

Shockwave therapy for cellulite

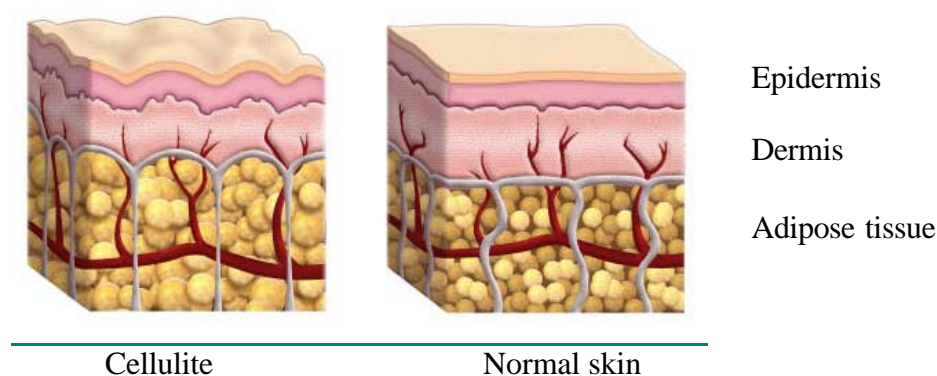
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Abstract

A suitable treatment for cellulite has been sought for many years. This paper discusses the use of shockwaves to treat cellulite. It was demonstrated that the use of shockwaves significantly reduced the circumference of the thigh and the skin became firmer and smoother.

Introduction

In people with cellulite weakness in the connective tissue fibres leads to the occurrence of septa in the subcutaneous fatty tissue, predominantly in the thighs, arms, hips, buttocks and abdomen, resulting in the formation of dimples in the skin's surface. It occurs almost exclusively in women, as men have a different connective tissue network in fatty tissue. Cellulite can occur even in younger adults in cases of excess weight and/or weak connective tissue, and with advancing age these changes can be found to varying degrees in 80 to 90 percent of all women.



A new treatment method is radial shockwave therapy (RSWT). Radial shockwaves are high-energy sound waves that are generated pneumatically outside the body. They are coupled over the skin surface close to the pain zone in human tissues and radiate radially (spherically) from this point outwards. This radial distribution means the treatment is perceived as particularly gentle. After the treatment the tissue around the pain zone reacts to the sound waves with an increase in metabolic activity, which as a result tightens the epidermis. The acoustic waves also stimulate blood flow, neovascularisation and the production of collagen. The improved metabolism and circulation accelerate the removal of lymph fluid.

Method

The Z-Wave shockwave therapy system from Zimmer MedizinSysteme GmbH in Neu-Ulm was used for the shockwave treatment. This system is used in physiotherapy and orthopaedics under the name enPuls.

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

For complete energy transfer, ultrasound gel was used as a coupling agent (Sono Plus). A protective silicone cap was placed on the applicator head to avoid contamination of the handpiece.

Various frequencies could be selected: 2 Hz, 5 Hz, 10 Hz and 16 Hz. The recommendation is 10 Hz or 16 Hz, with the perception of the test subjects being the decisive factor.

The shockwave can be delivered at four different energy levels – levels II or III were recommended so that the therapy could be carried out without any pain.

As a point of reference, 2500–4000 shocks were applied per treatment session.

The treatment should always be done in the direction of lymph drainage. The pressure on the handpiece could be increased, provided the treatment was in the direction of the lymph nodes.

An anti-cellulite gel (Beauté Pacifique, Denmark) was applied once daily throughout the study as an additional topical treatment .

The results were recorded by photos and ultrasound recordings.

The 'last observation carried forward' (LOCF) method was used in the case of missing values for the final examination, that is, the last value available for a test subject was used for the final analysis.

Results

Eighteen women with cellulite in stages I, II and III were available as test subjects.

The various stages of cellulite were classified using assessment of the skin profile on the buttocks and thighs based on the following definition:

Stage 0:

Smooth skin, no mattress-like appearance in the pinch test and no dimpling

Stage I:

Smooth skin while lying and standing; dimpling only visible with the pinch test

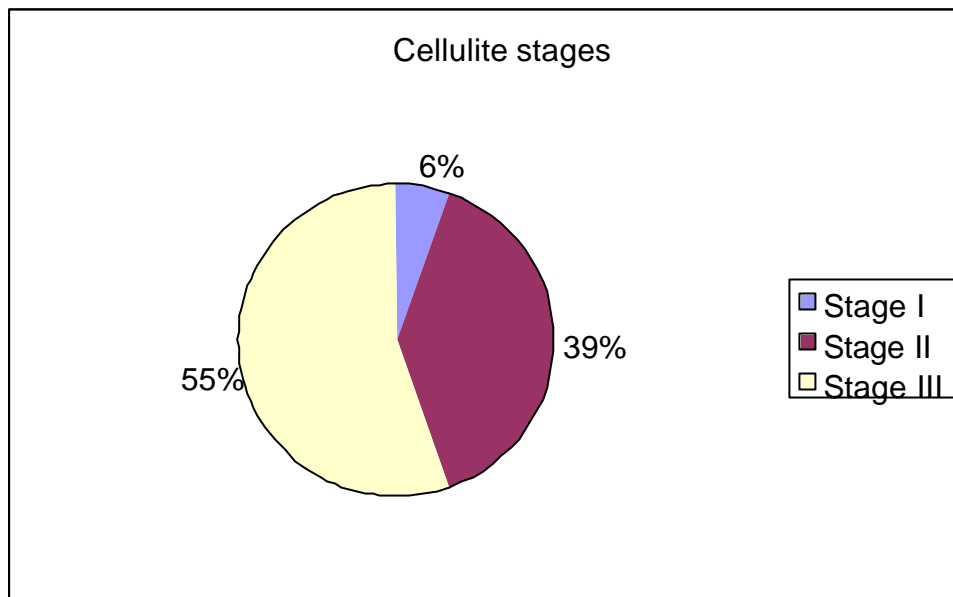
Stage II:

Smooth skin while lying; appearance of dimpling when standing and positive mattress phenomenon

Stage III:

Appearance of dimpling while lying and standing

Stage I was diagnosed in one subject (6%), stage II in 7 subjects (39%) and stage III in 10 subjects (55%).



The shockwave therapy was applied 2–3 times weekly with a total of 10 treatments over a four-week period. It was suggested to the test subjects that they do not change their usual lifestyle during the treatment period.

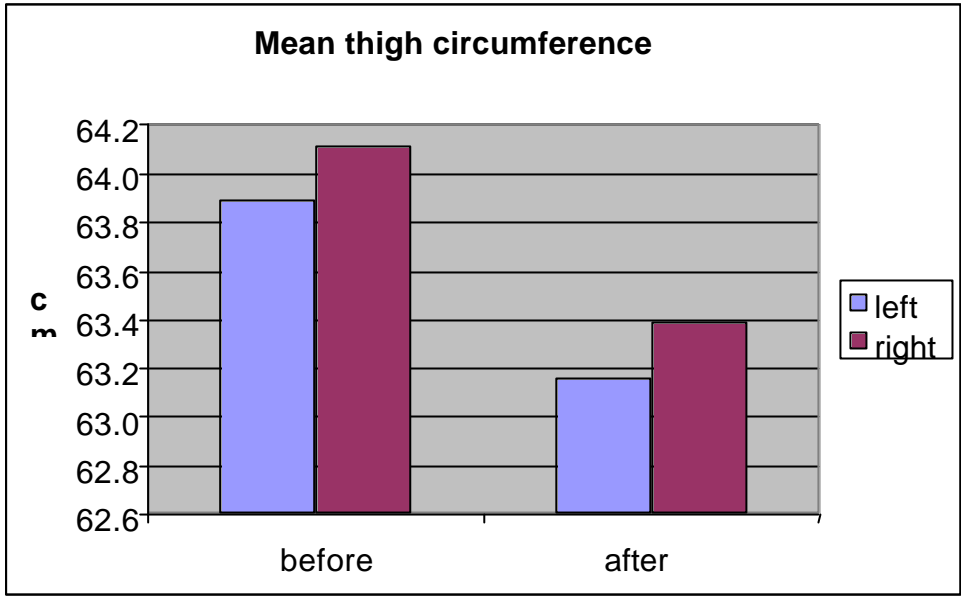
At the start of the therapy body weight was 74.1 kg on average and was reduced during the treatment to a mean weight of 73.9 kg.

The therapy did not affect the proportion of body fat – the values remained constant at 36% both before and after the treatment.

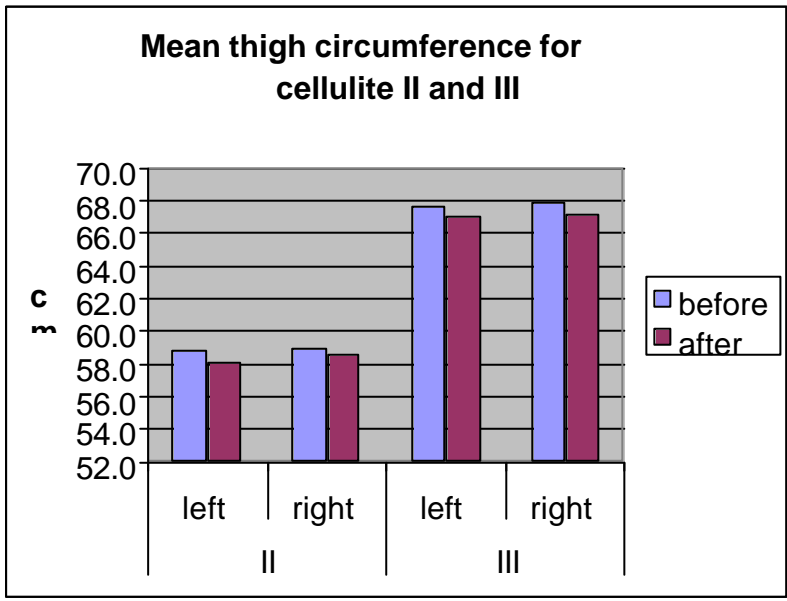
To determine the thigh circumference a zone on the lateral thigh was defined as the middle of a straight line between the head of the femur and the lateral knee joint space.

For the left side of the body, which was treated with the 40 mm head, the mean baseline thigh circumference of 63.9 cm (minimum 51 cm, maximum 73 cm) was reduced to 63.2 cm (minimum 49 cm, maximum 73 cm).

For the right side of the body, which was treated with the 25-mm head, the mean thigh circumference of 64.1 cm (minimum 49 cm, maximum 72 cm) was reduced to 63.4 cm (minimum 48 cm, maximum 72 cm).



If only the test subjects with cellulite stages II and III are considered, it can be seen that the reduction in the thigh circumference for cellulite in stage III is even greater than that for cellulite in stage II.



The subjective feeling of the test subjects was described throughout as positive. The skin was described as being tauter and smoother, the therapy as pleasant with an enjoyable tingling, which is indicative of the hyperaemic effect.

From the point of view of the doctor it was evident that the deeper dimples were still present but the skin appeared clearly firmer.

Discussion

Initial investigations were able to show that the thigh circumference in the presence of cellulite can be significantly reduced by shockwave therapy. The appearance of the cellulite can also be greatly improved. For test subjects with stage III cellulite somewhat greater changes can be expected than with the milder forms of cellulite. No influence resulting from the different applicator heads could be demonstrated.

Subjectively, after the therapy the test subjects described the skin as firmer and smoother. A complete disappearance of the deep dimples cannot be expected.

In summary, shockwave therapy provides a new, safe form of cellulite therapy that was well accepted by the test subjects.