



PROSLIMELT



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WELLNESS RESEARCH



Low frequency ultra sound technology for localised fat reduction



HISTORY

First developed in World War II to locate submerged objects, the technique is now widely used in virtually every branch of medicine.

In obstetrics, to study the age, sex, and level of development of the foetus and to determine the presence of birth defects or other potential problems.

In cardiology to detect heart damage.

In ophthalmology to detect retinal problems.

Also used to heat joints, relieving arthritic joint pain, and for procedures such as lithotripsy.





RATIONALE

High-frequency therapeutic ultrasounds (1 to 3 MHz) have long been used for their analgesic, coagulating, de-fibrotic properties.

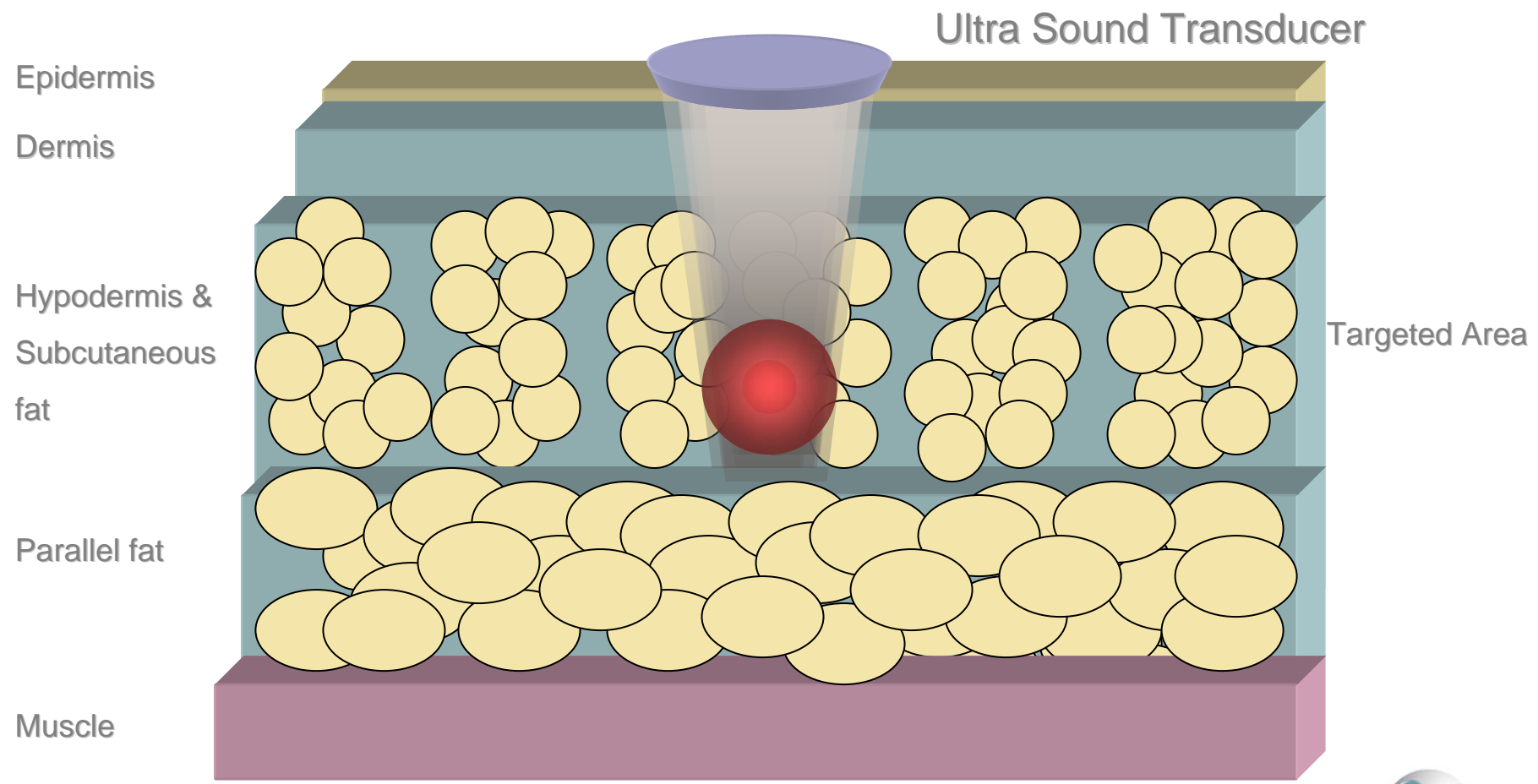
However high-frequency ultrasounds do not produce desired results on subcutaneous fat. Hence, the use of low-frequency ultrasounds for the treatment of lipodystrophies.

Ultrasound technology is non invasive, involves no radiation, and avoids possible hazards such as bleeding, infection, or reactions to chemicals.





TARGET = FAT



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AESTHETIC APPLICATION

- ❖ Improve shape
- ❖ Reduce volume



FUNCTION

Low-frequency ultrasonics waves have three principal effects

- Depolymerization or the molecular dislocation of triglycerides and the increase of their fluidity.
 - Lipolysis or the ejection of fatty acids from adipocyte cells due to stable cavitations and an increase in adipocyte cellular permeability.
- Adipocyte lysis (disruption)
- Defibrosis through the defibrinolytic mechanical action on bulk tissue present in the hypoderm.

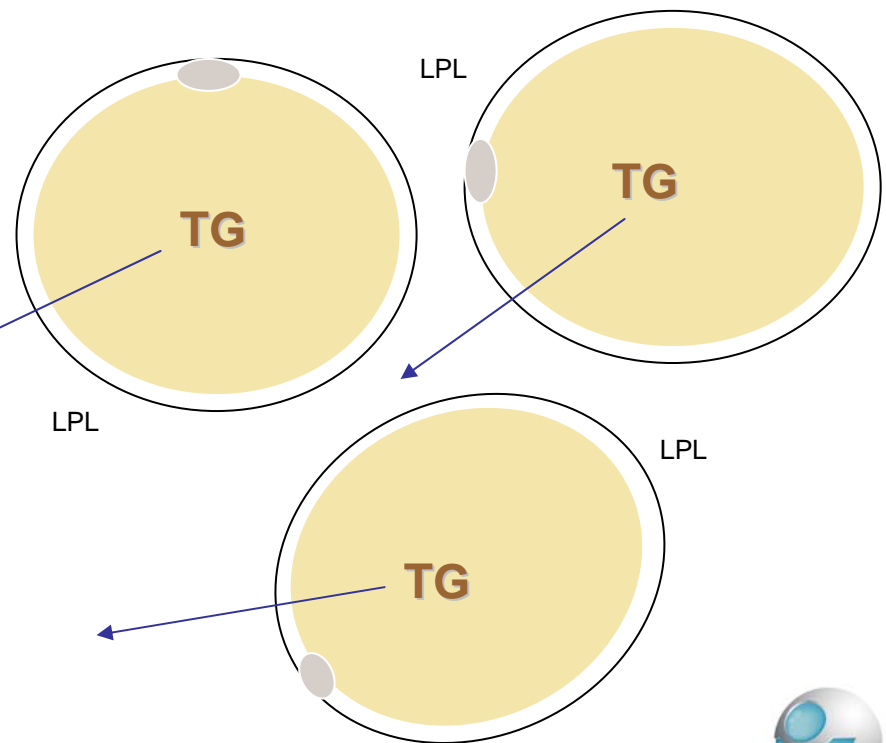




Lipolysis & Fat reduction



Adipocytes



TG with LPL → FFA +
Glycerol (water soluble)

FFA binds to Albumin (2 – 3
molecules of FFA binds to 1 of
albumin) transported away

FFA is metabolised by Liver

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CAVITATION

Acoustic cavitation occurs whenever a liquid is subjected to sufficiently intense sound or ultrasound (frequencies of 20 kHz up to 10 MHz).

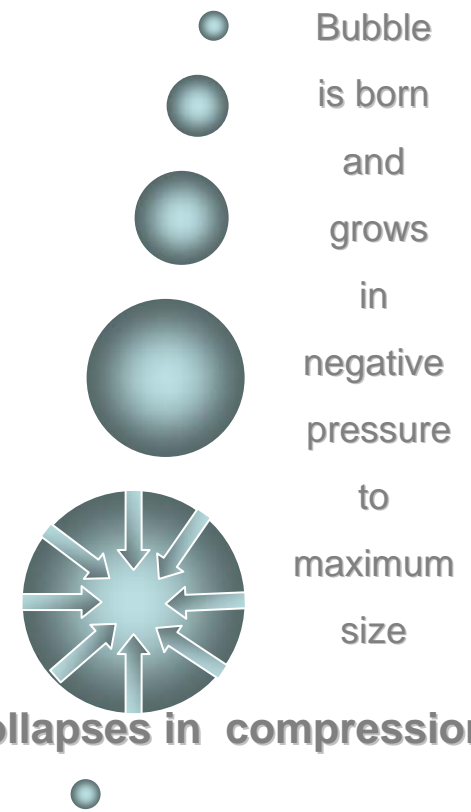
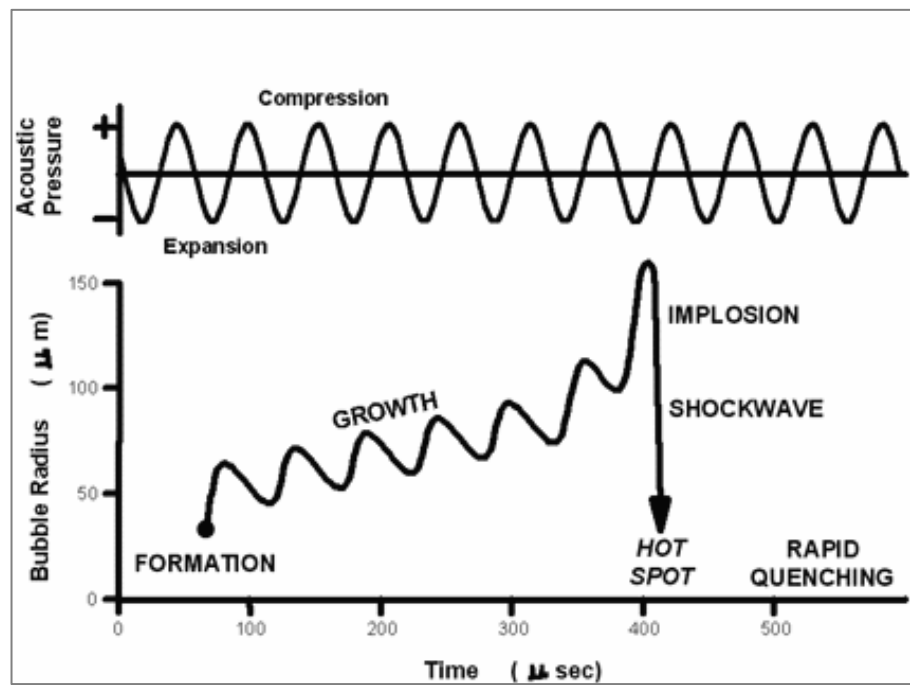
When sound passes through a liquid, it consists of **expansion waves** (negative-pressure) and **compression waves** (positive-pressure). If the intensity of the sound field is high enough, it can cause the formation, growth, and rapid recompression of vapour bubbles in the liquid.

The implosive bubble collapse generates **localized heating**, a pressure pulse, and associated high-energy chemistry.





CAVITATION PHENOMENON

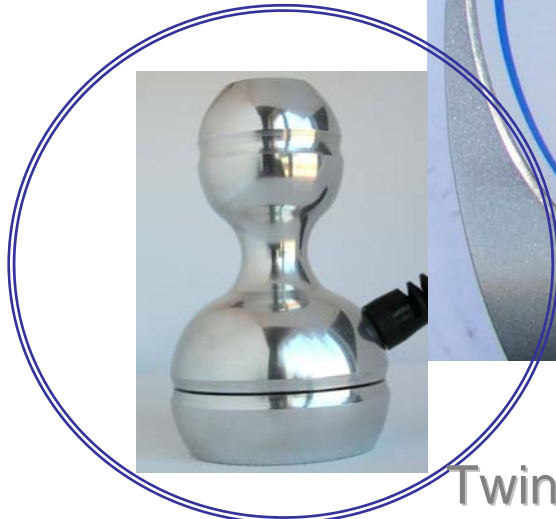


Bubble collapses in compression

A new bubble is born & cycle repeats itself



SPECIFICITIES



Focused Ultrasound
Twin Transducers Technology
45 mm diameter each with spot surface = 16 cm²

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SPECIFICITIES

- ❖ **Power : 5 watts / cm²**
 - ❖ **80 watts per treated spot**
- ❖ **Frequency : 30 khz – 70 khz**
- ❖ **Sweep Time: 3” – 30”**
- ❖ **Changeable parameters**
 - ❖ **Treatment time**
 - ❖ **Power**
 - ❖ **Sweep time**



PROTOCOLS

PRONE	SESSION TREATMENT TIME	
	<i>AREA</i>	<i>PER AREA</i>
BACK	4X15'	60' / 15" / 55
LOWER BACK & BOTTOM	4X15'	60' / 30" / 65
LATERAL EXTERNAL POSTERIOR THIGH	30'	60' / 30" / 65
CALVES	20'	40' / 5" / 45

ST = Sweep or Scan Time

P = Power

Interval between treatment sessions 15 - 21 days (related to patient basal metabolism and lifestyle)

PROTOCOLS

SUPINE	SESSION TREATMENT TIME	
<i>AREA</i>	<i>PER AREA</i>	<i>TOTAL / ST / P</i>
EXTERNAL ARMS	20-30'	40-60' / 5" / 45
EXTERNAL PART BREAST/ PECTORAL	20'	40' / 15" / 55
ABDOMEN 4 SEGMENT	4X15'	60' / 30" / 60
INNER, MEDIUM THIGH INNER KNEE	10 -15'X3 =30-45'X2	60-90' / 20"/50
EXTERNAL THIGH	30'	60' / 30" / 70

ST = Sweep or Scan Time

P = Power



PROCEDURES

The selected area is treated following a grid pattern.

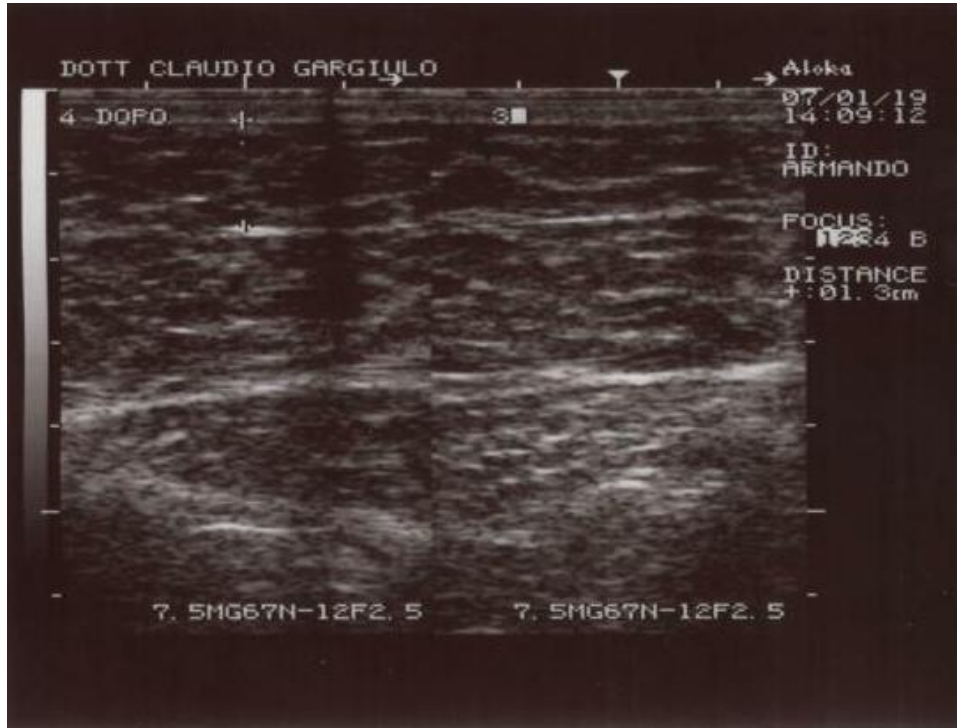
The transducer is moved over the grid slowly addressing each part of the grid with a circular motion for the determined seconds.

Treated areas: waist & abdomen, gluteus, outer thigh, posterior thigh, inner thigh and knee.





CLINICAL RESULTS



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CAMERA PICTURES

RESULTS
AFTER ONE SESSION

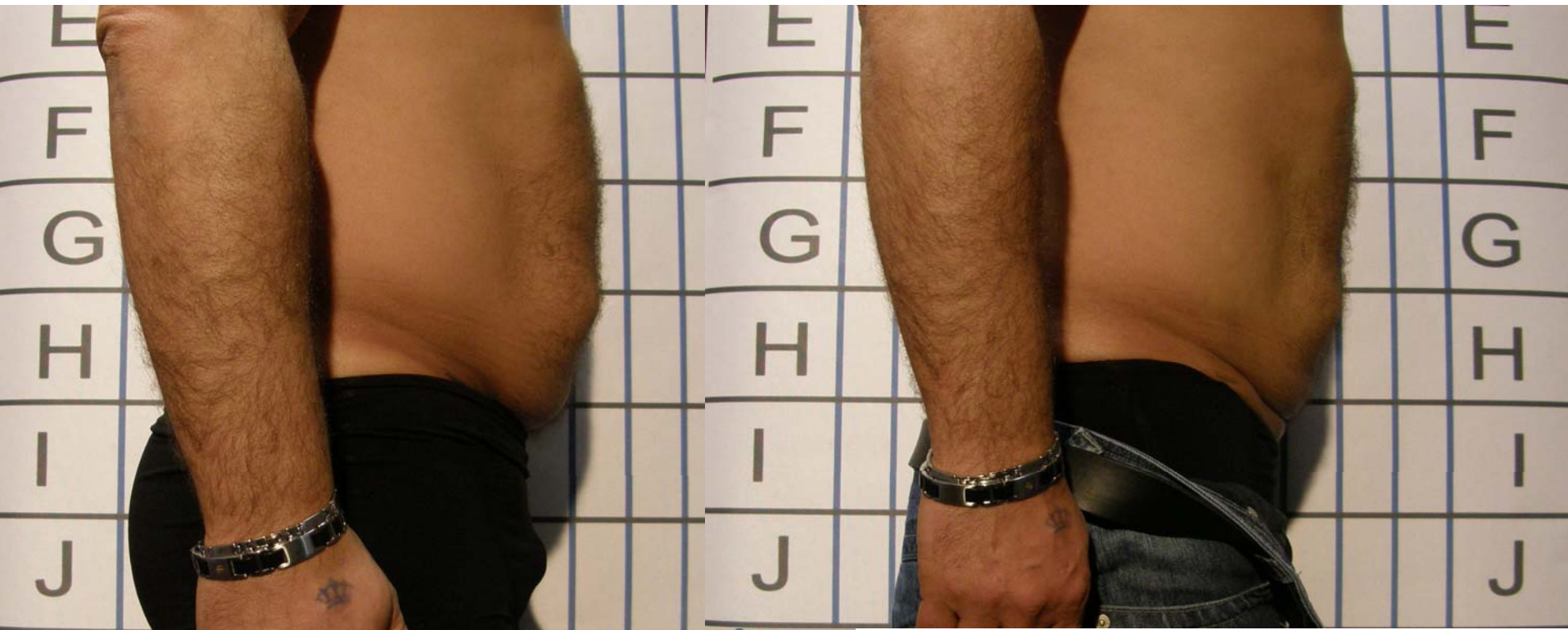


Before



After

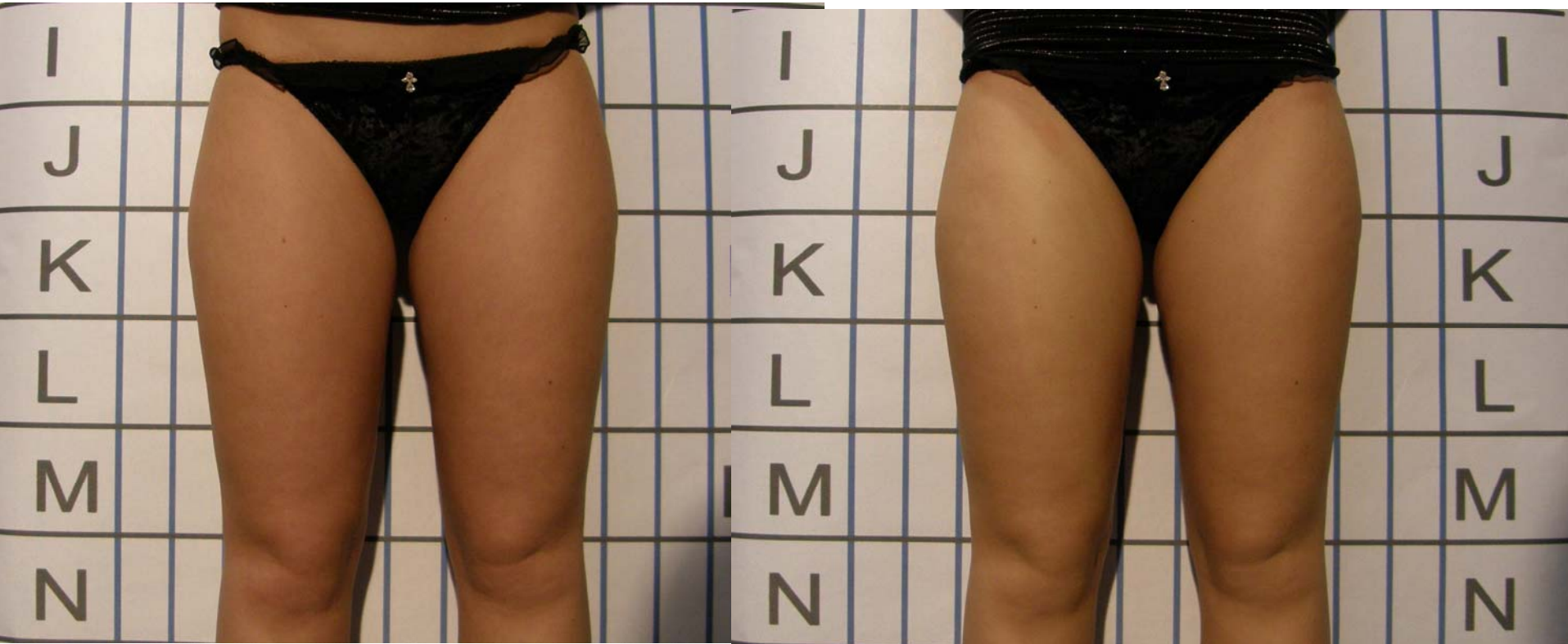
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Before

After

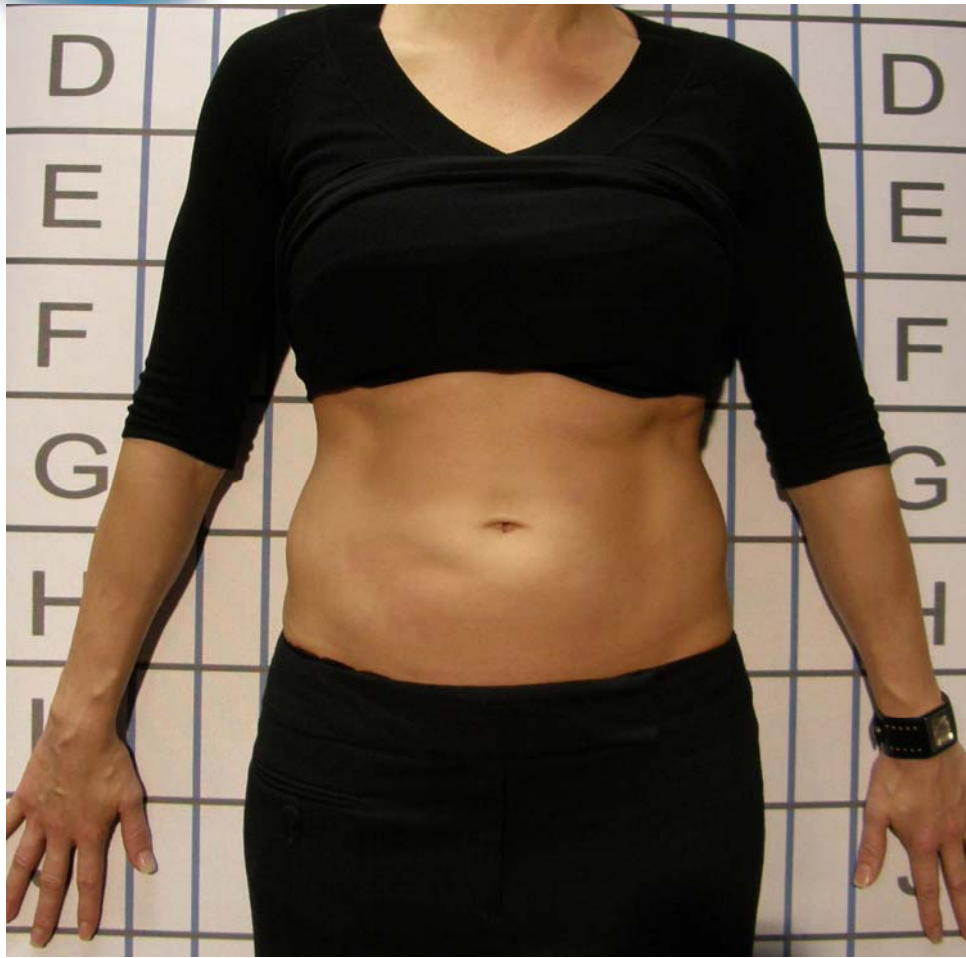
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Before

After

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Before

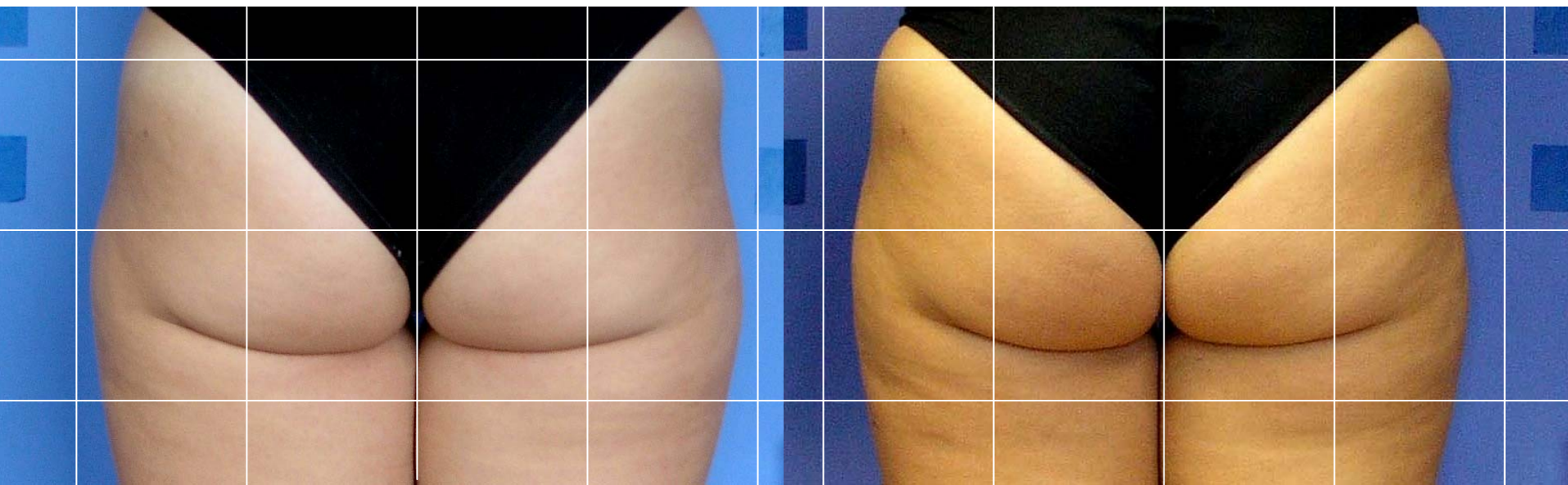


After

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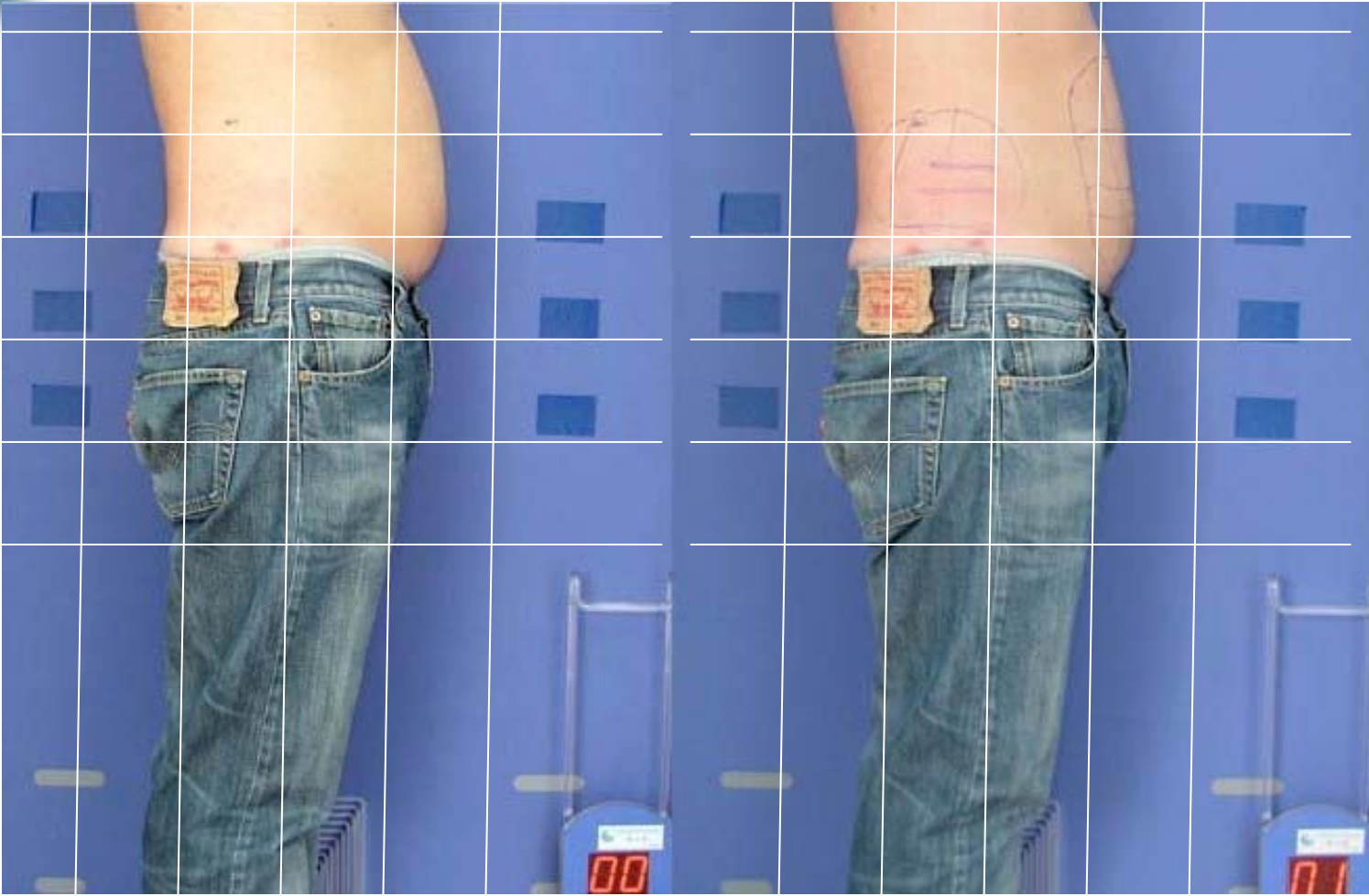


Before

After

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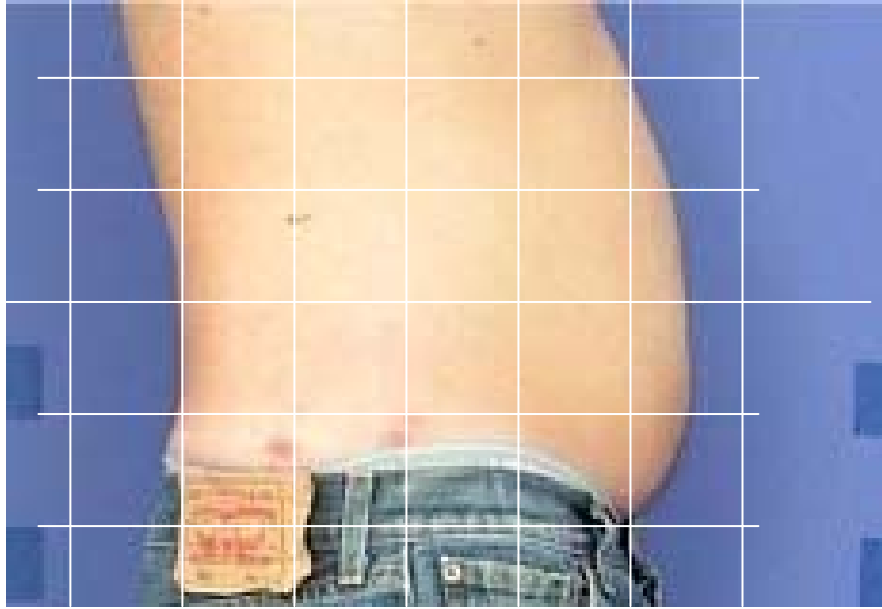


Before

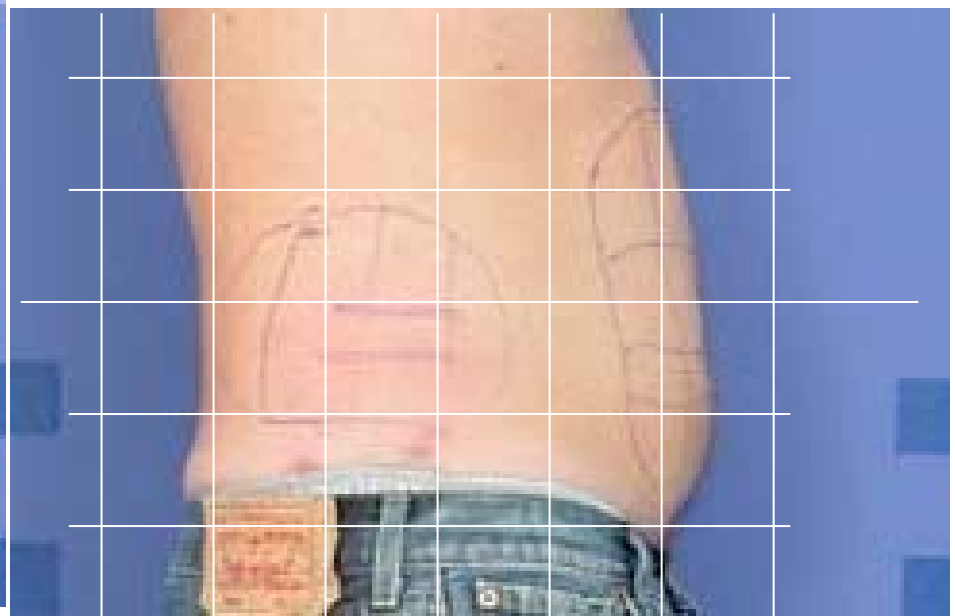
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Before



After

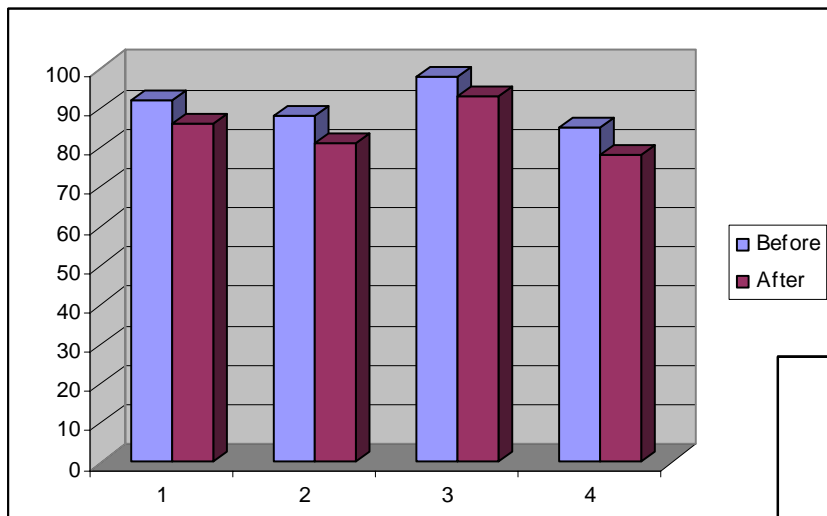
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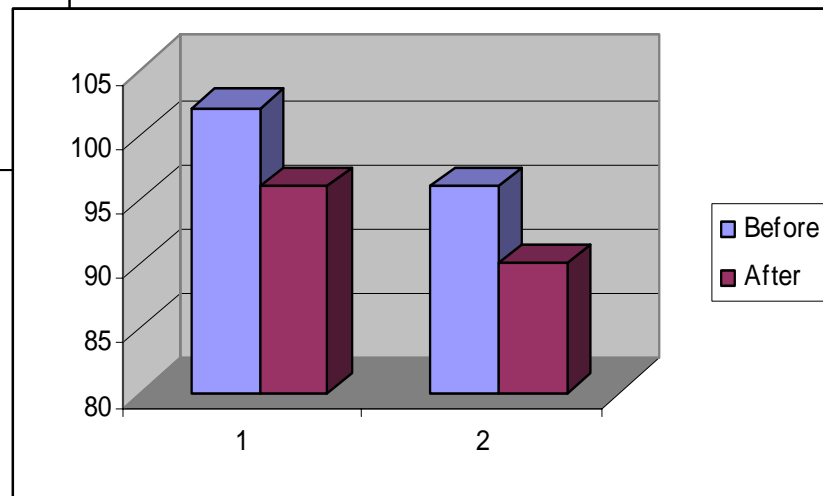
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PERIMETRIC EVALUATION



Abdomen after 4 sessions



Thigh after 6 sessions



Echographic evaluation

Measurement of the subcutaneous fat layer

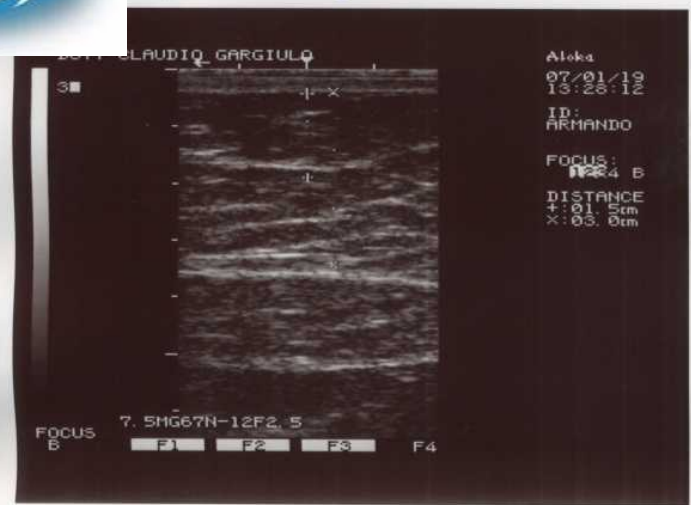
Abdominal area.

Initial : 1.5 mm

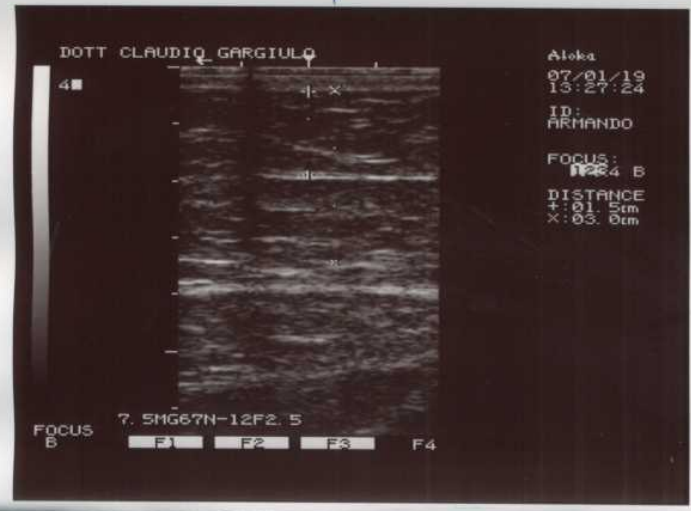
Post : 1.3mm

Perimetric reduction : 3 cm

3



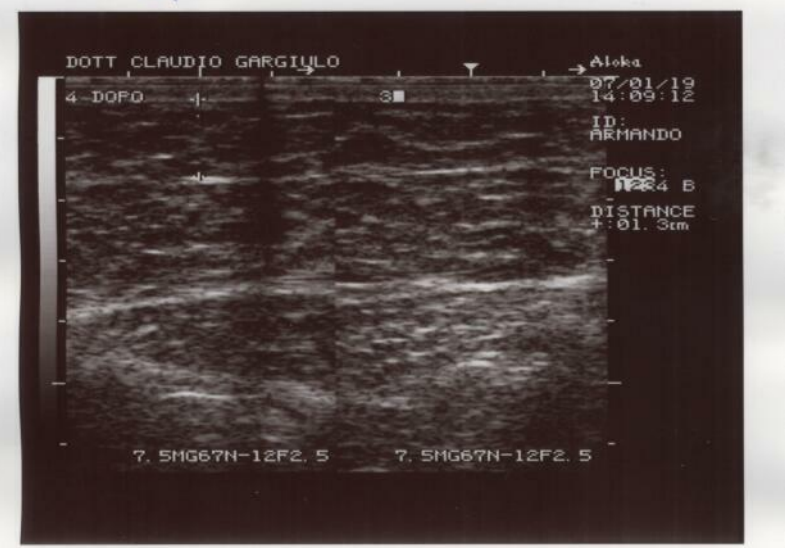
4



Pr

4

5



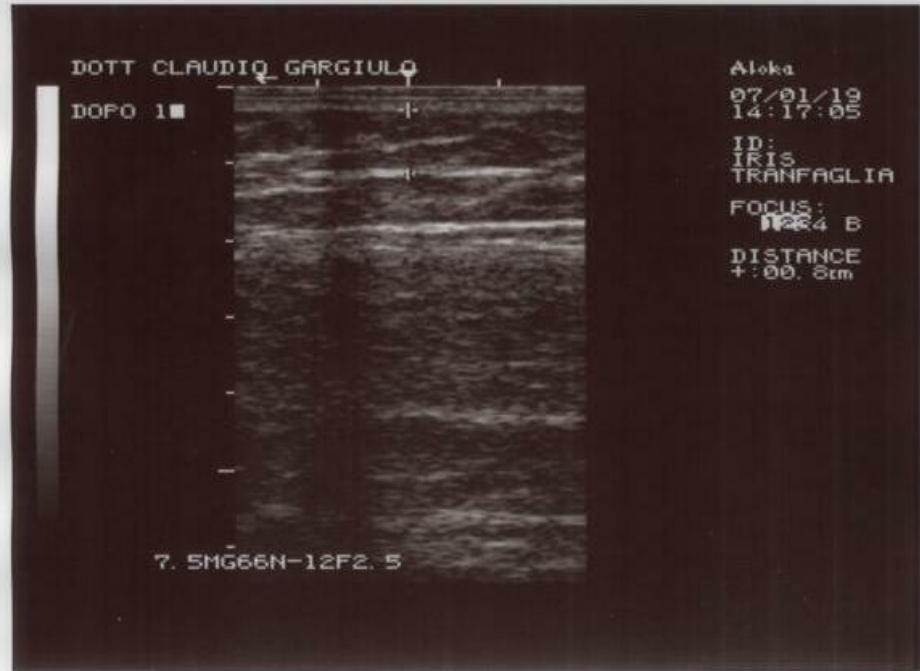


Upper flank area.

Initial : 0.9 mm

Post : 0.8mm

Perimetric reduction : 1 cm



The amount of fat loss is related to layer thickness

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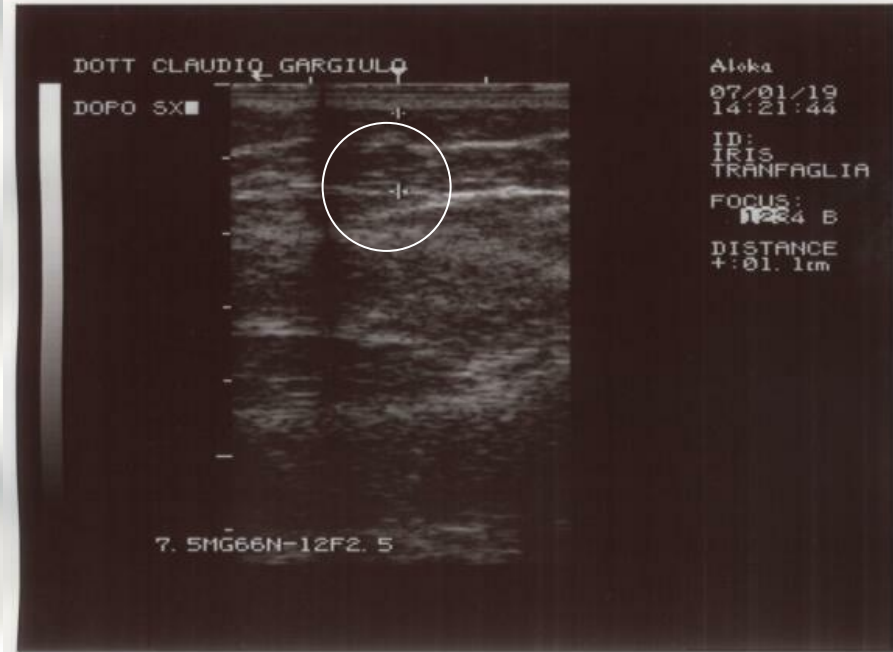
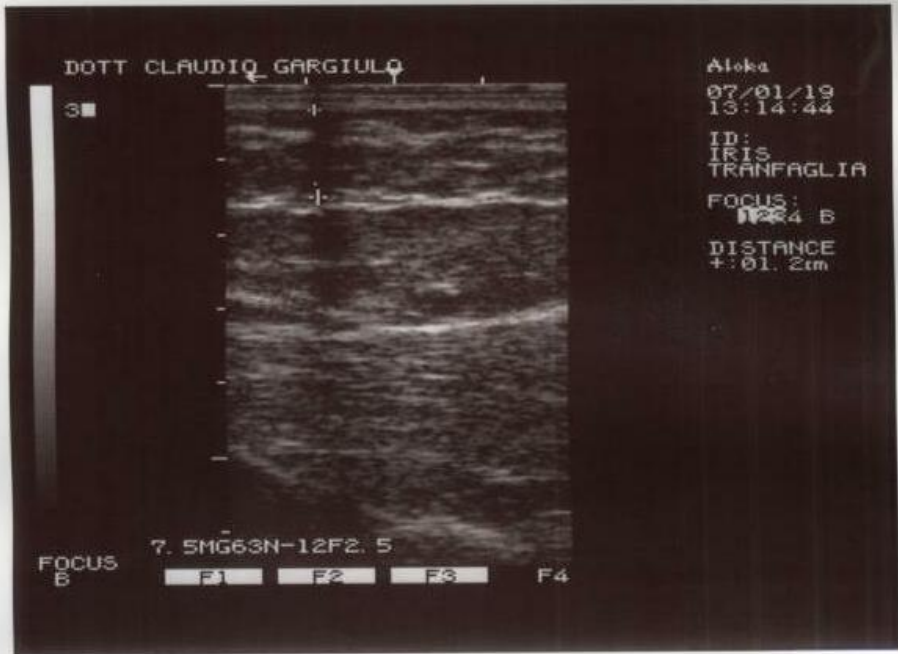


Mid flank area.

Initial : 1.2 mm

Post : 1.1mm

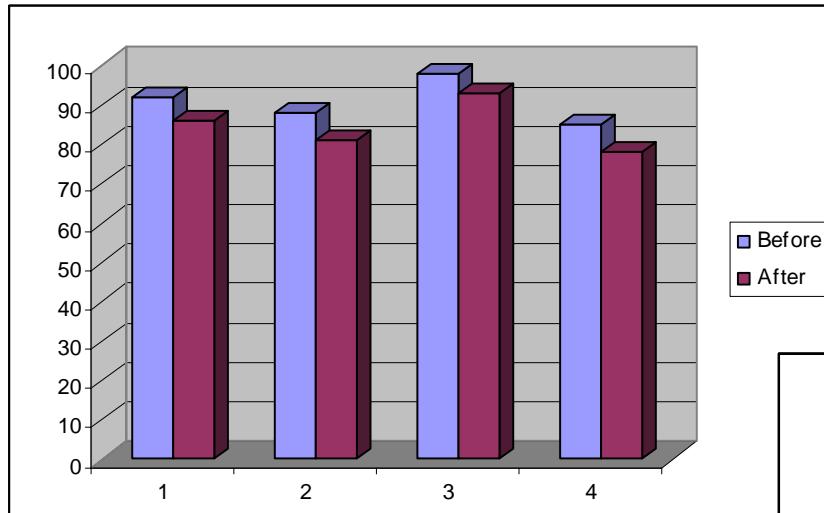
Perimetric reduction : 2 cm



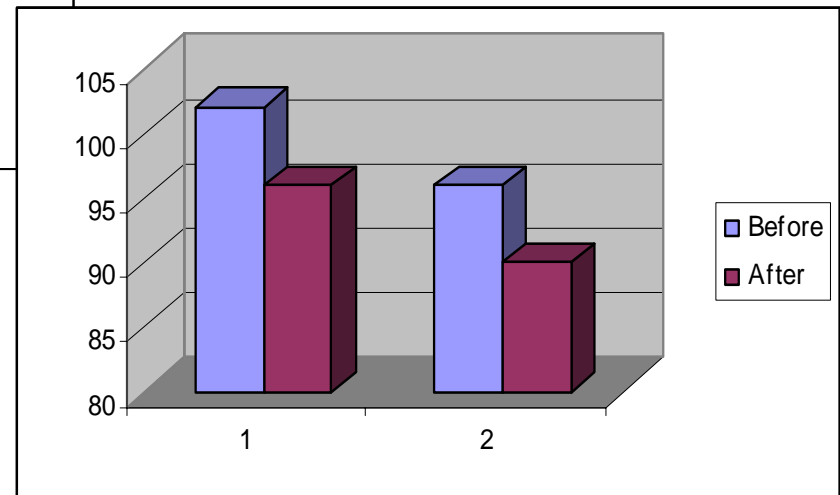
Density loss due to adipocytes disruption with no damage to surrounding tissues



PERIMETRIC EVALUATION



Abdomen after 4 sessions



Thigh after 6 sessions

CONTRAINDICATIONS

ABSOLUTE

- Pregnancy
- Breast feeding
- Serious Liver disfunction
(Hepatitis, Cyrhosis)
- Serious kydney disfunction
- Evolutive disease
- Metal implant
- Pace maker

CONCLUSION

- ❖ Time efficient & non invasive procedure
 - ❖ Efficient & Safe body contouring treatment
 - ❖ Visible reduction of body circumference after each treatment
 - ❖ Adipose tissue lysed and cleared through natural mechanism
- ❖ No down time / Walk in procedure
- ❖ Office base treatment / no surgical theater
- ❖ No anesthesia / comfortable procedure
- ❖ Possibility to treat 2 areas at the same time

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12. [Doan N](#), [Reher P](#), [Meghji S](#), [Harris M](#). **In vitro effects of therapeutic ultrasound on cell proliferation, protein synthesis, and cytokine production by human fibroblasts, osteoblasts, and monocytes.** J Oral Maxillofac Surg. 1999 Apr;57(4):409-19; discussion 420.PMID: 10199493 [PubMed - indexed for MEDLINE]