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Known facts and new information about cellulite

The more muscle you build, the less cellulite

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Foto: Fotolia

In the «Aesthetic Dermatology» section, members of the Swiss Group of Esthetic Dermatology and Skin Care (SGEDS), headed by Dr. med. Oliver Ph. Kreyden, report about new developments in theit .

Considerations on the possibilities of anti-cellulite therapy are part of the daily routine in a dermatology practice with specialising in aesthetics and laser medicine. But the majority of medical textbooks still ignore this issue.

Cellulite is defined as a change in the surface texture of the skin and is commonly referred to as orange peel or cottage cheese syndrome. It affects 85 to 98 percent of women of all ethnical groups [1]. Men rarely develop the condition, and if they do, it is usually a concomitant phenomenon of pathologies with androgen deficit such as Klinefelter`s syndrome or hypogonadism or of oestrogen replacement therapy.

Cellulite causes cellulite

Despite its high prevalence, there have been few scientific investigations into the pathophysiology of cellulite. Apparently, the causes of the condition are multimultifactorial. Female fatty tissue stores fat more easily and quickly than male tissue because adipose tissue acts as energy store during pregnancy. This is because the connective tissue septa are oriented in a vertical direction relative to the skin surface. As the fat cells enlarge, they bulge upwards between the collagen fibres towards the skin surface, giving the skin the typical dimpled orange peel appearance. Cellulite can occur in any body region, but it generally appears on the thighs and buttocks.

Factors cited as possible causes of cellulite include gender-specific differences in the subcutaneous connective tissue (so-called anatomy hypothesis), poor vascular supply and the formation of an oedema in the intercellular matrix [2]. Genetic predisposition, hormonal influences, lack of exercise, smoking and unhealthy diets are believed to worsen the appearance of cellulite.

What we need to understand is that cellulite causes cellulite. In clinical terms, the hardening of connective tissue to bulge upwards between the septa, leading to ppor blood circulation and lymph flow. Natural lipolysis is thus reduced and fat deposits in the tissue increase.

Comparison of therapy methods

Until recently, cellulite was considered an incurable condition. In my practice, I have gathered over ten years of experience in endermology, a treatment modality that combines pulsating vacuum suction with mechanical tissue stimulation. However, the lack of stable results and various other problems have caused me to resell the endermology system I had purchased.

Another technique frequently employed in anti-cellulite therapy is the one-off application of bipolar radiofrequency (RF). The depth of tissue heating achieved with this method depends on the distance of the electrodes. System manufacturers state that penetration depth of up to 1.5 cm can be achieved.

The VelaShape (manufactured by Syneron Medical Ltd.) is the first FDA-approved device for cellulite reduction. It uses a combination of endermology technology, infrared light (IR) and radiofrequency (RF).

The treatment method I have been working with for four years is Acoustic Wave Therapy (AWT) (Figs. 1 and 2).

Photo: Storz Medical AG

Fig. 1: Cellactor SC1 therapy system

Photo: Dr. Rümmelein

Fig. 2: Anti-cellulite treatment with Acoustic Wave Therapie

Fig. 4: Correlation between body weight and severity of cellulite

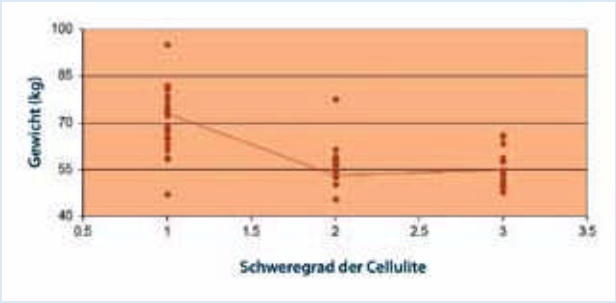
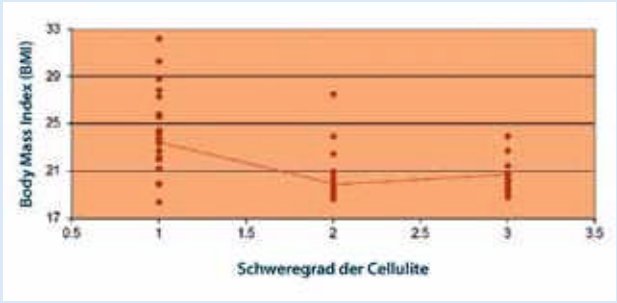


Fig. 5: Correlation between BMI and severity of cellulite



Grafiken: Dr. Rümmelein

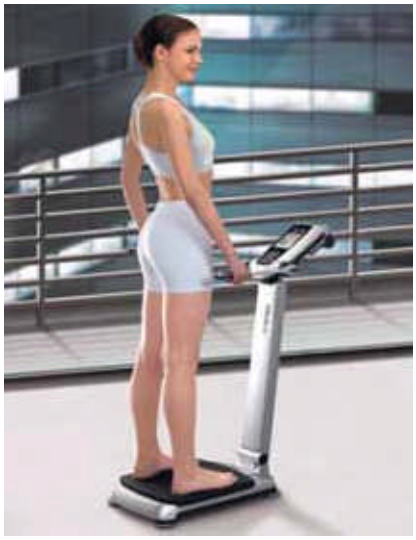
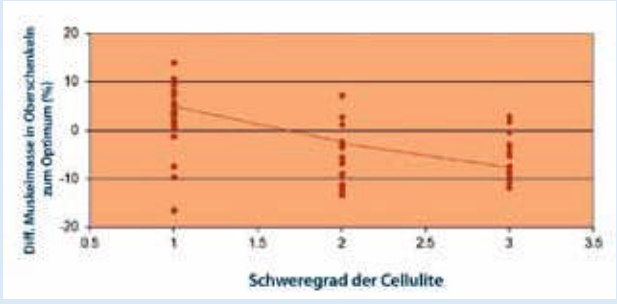


Photo: JP Global Markets GmbH

Fig. 3: InBody body composition analyser for patient examination

Acoustic Wave Therapy uses sound waves with high pressure amplitudes. Originally, these so-called shock waves were used to fragment kidney stones, for instance. Today, AWT is frequently employed in orthopedics, primarily in pain therapy. The accidental observation that the skin in the treated body areas becomes smoother after application of acoustic waves resulted in the further development of AWT for cosmetic purposes. The AWT system I am working with is the Cellactor SC1 (from Storz Medical). This system combines planar acoustic waves with radial pressure waves and has shown to produce various biological effects on different types of cells and tissue such as an increase in cell membrane permeability with release of triglycerides from fat cells, stimulation of microcirculation with enhanced blood flow and lymphatic drainage, antibacterial effects, stimulation of growth factors and stem cells[3]. AWT as an anti-cellulite treatment has been investigated in various studies [4, 5]. As connective tissue septa have a higher density than the surrounding fatty tissue, the re- fraction of the sound waves is veryvery strong when they strike the septa. This phenomenon eliminates the fibro-sis. The stimulation of biochemical processes induced by AWT, which result not only in vasodilation but also in neovascularisation, apparently plays a crucial role. Improved microcirculation seems to be the key reason for the observed long-term effectiveness of AWT. The lymphatic drainage effect reduces the oedema and, consequently, the tissue pressure. As a result, microcirculation is additionally enhanced and natural lipolysis is improved. Also, skin thickness has been demonstrated to increase as a result of the effects on fibroblasts produced by AWT [6].

Fig. 6: Correlation between muscle mass and severity of cellulite



Less cellulite thanks to increased muscle mass

Despite the promising literature on the effectiveness of AWT, the results achieved at my practice used to vary significantly among patients. For this reason, we tried to find a parameter that would enable us to better predict treatment results. At the initial examination of our patients, we noticed that the severity of cellulite seemed to be independent of the body weight.

This is why we decided to use the InBody body composition analyser to conduct the examinations (**Fig. 3**). In addition to taking the usual pictures for documentation and conducting circumference measurements, we measured the total and regional muscle mass, the body fat mass in kg, the percentage of body fat and the body mass index (BMI).

We examined 69 patients aged between 35 and 65 years. The data we gathered revealed a poor correlation between total weight and BMI on the one hand and cellulite on the other hand, but a close correlation between muscle tissue in thighs and the severity of cellulite. In fact, the more muscles the patients had, the less severe was the cellulite they exhibited - irre-

spective irrespective of their total weight [7].

Low muscle values in legs are undoubtedly the result of lack of exercise. An increase in physical exercise helps to improve blood circulation. Women with low muscle values are likely to have poor overall blood circulation. Although we did not measure the body temperature of our patients, many women reported that the skin in the body regions affected by cellulite felt extremely cool and seemed not to warm up significantly during exercise.

AWT has a penetration depth of up to 6 mm. It is well conceivable that the tapping effect additionally stimulates muscular tissue, as in the use of power plates.

So the advice we give our patients is "Better go for sports than for a diet!"

To conclude, I would like to add that, contrary to what many patients believe, liposuction is not the method of choice in cellulite treatment. It involves a high risk of a poor aesthetic outcome. Among the patients treated at my practice, those with the most severe cellulite had undergone liposuction a few years ago. The question whether extreme cellulite is a late effect of liposuction should be investigated in further research.

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