

A new concept radiofrequency device for the treatment of cellulite

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ABSTRACT

Many techniques are commonly used to treat cellulite. Among these, a technology based on radiofrequency energy application, exists. The purpose of this work is to clinically evaluate the results obtained with a new radiofrequency device just appeared on the market.

We have observed 20 patients affected by cellulite, aged 30 to 60 years. Each patient was submitted to 10 sessions of application of radiofrequency energy, by an Italian device named “Thuzzle®” (GMV, Rome, Italy). This device is characterized by a handpiece able to simultaneously deliver 4 waves, different in power, frequency, duration, and electrode geometry. Each session was 40 minutes long, 20 min. per leg. Each patient, before and after the treatment, was subjected to an ultrasound scan, a measurement of the diameter of the legs, and a questionnaire.

Two patients gave up before the end. All the remaining 18 patients have instead shown a cellulite improvement, pointed out by the reduction of the diameters of the legs, the improvement of the skin appearance, and the subjective feeling of diminished leg heaviness.

The obtained results show the high effectiveness of the performed treatment. Given the still small number of patients treated, further studies are needed to confirm our observations.

KEY WORDS: cellulite, radiofrequency, tetra-wave, multi-wave, medical aesthetics, regenerative medicine

INTRODUCTION

As know, the so-called “*cellulite*” affects a great percentage of women worldwide. Many techniques are commonly used to treat cellulite. Among these, a technology based on radiofrequency energy application, exists. This technology is normally used, moreover, to treat also the abdominal laxity and

any fat local accumulation, having positive action on the adipocyte metabolism and stimulating production of new collagen.

A new device has just appeared on the market, based on the application of radiofrequency energy, which seems innovative and very promising for the results it can achieve. The purpose of this work is to clinically evaluate the results obtained with the use of this equipment.

MATERIALS AND METHOD

We have observed 20 patients affected by cellulite, aged 30 to 60 years. Each patient was previously submitted to a dynamic ultrasound evaluation (Hitachi Aloka Medical ProSound F75, Olympus Corporation, Tokyo, Japan) of the affected legs, performed at the area of the haunch, the knee, and the ankle. The circumference of the legs was also previously measured, at the same levels. In addition, photographs were taken of each patient in standard projections. Finally, a questionnaire was submitted to each patient, before and after the treatment, to evaluate the perception of the appearance of the area affected by cellulite, and of the presence of feelings of heaviness or tenderness in the legs (fig. 1).

Each patient was submitted to 10 sessions of application of radiofrequency energy, by an Italian device named “Thuzzle®” (GMV, Rome, Italy). Each session was 40 minutes long, 20 min. per leg. Ten sessions formed a cycle. The energy was supplied by a handpiece able to simultaneously deliver 4 waves, different in power, frequency, duration, and electrode geometry (concatenated controlled multi-wave technology). The device allows to setting up, before starting the treatment, the output level, and, during the treatment, to control in real time 3 parameters: temperature reached in the dermis, real power density absorbed by the tissue, and contact quality (i.e., the correct positioning of the handpiece on skin surface, measuring the impedance of the contact). Each leg was treated from knee to hip. The haunch was divided into 4 quadrants, and each of this was dealt for about 5 minutes.

We started from the superior quadrant, performing continuous rotary movements, as usually it's performed by using any radiofrequency-based appliance.

At the end of cycle, dynamic ultrasound evaluation and leg measurement, at the same previous areas, was again performed to each patient, as well as the photographs in standard projections.

RESULTS

Two patients gave up before the end; one because she had a slight vasculopathy and another because she had decided to start a laser treatment for hair removal

The first of these, in fact, had suffered from a postpartum vasculopathy that he had not reported to the anamnesis before the treatment. The second, however, despite our advice, wanted to start another different treatment.

In both cases, it was obviously decided to stop the treatment of cellulite.

All the remaining 18 patients have instead shown a cellulite improvement, pointed out by the reduction of the diameters of the legs, the improvement of the skin appearance (Fig. 2, 3, 4, 5), and the subjective feeling of diminished leg heaviness.

DISCUSSION

In the international scientific community, there is a lack of unanimous agreement on recognizing the nosological identity of cellulite and on the physiopathological mechanisms that underlie it (1).

According to some, cellulite would originate from alterations of the lymphatic system at the level of adipose deposits (2). In the initial phase of cellulite, there would thus be an accumulation of fluids and other substances in the interstitial space, which would give rise to a local reaction which, in turn, would worsen the condition (2). At the origin, there would be the action of female sex hormones on fat deposits and on vessels (2). The most widespread opinion today is that cellulite results essentially

from an excessive accumulation of fat in the subcutaneous adipose tissue, which exerts considerable pressure on the surrounding skin tissue, creating an irregular dimpled appearance (3). The disorders of the extracellular matrix and of the lymphatic system, with regional lymphostasis, may in turn represent the pathophysiological mechanism leading to cellulite (3).

The application of radiofrequency energy to treat cellulite is based on internal thermogenesis induced by applied energy (4). The increase in internal temperature then determines vasodilation and increases microcirculation, new collagen formation, and contraction of existing collagen fibers (5, 6, 7). Monopolar, bipolar or multipolar radiofrequency, however, acts only at a single depth; notably, monopolar radiofrequency acts deeply, whereas bipolar acts superficially, as known. The multipolar radiofrequency, instead, acts always at a same depth, depending on the distance between the electrodes at the surface of the handpiece. The equipment we used (Thuzzle®), instead, employing in the same handpiece and simultaneously 4 waves different for power, frequency, duration, and electrode geometry, reaches 4 different depths at the same time (simultaneous controlled electromagnetic multi-energy, or concatenated controlled multi-wave). So, it acts on 4 different tissues: adipose tissue, lymphatic vessels, blood vessels, and skin collagen. In other words, Thuzzle® acts on the causes of cellulite, in the same session and simultaneously. This enhances the obtained results and allows better and faster results. The shape of the handpiece, furthermore, permits an easy and wide contact with the skin surface. The device allows, moreover, to check, in real time, as mentioned before, 3 parameters: dermis temperature, power density absorbed by the tissue, and quality contact (i.e., the correct positioning of the handpiece on skin surface). This enhances the safety and the quality of the treatment.

In fact, a single cycle of treatment allowed us to obtain good results, both from patient subjective point of view, and objectively as showed by legs measurement and photographs.

Despite the exiguous number of patients so far enrolled in our study, the obtained results show the high effectiveness of the performed treatment. In fact, all the patients that ended the cycle of

treatment, showed an improvement of skin appearance, and a subjective feeling of diminished leg heaviness. According to this data, the measurements of the leg diameters also showed a reduction. Of course, further studies are needed to confirm our initial observations.

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