Application of a new thermal technology used in the Thuzzle device under the control of high Skin Scanner

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WARSAW
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- Post-Doc, Institute of Cognitive Sciences and Technologies (ISTC), National Research Council (CNR), Rome, Italy.
- Scientific Director, GMV srl, Rome, Italy.

The demand

+ 4.2% Increase **of non-surgical procedures**

The nonsurgical procedures that saw the most significant increases

+ 99.5% Micro-Ablative Skin Resurfacing (Plexr)
+ 29.2% Full Field Ablative Skin Resurfacing
+ 24.7% Non surgical Fat Reduction
+ 15.1% Non surgical skin tightening

Source: American Society for Aesthetic Plastic Surgery (2017)

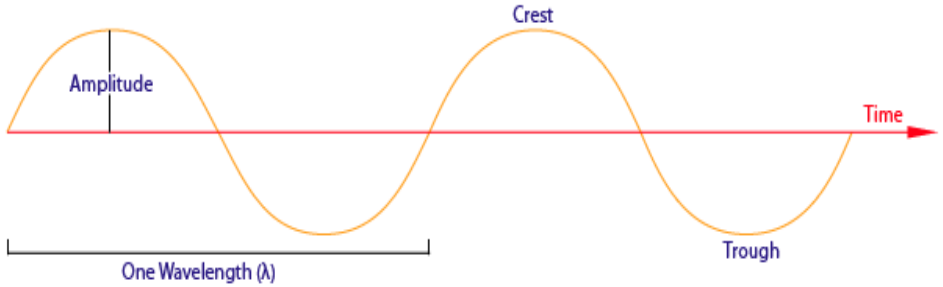
The demand

"The future of RF skin rejuvenation, body contouring and skin tightening looks very bright… Over the next 5 years, I expect that RF skin rejuvenation devices will continue to have a positive impact on how we approach our patients who are interested in rejuvenating their skin. Newer devices will continue to enter the market that will allow us to treat our patients even more safely and with greater efficacy than the devices currently available."

Michael H Gold
The Increasing Use of Nonablative Radiofrequency in the Rejuvenation of the Skin
Expert Rev Dermatol.

Radiowaves in medical aesthetics

Micro-waves and radio waves	EHF	Extremely high frequency	300 GHz	1 mm
	SHF	Super high frequency	30 GHz	1 cm
	UHF	Ultra high frequency	3 GHz	1 dm
	VHF	Very high frequency	300 MHz	1 m
	HF	High frequency	30 MHz	10 m
	MF	Medium frequency	3 MHz	100 m
	LF	Low frequency	300 kHz	1 km
	VLF	Very low frequency	30 kHz	10 km
	ULF	Ultra low frequency	3 kHz	100 km

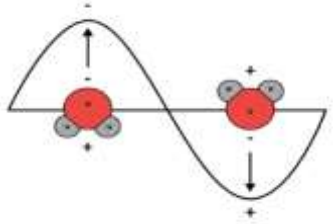


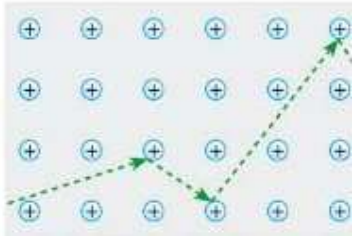
Diathermy

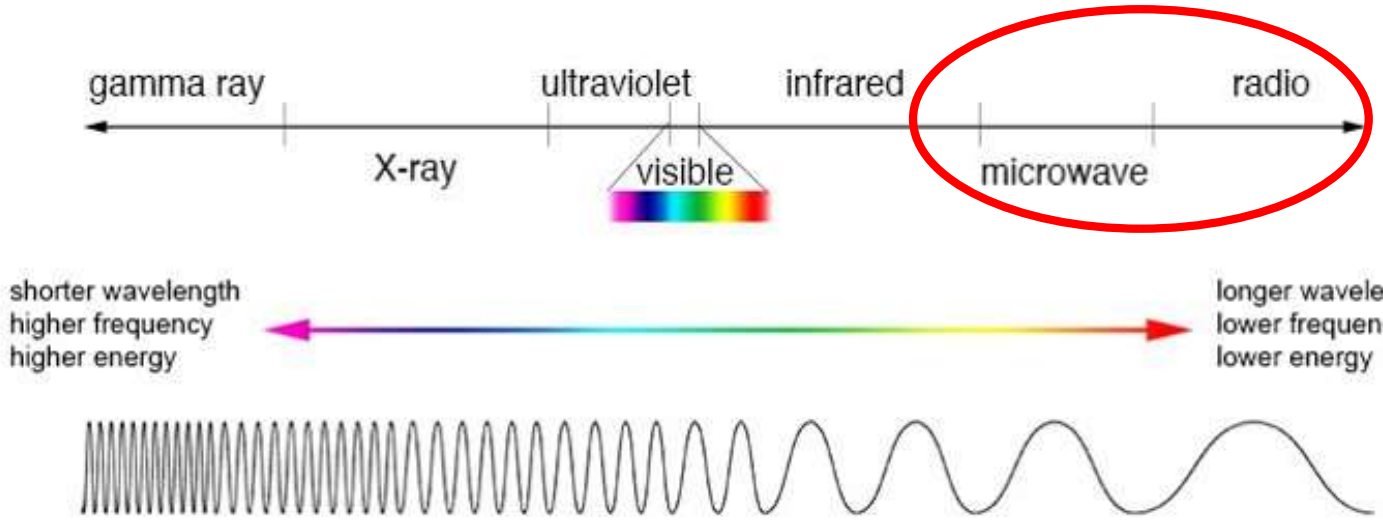
Therapeutic method which consists in raising the temperature of an internal part of the body making it pass through by low voltage and high frequency electric current.

Microwaves and radiowaves

Diathermy - heating







Effects on the skin

Non ablative

The heat is gently introduced through a conductive gel into the tissue

- Capacitive vs Resistive
- Monopolar, Bipolar, Multipolar, Multiwave

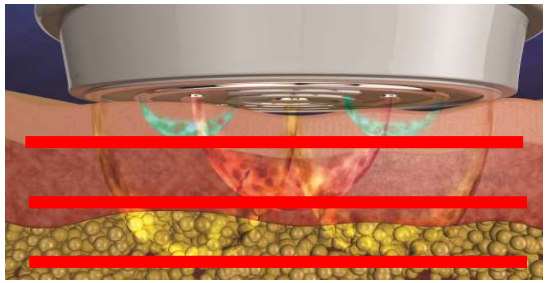
Ablative / Micro-ablative

Short application, high power application to cut or create a superficial damage for resurfacing

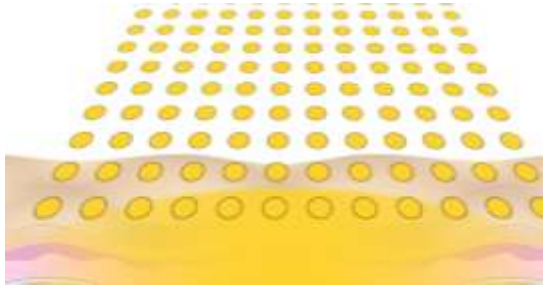
- Electrosurgery, Fractional RF

Thuzzle technologies

- **Multiwave technology**
  Non ablative technique for face and body

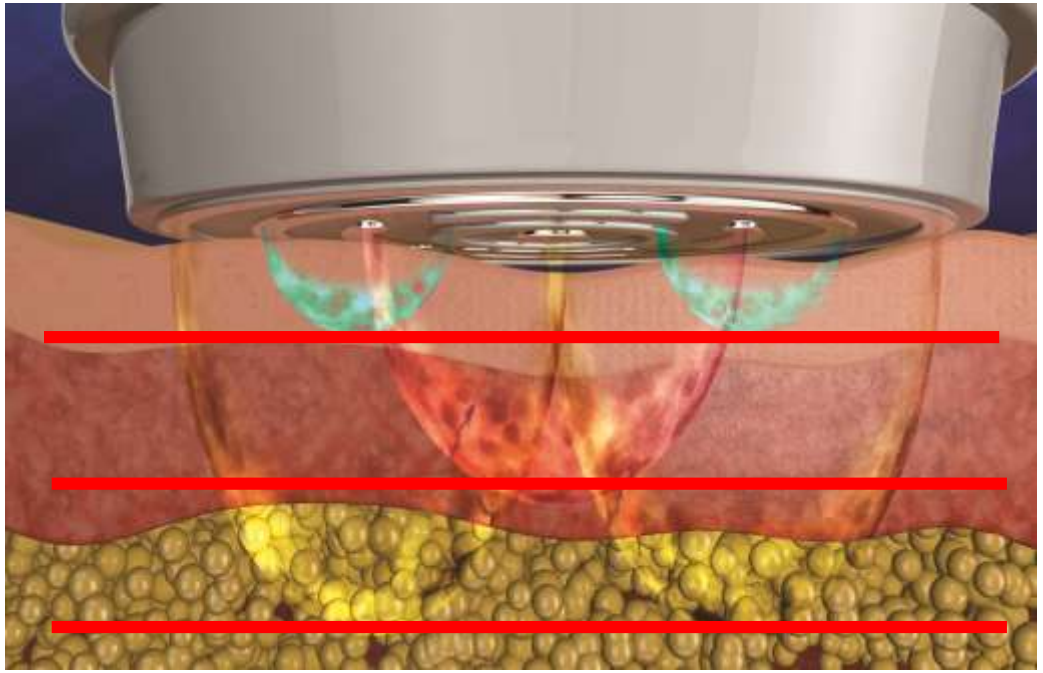


- **The fractional radial**
  Micro-ablative resurfacing



- **Multimodal gynecology**
  Non ablative treatments for SUI and GSM

The Multiwave technology



Non ablative RF Mechanism

35-37 C° on the epidermis and 41-43 C° in the dermis

1. Heat denatures unstable collagen generating its stochiometric rearrangement. The collagen fibers becomes shorter and thicker, generating the skin contraction. INSTANT EFFECT
2. Increased fibroblastic protein synthesis for the renewal of the collagen fibers.
3. Increased vascularization and neo-angiogenesis.
4. Increased metabolism of adipocytes.
5. Elimination of cellular waste products and water (drainage).
6. Hydration/Lubrication (Mucosa)
7. Tissue nourishment.

Literature

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- Aster T.S., Tanzi E.: Improvement of neck and cheek laxity with a nonablative radiofrequency device : a lifting experience. Dermatol Surg Apr 2004; 30: 503
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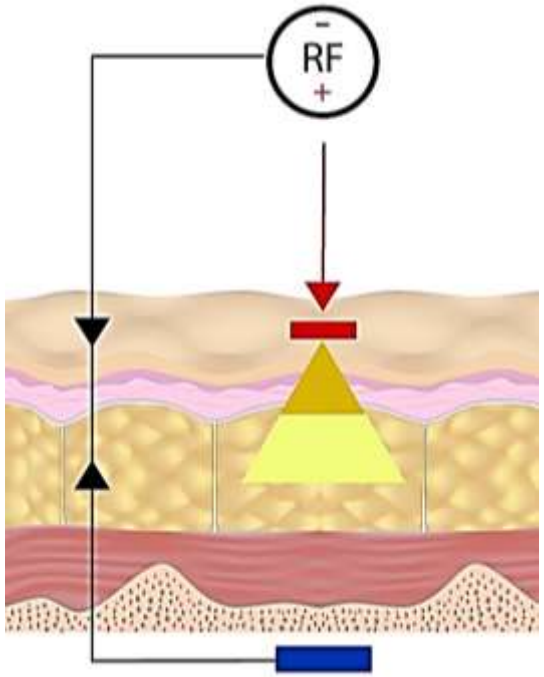
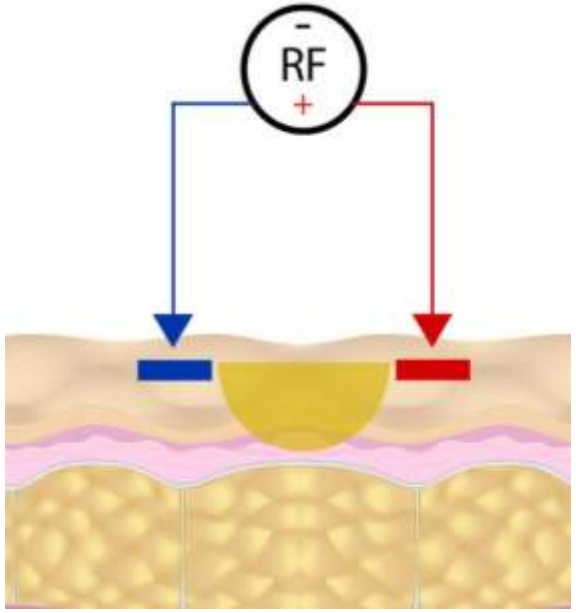
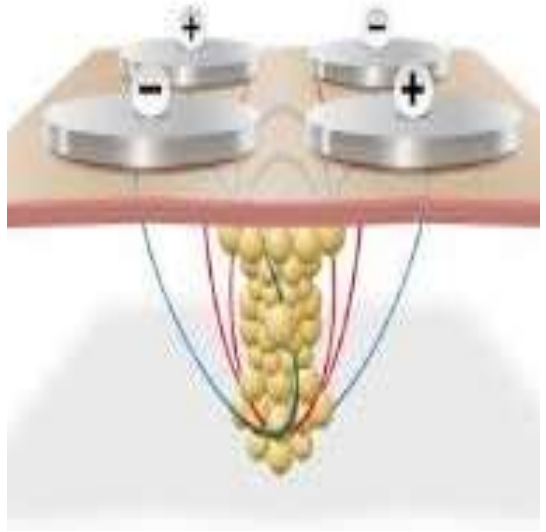
Monopolar vs Bipolar vs Multipolar



- Divergent
- Diffused
- Deep



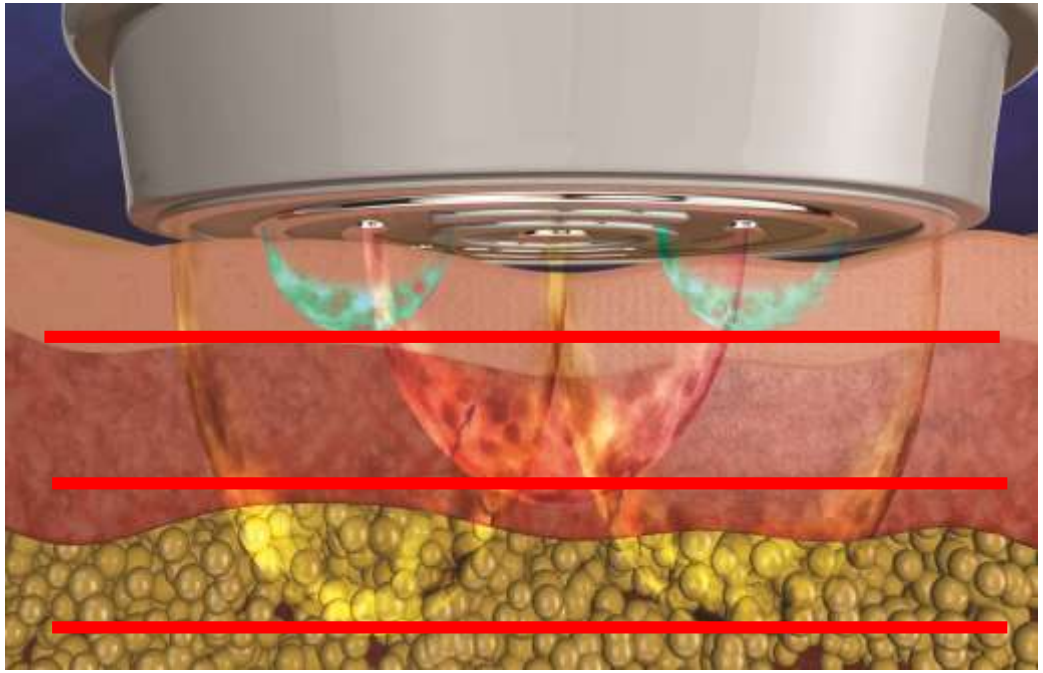
- Superficial (depending on the electrode distance)
- Localized



- Superficial (depending on the electrode distance)
- Localized
- No effective improvement if compared to the regular bipolar.

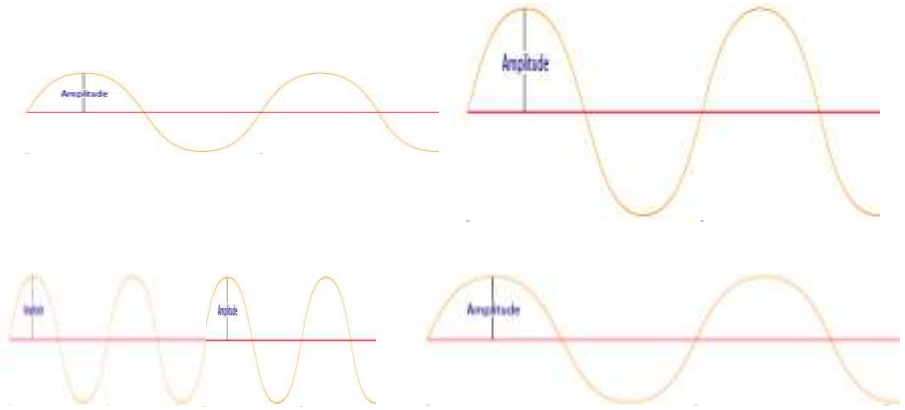
The Multiwave technology of Thuzzle

- Power
- Frequency
- Duration
- Electrode Geometry



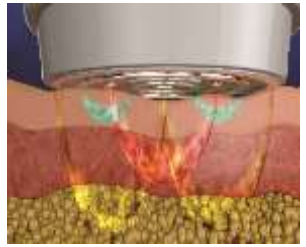
Parameters impacting the effects

- Power
- Frequency
- Duration
- Electrode Geometry

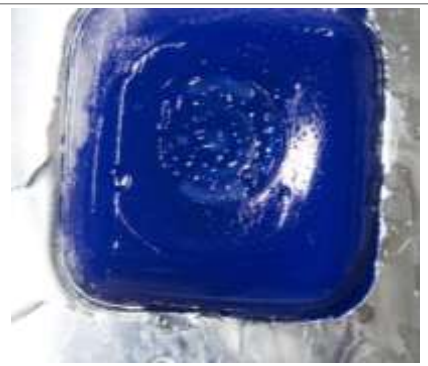


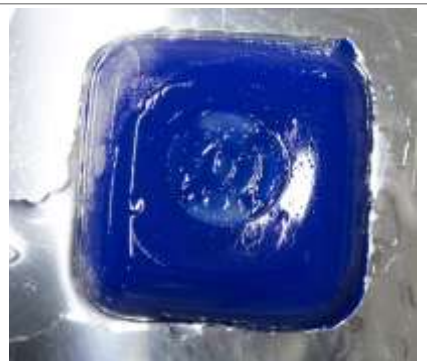
1 ms, 10 ms, 100 ms, 1 s,……

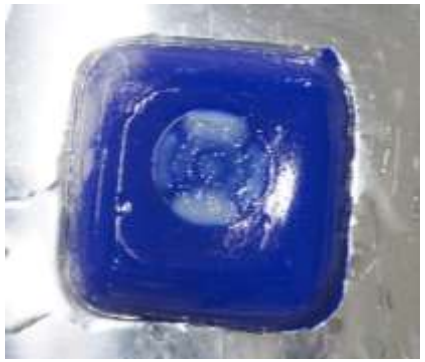
The Multiwave technology of Thuzzle

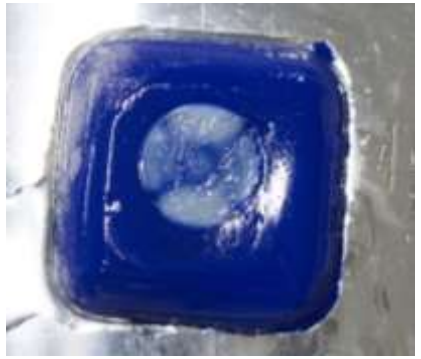


T_0 T_1 T_2



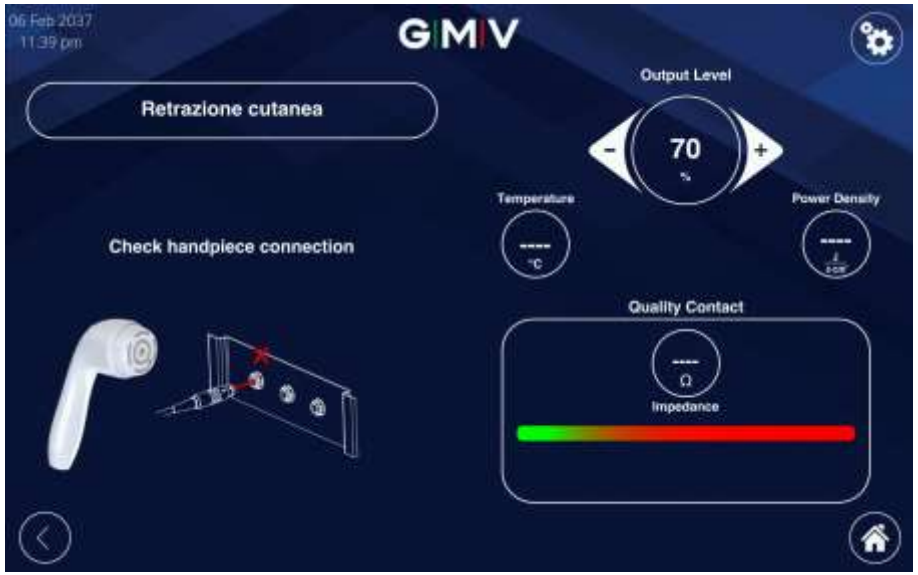






T_3 T_4 T_5

Thuzzle safety



1. Connection Control
2. Skin-Touch sensor Controlling the power
3. Motion control (Accelerometer)
4. Temperature monitoring
5. Effective energy absorbed by the body
6. Ten modes to deliver energy

Clinical study

dr Kasela

Results of examinations which were carried out using high frequencies ultrasonograph and Thuzzle device, which is using innovative multiwave technology [Dr. Tomasz Kasela, Poland]

Examination

dr Kasela

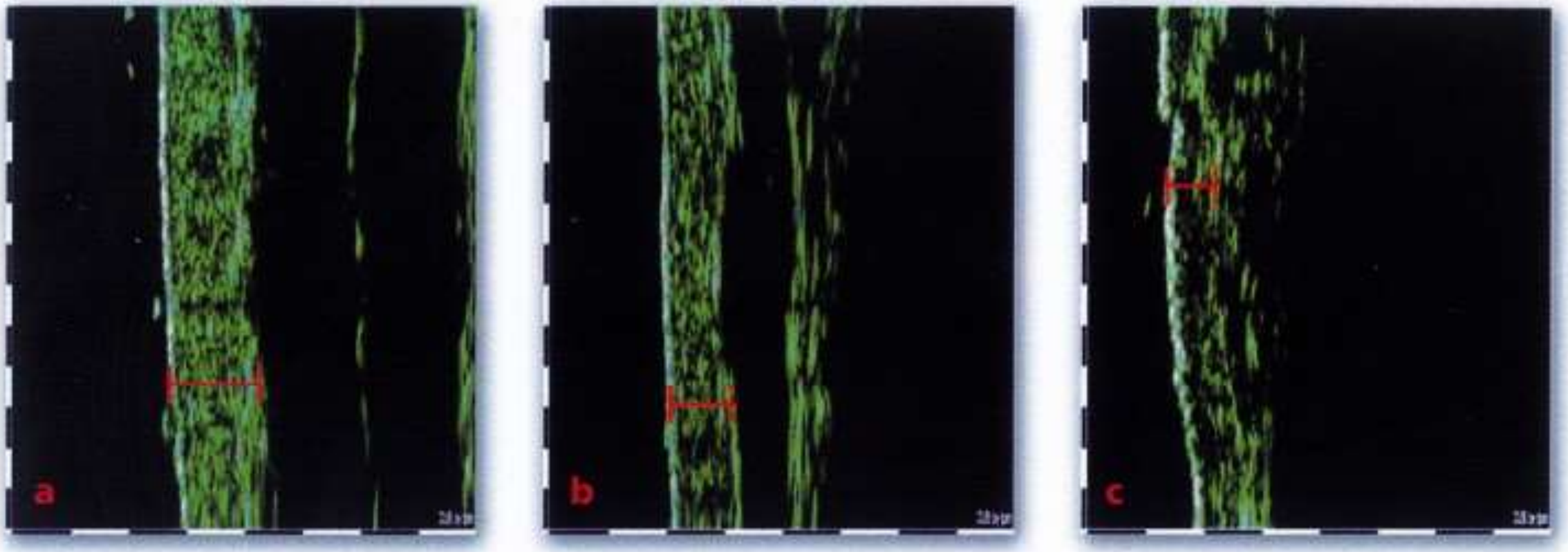
High frequency ultrasound is a method for skin imaging diagnostics that allows:

- To obtain an image in the form of cross section of epidermis and dermis with a resolution up to 21 µm.
- The assessment of skin condition and age, effectiveness of the performed treatments, monitoring and evaluation of the applied cosmetics, skin changes, scars, measurements of cellulite and depth of wrinkles.

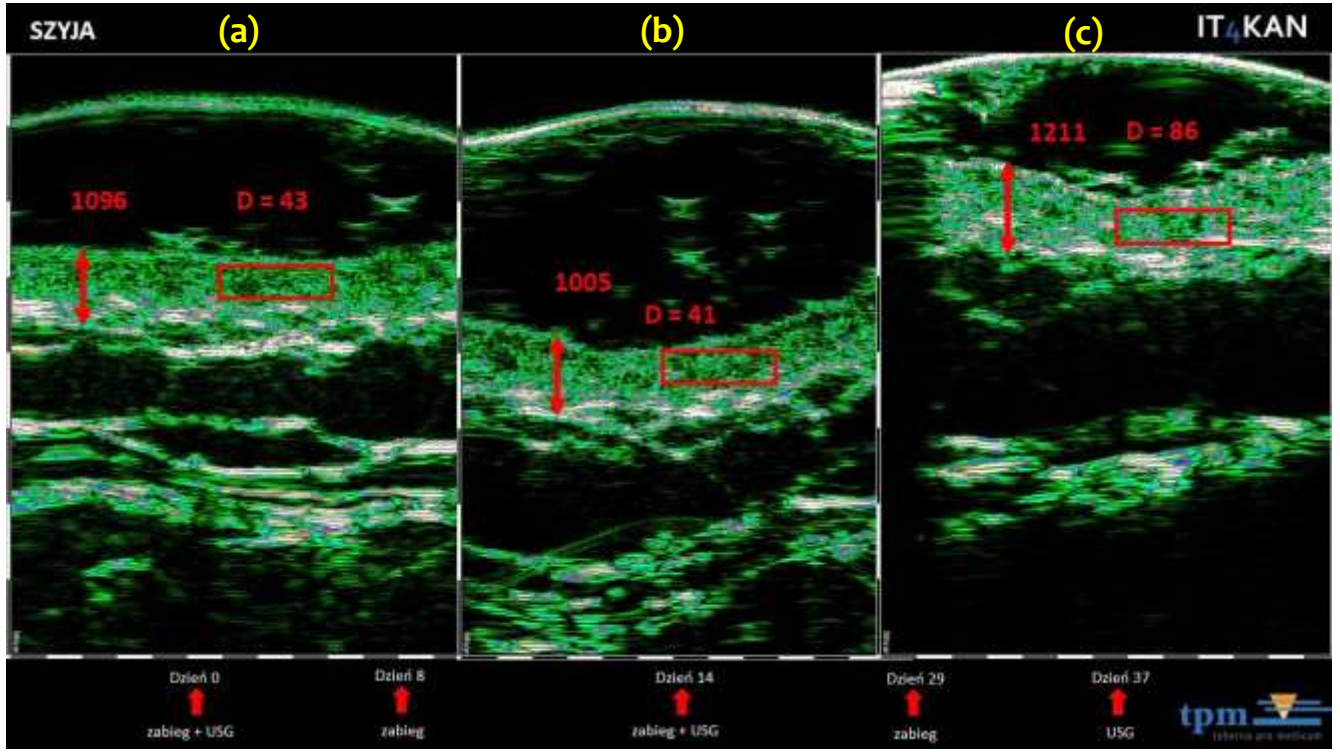
The equipment was used to depict the condition of the skin after treatments with the Thuzzle device.

dr Kasela

Skin aging - 22 MHz



Slide above shows skin density and thickness of persons age 28 (a), 45 (b) and 80 (c) years old.
Visible loss of density including collagen and elastin fibers and also skin thickness with increasing age.



dr Kasela

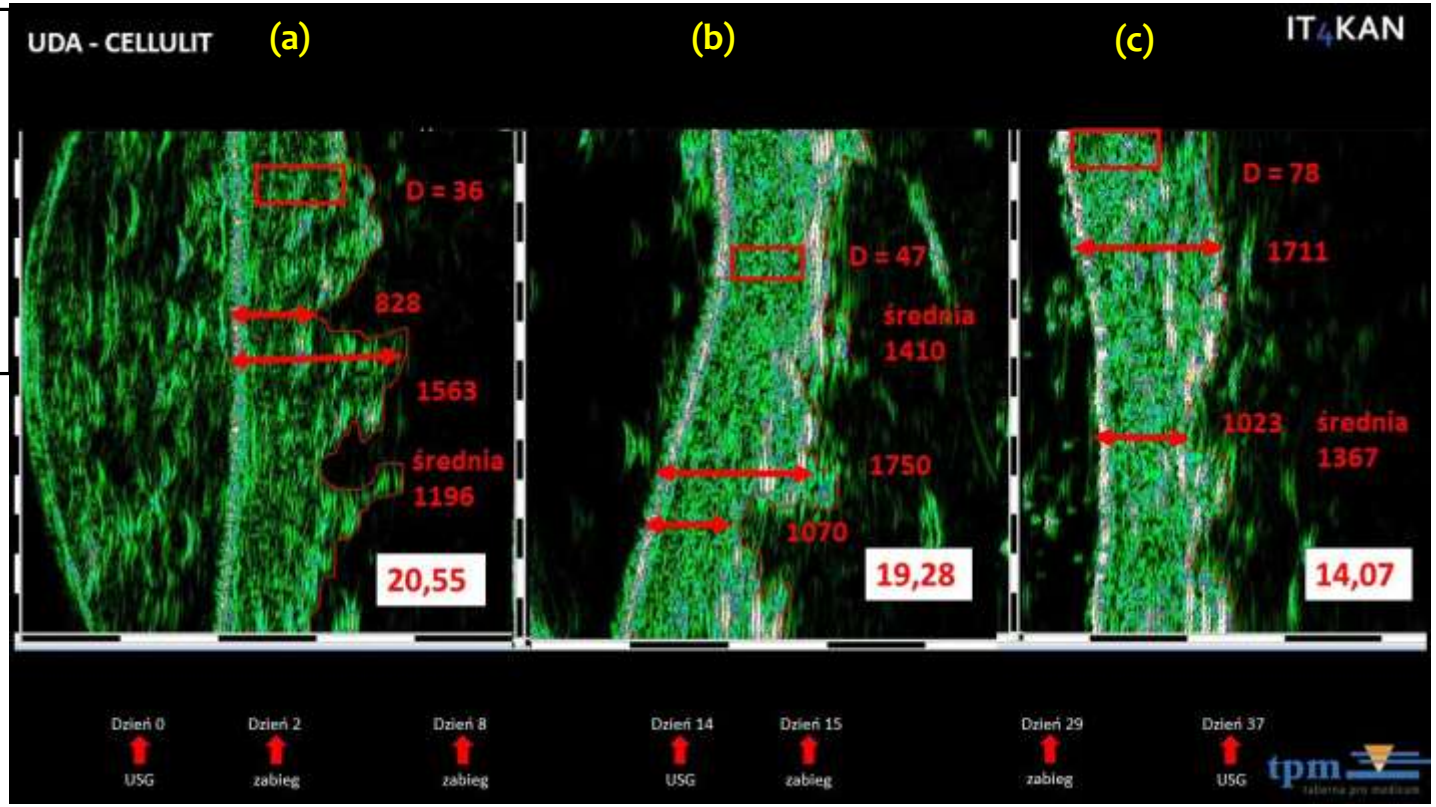
Patient 1: Neck, Female 39 years old - Four treatments performed with Thuzzle

a) **before** treatment: thickness of the skin was 1.096 micrometres, i.e. slightly more than 1 mm - its density was 43 units (acoustic density), a characteristic size for an ultrasound image.

b) **14 days** after the first treatment: density and thickness of the skin decreased (remodeling phase).

c) **37 days** after the first treatment: significant regeneration - the thickness of the skin increased to 1.211 um, and its density to 86 units.

The image is marked with a red line between the skin and the subcutaneous tissue with fat - special attention should be paid to the occurrence of "cellulite teeth" - bands of subcutaneous tissue with fat penetrating deep into the dermis.



dr Kasela

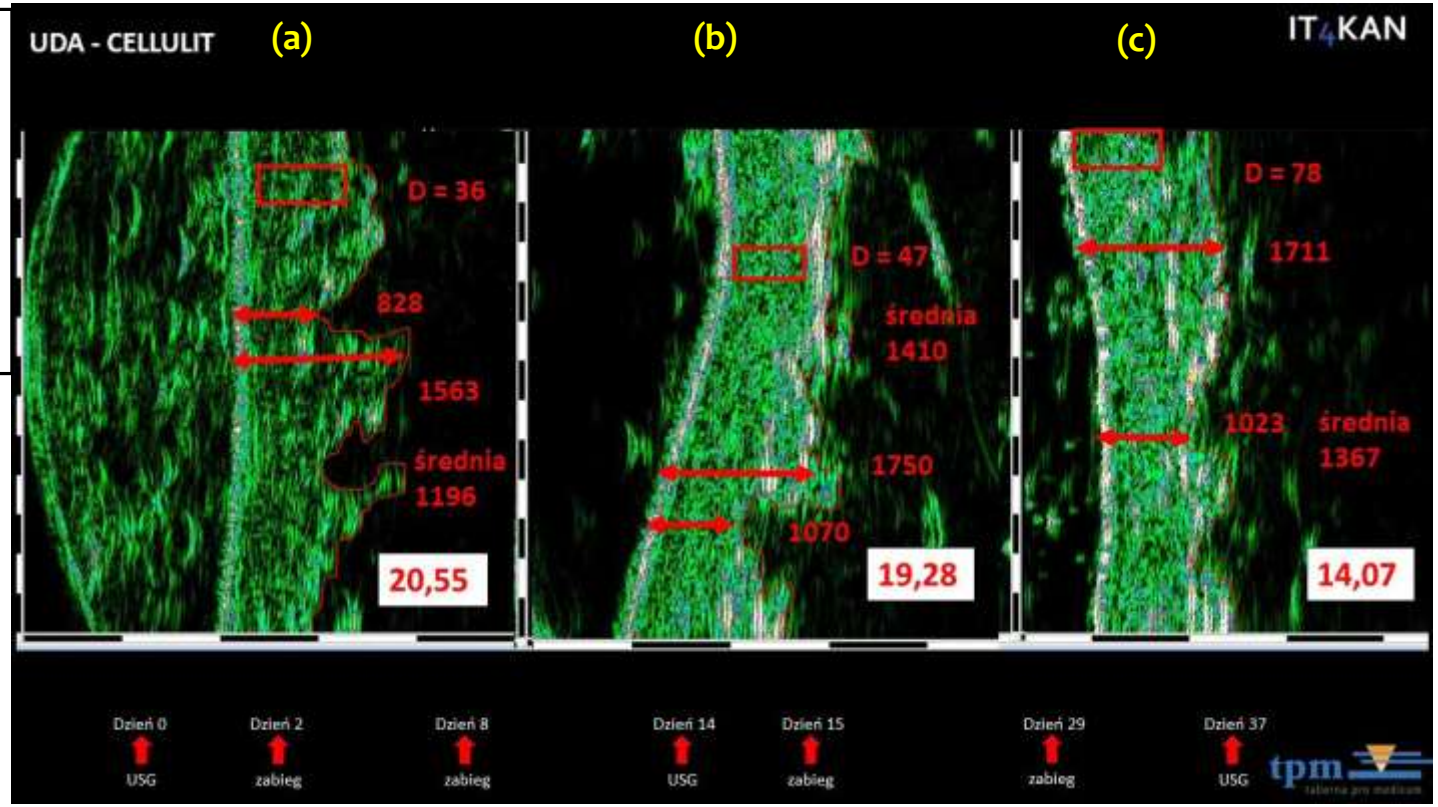
Patient 2: Cellulite, Female 39 years old - Four treatments performed with Thuzzle

a) **before** treatment: the maximum thickness of the skin was over 1.5 mm, the minimum thickness was 0.8 mm (average skin thickness about 1.2 mm); skin density on the thigh was 36 - units of acoustic density. Length of subcutaneous tissue border: 20.55 mm.

b) **14 days** after the first treatment: density was 47 units, maximum thickness 1.75 and minimum thickness 1.07 mm (average thickness 1.41 mm). The length of the subcutaneous tissue border with fat is 19.28 mm.

c) **37 days** after the first treatment: results were as follows: density - 78, maximum thickness - 1.711 mm, minimum thickness - 1.023 mm, tissue border length: 14.07.

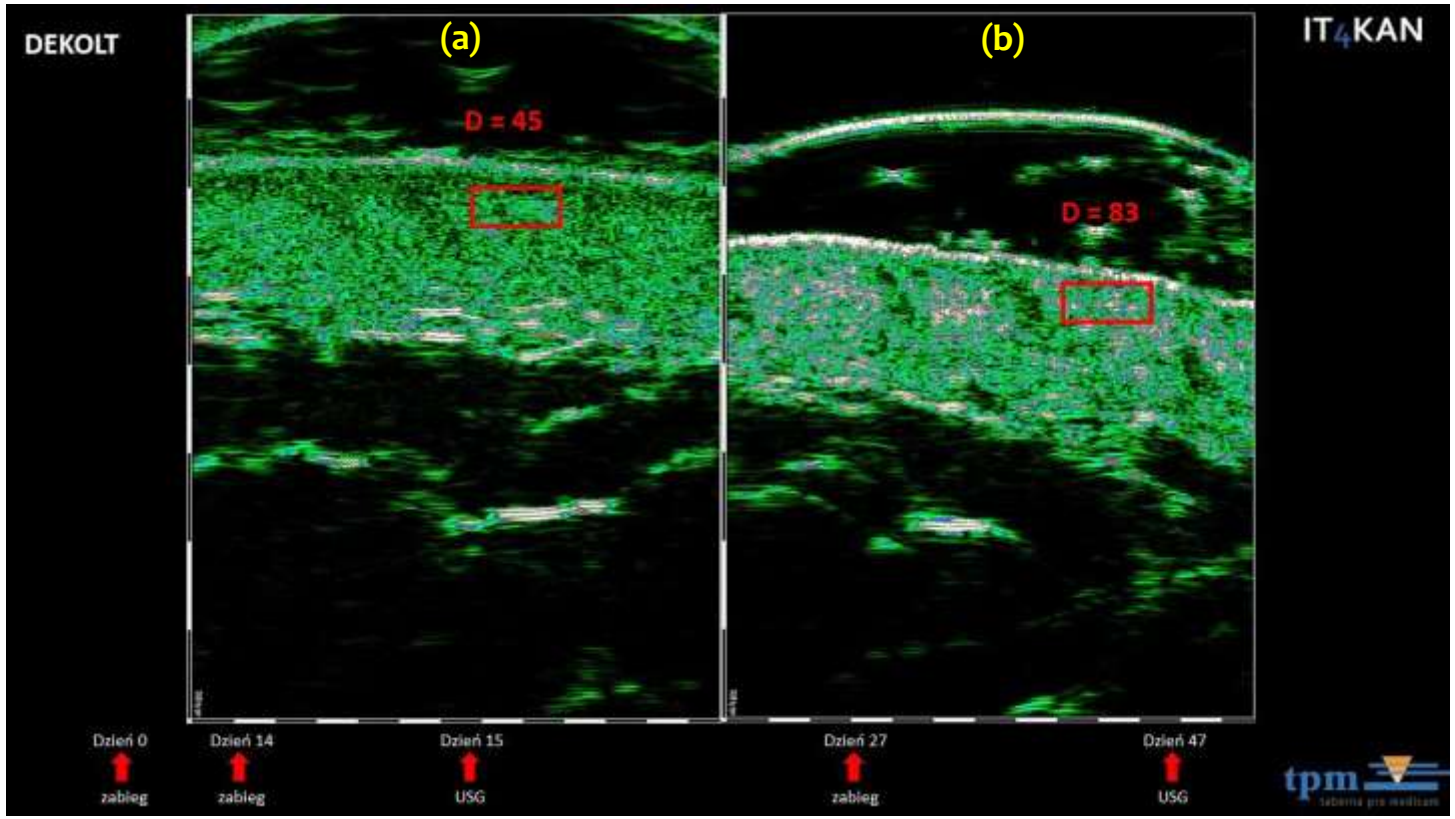
The image is marked with a red line between the skin and the subcutaneous tissue with fat - special attention should be paid to the occurrence of "cellulite teeth" - bands of subcutaneous tissue with fat penetrating deep into the dermis.



dr Kasela

Patient 2: Cellulite, Female 39 years old - Four treatments performed with Thuzzle

Particularly noteworthy is the image of shallow "cellulite teeth": length of the border between the subcutaneous tissue with fats and the dermis has **decreased by 6.48 mm**, which is **over 30%.**



dr Kasela

Patient 3: Neckline, Female 43 years old – Three treatments performed with Thuzzle

a) **14 days** after the first treatment: density was 45 units

b) **47 days** after the first treatment: density was 83 units

Clear increase in skin density - Regeneration of collagen and elastin fibers

dr Kasela

Conclusions

Results indicated that cross-linked wave technology is **great for skin condition** by increasing its density, thickness, metabolism, collagen content and elastin and, thanks to that, flexibility, tension and shallow wrinkles.

In addition to the effect illustrated in the research, the study has recognized **high patient satisfaction** and **complete safety** of performed treatments.

We can conclude that **Thuzzle device is perfect for reducing cellulite** by making it shallow "Cellulite teeth" while firming skin.

Which treatments can Thuzzle perform?

GYNAECOLOGY

ATROPHY
RESTORING CALIBER AND TONE
COLLAGEN PRODUCTION
URINARY INCONTINENCE
FUNCTIONAL DISORDERS
VAGINAL PROLAPSE
CLITORAL VASCULARIZATION
VASCULARIZATION
PELVIC PAIN
INCREASE IN SENSITIVITY

BODY

FAT REDUCTION
PEFS
TIGHTENING
CONTOURING
TONING
DRAINAGE
VASCULARIZATION

FACE

RESURFACING
WRINKLES
ACNE SCARS
SKIN LAXITY
LIFTING
TONING
PALPEBRAL BAGS

Thank you for your attention!

Special thanks to Dr Kasela

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