

Focused extracorporeal shock wave therapy (ESWT)

Combating cellulite with shock waves

Dermopanniculosis deformans (cellulite) – a non-inflammatory change in the subcutaneous fat tissue that is caused by constitutional factors – affects the thigh and buttocks area, generally in women. In cases of obesity, hormonal changes or weak connective tissue, this dimpling of the skin may occur at a young age. With advancing age, 80 to 90% of females get cellulite to differing extents.

Uncontrolled cohort studies suggest that focused extracorporeal shock wave therapy (ESWT) is effective at improving cellulite. Randomized controlled evidence for the effectiveness of focused ESWT had, however, not been available until now. Knobloch et al. put forward the hypothesis that focused ESWT combined with gluteal strength training is superior to placebo application of ESWT and an identical strength-training regime in patients with moderate to severe cellulite.

Patients and methods

In a double-blind randomized controlled study, 53 patients with a mean age of 42 ± 5 years (BMI 24.2 ± 2.3 kg/m²) were assigned randomly to either an intervention group or a control group. The subjects in the intervention group underwent six sessions

of focused ESWT (Storz Duolith, 0.35 mJ/mm², 2,000 pulses) and gluteal strength training in the form of two exercises with 3x15 repetitions. Follow-up took place after 12 weeks. The study's primary endpoint was the Cellulite Severity Scale (CSS), a validated rating for assessing cellulite levels based on digital images, ranging from 0 (no cellulite) to 15 points (maximum cellulite level). Photographic documentation was carried out on a standardized basis by a medical photographer prior to treatment and 12 weeks thereafter. Assessment was carried out on a blinded basis by two independent experts.

Results

In the intervention group, the CSS improved from 10.9 ± 3.8 at baseline to 8.3 ± 4 after 12 weeks ($p=0.001$; 2.53



Fig. 2: Treatment

improvement; 95% confidence interval (CI): 1.43–3.62). The CSS in the placebo group remained unchanged at 10.0 ± 3.8 points ($p=0.876$; 95% CI: 1.1–0.97). However, the change in CSS between the intervention group and the control group was highly significantly different ($p=0.001$; -24.3 effect size; 95% CI: -36.5 to -12.1). Only in the intervention group did all five criteria of the Cellulite Severity Scale improve. No side effects were observed.

Conclusion

A combination of focused extracorporeal shock wave therapy and gluteal strength training is superior to placebo ESWT with identical strength training. ■

Reference:

Knobloch K. et al.: *Dermatol Ther* 2013; 3: 143-155. DOI 10.1007/s13555-013-0039-5

English translation of original article entitled "Fokussierte extrakorporale Stoßwellentherapie (ESWT) – Mit Stoßwelle gegen Cellulite" published in German in issue 2/14 of *JATROS Dermatologie & Plastische Chirurgie*.

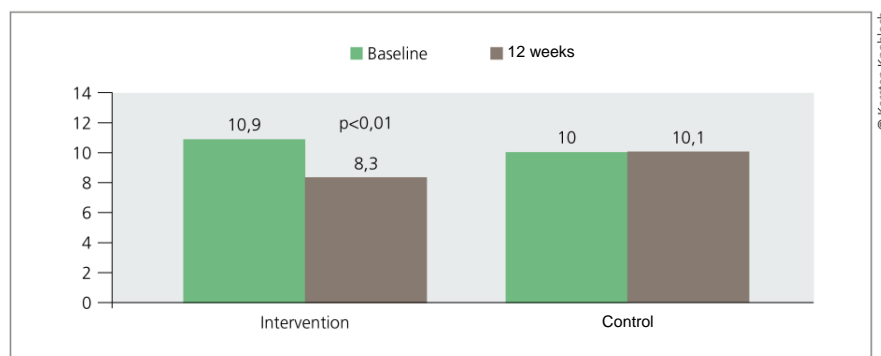


Fig. 1: Cellulite Severity Scale

Shock waves

Cellulite improves by around 30 percent

The aim of focused shock wave therapy is to stimulate the breakdown of fat while also relaxing the connective tissue. Within the first three months of treatment, the appearance of the skin improves by some 30 percent. We asked plastic surgeon Professor Karsten Knobloch, M.D., of Hannover, one of the first to use focused shock therapy in cellulite treatment in the German-speaking world, about the different shock wave therapy modalities.



K. Knobloch, Hannover

Which type of shock wave is suitable for treating cellulite?

K. Knobloch: In most studies conducted so far – some of them carried out on a randomized controlled basis with a very high level of evidence in cellulite treatment – focused shock wave therapy devices have been used.

How can the different modes of action of the different shock waves, i.e. focused and radial, be explained in terms of their effect on connective tissue?

K. Knobloch: There are indications that focused shock wave therapy speeds up skin regeneration – as is suggested, for example, by random-

ized studies on burns treatment that show epithelial healing occurs three days sooner. Stem cell activation probably plays a vital role, which is why we assume that shock waves have a regenerative effect. The direct massaging effect on the lymph that is involved in radial shock wave therapy may help to reduce the lymphoedema that is often present.

Does this mean that focused and radial shock waves should be combined?

K. Knobloch: In my randomized controlled CelluShock study, we have successfully tested focused shock wave therapy alone. In clinical practice, I combine focused and radial

shock wave therapy in order to achieve potential synergistic effects. However, any additional benefit from combination as compared with focused treatment alone has not yet been quantified in a published study.

So evidence-based data on combined therapy are not yet available?

K. Knobloch: No, there have not yet, to my knowledge, been any controlled studies on the effect of combined focused and radial shock wave therapy on cellulite. However, clinical experience of combined treatment (including that in my own practice) is positive.



Fig. 1: CSS improved from 10 to 5



Fig. 2: CSS improved from 12 to 2



Fig. 3: CSS improved from 15 to 7

**When does the desired effect kick in and how long does it last?**

K. Knobloch: Most existing studies report outcomes three months after a series of shock wave treatments – usually six – as we did in the CelluShock study. We have reason to assume that pronounced effects are still evident after one year; however, this is not as yet based on controlled observations.

Which frequencies do you recommend, and at what intervals?

K. Knobloch: In the CelluShock study, we provided six treatments at weekly intervals – which is also what I recommend in my day-to-day practice. We used a Storz Duolith device with 0.35 mJ/mm² and 2,000 pulses per session. However, I do need to

add that transferring these device parameters to other makes of shock wave devices is not straightforward, so that the outcomes achieved at these settings apply only to Storz devices.

Is this treatment painful?

K. Knobloch: No, at worst, patients receiving focused shock wave therapy may have a sensation resembling fine pin-pricks, but that's all.

What is the current state of the art?

K. Knobloch: The majority of positive studies involved the use of focused shock wave therapy devices. At present, I am aware of only one investigation into radial shock wave therapy for cellulite. Looking at all the current data, experts would say promising results have been reported

for focused shock wave therapy, whereas there is too little data available to make such a recommendation for devices that provide radial shock wave therapy. ■

Thank you for talking to us!

This interview was conducted by
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English translation of original article entitled "Stoßwelle – Verbesserung der Cellulite um etwa 30 Prozent" published in German in issue 2/14 of *JATROS Dermatologie & Plastische Chirurgie*.