

# Enhanced Skin Retraction in Body Contouring in Adults with Sole VASER Ultrasound Assisted Liposuction

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**Abstract:** The Authors introduce ultrasound-assisted liposuction (UAL), in older patients, as a body contouring procedure, capable of enhancing skin retraction beyond the normal deflation that accompanies the fat removal. Lately, new technologies have been introduced to treat skin laxity, such as Renuvion Helium Plasma, and different combinations of them have been experimented and performed, such as UAL and PAL accomplished with plasma gas source. On the contrary, the Authors feel and show that, by simply using sole subdermal UAL, it is still possible to achieve amazing results of skin retraction in different areas of body contouring, in adults. In this study, we present results of 40 patients (age ranging from 50 to 67 yo) treated with sole VASER UAL. We evaluated skin retraction objectively, by measuring the shrinkage of the treated areas, by using microdot tattooing with India Ink. 6-months post op results show the successful enhancement of skin retraction obtained with the sole UAL technique, despite laxicity of skin. The Authors also report two cases of complications, after body contouring procedures in the abdominal region, performed by other surgeons who combined UAL with PAL and plasma gas source. In conclusion, we state that VaserLipo, as sole technology, used in subdermal layer, can safely enhance skin retraction, if properly performed by a well-trained surgeon, even in older patients, in all areas, minding that a minimum amount of fat is present.

**Keywords:** Ultrasound Assisted Liposuction, Skin Laxity, Skin Retraction, Helium Plasma, Body Contouring, Older Patients.

## INTRODUCTION

How does VaserLipo work and induce skin retraction? We did observe for years the potential of VASER Ultrasound Assisted Liposuction (VAL) (fig. 1) for skin retraction, instead of Suction Assisted Liposuction (SAL), Power Assisted Liposuction (PAL) or Laser Assisted Liposuction (LAL).

As a remind, VAL works with a mechanical phenomenon named "cavitation" (fig. 2), which is a reflection of the acoustic streaming of the ultrasound energy, delivered by a handpiece with a shaft with rings at the end. As a fact, ultrasound energy, so delivered, will impact only the adipose cells, already expanded by the tumescent solution infiltration, causing implosion and 'emulsification' (fig. 3), thus improving tissue selection.

The mechanical effects of VaserLipo on tissues are well represented by this photo in figure 4:

- 1- anatomy of superficial, intermediate and deep fat layer before treatment
- 2- treatment of intermediate and deep layers with emulsifications at both of them
- 3- superficial fat treatment with soft emulsification and preservation of the vascular network of tissue, as well as connective supporting skin structures
- 4- tissue remodelling, via a combination of horizontal and vertical forces in action

VAL confirms the selectivity of its action by:

- 1- gently emulsifying only the adipose tissue, creating a melty cream of fat, which is then aspirated (fig. 5);
- 2- preserving connective structures, elastic fibers and vascular network (fig.6).

Subdermal fat layer is very delicate and difficult to manipulate: to obtain properly skin retraction, the technique should be able to defat homogeneously without interfering with connective structures and vascular supply. This is the pre-requisite to explain the skin retraction which follows VAL in comparison with other types of liposuction.

It is evident that all other types of liposuction (SAL, PAL, LAL) are blind techniques, as those ones are unable to differentiate what to destroy and what to preserve. More importantly, all those techniques are unable to treat the superficial subcutaneous fat layer in a safe and conservative way, contrary to VAL.

On the other hand, superficial liposuction, performed by VAL, can easily hesitate in skin contouring irregularities and in superficial vascular network compromise, thus consequent necrosis. The outcome of this maneuver is potentially dangerous and surgeon skill related. A properly trained Vaser Surgeon, must be able to safely undermine the superficial subdermal layer, as first action of his comprehensive body contouring procedure, minimizing the risk of complications [1].

UAL technology is unique in its role of allowing a safe superficial undermining and preservation of vascular and connective networks, thus allowing superior skin retraction.

Skin retraction, or contraction, induced by UAL also relies on the following biological principle: Watts, Grillo and Groos in 1958 showed that the main contractile elements are located in the dermal-subdermal interface. By reducing the subdermal thickness (by a controlled and safe ultrasound defatting) miofibroblasts are exposed and enhance skin contraction [2].

All this is the basic science to explain why VAL can be safely used alone to treat loose skin associated with fat (minding that the ultrasounds target fat tissue in a selective way). It is mandatory to have a minimum amount of fat in the areas where skin retraction is needed.

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## How does Renuvion work?

Renuvion is a skin tightening technology that uses radiofrequency (RF) energy in combination with helium gas to improve sagging, loose skin. During the treatment, a thin wand is inserted just under the skin, RF energy is used to energize an electrode and, at the same time, helium plasma is generated as helium gas passes over the energized electrode. This mechanism allows heat to be applied to tissue in two different ways:

- 1- the plasma beam generated provides heat through the ionization and rapid neutralization that helium atoms undergo;
- 2- a portion of RF energy, that passes through the tissue impedance, generates a small amount of additional heat.

These heat streams cause the collagen fibers beneath the skin to contract, resulting in tighter and firmer surface skin. With each stroke of the Renuvion device, the RF energy encounters tissue with varying impedance and will continuously change paths of heat transfer. In addition, as electrical energy takes the path of least resistance, the user does not need to redirect the hand-piece and tissue is treated in 360°.

Renuvion also spurs the body's healing process, prompting the longer-term production of collagen for even firmer skin.

The main benefit of Renuvion is to contract the skin excess in the vertical vector, thus reducing skin laxity. The limitation of Renuvion is that it does not eliminate horizontal skin excess, otherwise described as skin redundancy (like patients who have recently undergone massive weight loss).

One common side effect associated with the J Plasma procedure is temporary bruising and swelling, as the treatment involves the use of heat energy.

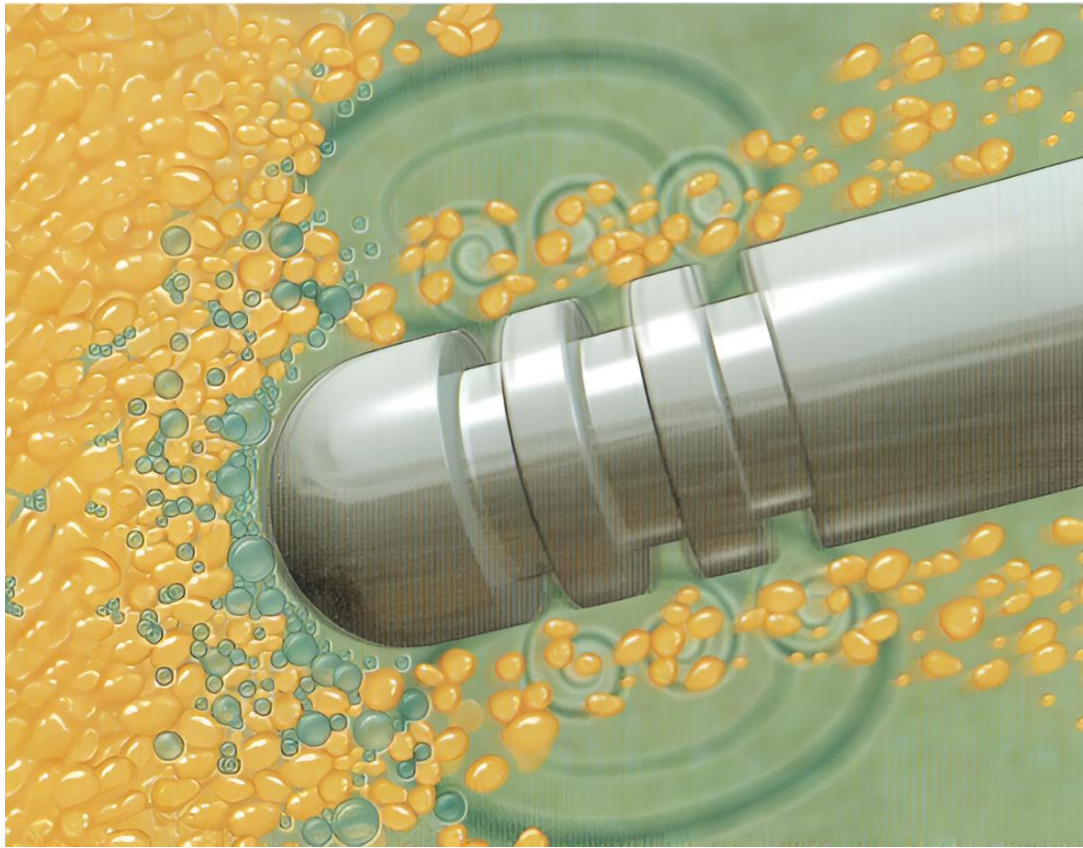
In Literature, good results of skin retraction in body contouring have been published, by combining UAL along with Renuvion (Helium Plasma) [3]. Sachin et al. showed that, at present, this combination is safe [4], but, at the same time, some complications, even dramatic, have been reported by those devices accomplished together [5].

Ruff et al. stated that Renuvion J-Plasma is safe when used alone in chin and neck without excessive fat tissue, in older patients, for enhancing skin retraction [6].

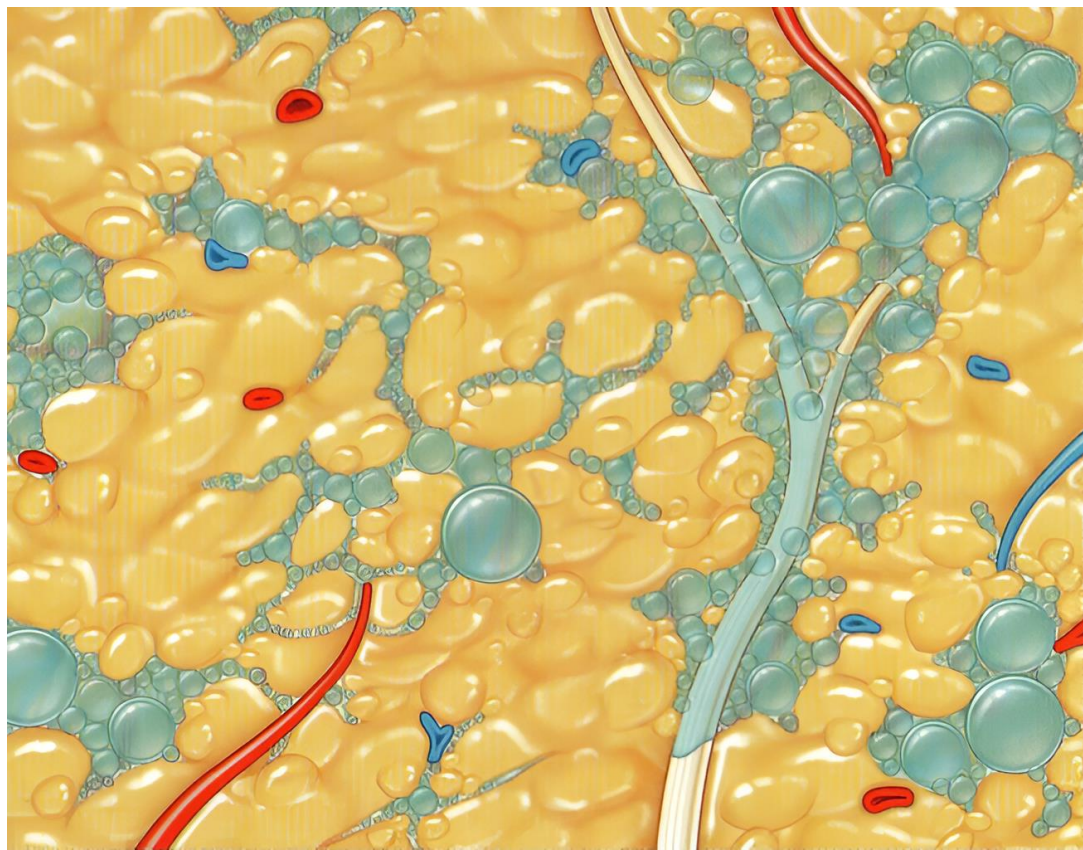
Instead, the Authors of this article are willing to declare that UAL, even used alone, could be the most appropriate solution to manage skin laxity with excessive fat, since this technology is useful for both liposuction and enhancement of skin retraction. A well trained Vaser Surgeon, who knows how to perform superficial undermining, can achieve great results relying on a single technology, even in adults.



**Figure 1:** VASER device.

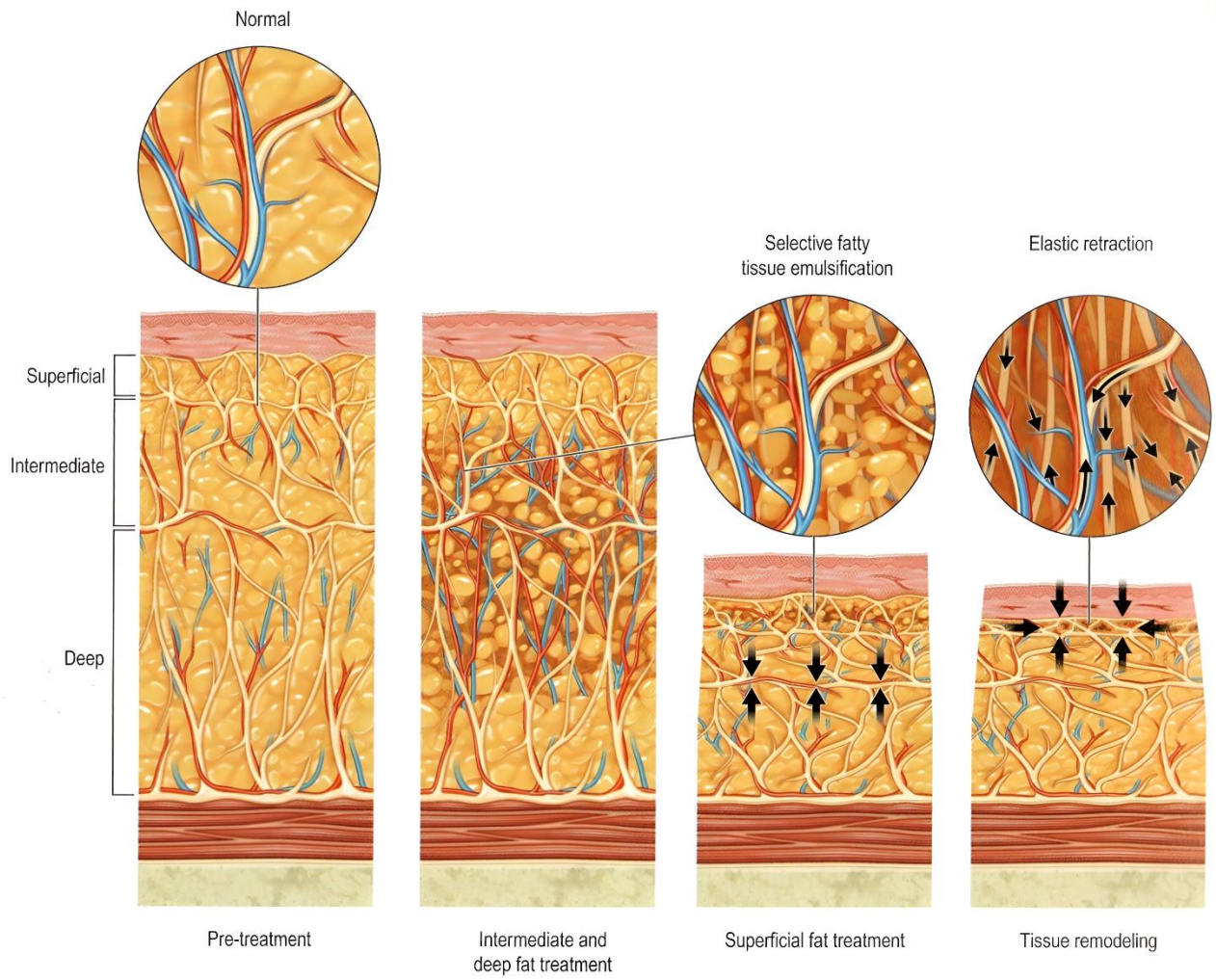


**Figure 2:** Acoustic streaming is the result of powerful fluid forces that create intense swirling around the vibrating ultrasonic probe tip. This swirling causes the fat cells that have been dislodged from the matrix to mix with the infusion fluid creating the emulsification.



**Figure 3:** The growth of the microbubbles to almost 200  $\mu\text{m}$  forces the fat cell apart. As the microbubbles reach resonant size and collapse they dislodge the fat cells from the tissue matrix.

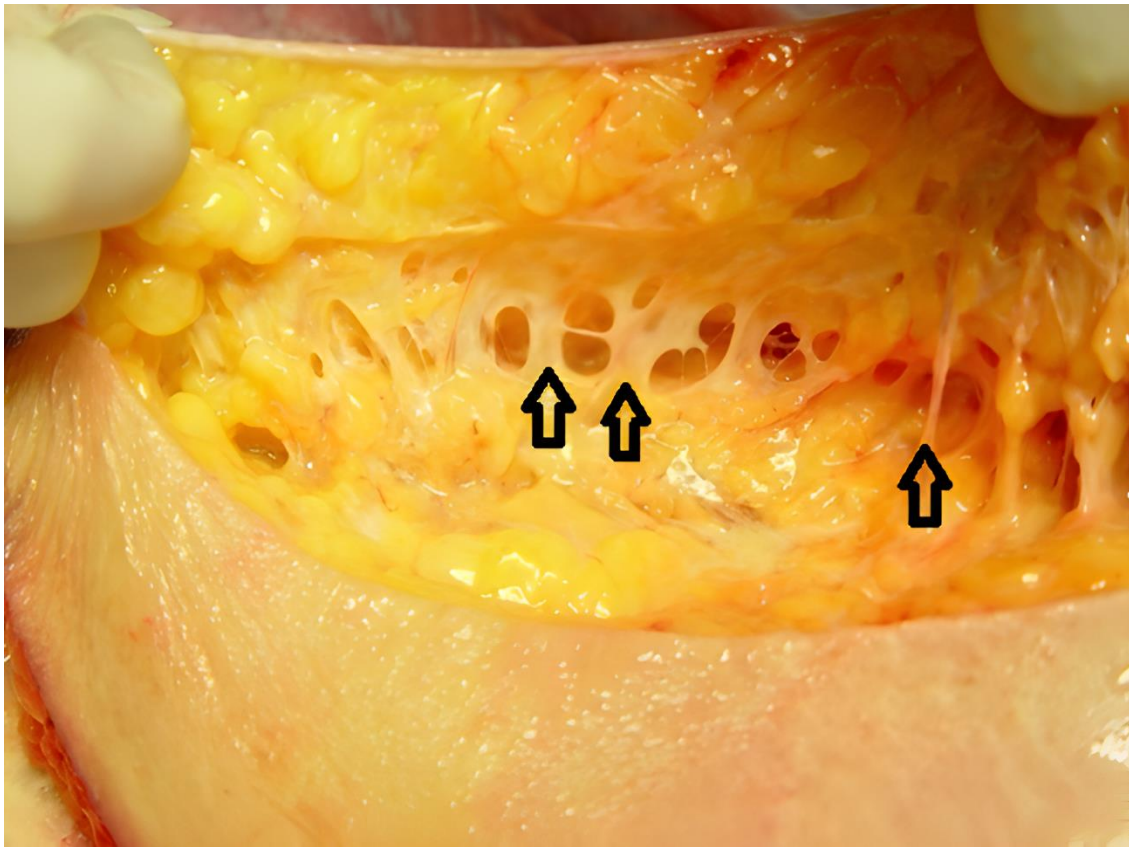




**Figure 4:** VASER effect on tissues.



**Figure 5:** Post-ultrasound treatment: fatty tissue is broken apart and cells are suspended in infiltration fluid.



**Figure 6:** Post-aspiration: connective tissue is left intact after adipose tissue has been removed.

## MATERIALS AND METHODS

40 patients, mainly females (35 females and 5 males), have been included in this study. Patients age varies from 50 to 67 yo and BMI ranged between 24 and 29. For this study, we considered older candidates, since it is more challenging to obtain skin retraction in this type of patients.

Due to the lower quality of their skin, we wish to highlight the potential of VASER UAL.

The areas of treatment considered were upper arms, abdomen, flanks, back and thighs. In all this areas we drew a square with India Ink and measured its area before and after treatment to evaluate skin retraction.

All patients were operated by the same surgeon, mainly under general anesthesia, or local tumescent anesthesia and iv sedation, in hospital facilities.

All patients underwent sole Vaser Liposuction technique to remove extra fat and, at the same time, enhance skin retraction.

All subjects provided signed informed consent prior to trial participation.

How did we draw the squares and calculate skin retraction?

In order to measure the skin retraction capability of VAL, the Authors have followed a study initially designed by W.W. Cimino, Ph.D. (ideator and inventor of VASER technology) [7] [8] [9], but never published, and then validated with a more specific protocol by other Authors [10] including Alam et al. [11].

To project our study we followed Alam's indications, delineated in his paperwork.

In each patient, we selected the area where the majority of skin laxity was present, in order to challenge the potential skin retraction of VAL. In each area selected we drew one square (3x3 cm side length) with a surgical marker: the corners of each square were tattooed with IndiaInk delivered by dermal puncture with an 18-gauge needle (fig. 7). The microtattoo pigment used for this study (Infinitink, Freedom-2™) was developed for easy removal by Q-switched laser devices (1064-nm Q-switched Nd:Yag laser).

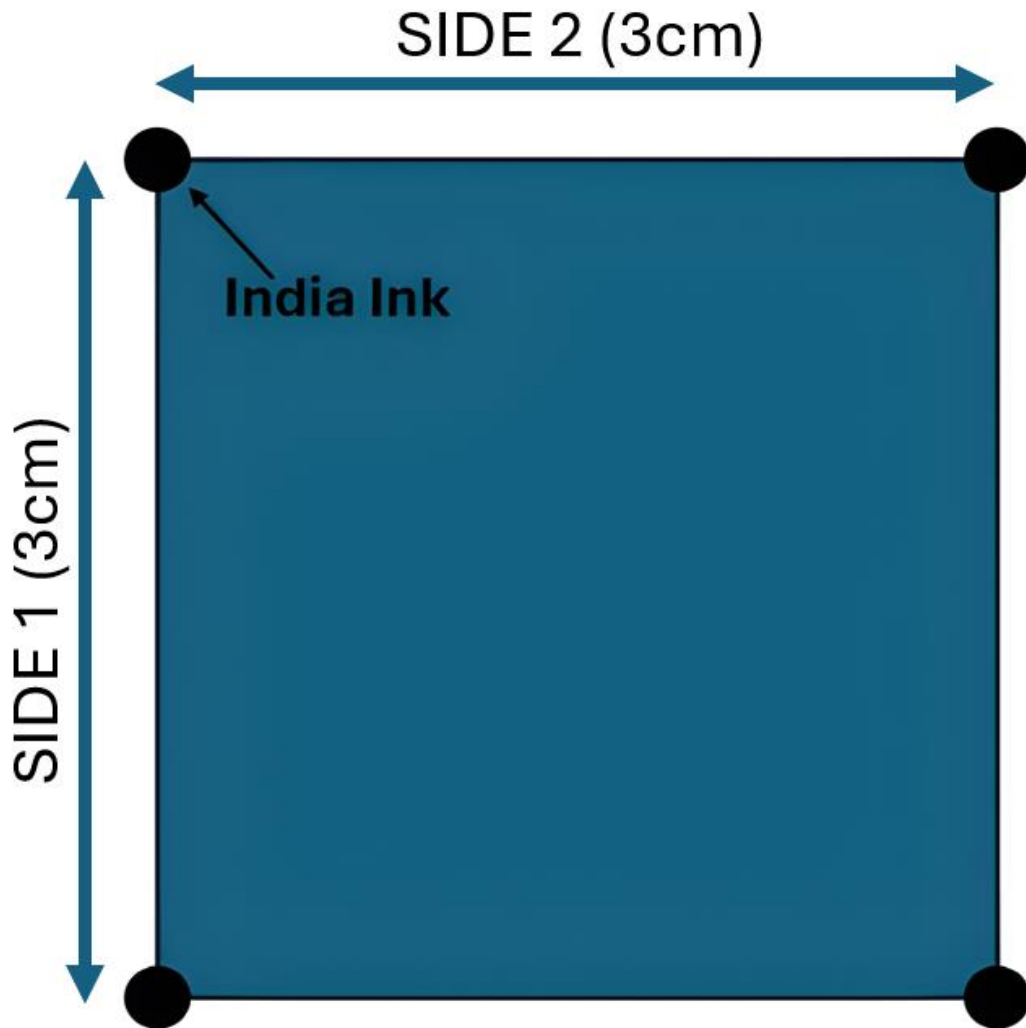
A non-stretchable measuring tape was used to measure the same two consecutive sides of each square before treatment and at a 6 months follow-up visit. We decided to measure two sides, even though we drew a square, in order to keep in consideration the possibility of a slightly different skin retraction between orizontal and vertical axis. We, then, calculated the areas of the squares, pre op and 6 months post op, with the following simple formula: Area = lenght of side 1 x lenght of side 2.

At this point, in each patient, we compared pre and post op square areas to quantify skin contraction.

Below, we describe in details the Vaser protocol followed to treat out patients.

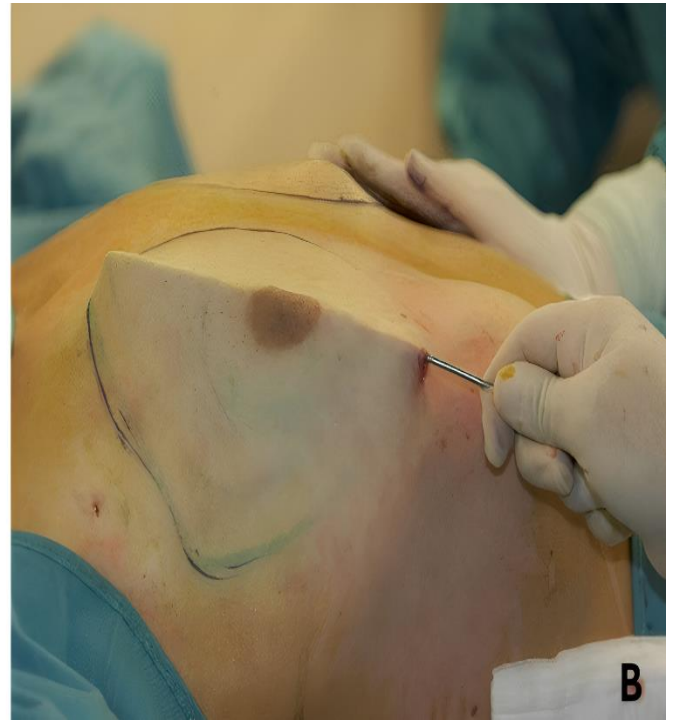
In order to obtain the highest skin contracture, the subdermal layer have to be exposed and thinned properly and in a safe way.

- 1- Superficial tumescent infiltration: 2:1 ratio infiltration rate is required in the superficial layer to best address treatment of the area. More tumescent means higher protection of the skin from burns and more selective defatting of the dermal.
  - 2- Probes: 2,9mm or 3,7mm Vaser, 2 rings Vaser Ultrasound probes are utilized for superficial tightening or undermining (fig. 8A).
  - 3- VASER continous mode of ultrasound administration, 6-8 minutes for completing the superficial undermining, depending from the extension of the body area.
  - 4- Final checking of full undermining on the treated area via a 2-3mm cannula without suction to free, eventually, minor residual adhesion (fig. 8B).
  - 5- Superficial undermining is always the first step of VASER to body contouring, as to better use the tumescent state
- which is temporary and tends to elaps by timing and by gravity.
- 6- To follow, the intermediate and deeper layer are addressed, in order to debulk fat excess.
  - 7- Early post op compression by a garment is required for 4 to 8 weeks depending on skin elasticity and swelling.
  - 8- Vodder post op lymphatic massage, twice a week, for 4 weeks at least, is recomended.
  - 9- All patient had post op compression garment applied for 6-8 weeks to facilitate swelling absorptio and skin contracture.
  - 10- Patients had further extra-compression with foam pads (by Lipoelastic Medical Products) night time, for 4 weeks post op, to further enhance skin retraction and fluid drainage in specific areas (abdomen, flancks and tighs) (Fig. 9).

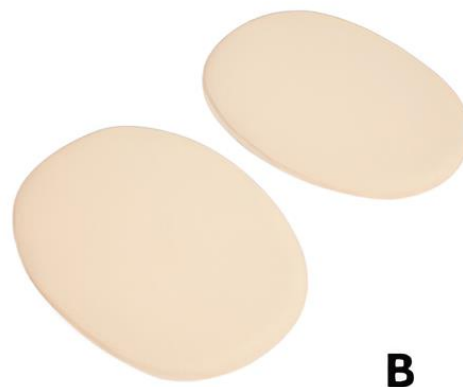


**Figure 7:** 3x3cm square.





**Figure 8:** A: 2,2mm, 2,9mm or 3,7mm Vaser ultrasound probes; B: final checking of subcutaneous undermining after treatment of a gynecomastia with vaser. Note the 2mm cannula without suction which carefully free the remaining adhesions.



**Figure 9:** A: elastic garment; B: foam pads for extra compression.

# RESULTS

In the final table we reported all our measurements, taken in each patient, and, comparing pre op and post op square areas, we indicated the percentage of skin shrinkage that each patient was able to achieve (table 1).

Skin retraction did vary from 12% to more than 30%, depending on areas.

On average, skin retraction in upper arms was 27%, in the abdomen was 25%, in the flanks was 15%, in the back was 21% and in the inner thighs was 10%.

Anyway, also clinical evidence in pre and post op photos assessments are very important criteria to judge skin retraction obtained. We requested a subjective evaluation to each patient as well as to an independent surgeon (blind reviewer). They all could express their degree of satisfaction giving a score from 1 to 5 to the result obtained.

All patients involved in this study, and also the blind reviewer, reported good feedbacks and were glad with the results (table 2).

Below we present pre and post op photos of some of the patients we treated.

**Table 1:** Percentage of skin shrinkage achieved in each patient. The red cells, in the first column, highlight the patients presented in the “Result” section of this article.

PATIENT	AGE	BMI	SEX	AREA TRATED AND ANALYZED WITH THE SQUARE	MINUTES OF ULTRASOUND ADMINISTRATED	SIDE 1 LENGHT PRE OP (cm)	SIDE 2 LENGHT PRE OP (cm)	SIDE 1 LENGHT 6 MONTHS POST OP (cm)	SIDE 2 LENGHT 6 MONTHS POST OP (cm)	SQUARE AREA PRE OP (cm <sup>2</sup> )	SQUARE AREA 6 MONTHS POST OP (cm <sup>2</sup> )	PERCENTAGE OF SKIN SHRINKAGE	AVERAGE SKIN RETRACTION PER BODY AREA	
CASE 1	1	60	28	F	UPPER ARM	7	3,0	3,0	2,5	9,0	6,3	30,56%	27,18%	
CASE 2	2	54	24	F	UPPER ARM	6	3,0	3,0	2,6	9,0	6,8	24,89%		
	3	52	25	F	UPPER ARM	7	3,0	3,0	2,5	9,0	6,5	27,78%		
	4	65	25	F	UPPER ARM	8	3,0	3,0	2,6	9,0	6,5	27,78%		
	5	63	26	F	UPPER ARM	6	3,0	3,0	2,6	9,0	6,8	24,89%		
CASE 3	6	50	28	F	ABDOMEN	26	3,0	3,0	2,6	9,0	7,0	22,00%	25,71%	
CASE 4	7	54	29	F	ABDOMEN	27	3,0	3,0	2,7	9,0	7,3	19,00%		
CASE 5	8	55	26	F	ABDOMEN	16	3,0	3,0	2,8	9,0	7,8	12,89%		
CASE 6	9	63	28	F	ABDOMEN	45	3,0	3,0	2,5	9,0	6,5	27,78%		
CASE 7	10	67	28	F	ABDOMEN	30	3,0	3,0	2,2	9,0	5,1	43,78%		
CASE 13	11	50	29	F	ABDOMEN	52	3,0	3,0	2,6	9,0	6,8	24,89%		
CASE 16	12	50	29	F	ABDOMEN	30	3,0	3,0	2,7	9,0	7,3	19,00%		
CASE 18	13	59	25	M	ABDOMEN	25	3,0	3,0	2,7	9,0	7,3	19,00%		
CASE 19	14	52	28	F	ABDOMEN	36	3,0	3,0	2,6	9,0	6,8	24,89%		
CASE 20	15	51	26	F	ABDOMEN	12	3,0	3,0	2,6	9,0	6,8	24,89%		
	16	57	27	F	ABDOMEN	38	3,0	3,0	2,6	9,0	7,0	22,00%		
	17	61	26	M	ABDOMEN	42	3,0	3,0	2,4	9,0	5,5	38,67%		
	18	54	27	F	ABDOMEN	39	3,0	3,0	2,7	9,0	7,3	19,00%		
	19	65	28	F	ABDOMEN	26	3,0	3,0	2,6	9,0	6,5	27,78%		
	20	67	29	M	ABDOMEN	33	3,0	3,0	2,4	9,0	5,8	36,00%		
	21	57	25	F	ABDOMEN	35	3,0	3,0	2,5	9,0	6,3	30,56%		
	22	54	25	F	ABDOMEN	33	3,0	3,0	2,6	9,0	6,8	24,89%		
CASE 15	23	62	24	F	FLANK	30	3,0	3,0	2,8	9,0	7,8	12,89%		15,44%
CASE 17	24	62	26	M	FLANK	25	3,0	3,0	2,7	9,0	7,3	19,00%		
	25	60	28	F	FLANK	24	3,0	3,0	2,7	9,0	7,6	16,00%		
	26	58	27	F	FLANK	28	3,0	3,0	2,8	9,0	7,8	12,89%		
	27	57	26	F	FLANK	25	3,0	3,0	2,7	9,0	7,3	19,00%		
	28	55	27	F	FLANK	30	3,0	3,0	2,8	9,0	7,8	12,89%		
CASE 6	9	63	28	F	BACK	20	3,0	3,0	2,6	9,0	7,0	22,00%	21,81%	
CASE 8	29	75	25	F	AXILLARY TAIL	7	3,0	3,0	2,7	9,0	7,3	19,00%		
CASE 9	30	65	28	F	BACK	20	3,0	3,0	2,4	9,0	5,5	38,67%		
CASE 12	31	67	28	F	BACK	35	3,0	3,0	2,7	9,0	7,3	19,00%		
CASE 14	32	60	27	F	BACK	35	3,0	3,0	2,6	9,0	6,8	24,89%		
	33	62	25	F	BACK	15	3,0	3,0	2,8	9,0	7,8	12,89%		
	34	65	28	M	BACK	24	3,0	3,0	2,7	9,0	7,6	16,00%		
	35	61	27	F	BACK	25	3,0	3,0	2,7	9,0	7,3	19,00%		
	36	61	25	F	BACK	27	3,0	3,0	2,6	9,0	6,8	24,89%		
CASE 10	37	52	26	F	THIGH	32	3,0	3,0	2,8	9,0	8,1	9,78%		9,78%
CASE 11	38	56	26	F	THIGH	32	3,0	3,0	2,9	9,0	8,1	9,78%		
	39	51	27	F	THIGH	28	3,0	3,0	2,9	9,0	8,1	9,78%		
	40	55	25	F	THIGH	27	3,0	3,0	2,9	9,0	8,1	9,78%		

**Table 2:** Degree of satisfaction.

PATIENT NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
PATIENT EVALUATION (1 > 5)	5	4	5	5	3	4	5	4	4	5	4	5	3	4	4	5	3	4	4	5	4	5
BLIND REVIEWER EVALUATION (1 > 5)	5	4	4	5	4	5	5	4	4	5	4	5	4	5	3	5	3	4	5	5	4	4

PATIENT NUMBER	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
PATIENT EVALUATION (1 > 5)	4	5	4	3	5	4	5	5	5	4	4	4	5	4	4	4	4	
BLIND REVIEWER EVALUATION (1 > 5)	5	5	4	4	4	4	4	5	4	4	5	4	5	5	4	4	4	



**CASE 1**

60 yo female patient, BMI 28, with a large and hanging arms.

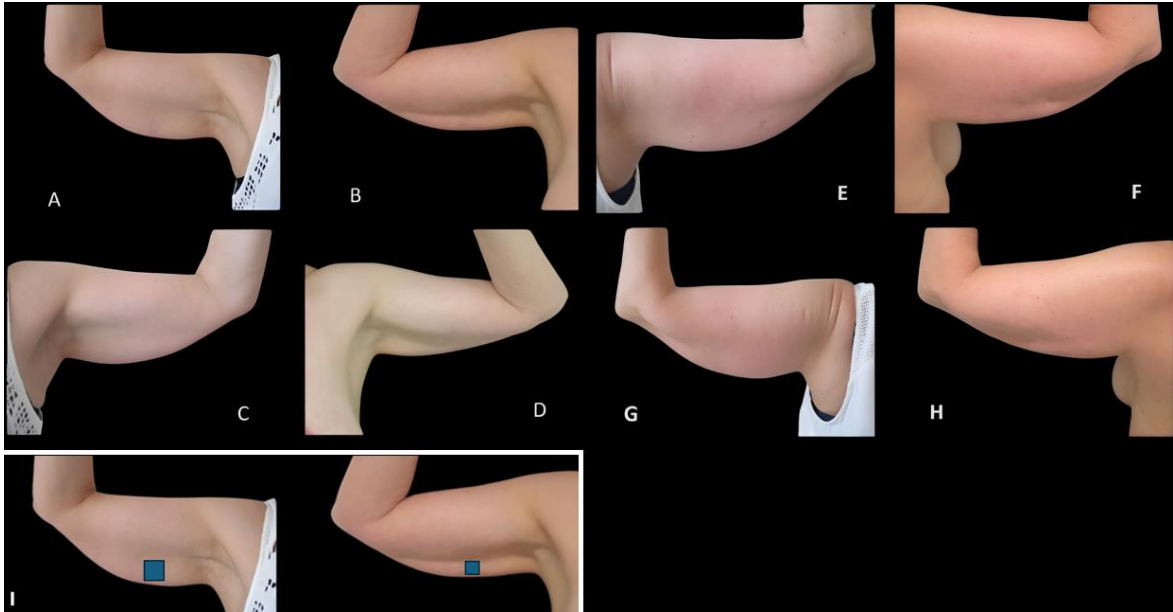
Vaser timing: 7 minutes continuous with 3,7 mm 2 rings probe at 70% power.

Fat removed from each side: 250 ml.

Post op compression performed as protocol with no extra pads.

Results showed at 6 months post op (fig. 10).

Upper arm skin retraction was measured on the right arm, pre op and 6-months post op.



**Figure 10:** A: pre op front view of the right arm; B: post op front view of the right arm; C: pre op front view of the left arm; D: post op front view of the left arm; E: pre op posterior view of the right arm; F: post op posterior view of the right arm; G: pre op posterior view of the left arm; H: post op posterior view of the left arm; I: pre op and post op area where skin retraction was evaluated.

**CASE 2**

54 yo female patient, BMI 24, with loose skinny arms.

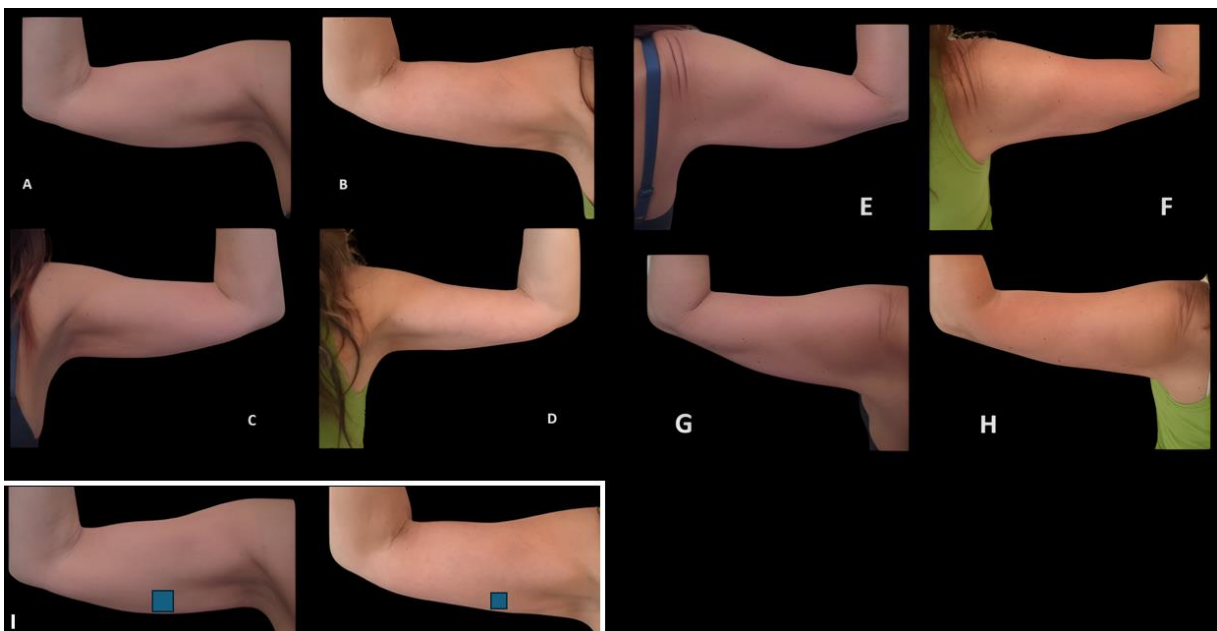
Vaser timing: 6 minutes continuous with 3,7 mm 2 rings probe at 70% power.

Fat removed from each side: 160 ml.

Post op compression performed as protocol with no extra pads.

Results showed at 6 months post op (fig. 11).

Upper arm skin retraction was measured on the right arm, pre op and 6-months post op.



**Figure 11:** A: pre op front view of the right arm; B: post op front view of the right arm; C: pre op front view of the left arm; D: post op front view of the left arm; E: pre op posterior view of the right arm; F: post op posterior view of the right arm; G: pre op posterior view of the left arm; H: post op posterior view of the left arm; I: pre op and post op area where skin retraction was evaluated.

### CASE 3

50 yo female patient, BMI 28, with lypodistrophy of abdomen, trunk and flanks.

Areas of treatment: abdomen, trunk and flank.

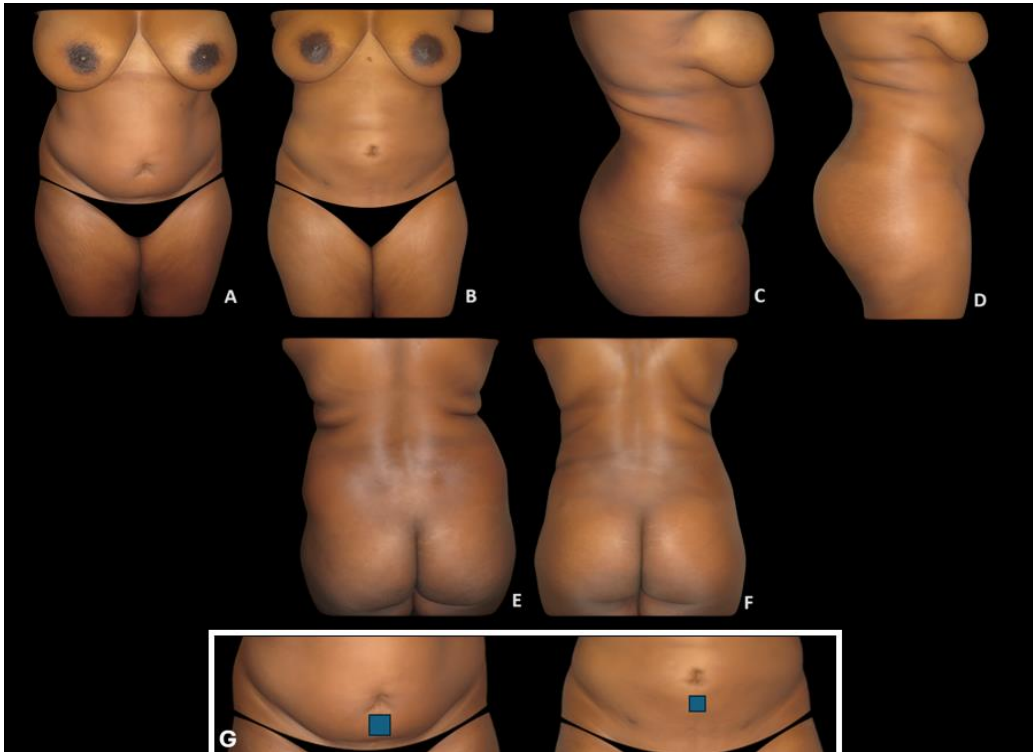
Vaser timing: 26 minutes with 3,7 mm probe with 2 rings.

Total fat extraction: 3200 ml.

Extra-compression with foam pads for 4 weeks to enhance skin retraction.

Results showed at 6 months post op (fig. 12).

In this case, skin retraction was measured in the lower abdomen, pre op and 6-months post op.



**Figure 12:** A: pre op front view; B: post op front view; C: pre op lateral view; D: post op lateral view; E: pre op back view; F: post op back view; G: pre op and post op area where skin retraction was evaluated.

### CASE 4

54 yo female patient, BMI 29, with lypodistrophy of abdomen with sovrapubic plication., flanks and torso.

Areas of treatment: abdomen, flanks and torso.

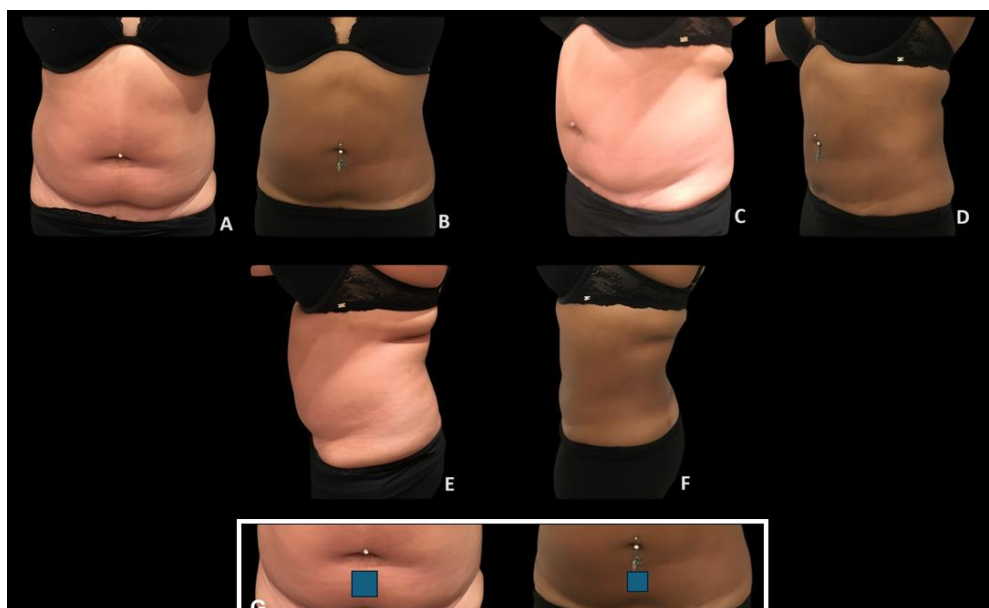
Vaser timing: 27 minutes with 3,7 mm probe with 2 rings.

Total fat extraction: 2700 ml.

Extra-compression with foam pads for 4 weeks to enhance skin retraction.

Results showed at 6 months post op (fig. 13).

In this case, skin retraction was measured in the lower abdomen, pre op and 6-months post op.



**Figure 13:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op lateral view; F: post op lateral view; G: pre op and post op area where skin retraction was evaluated.

CASE 5

55 yo female patient, BMI 26, with lypodistrophy of abdomen and flanks.

Areas of treatment: upper and lower abdomen and flanks (note skin flaccidity).

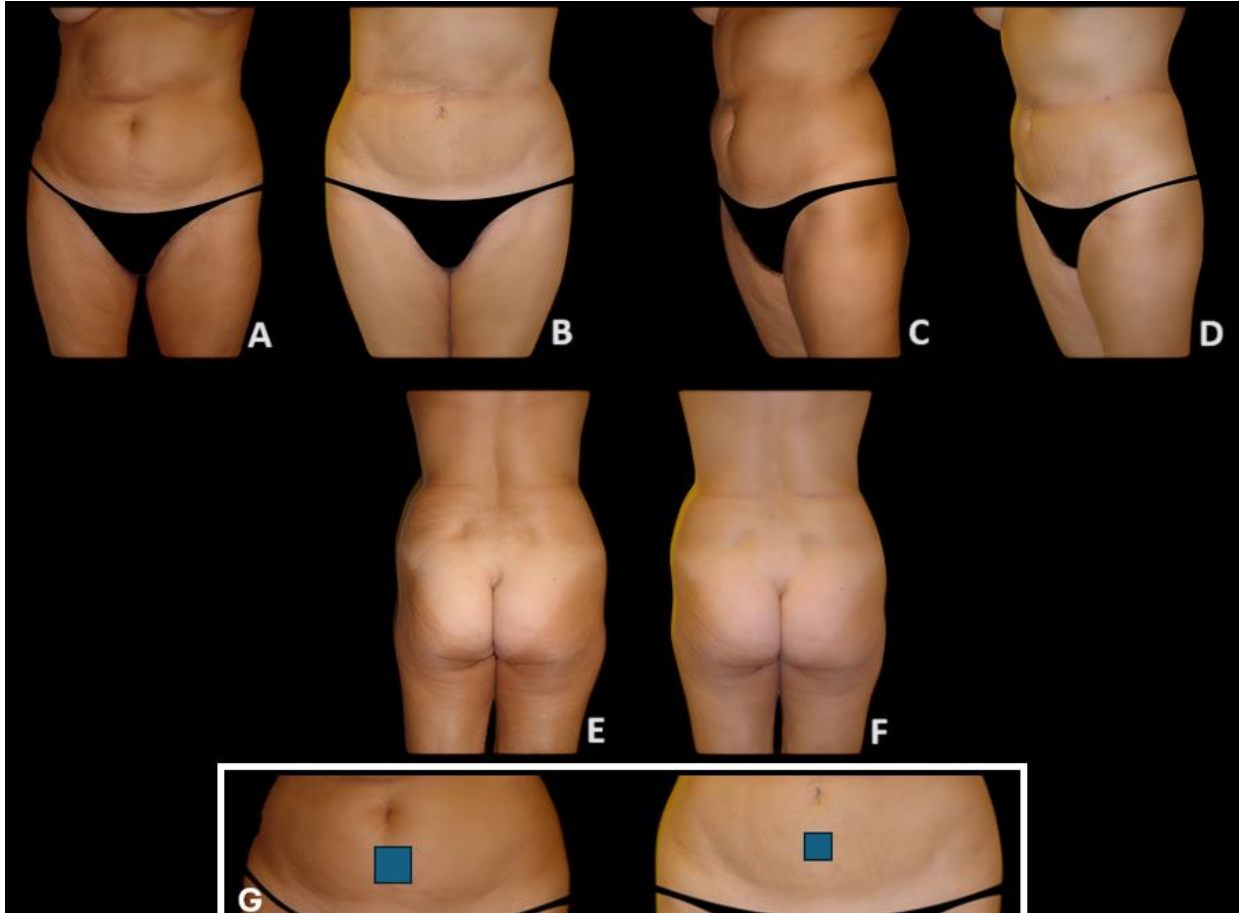
Vaser timing: 16 minutes with 3,7mm probe with 2 rings.

Total fat extraction: 1400 ml.

Extra-compression with foam pads for 4 weeks to enhance skin retraction.

Results showed at 6 months post op (fig. 14).

In this case, skin retraction was measured in the lower abdomen, pre op and 6-months post op.



**Figure 14:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op back view; F: post op back view; G: pre op and post op area where skin retraction was evaluated.



## CASE 6

63 yo female patient, BMI 28, with fat abdomen and hanging apron, back rolls and loose skin in posterior flanks and dorso.

Areas of treatment: upper and lower abdomen, lateral flanks and torso.

Vaser timing: 45 minutes with 3,7 mm and 2,9 mm probe with 2 rings.

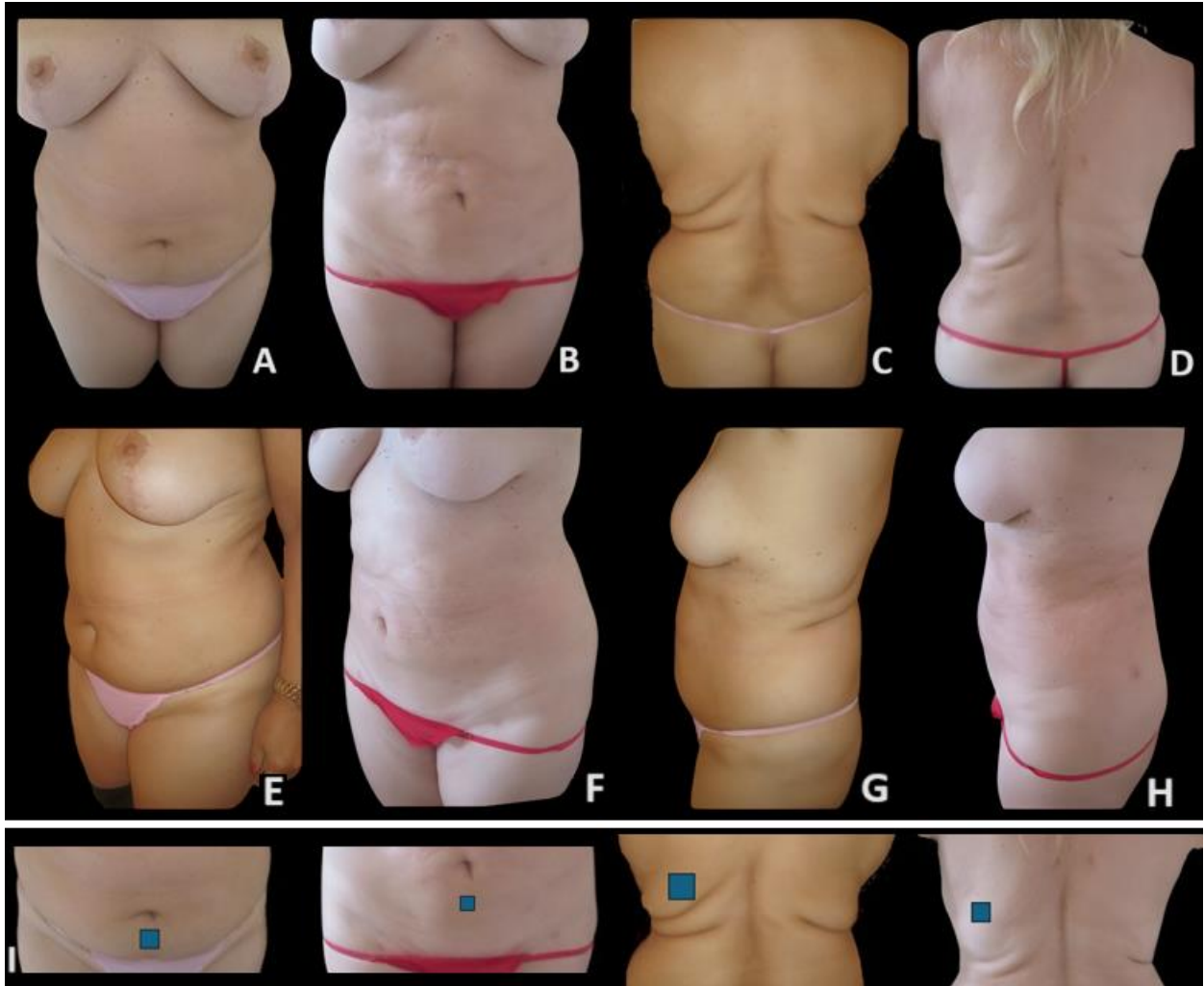
Total fat extraction: 2800 ml.

Extra-compression with foam pads for 4 weeks to enhance skin retraction.

Results showed at 6 months post op (fig. 15).

Note loose redundant skin redraping in post op results with sole VaserLipo.

In this case, skin retraction was measured in the lower abdomen and in the back, pre op and 6-months post op.



**Figure 15:** A: pre op front view; B: post op front view; C: pre op posterior view; D: post op posterior view; E: pre op oblique view; F: post op oblique view; G: pre op lateral view; H: post op lateral view; I: pre op and post op area where skin retraction was evaluated.

**CASE 7**

67 yo female patient, BMI 28, with fat abdomen and hanging apron, back rolls and loose skin in posterior flanks and dorso.

Areas of treatment: superior and inferior abdomen and lateral and posterior flanks. Vaser timing: 30 minutes with 3,7 mm and 2,9 mm probe with 2 rings.

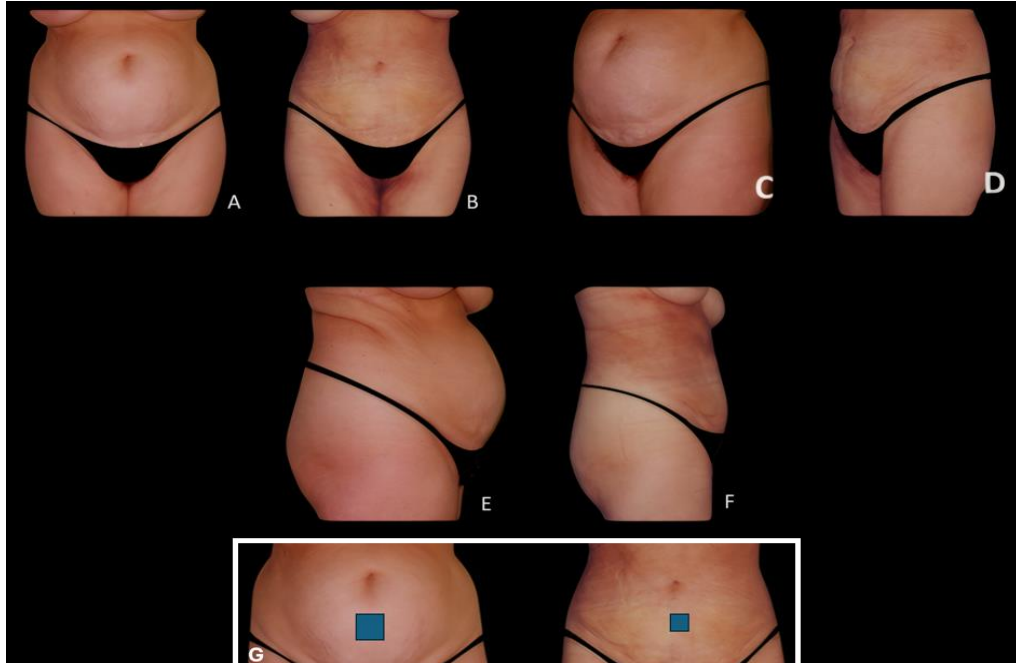
Total fat extraction: 2200ml.

Extra-compression with foam pads for 4 weeks to enhance skin retraction.

Results showed at 6 months post op (fig. 16).

Note excellent skin retraction and contouring with sole VaserLipo.

In this case, skin retraction was measured in the lower abdomen, pre op and 6-months post op.



**Figure 16:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op lateral view; F: post op lateral view; G: pre op and post op area where skin retraction was evaluated.

**CASE 8**

75 yo female patient, BMI 25, with hanging skin at the axillary tail.

Vaser liposuction was performed under local anesthesia and sedation.

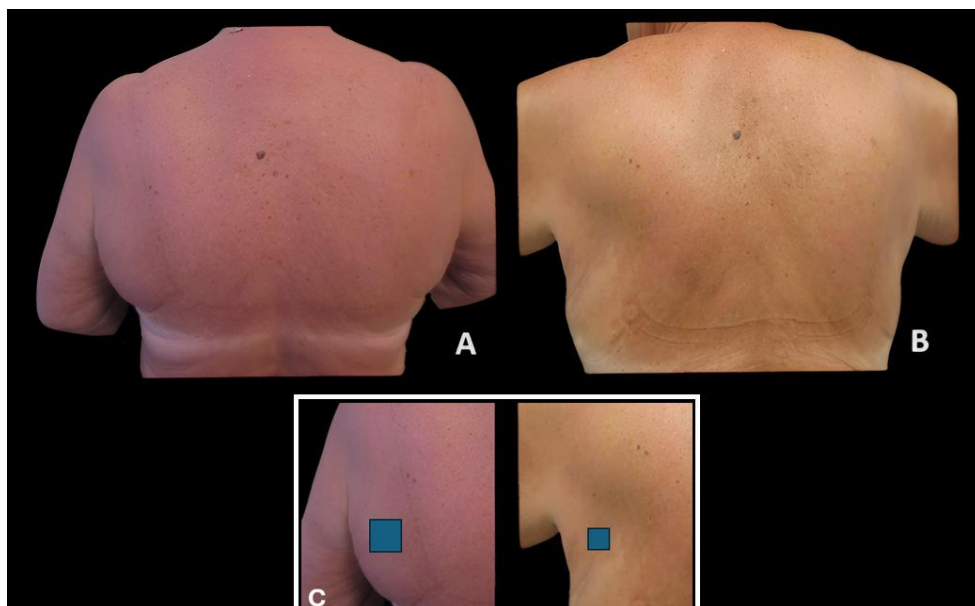
Vaser timing: 7 minutes with 2,9 mm probe with 2 rings.

Total fat apirated: 100ml.

Extra-compression with foam pads for 4 weeks.

Results showed at 6 months post op (fig. 17).

In this cas,e skin retraction was measured in the lateral side of the axillary tail, pre op and 6-months post op.



**Figure 17:** A: pre op posterior view; B: post op posterior view; C: pre op and post op area where skin retraction was evaluated.

CASE 9

65 yo female patient, BMI 28, with severe back rolls with loose skin associated.

Areas of treatment: posterior trunk and flanks.

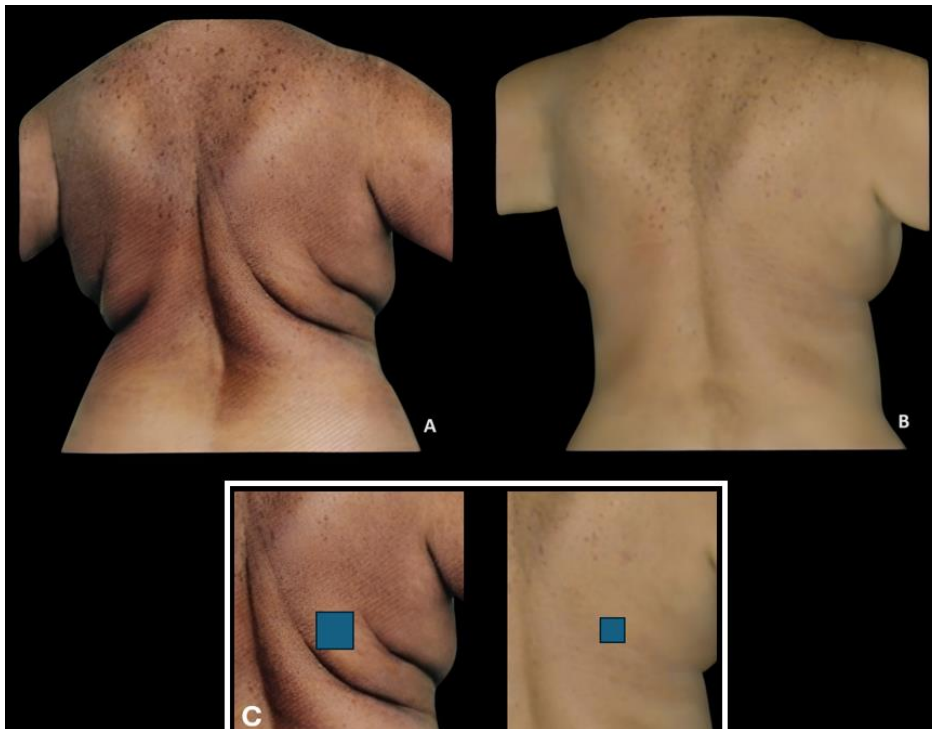
Vaser timing: 20 minutes with 2,9 mm probe with 2 rings.

Total fat aspirated: 1800 ml.

Extra-compression with foam pads.

Results showed at 6 months post op (fig.18).

In this case, skin retraction was measured in the back, pre op and 6-months post op.



**Figure 18:** A: pre op posterior view; B: post op posterior view; C: pre op and post op area where skin retraction was evaluated.

CASE 10

52 yo female patient, BMI 26, with fat excess, loose skin and lack of contouring

Areas of treatment: abdomen, posterior flanks, trochanter, inner and anterior thighs.

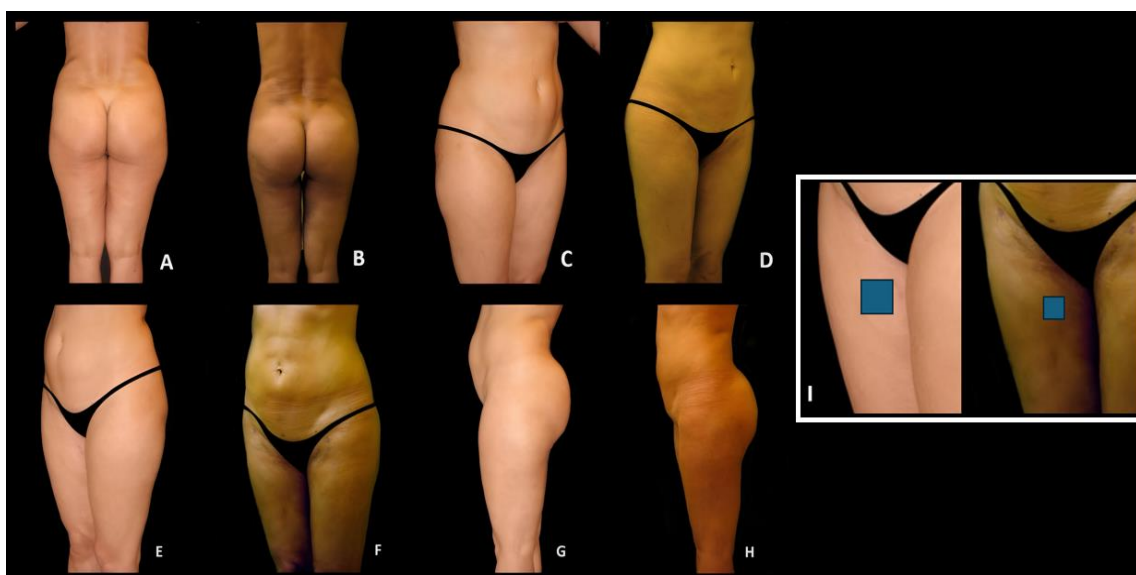
Vaser timing: 32 minutes with 2,9 mm probe with 2 rings.

Total fat aspirated: 2800 ml aspirated.

Extra-compression with foam pads.

Results showed at 6 months post op (fig. 19).

In this case, skin retraction was measured in the inner part of the thigh, pre op and 6-months post op.



**Figure 19:** A: pre op posterior view; B: post op posterior view; C: pre op right oblique view; D: post op right oblique view; E: pre op left oblique view; F: post op left oblique view; G: pre op lateral view; H: post op lateral view; I: pre op and post op area where skin retraction was evaluated.



CASE 11

56 yo female patients, BMI 26, with fat excess, loose skin and lack of contouring. Areas of treatment: abdomen, posterior flanks, trocanter, inner and anterior thighs.

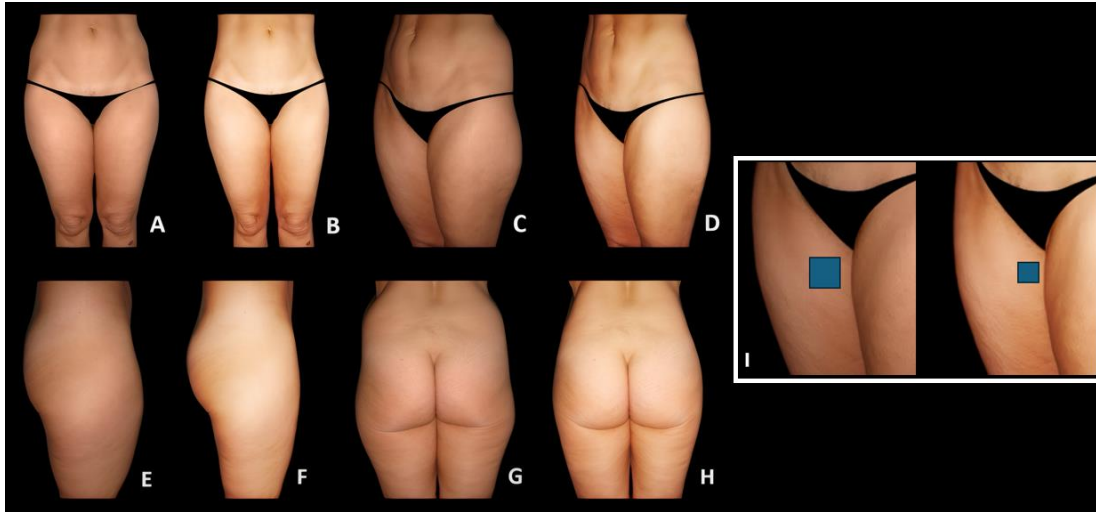
Vaser timing: 32 minutes with 2,9 mm probe with 2 rings.

Total fat aspirated: 3000 ml aspirated.

Extra-compression with foam pads.

Results showed at 6 months post op (fig. 20).

In this case, skin retraction was measured in the inner part of the thigh, pre op and 6-months post op.



**Figure 20:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op lateral view; F: post op lateral view; G: pre op posterior view; H: post op posterior view; I: pre op and post op area where skin retraction was evaluated.

CASE 12

67 yo female patient, BMI 28; post bariatric patient which had abdominoplasty elsewhere, which presents loose skin and back rolls at lateral flanks, flaccidity and poor flat buttocks.

Areas of treatment: torso, posterior and lateral flanks and buttocks

Vaser timing: 35 minutes with 3,7 mm probe with 2 rings

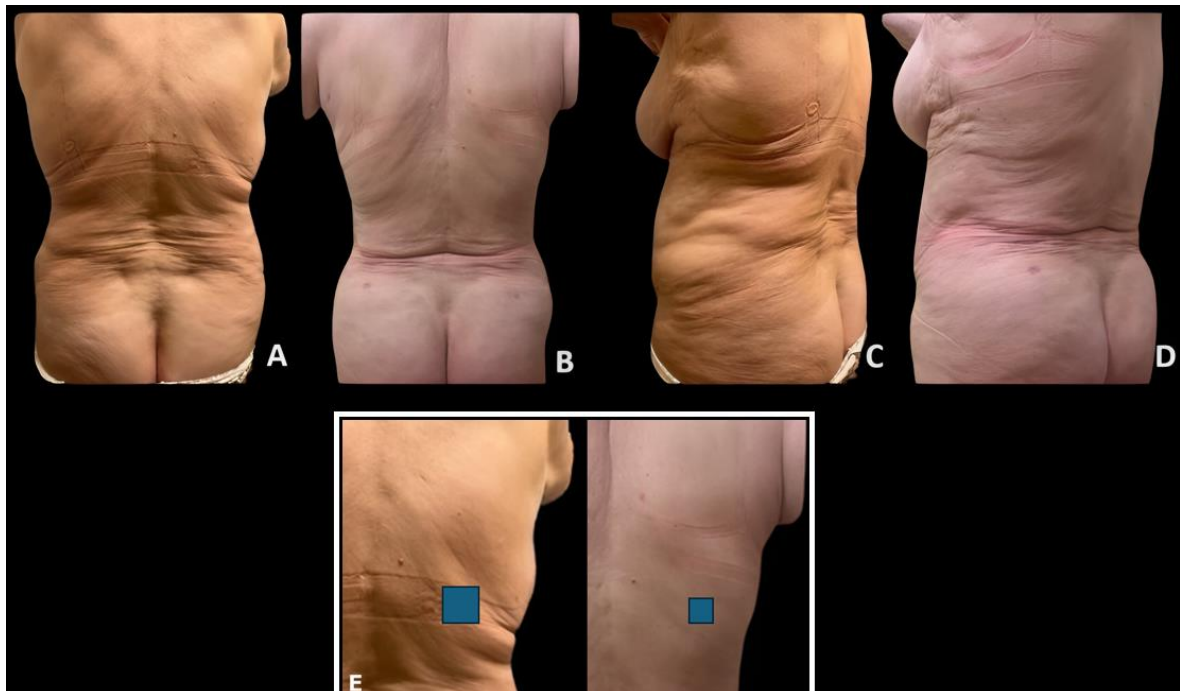
Total fat aspirated: 3800 ml

Total fat infiltrated to fill buttocks: 1200 ml.

Extra-compression with foam pads.

Results showed at 6 months post op (fig. 21).

In this case, skin retraction was measured in the back, pre op and 6-months post op.



**Figure 21:** A: pre op posterior view; B: post op posterior view; C: pre op lateral view; D: post op lateral view; E: pre op and post op area where skin retraction was evaluated.

CASE 13

50 yo female patient, BMI 29, with fat excess, hanging apron and poor contouring.

Areas of treatment: abdomen, flanks and torso.

Vaser timing: 52 minutes with 3,7 mm probe with 2 rings.

Total fat aspirated: 3500 ml.

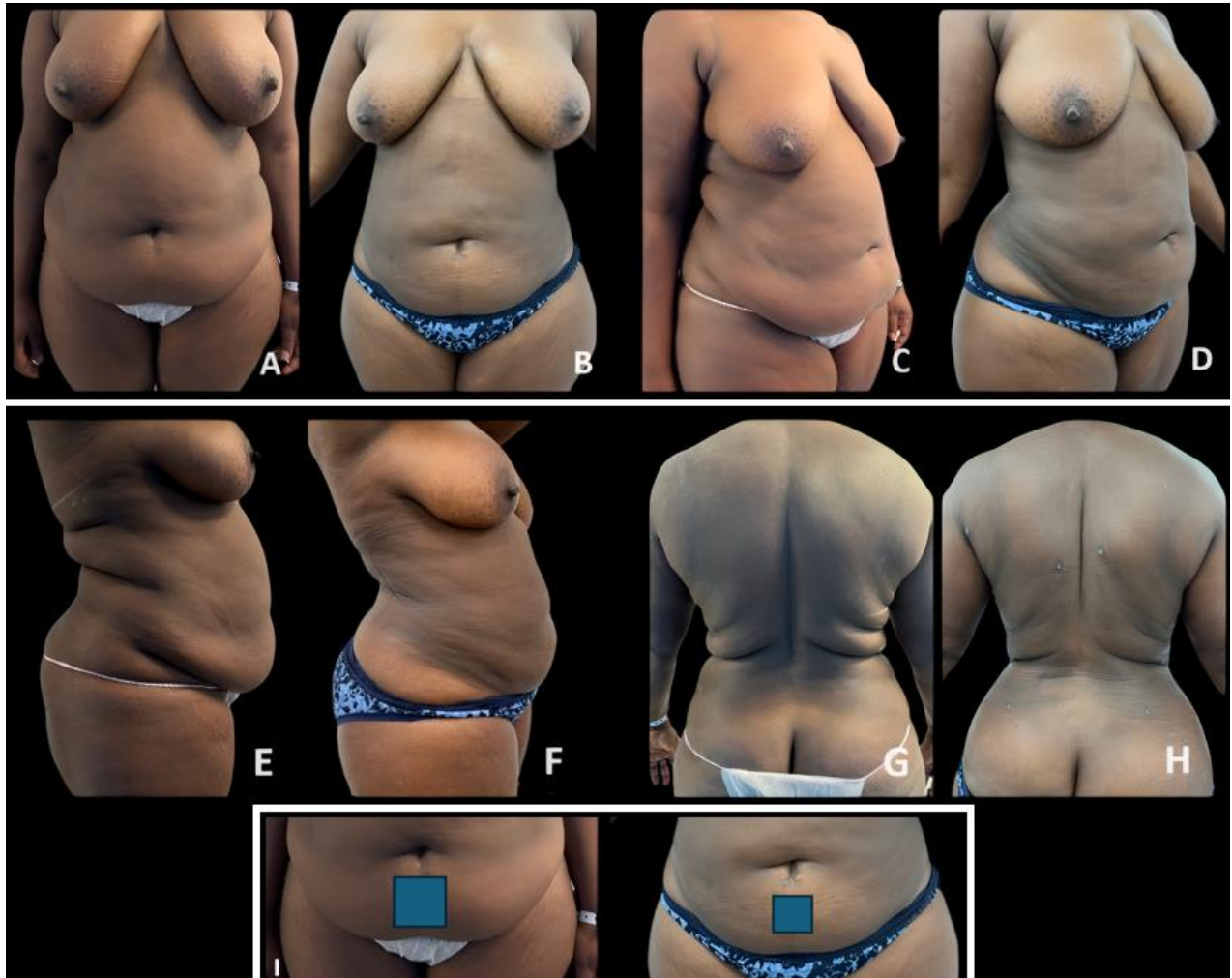
Extra-compression with foam pads.

Results showed at 6 months post op (fig. 22).

In this case, skin retraction was measured in the lower abdomen, pre op and 6-months post op.

Note skin retraction on the hanging apron.

This patient would have probably been a candidate for a full abdominoplasty for the majority of plastic surgeons.



**Figure 22:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op lateral view; F: post op lateral view; G: pre op posterior view; H: post op posterior view; I: pre op and post op area where skin retraction was evaluated.

CASE 14

60 yo female patient, BMI 27, who previously underwent an abdominoplasty, was complaining for skin irregularities, lack of contouring and saggy skin on the upper-lateral trunk.

Areas of treatment: abdomen, lateral and posterior flanks and inner thighs.

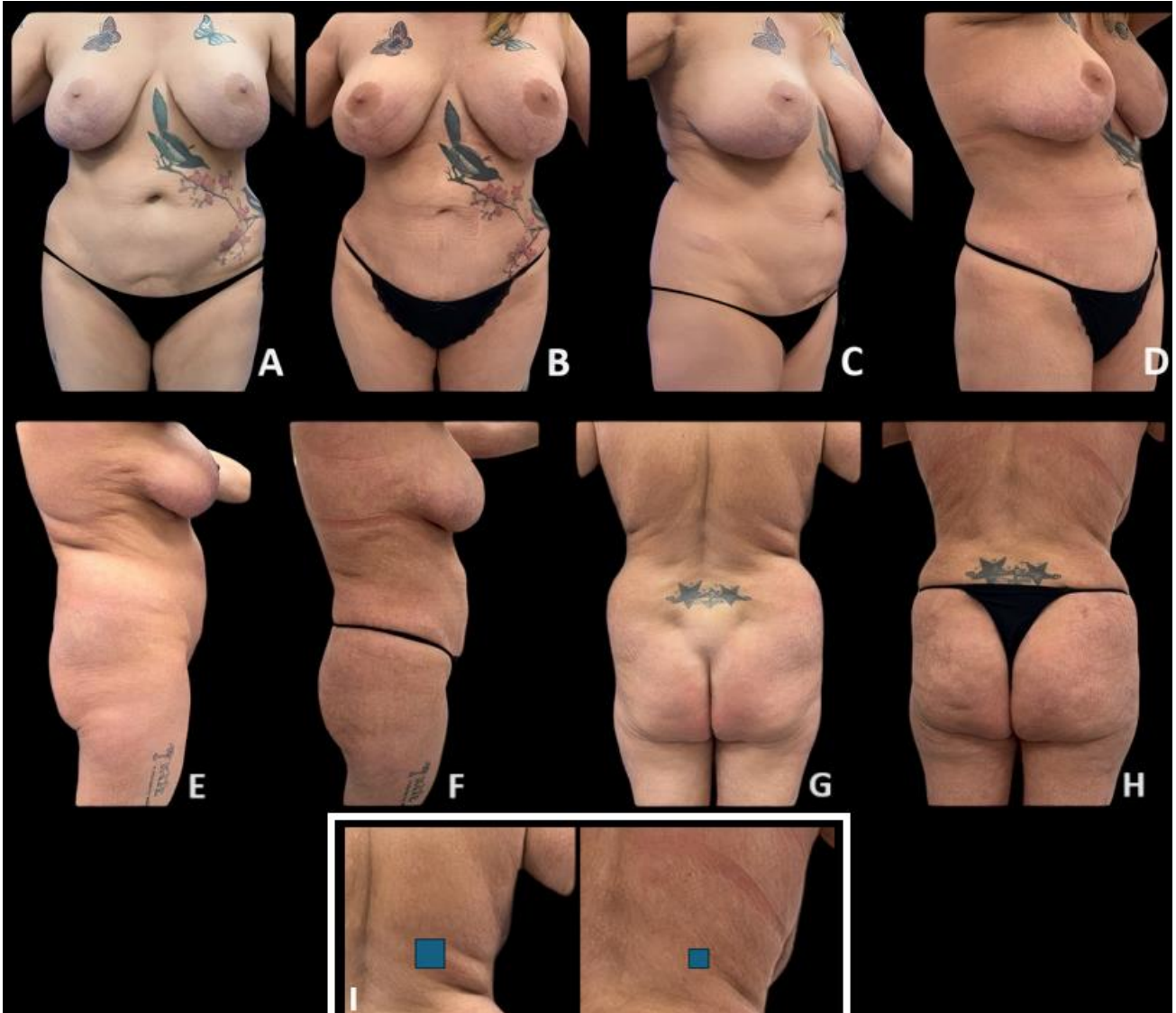
Vaser timing: 35 minutes with 2,9 mm probe with 2 rings

Total fat aspirated: 2000 ml.

Extra-compression with foam pads.

Results showed at 6 months post op (fig. 23).

In this case, skin retraction was measured in the back, pre op and 6-months post op.



**Figure 23:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op lateral view; F: post op lateral view; G: pre op posterior view; H: post op posterior view; I: pre op and post op area where skin retraction was evaluated.



CASE 15

62 yo female patient, BMI 24, who underwent previously an abdominoplasty, was complaining for skin irregularities, lack of contouring and saggy skin on the lateral trunk and poor buttocks contouring.

Areas of treatment: abdomen, lateral flanks, posterior trunk and inner thighs.

Vaser timing: 30 minutes with 2,9 mm probe with 2 rings

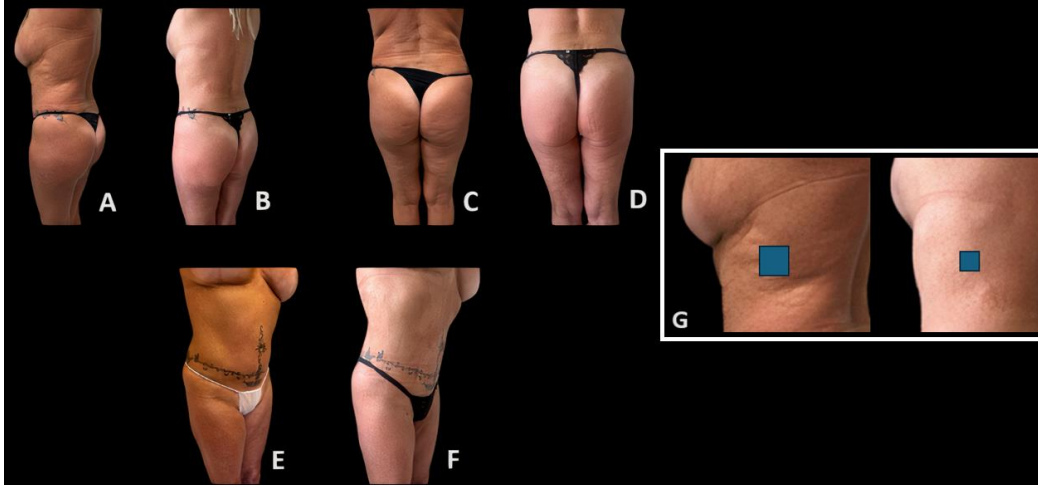
Total fat aspirated: 2000 ml.

Total fat infiltrated to fill buttocks: 300 ml for each side.

Extra-compression with foam pads to enhance lateral skin contraction.

Results showed at 6 months post op (fig. 24).

In this case, skin retraction was measured in the lateral flank, pre op and 6-months post op.



**Figure 24:** A: pre op left lateral view; B: post op left lateral view; C: pre op posterior view; D: post op posterior view; E: pre op right lateral view; F: post op right lateral view; G: pre op and post op area where skin retraction was evaluated.

CASE 16

50 yo female patient, BMI 29, with lipodystrophy of the abdomen with hanging bulge.

Areas of treatment: upper and lower abdomen, flanks, and trunk.

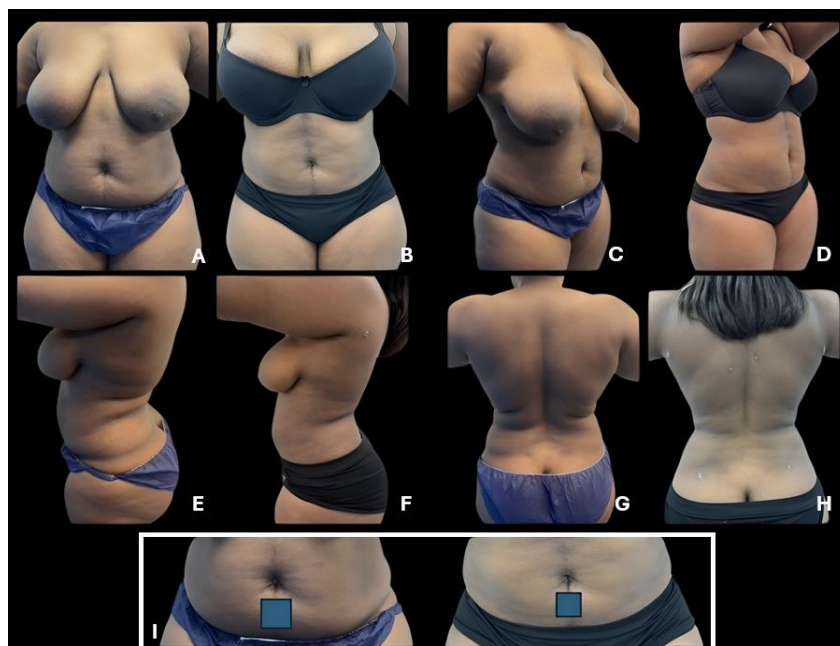
Vaser timing: 30 minutes with 2,9 mm probe with 2 rings.

Total of 3500 ml aspirate.

Extra-compression with foam pads.

Results showed at 6 months post op (fig. 25).

In this case, skin retraction was measured in the lower abdomen, pre op and 6-months post op.



**Figure 25:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op lateral view; F: post op lateral view; G: pre op posterior view; H: post op posterior view; I: pre op and post op area where skin retraction was evaluated.

CASE 17

62 yo male patient, BMI 26, complaining for poor laxity and minor fat tissue at abdomen, flanks and chest.

Areas of treatment: abdomen, flanks and chest.

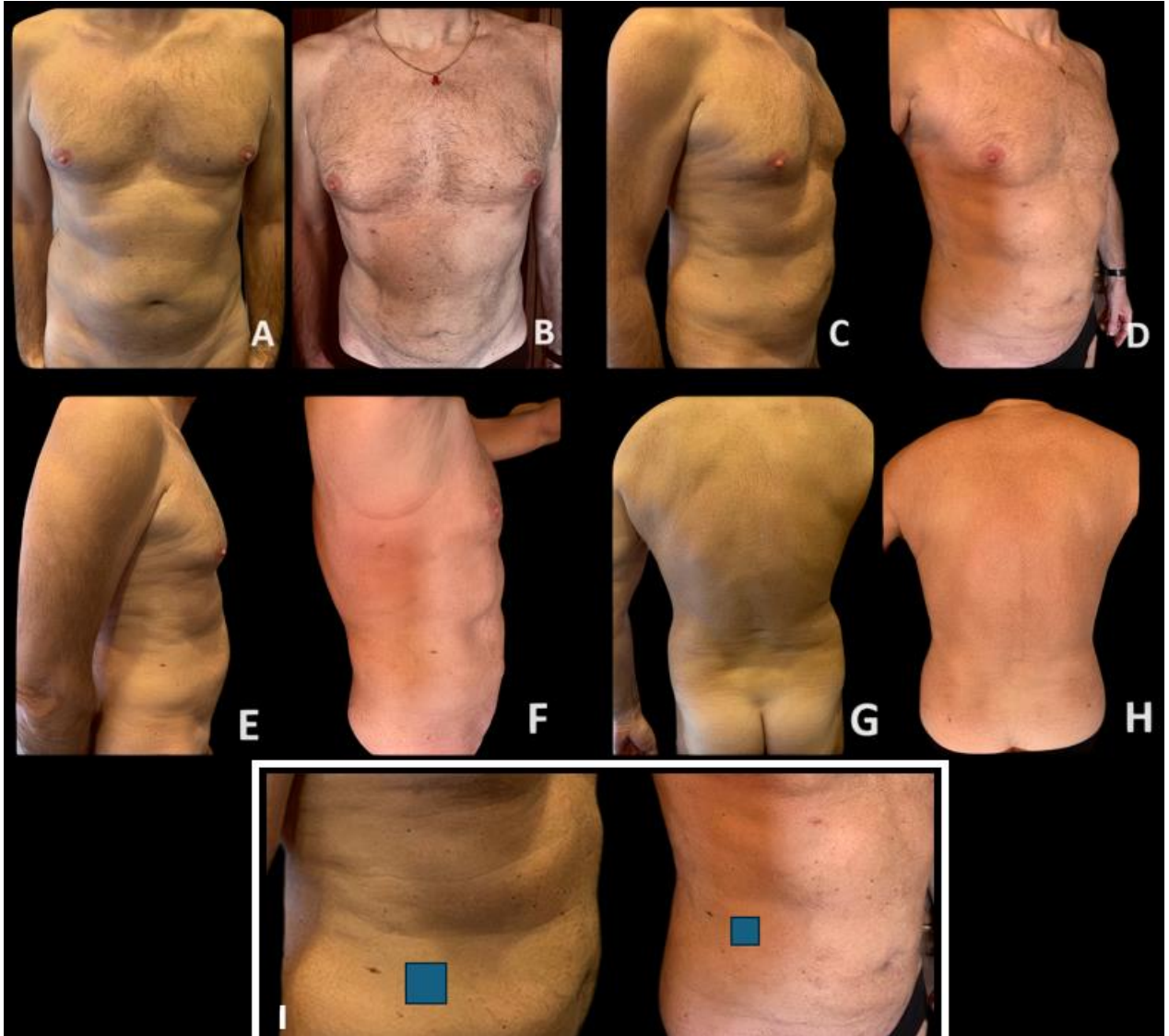
Vaser timing: 25 minutes with 3,7 mm probe with 2 rings.

Total fat aspirated: 2000 ml.

Extra-compression with foam pads.

Results showed at 6 months post op (fig. 26).

In this case, skin retraction was measured in the lateral flank, pre op and 6-months post op.



**Figure 26:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op lateral view; F: post op lateral view; G: pre op posterior view; H: post op posterior view; I: pre op and post op area where skin retraction was evaluated.

CASE 18

59 yo male patient, BMI 25, complaining for poor laxity and minor fat tissue at abdomen, flanks and chest and poor definition.

Areas of treatment: abdomen, flanks and chest

Vaser timing: 25 minutes with 3,7 mm probe with 2 rings.

Total fat aspirated: 2300 ml.

Extra-compression with foam pads.

Results showed at 6 months post op (fig. 27).

In this case, skin retraction was measured in the abdomen, pre op and 6-months post op.



**Figure 27:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op lateral view; F: post op lateral view; G: pre op and post op area where skin retraction was evaluated.



CASE 19

52 yo female patient, BMI 28, with abdominal bulge.

Areas of treatment: upper and lower abdomen and trunk.

Vaser timing: 36 minutes with 2,9 mm probe with 2 rings.

Total of 3800 ml aspirate.

Extra-compression with foam pads.

Results showed at 6 months post op (fig. 28).

In this case, skin retraction was measured in the lower abdomen, pre op and 6-months post op.



**Figure 28:** A: pre op front view; B: post op front view; C: pre op oblique view; D: post op oblique view; E: pre op lateral view; F: post op lateral view; G: pre op and post op area where skin retraction was evaluated.

CASE 20

51 yo female patient, BMI 26, who lost weight and presents skin laxity in the upper quadrants of the abdomen. There was no indication for a full abdominoplasty, minding the minor skin bulge of the lower quadrants.

Areas of treatment: upper and lower abdomen.

Vaser timing: 12 minutes with 2,9 mm probe with 2 rings.

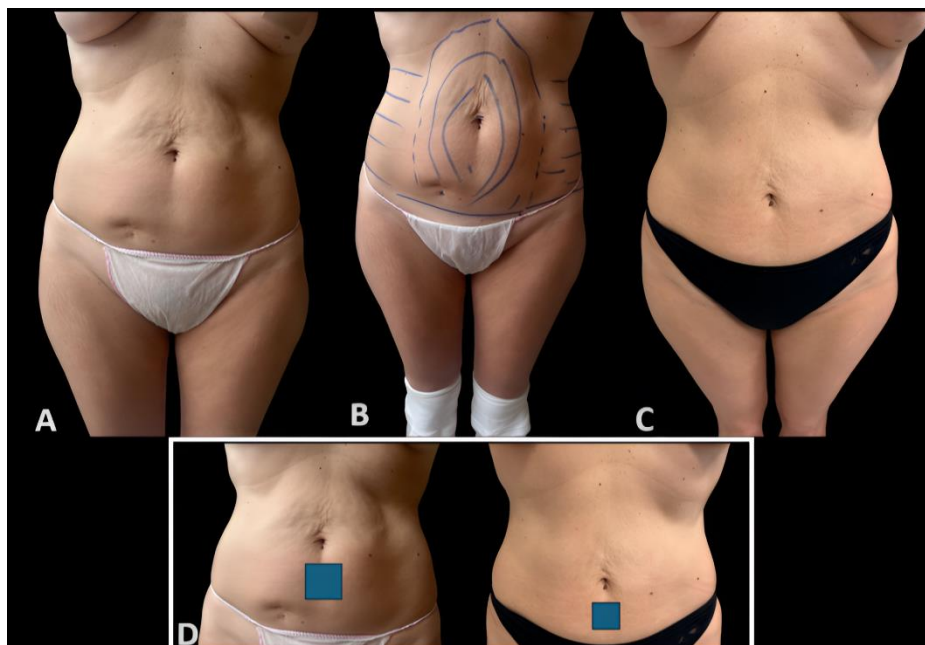
Total of 800 ml aspirate.

Extra-compression with foam pads.

Results showed at 6 months post op (fig. 29).

Note the skin retraction of the upper abdomen after sole VASER superficial liposuction.

In this case, skin retraction was measured in the lower abdomen, pre op and 6-months post op.



**Figure 29:** A: pre op front view; B: planning front view; C: post op front view; D: pre op and post op area where skin retraction was evaluated.

## COMPLICATIONS

The utilization of VAL or SAL with PAL accomplished with a plasma gas source is a new trend in body contouring procedures, since few years. Some surgeons have proposed the combination of those technologies together, in loose skin types, to promote skin retraction by stimulating collagen fibers contraction, by multiple passages with plasma gas (heat).

So far, no protocol has been published to safely accomplish those technologies, and complications have started to appear.

We saw, in our clinic, recently, two major complications following the utilization of VAL + PAL + plasma gas and, below, we present these two cases.

### First scenario of complications:

40 yo female patient with mild lipodistrophy of abdomen and flanks and initial apron. Patient refers around 2000 ml of aspiration after VAL + PAL + plasma gas.

No further data are available.

Please apologize quality of photos as own made by the patient (fig. 30).

Despite an initial satisfactory result, at 3 months post op there is an unpleasant asymmetry of the abdominal contouring, with an asymmetric skin retraction.

The lower abdomen looks as if the patient had an abdominoplasty, which is not the case. It looks like skin retraction worked in a different, asymmetric way, which is typical of technology which cannot be directed or controlled by the surgeon.

### Second scenario of complications:

44 yo female patient had liposuction and plasma gas 6 months ago. She refers that the surgeon did advice this combination technologies as the latest on the market.

She sent this pre op photo in bikini of previous summer. She probably did not need any liposuction. The post op photo shows the totally unacceptable and unpleasant result obtained (fig. 31).



**Figure 30:** A: pre op; B: 3 weeks post op; C: 2 months post op; D: 3 months post op.



**Figure 31:** A: pre op; B: 1 year post op.

## DISCUSSION AND CONCLUSION

The purpose of this trial, was to measure skin retraction achieved in adults, by using subdermal Vaser Liposuction, as sole technology [12] [13] [14].

The numbers obtained and the clinical results achieved, confirm that sole Vaser Ultrasound Liposuction can achieve excellent skin retraction, even in older patients. A single technology, if properly utilized, reduces risks and complications connected with improper utilization of combination of technologies.

## DISCLOSURE

The Authors have no conflict of interest.

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