

VASER® Lipoplasty

By Maurice P. Sherman, M.D.

Body contouring procedures date back to the late 1970s when Europeans such as Georgio Fisher and others described a selective localized fat removal procedure using suction canulas. Scuderi, in 1987, first reported using ultrasonic energy for lipoplasty. The first generation of ultrasonic devices was an SMEI device, which utilized 4-6mm solid probes. Lysonix, 1996, developed a second generation ultrasonic device which had a golf-tee shape at the end of a 5mm canula with a 2mm lumen for simultaneous aspiration. Finally, in 2002, a third generation ultrasonic device marketed by Sound Surgical Technologies, termed the VASER® System, became available and was marketed as LipoSelection®.

HISTORY OF THE ULTRASOUND METHOD

The early ultrasonic systems were less than optimal. The low

efficiency of the probes required high energy settings. The probes themselves were large diameter with sharp edges, and the hollow canulas had insufficient capability of aspirating the ultrasonic emulsified fat. Due to inefficient distribution of the ultrasonic energy, where most of the energy was directed at the tip along with imprecise infiltration of tumescent solution, a high rate of complications was reported in 8-14% of all procedures. These complications consisted of seroma formation, prolonged indurations, skin necrosis, hypopigmentation, prolonged swelling, and scarring from "end hits" producing burns and cellulitis. This figure contrasts markedly with a 2% overall complication rate with VASER lipoplasty, with elimination of skin

necrosis or scarring events. Revision rates in studies also seemed to be reduced by at least 50%.

ULTRASONIC EMULSIFICATION

The idea of ultrasonic emulsification of the fat revolves around the concept of avulsion versus emulsion. In traditional liposuction, surgical skill cannot overcome the potential issues associated with the tearing or avulsion of tissues seen

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with a suction canula. This traumatic avulsion technique is caused when the fat is introduced into the lumen of the canula, and then sheared off by

the movement of the canula back and forth.

This action produces non-selective tissue trauma, leading to unevenness of fat removal with inconsistent precision and potentially uneven results. This technique is associated with more painful recovery along with elongated recovery time. Physician position fatigue can limit cases, or

for fat. Nerves, blood vessels, and connective tissue remain relatively undisturbed, promoting smoothness of contouring with precise sculpturing and contouring finesse. Strain and fatigue on the surgeon during the removal process is significantly eased; and because of the reduction of tissue trauma, there is low to minimal pain development post-operatively.

The VASER (which stands for Vibration Amplification of Sound Energy at Resonance) features small diameter, solid probes which require only a 4mm incision

for access.

There is a pulsed and continuous ultrasonic mode which is varied according to the type of tissue treated. The pulse mode lowers the amount of energy delivered to the

target, while maintaining efficiency of emulsification. The VASER platform includes a precision fluid management system, which integrates infusion and suction, and permits accurate measurement of tumescent infiltration by plus or minus 1cc.

VASER TREATMENT

After marking the patient in the traditional manner and standard prepping and draping, a wetting infusion consisting of a standard tumescent Klein's solution is infused at a ratio of 1.5 - 2cc per every expected cc of fat removal. The infusion serves as thermal protection, as well as a medium for delivery of the ultrasonic energy and aids in formation of the emulsion. A 10- to 20-minute wait before ultrasonic application ensures a dry field with almost total absence of blood in the aspirate. VASER probes are inserted

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limit time spent on each case; and with more tissue trauma, there is an inability to control finesse of the fat removal. This contrasts with emulsion seen with delivery of ultrasonic energy, which is tissue selected





Before (Left) and After Abdomen Treatment (Right).
Photos Courtesy Maurice P. Sherman, M.D.

through the skin ports which are either screwed or sutured to the inside of the incised access sites.

The proprietary side grooved design of the solid probes redistributes the ultrasonic energy from the tip to the sides and disburses the energy in a more efficient manner. Hence, there is a 50% less energy requirement compared to previous systems. The canulas are blunt and passed through tissues easily with less trauma. For body work, 3.7mm diameter probes are used, and the probes come with 1, 2, and 3 rings at the distal tip. The 3-ring probe produces more disbursement of the ultrasonic energy away from the tip, and the 1-ring probe produces more concentration of the ultrasonic energy at the tip. These variations produce probes that can be altered specifically for the amount of fibrous nature of the treated areas. Additionally, a 3-ring,

2.9mm probe is available for very fibrous tissue seen in male patients or in revision cases. The 2.2mm probes are also available for more precise use in delicate areas such as the neck and face.

Several minutes into the application of the ultrasonic energy, a creamy fat emulsification will be seen exiting the insertion ports. Generally, the VASER usage is confined to 1 to 1.5 minutes of usage per every 100cc of tumescent solution infiltrated into a given area. Emulsification is followed by aspiration using a proprietary Vent X™ Canula. The canula comes in multiple diameter sizes and is of a non-aggressive design with a blunt tip. The handle is vented to provide continuous uninterrupted suction without suction surges which may

harm non-fatty tissues. The vents also prevent clogging of the canula and tubing.

The emulsified fat is collected in containers, with the aspirated fat showing a significant reduction in blood staining compared to traditional techniques. Foam padding is then applied to the treated areas, in addition to an elastic compression garment that is placed on the patient. Post-operative instructions include immediate ambulation with full activity beginning in 7-10 days. We remove the foam padding after three days but instruct our patients to wear compression garments for four weeks. We also highly suggest use of Endermologie Massage Therapy starting three weeks after the surgery, and consisting of eight to ten weekly sessions.

ADVANTAGES OF THE VASER TREATMENT

By altering the probes, amount of energy utilized, and the continuous VASER versus pulsed modes, any

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areas of fat collection throughout the body can be treated. The main VASER advantages include ease of fat aspiration, more precise aspiration

and body contouring, easier recovery secondary to minimal production of pain, discomfort, and bruising. Perhaps the most significant advantage in my practice is the ability to produce skin contraction/retraction with use of more superficial application of the ultrasonic energy, which can enable us to utilize the VASER System in place of surgical resection of excess skin in many situations.

BREAST REDUCTION TECHNIQUE

The use of VASER in breast

reduction techniques provides for a definitive noticeable amount of skin contraction compared to traditional liposuction. This quality is especially desirable in breast liposuction for reduction. This characteristic also permits simultaneous treatment of the axillary breast roll seen in many patients. VASER breast reduction is also seen in mastopexy patients permitting reduction of the breast mass with minimal bleeding, and maintenance of the vascular network of the breast tissue, leading to reduced incidence of skin necrosis

or wound breakdown. Excellent post-operative nipple sensation has been reported in my patient experience.

FACE AND NECK TREATMENTS

In the face and neck, the use of the small diameter 2.2mm probes combined with the VASER mode for pulsed application of the ultrasonic energy allows for the surgeon to work very close to the dermis in thin subcutaneous fatty areas such as the neck. Safe contraction of this tissue is promoted since greater than 50% reduction of applied ultrasonic power is used compared to previous ultrasonic devices. The emulsification also provides the ability to avoid over aggressive use of the suction canula.

UPPER ARM TREATMENT

In the upper arms, this contraction quality permits VASER liposuction in both the deep and superficial levels to reduce bulk, stimulate skin contraction, and potentially avoid the need for brachioplasty. In the lateral back, the surgeon is presented with the challenge of typically fibrous fat with difficult passage of the standard liposuction canula.

Because of the ability to switch probes to match tough fibrous tissue type, efficient treatment of both excess fat and redundant skin can be performed, leading to excellent contour shaping without skin resection. For similar reasons, the abdomen also responds favorably to these qualities and may permit the surgeon to avoid a horizontal



Before (Left) and After Abdominoplasty Treatment (Right).
Photos Courtesy Maurice P. Sherman, M.D.



Before (Left) and After Upper Arm Treatment (Right).
Photos Courtesy Maurice P. Sherman, M.D.




techniques which produce desirable etching in the abdominal skin mimicking the high definition of “two packs” or “six packs” seen in male and female body builders.

VASER CLINICAL OUTCOMES

In conclusion, I feel technological advances seen in the VASER Ultrasonic System, along with education in the optimal use of this device, produce excellent clinical outcomes without the complications formerly associated with previous generations of ultrasonic emulsification systems. The benefits include better sculpting of tissues, especially of a fibrous nature, faster overall surgical time, significantly less work for the surgeon with less bruising and discomfort for the patient, secondary to the reduced tissue trauma from evacuation of the fat. We do not worry about increased complication rates and do expect to see a significant reproducible degree of skin contraction.

Newer modalities such as Laser Lipolysis under the marketed trade labels of “Smart Lipo” and “Cool Lipo” have emerged over the past 1-1/2 years based upon their claim for skin contraction. Whether the VASER or Laser Lipolysis Systems produce the same or more skin contraction is yet to be answered; however, in several antidotal cases in my practice where Laser Lipolysis and VASER were used in comparable body areas on the same patient, no difference in skin contraction was ascertained in comparing the post-operative results three to six

months later. In my practice now, and for the previous six years, VASER technology continues to be an indispensable tool in all forms of body lipoplasty. 



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gained a distinguished reputation as a creator of the “Natural Look” in cosmetic surgery. For the past 19 years, Dr. Sherman has been in private practice both in Vista and La Jolla, Scripps Memorial Hospital campus, and is now located centrally in Del Mar at the Del Mar Cosmetic Medical Center. Triple boarded in Cosmetic Surgery, Facial Plastic Surgery, and Otolaryngology, he also serves on committees at the San Diego County Medical Society and is an Associate Clinical Professor of Surgery at UCSD, teaching at Veterans’ Administration Hospital in La Jolla. Dr. Sherman has lectured widely since coming to the San Diego area and has been a faculty member at numerous national meetings on cosmetic surgery. He initiated and donated his services to the Face To Face Program in San Diego for cosmetic restoration of battered and abused women, and has hosted numerous visiting physicians in his clinic who have observed his surgical techniques.

lower abdominal scar as seen with abdominoplasty procedures. The pubic mons area also can be treated vigorously with the VASER despite its typical fibrous nature.

Additionally, certain physicians such as John Millard, M.D., in Colorado have developed high definition VASER contouring