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# Vaser Body Contouring Achieving a More Defined Shape

*Alberto Di Giuseppe, Federico Giovagnoli,  
Saverio Di Giuseppe and Diana Ronconi*

## Abstract

The art of body shaping has changed in the last decade, with the new philosophy of superficial sculpturing and fat removal and fat adding in combination. Vaser ultrasound device allows a superficial undermining of the skin all over the body; deeper fat removal allows precise contouring. Fat harvesting with new device allows harvesting and concentrating high-quality fat, which is added in zones to enhance curvature and balance of body shape.

**Keywords:** vaser liposuction, fat harvesting, fat transfer, superficial sculpturing

## 1. Introduction

The evolution of body shaping techniques in the last decades has affected new technologies as well as vaser ultrasound liposuction; new blunt and narrow cannulas, which replaced sharp, larger diameter ones; and wet and superwet infiltrations which have replaced aggressive dry liposuction. Moreover, the art of fat harvesting and fat transfer, combined with the new studies of stem cell and their capability of generating new tissues, has led to a more sophisticated way to intend the art of body contouring. The new vision has a more artistic impact on the tridimensional sculpture of body frame. Another fundamental issue has been the understanding of the skin retraction capabilities enhanced by new technologies and the importance of full understanding of the anatomy of body muscles to help define and shape the body.

## 2. Heading section

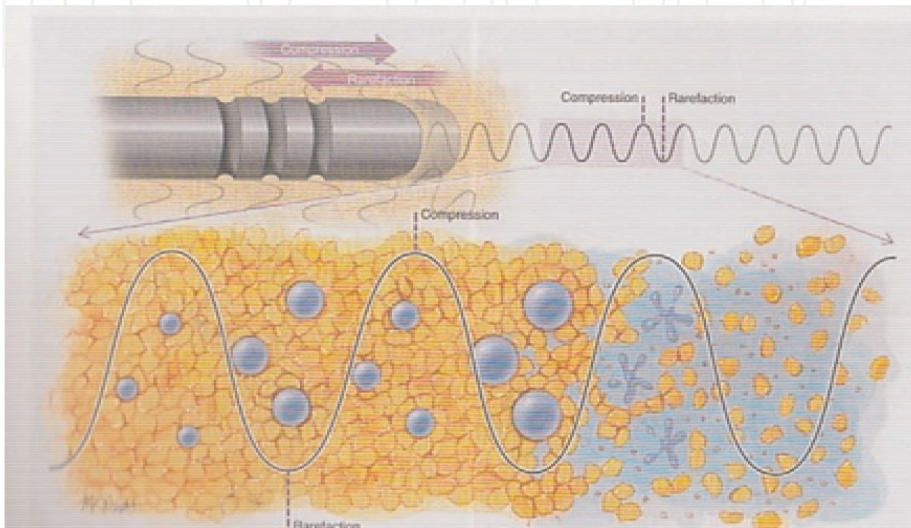
New technologies have entered the market in the last decade, as power-assisted technology, ultrasound technology, and laser technology, in order to facilitate fat removal, reduce trauma, and improve skin retraction. I have personally been one of the pioneers of ultrasound-assisted liposuction since they appeared in the early 2000s and contributed to the realization of the new vaser device, more advanced and safer than previous ultrasound-assisted devices in commerce 20 years ago. In vaser technology (**Figure 1**), vaser is an acronym of vibration amplification sound at resonance and is a third generation of ultrasound-assisted liposuction that uses ultrasound energy to melt fat tissue, ultrasound technology emulsifies the fat for removal in such a delicate way that preserves as much of the tissue of the matrix as possible while emulsifying the desired amount of fatty tissue. Special titanium

probes deliver the ultrasound energy to fat tissue, after proper infiltration with tumescent solution, allowing the selective destruction of only the fat tissue through three mechanisms: (1) cavitation, (2) mechanical, and (3) thermal.

In cavitation effect (**Figure 2**), the vaser probes vibrate at ultrasonic frequencies creating compressive and rarefactive forces around the grooved tip; cavitation microbubbles expand and then implode, releasing energy that disrupts the adipocyte architecture until an emulsion of fat and fluid is formed.



**Figure 1.**  
*Vaser system.*



**Figure 2.**  
*Cavitation.*

Mechanical disruption of fat occurs at the tip of the probe, where the vibrating metal surface comes in contact with the adipocytes. Cavitation and mechanical disruption of adipose tissue occur due to relative fragility of this tissue compared to other tissues such as vessels, muscle, and nerves. This is why this process is safe and effective, spares the connective and vascular network of the skin and subcutaneous tissue, allows a safe subcutaneous superficial undermining of the skin, and is thus a major skin retraction of tissue. The thinnest is the dermal tissue, the highest is the skin retraction, and liposuction is the term to define vaser smoothening of the fat. Careful emulsification, not an aggressive fat removal, is selective where needed in two different layers: subcutaneous for superficial definition and deep dermal for volume removal.

Minding the advantages of this technology, the plastic surgeon must be able to achieve superior results in terms of definition and shaping.

1. With superficial fattening and careful undermining, he can achieve a thin layer of skin flap, ideal for superior skin retraction.
2. Deeper fat removal can be done in a less traumatic mode, leaving less scar tissue, with less chances of seroma formation and induration and asymmetry.
3. Fat removal can be accomplished with fat preservation, harvesting, and preparation for further implant. Fat emulsified still contains the same amount of viable adipocytes as in standard liposuction, with same stem-derived cells that are vital to enhance fat survival rate when transferred to target areas (breast, thighs, buttocks, face, etc.).

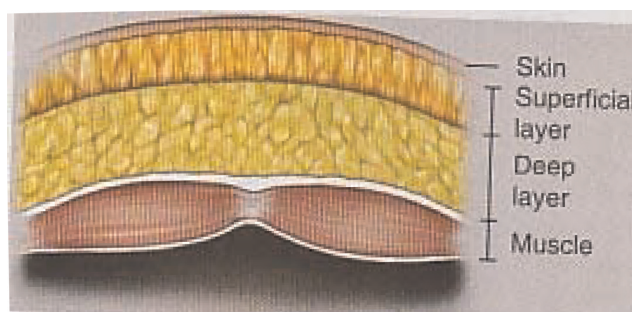
All those potential weapons must be utilized by surgeon to better define the body shape and achieve better contouring [1, 2].

### 3. Fat anatomy

The subcutaneous tissue is divided into three layers: a superficial adipose tissue layer, an intermediate membranous layer, and a deep adipose tissue.

The thickness and proportion of those layers vary throughout the body depending on the anatomic region: the abdominal has a prominent fascial plane, making it easier to distinguish between the two fatty layers.

In the leg, there is an attenuated fibrous membrane which separates from the muscle fascia. In the trunk, the adipose tissue is similar, as in gross appearance and density and structure (**Figure 3**).



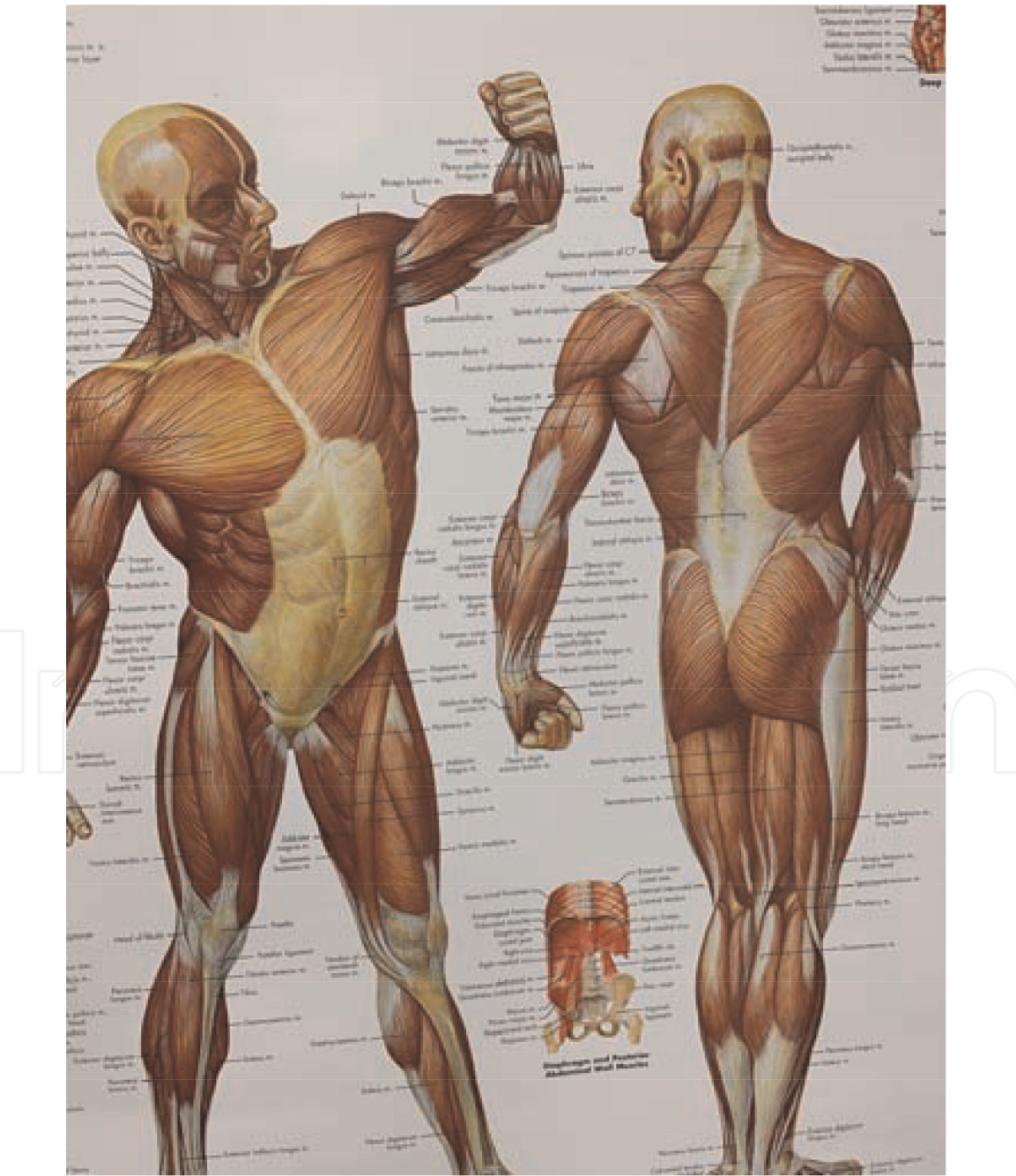
**Figure 3.**  
*Fat anatomy.*



In the thighs and gluteus, the subcutaneous fascia fuses with the gluteal crease and intergluteal fold [3].

**4. Surgeon ability in shaping**

The introduction of vaser allows efficient and safe emulsification of fat in superficial and deep layers while preserving vascular and neural structures. This is a new chisel in surgeon hands to sculpture the body as a work of the artist, working in all subcutaneous planes, by adding and subtracting fat with delicate instruments and refined techniques. The subdermal plane is no longer a taboo area; controlled deformities are desirable, and muscular definition is attainable through lipoplasty by revealing the underlying anatomy.



**Figure 4.**  
*Muscle anatomy.*

The full understanding of muscle anatomy is essential to try to recreate a muscle-shaped body and enhance definition and contouring (**Figure 4**).

The lines of body are described as natural curves which are defined by muscle, bone frame, and fat deposit. Posture is another component to assess the natural body appearance, and man and woman are different of course. Lipoplasty can address only subcutaneous tissue and is not a solution for abdominal protrusion secondary to muscle weakness or intraabdominal fat. This will require muscle exercise and diet to compensate. The achievement of symmetry and proportion is the goal of any body contouring procedure. The man of Vitruvio, designed by Leonardo da Vinci, remains the golden reference of human proportions. In the recent age, new trends in fashion have defined new more athletic figure, more toned, even in woman, answering to the so popular attended gym all over the world.

The surgeon view and sense of artistry are essential in planning a good shaped body. He must create in his mind a tridimensional view of the new body to shape: ideally must thin the subcutaneous tissues as much as to display and reveal the superficial musculature, removing fat and highlighting major muscle groups. The salient features of the muscular anatomy relevant to body contouring are outlined such as origin, insertion, orientation, form created, and relationship to adjacent muscle groups.

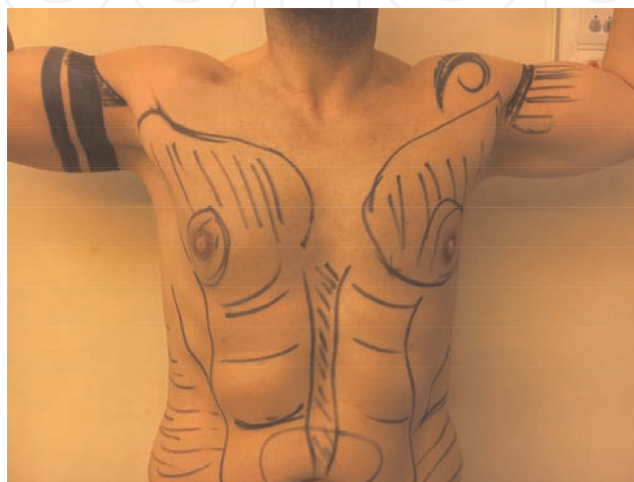
Main muscles involved are the rectus muscles, the oblique muscle, the pectoralis in the front appearance, the latissimus dorsi, the lumbaris, and the gluteus in the back.

The muscle edges and the intermuscular digitations must be outlined to better define an athletic abdomen, together with the linea alba and linea semilunaris recreation.

Lines of transition between muscles must be obtained with more suction in a superficial manner. The main concept is removing and revealing what is underneath in normal-weighted patient, while traditional liposuction focuses in removing fat in overweight patient. The sculpturing surgeon tries to reveal the underlying musculature and body anatomy; shaping is a combination of removal to reveal what is underneath and adding in areas of deficiency to give more curvature.

It is a mixture of light and shadow and depression and concavities to give the impression of more defined and toned body. In man, fullness is desirable in the upper pectoral region, deltoid, and biceps, and frequently, fat is grafted to augment the pectoralis and deltoids. In woman, the buttocks and breasts often require augmentation to improve fullness and increase curves.

An example of this high-definition surgery in man is given:



**Figure 5.**  
*Planning high-definition frontal view.*



**Figure 6.**  
*Planning of lateral side. Margin of the oblique muscle outlined, edge of latissimus muscle, the inguinal ligament, and in red the outer medium gluteus zone to be grafted with fat to increase roundness.*



**Figure 7.**  
*Preop appearance.*





**Figure 8.**  
*Postop appearance at 3 months.*



**Figure 9.**  
*Preop oblique view.*





**Figure 10.**  
*Postop oblique view.*



**Figure 11.**  
*Pregyluteal definition and torso contouring.*

32-year-old athletic body, looking for definition (**Figure 5**).  
The areas of biceps muscle are marked, the area of male gland reduction is circled, the area of superficial fattening of male breast is marked, and the area of fat transfer to pectoralis muscle to add volume is marked as well.



**Figure 12.**  
*Postgluteal definition and torso contouring.*

The linea alba is marked in the central abdomen; the outer margin of the rectus muscle and the interdigitations of the muscle area are marked as well.

The margin of the oblique muscles, the inguinal ligament to create a marked depression, and the extra fat surrounding the navel are circled, and finally, the lateral flanks are lined where fat needs to be removed (**Figure 6**) [3, 4].

Result of definition of an athletic young body is shown, after linea alba and linea semilunaris deepening and oblique muscle and inguinal ligament being enhanced.

Note the concavities and shadows created with false deformities to give more power and more density to muscle areas (**Figures 7–10**).

The gluteal region is approached in a distinct way: lateral flanks are reduced in an aggressive way; the inguinal ligament is enhanced and glutes' prominence reduced, while the outer medium gluteus muscle is filled to improve athletic definition (**Figures 11 and 12**).

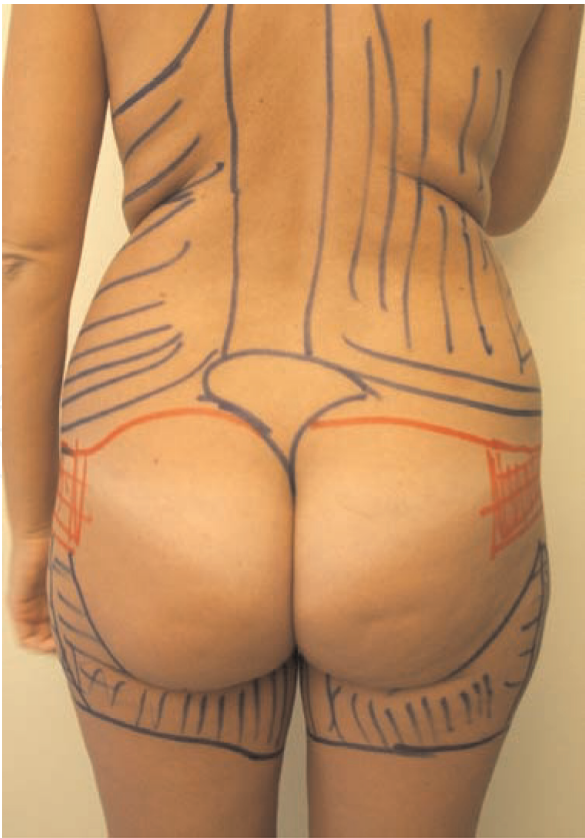
## 5. Woman contouring

Woman body is different from man body, in human form, bone shape, muscle density, and fat distribution. Hormones influence woman body through all life and are responsible for fat distribution changes and shape changes.

Maternity affects body volume and shape as well, with radical changes which need to be addressed in body contouring surgery.

Forty-five-year-old lady had two pregnancies and never regained young body appearance after first pregnancy from preop figure, flanks appear large, abdomen is fatty, and there are no lines, no curvature, and no definition in body shape.

The posterior trunk appears heavy, and back rolls are located in the middle of the trunk.



**Figure 13.**  
*Planning.*



**Figure 14.**  
*Planning.*



**Figure 15.**  
*Preop.*



**Figure 16.**  
*Postop.*





**Figure 17.**  
*Planning of fat removal.*



**Figure 18.**  
*Planning of buttocks fat grafting.*



**Figure 19.**  
*Preop.*



**Figure 20.**  
*Postop 3 months.*



**Figure 21.**  
*Pre- and immediate postop result after 1400 ml fat grafting buttocks.*



**Figure 22.**  
*Pre- and immediate postop result after 1400 ml fat grafting buttocks.*



**Figure 23.**  
*Pre- and immediate postop result after 1400 ml fat grafting buttocks.*



**Figure 24.**  
*Pre- and immediate postop result after 1400 ml fat grafting buttocks.*





**Figure 25.**  
*Pre- and immediate postop result after 1400 ml fat grafting buttocks.*

Vaser liposuction is planned, with definition of anterior rectus muscle, flattening, and contouring and reshaping back and creating more female lines (**Figures 13–16**).

About 4000 ml of fat is removed from anterior upper and lower abdomen, back and flanks, and inner thighs.

Buttocks area is one of the most requested by women nowadays. Reshaping means enhancing volume and giving more roundness and projection. Women are often lucky to have enough donor fat areas from abdomen, posterior trunk, and flanks.

This 28-year-old woman asked for body reshaping and buttock enhancement.

Vaser liposuction was performed, 4500 ml removed, and 1500 ml of fat harvested and then grafted to buttocks, outer and top buttock areas.

Results after 3 months are presented (**Figures 17–25**) [5].

## **6. Conclusion**

Body contouring surgery has changed deeply in the last decade—new technologies, more sophisticated technique—and has led to superior result in terms of definition. This is an art and must be considered in this way—plastic surgeon is a sculpturing boy and uses his chisel and talent to shape in a tridimensional space using fat removal and fat enhancement.

## **Conflict of interest**

The authors have no conflicts of interest to declare.

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## Author details

Alberto Di Giuseppe<sup>1,2,3\*</sup>, Federico Giovagnoli<sup>4</sup>, Saverio Di Giuseppe<sup>5</sup> and Diana Ronconi<sup>5</sup>

1 Department of Plastic Surgery, University of Padova, Italy

2 Private Practice, London, UK

3 Private Practice, Bologna, Italy

4 Liceo Galilei Ancona, Italy

5 Faculty of Medicine and Surgery, University of Rome, Italy

\*Address all correspondence to: [albertodigiuseppemd@gmail.com](mailto:albertodigiuseppemd@gmail.com)

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## References

- [1] Shiffman MA, Di Giuseppe A, editors. *Body Contouring*. DOI: 10.1007/978-3-642-02639-3
- [2] Rubin JP, Jewell ML, Richter DF, Uebel CO, editors. *Body Contouring and Liposuction*. DOI: 10.1007/978-1-4557-3796-3
- [3] Shiffman MA, Di Giuseppe A, Bassetto F, editors. *Stem Cells in Aesthetic Procedures*. DOI: 10.1007/978-3-642-45207-9
- [4] Shiffman MA, Di Giuseppe A, editors. *Liposuction*. 2nd ed. DOI: 10.1007/978-3-662-48903-1
- [5] Hoyos AE, Prendergast PM, editors. *High Definition Body Sculpting*. DOI: 10.1007/978-3-642-54891-8