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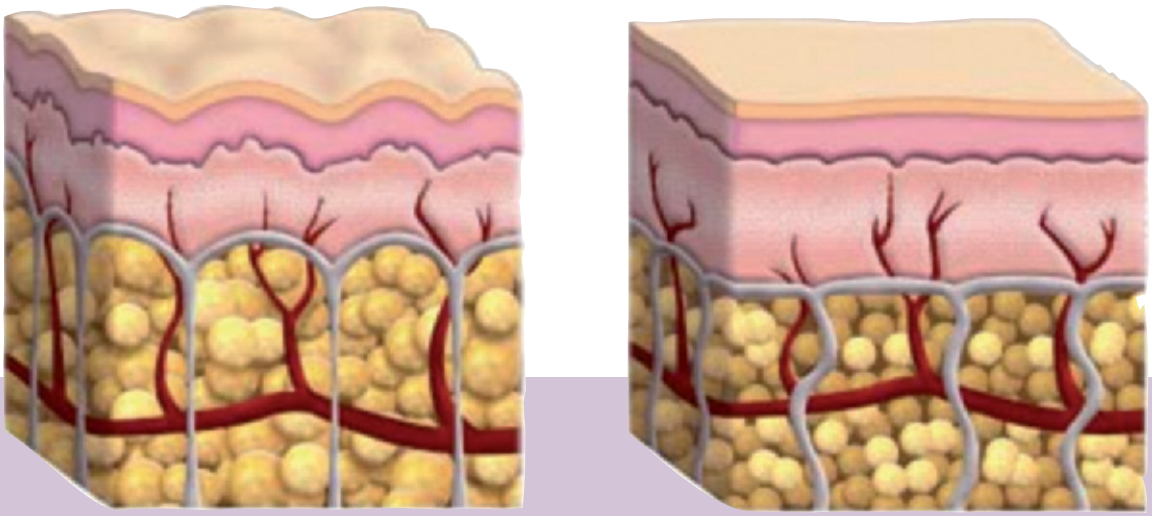
intern

Shockwave treatment for cellulite

The search for an appropriate treatment for cellulite has been going on for decades. This paper presents the use of shock waves in cellulite therapy. Results show that the use of shock waves distinctly reduces thigh circumference and renders the skin firmer and smoother.



Introduction

In cellulite, weak connective tissue fibres cause bulging of the septa of the subcutaneous adipose tissue – primarily in the thighs, upper arms, hips, buttocks, and abdomen. This causes dimpling of the skin surface. Cellulite is found almost exclusively in women since men have a different connective tissue structure in adipose tissue. In overweight persons and/or those with weak connective tissue, cellulite can already manifest in young adulthood; with increasing age, varying degrees of cellulite are found in 80 to 90 percent of women.

Radial shock wave therapy (RSWT) is a new treatment method. Radial shock waves are high-energy acoustic waves that are pneumatically generated outside of the body. They are applied to human tissue via the skin surface near the affected area, and they then spread radially (spherically. This radial spreading makes the treatment feel particularly comfortable. After treatment, the tissue around the affected area reacts to the shock wave with increased metabolic activity. The epidermis becomes tighter as a result. In addition, the acoustic waves stimulate circulation, neovascularisation, and the production of collagen. The improved metabolism and circulation speed the drainage of lymphatic fluid.

Method

The Z-Wave shock wave therapy system (Zimmer MedizinSysteme GmbH, Neu-Ulm, Germany) was used for shock wave treatment. The same system is used in physical therapy and orthopaedics under the name enPuls.

Two applicator heads, a large one (40 mm diameter) and a small one (25 mm diameter), were available for therapy. The left side of the body was always treated with the large head and the right side with the small head.

Ultrasound gel (Sono Plus) was used as a coupling medium to ensure complete energy transmission. To avoid soiling of the handpiece, a protective silicone cap was applied to the applicator head.

Different frequencies were available: The recommended frequencies were 10 Hz and 16 Hz, and their selection was determined by the sensation that each patient reported.

The shock wave can be emitted at four different energy levels – levels II and III were recommended here for pain-free therapy.

For each treatment session, 2500 to 4000 shocks were recommended.

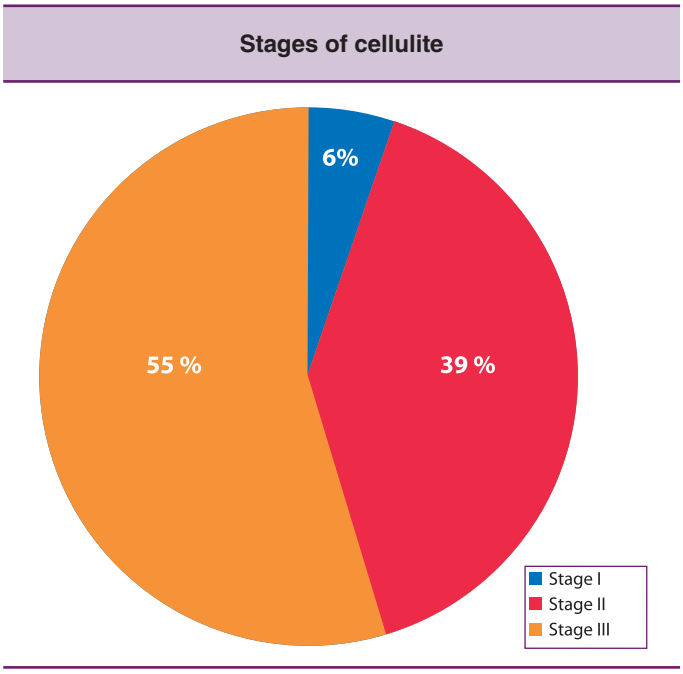


Fig. 1: Stages of cellulite in the volunteers

The treatment should always be applied in the direction of lymph flow. The pressure on the handpiece could be increased when moving in the direction of lymph nodes. As an additional topical treatment, an anti-cellulite gel (Beaute Pacifique, Denmark) was applied once daily throughout the study period.

Results were supplemented with photo and ultrasound documentation. If the final examination results of a particular volunteer were missing, we used the "last observation carried forward" (LOCF) method, in which the last value available for that patient was used in the final analysis.

Results

Eighteen women with cellulite in stages I, II, and III volunteered for this study.

The stages were identified by evaluating the skin surface relief on the buttocks and thighs using the following system:

Stage 0
Smooth skin, no mattress phenomenon, and no orange peel effect in the pinch test.

Stage I:
Smooth skin when lying and standing; orange peel effect only triggered by so-called pinch test.

Stage II:
Smooth skin when lying; cellulite exhibited when standing and positive mattress phenomenon.

Stage III:
Cellulite exhibited when lying and standing

Stage I was identified in one patient (6%), stage II in 7 patients (39%), and stage III in 10 patients (55%).

Shock wave therapy was performed 2-3 times per week, with a total of 10 treatments administered in a period of 4 weeks. The patients were asked not to change their usual lifestyle during the treatment period.

The patients' average body weight was 74.1 kg at the start of therapy and dropped to an average weight of 73.9 kg in the course of treatment.

Body fat measurements showed no effect of the treatment – their value stayed unchanged at 36% before and after treatment.

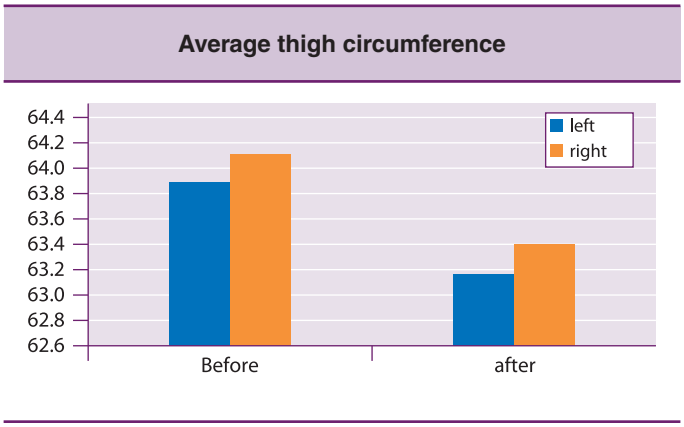


Fig. 2 Average thigh circumference before and after the treatments.

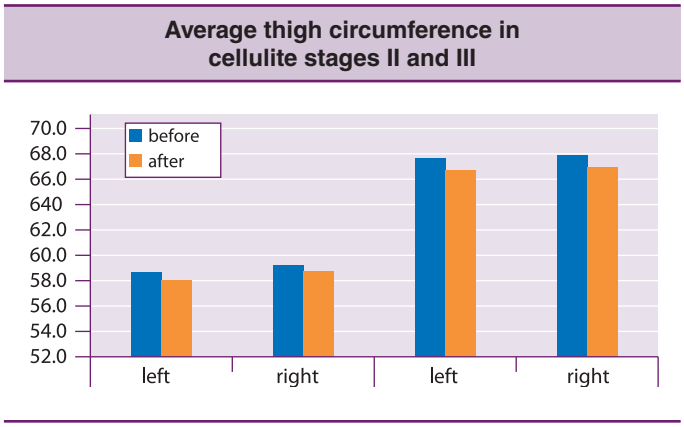


Fig. 3: Average thigh circumference of patients with cellulite stages II and III before and after treatment

For the thigh circumference measurement, a zone at the lateral thigh was defined in all patients; this zone was in the centre of a straight line between the femoral head and the lateral knee joint line.

On the left side of the body, which was treated with the 40 mm head, the thigh circumference was reduced from an initial average of 63.9 cm (minimum 51 cm, maximum 73 cm) to 63.2 cm (minimum 49 cm, maximum 73 cm).

On the right side, which was treated with the 25 mm head, the average thigh circumference was reduced from 64.1 cm (minimum 49 cm, maximum 72 cm) to 63.4 cm (minimum 48 cm, maximum 72 cm).

When the data of the patients with stage II or III cellulite were analyzed, the reduction of thigh circumference was somewhat greater for stage III than for stage II.

The patients consistently reported a positive subjective experience. They reported firmer and smoother skin, and the therapy was experienced as pleasant with an agreeable tingling sensation, which is suggestive of a hyperaemic effect.

From the physician's perspective, deeper dimples were still present, but the skin appeared much firmer.

Discussion

Initial investigations have shown that thigh circumference can be significantly reduced by shock wave therapy in patients with cellulite. The appearance of cellulite can be noticeably improved as well. In patients with stage III cellulite, slightly more changes can be expected than in those with milder forms of cellulite. No difference in effect was shown for the different applicator heads.

The patients subjectively experienced the skin as firmer and smoother. Deep dimples are unlikely to completely disappear.

In summary, shock wave therapy offers a new form of cellulite treatment that is free of side effects and very well accepted by patients. ■