretch marks resulting from pregnancy. It is particularly important for application in curative cosmetics that shockwave therapy is virtually free from pain, risk and side effects.

In conclusion, the first application of the Vario mode in shockwave therapy has proven to be very effective with a very positive effect on patient compliance. This also makes this mode ideal for cosmetic and physiotherapy applications. With this type of application, patients tolerate higher energy without experiencing any pain, which is beneficial for the healing and regeneration process and also has a visible effect in improving the skin. 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.

A handwritten signature in black ink, appearing to read 'Hans-Jürgen Duchstein'.

Prof. Dr. Hans-Jürgen Duchstein