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Short Communication Open Access

The Liposuction and Body Contouring

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Abstract

Sophisticated body contouring surgery combines excision with liposuction. Liposuction of flaps and neighboring tissues require liposuction that best preserves residual cytoarchitecture. Following a review of the literature and personal clinical assessment of a variety of modalities, VASER provides the gentlest extraction of fat along with lipoaugmentation. Two cases show representative results. VASERlipo assists in the optimal sculpture of body contouring.

Keywords: Liposuction; Fascia; Hemorrhage; Lipoaugmentation

Short Communication

Liposuction is minimally invasive surgery for safe removal of undesirable fat between the skin and muscular fascia. Through small scattered incisions the target adipose layers are infused with saline containing dilute amounts of xylocaine and epinephrine until turgid. With traditional liposuction, long hollow 2 to 6 millimeter wide probes with side cut openings near the end are passed through the tissues while connected through tubing to high pressure vacuum aspirators. Slow and steady evacuation under visual and palpatory guidance leads to smoothly reduced contours. Unavoidable collateral damage to supportive connective tissue and neurovasculature may reduce the desire yield of fat and increase postoperative complications such as hemorrhage, swelling, induration, seromas, neuropraxia, skin laxity, minor contourdeformities and even skin necrosis. As liposuction as become an integral part of most major body contouring excisional operations, it has required a greater degree of sophistication.

A variety of technologies has been developed to deliver preliminary energies through probes to more specifically target the adipose cell and/or provoke skin retraction. These machines increase the ease of evacuation and appear to improve results. High-powered water infusion, focused ultrasound, laser and radiofrequency destructive forces are commercially available. High powdered water infusions appear to be difficulty to manage leading to fluid excess. Both lasers such as SmartLipo by Cynsure and radiofrequency such as BodyTite by InVasix uses thermal injury to lyse fat and tightened subcutaneous tissues by damaging collagen leading to new collagen deposition. Microaire provides a modified drill that facilitates traditional liposuction.

The gentlest liposuction, especially through fibrous areas such as the back and epigastrium, is provided bypreliminary ultrasonic assisted lipoplasty (UAL). Then the subsequent lipoaspiration is less damaging to remaining tissues. Both the LySonix (Mentor Corporation, Santa Barbara California) and the VASER (Sound Surgical Technologies, Louisville, CO) ultrasound systems serve this purpose. Bleeding rarely occurs, and if spot bleeding is seen in the cannula, it is probably due to a singular torn vessel and is of no consequence.

The author has a two decade experience with UAL, starting with joining the 1995 teaching faculty jointly sponsored by several national plastic surgery societies and the two competing companies of Mentor Corporation and Allergan. Unfortunately, the teaching of the time was to apply energy until the desired contour was obtained. This approach resulted in excessive energy, leading to a thermal injury leading to some seromas, subcutaneous fats necrosis and scarring. Without special care there could be skin burns and necrosis. Now emphasis is on continually but slowly moving the probe through the tissues until there is reduced tissue resistance. With these fundamental changes in technique seroma are no longer occurs.

UAL uses high frequency sound to implode adipose tissue to the point of emulsification. A piezoelectric handle transfers electrical energy to a metal probe that pistons to and fro at 25 to 36 kiloHertz over a one millimeter excursion. LySonix® 3000 offers hollow probes with inline suction and tips which are named by their resemblance to a golf tee and a bullet. The circular sharp edge can cause excessive injury to subcutaneous tissue, leading to prolonged induration and chronic focused scar. The ring of focused ultrasound energy makes the golf tee tip relatively aggressive but effective [1]. Switching to the pulse mode will decrease the extraneous heat and effectiveness. These probes deliver energy during long strokes with continuous palpation and massage of the helping flattened hand under the moving tip. The helping hand maintains awareness of safe tip position and helps deliver the fat to the tip. Unless a depression is desired or there is simply no other way to deliver the fat, the helping hand does not grasp and squeeze the tissues around the moving probe. The pace of the thrusts and returns are slower than traditional liposuction. They relate to the tissue resistance. Some resistance needs to be felt to each penetration, if not, with no obstacle to advancement heat is accumulated to injurious levels. To assist in your understanding, apply UAL to an abdominoplasty specimen and watch effectiveness of the right speed. Too slow and the tissues are over heated. Too fast and the adipose is not emulsified. The contact time is analogous to the application of radiofrequency electrosurgery for hemostasis. Proper application results in low rate of complications [2].

The creamy yellow aspirate is real-time feedback as to the effectiveness of the emulsification. If the emulsion has particles then the operator is stroking to fast, the power is too low or the machine is malfunctioning. Bloody aspirate is an indication stopping energy, even if tissue resistance is high. Traditional liposuction with a multiholed cannula follows. The endpoint occurs when the desired contour is achieved. For symmetry and accountability the time of exposure to ultrasound, and amounts of aspiration are recorded.

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Close proximity of the end of the probe is needed to transfer the damaging energy through cavitation bubbles and direct percussion hits. The magnitude of power is adjusted as a percentage of total energy available with 80% being adequate in most cases. While its overuse does cause thermal injury, UAL is not intended to melt but rather to emulsify fat. The LySonix tends to disrupt cell membranes and release the fatty acids. The VASER more gently disrupts the fat cell aggregations. Both emulsions are evacuated through liposuction cannulas. The subsequent post UAL tissue contraction is due to preservation of elastic subcutaneous connective tissue [3]. Prolonged exposure to the energy causes necrosis and scarring which leads to contraction and undesirable skin tightening.

Sound Surgical Systems of Louisville, Colorado has refined VASERlipo for the least traumatic evacuation of undesirable fat and blood loss [4]. Recent VASER models offers solid probes from 1to 5 rings at the working end. The more rings, the more the energy is dispersed over a wider area. More rings mean faster fat disruption at lower power intensity. Use the most rings that the resistance of the tissues will permit for easy passage. Power and heat is further reduced in the pulsing VASER mode with slows the emulsification but also reduces extraneous heat and thereby collateral soft tissue damage. The subsequent aspirate has much particulate fat parcels, viable for fat grafting. VASER pulsing is like shaking grapes from a vine.

The VASER is also effective in emulsifying fat in secondary cases due to contour irregularities and scarring. A sophisticated system of ultrasound energy dispersing ringed probes has been connected to pulsing adjustable power that with experience can deliver the least amount of damaging energy needed to disperse the fat. While always advantageous, this tissue damage sparing effect is critical in the combination of liposuction with excisional body contouring surgery. Hence, an added benefit of this high energy system is the harvest throughout the body of useable fat for large volume lipoaugmentation. The filtered fat from the VASER aspirate is seen load in syringes for injection into the breasts (Figure 1).

Commonly, areas of body excisions such as abdominoplasty are bordered by oversized epigastrium are best reduced by liposuction.

Figure 1: The fat aspirated after the VASERlipo was filtered through a kitchen colander and load into ten cc.'s syringes for lipoaugmentation of her breasts.

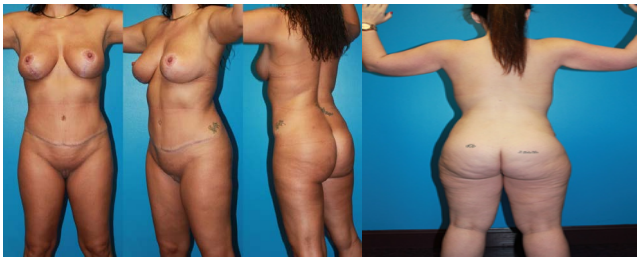

Figure 2: A 26 year old after 125 pound weight loss is marked for combined abdominoplasty with VASERlipo of her arms, trunk and left lateral thigh and 250 cc. per breast lipoaugmentation

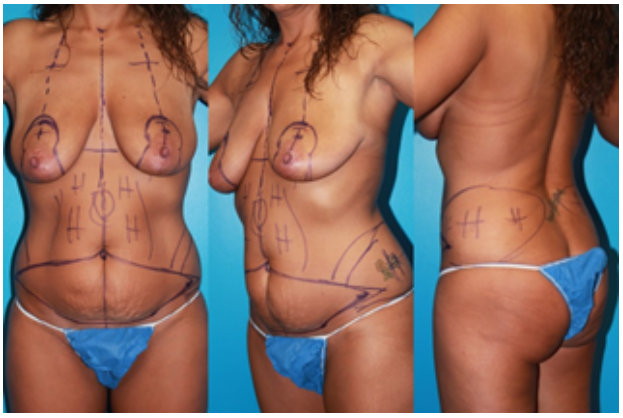

Figure 3: Result of the patient.

Traditional liposuction, with its vigorous back-and-forth traumatic passage under 27 inches Hg vacuum, is too traumatic to the body flaps. When the aspiration of the fat results in a bloody return, it may signal significant damage to the flap vasculature. For example, when aspirate from the epigastrium is bloody, there may be significant vascular injury to the abdominoplasty flap, leading to distal fat and skin necrosis.

Expert application of VASER technology has recently changed our approach to MWL cases with borderline skin laxity and adiposity especially in the young. Major excisional surgery has been either reduced or eliminated. Figure 2 shows impressive reduction in the arm fullness without sagging skin and appropriate smooth concavities of the torso and breasts. Figure 3 shows result of the patient after abdominoplasty along with 4,000 cc.'s of VASERlipo of the arms, trunk and left lateral thigh with 250 cc. Lipoaugmentation of each breast from the processed adipose. She is 26 years old, 5'2" and lost 125 after Gastric Lap Band 2 years earlier. Deep and superficial application of highly selective low energy ultrasonic surgery remove fat at all levels and preserved subcutaneous tissue elasticity.

Conclusion

Advanced body contouring surgery combines gentle aspiration of difficult to extract fat often followed by large volume lipoaugmentation. Intelligent use of VASER technologies is the optimal approach.

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