



Laser-Assisted Lipolysis

Evolves Body Contouring Arena

By Bob Kronemyer, Associate Editor

Body contouring has progressed into a less aggressive treatment with minimal bruising, reduced recovery time and impressive results – including improvement in contour, smoothness and skin tightening – with the introduction of laser-assisted lipolysis. This relatively new procedure positively impacts the fat layers and the skin itself and can be performed with an extremely safe form of tumescent anesthesia.

Laser-Assisted Lipolysis

According to Steven Victor, M.D., a cosmetic dermatologist in private practice in New York City, N.Y. and London, England, "The laser seals the blood vessels and melts the fat so there is less physical work for the doctor. The laser also makes the suction portion of the procedure much easier for the doctor and much easier for the patient. I don't require anything larger than a 3 mm cannula."



Steven Victor, M.D.
Cosmetic Dermatologist
New York City, NY and London, England

Dr. Victor refers to Cynosure, Inc.'s (Westford, Mass.) Smartlipo – featuring a pulsed YAG 1064 nm laser – as "gentle liposuction. The laser basically cuts through the scar tissue to soften and even it up."

In December 2006, the original Smartlipo was FDA approved, and only 15 months later Cynosure debuted its fourth generation system: Smartlipo with Multiplex technology which simultaneously fires two of the most popular wavelengths (1064 and 1320). "Over more than a year of research, we've extensively analyzed the quality of each of these two wavelengths," explained Barry DiBernardo, M.D., F.A.C.S., a plastic surgeon in private practice in Montclair, N.J. "Each wavelength has its own benefits and downsides, but when you combine them in a

certain way, you can actually get the best qualities of both, which changes not only the efficacy of your treatment, but the safety margin as well."

A single treatment of Smartlipo with Multiplex technology should result in the expected amount of fat removal, while skin tightening will occur over several months from increased production of collagen and elastin due to the stimulation. Dr. DiBernardo also uses tumescent anesthesia at 100 ccs per sector (5 x 5 cm). In addition, patients take two Percocet from Endo Pharmaceuticals (Chadds Ford, Pa.) and two doses of oral Valium (10 mm each) from Roche Pharmaceuticals (Basel, Switzerland).



Barry DiBernardo, M.D., F.A.C.S.
Clinical Associate Professor
of Plastic Surgery
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Newark, NJ

"Smartlipo – featuring a pulsed YAG 1064 nm laser – is gentle liposuction. The laser basically cuts through the scar tissue to soften and even it up."

Treatment of the deep layer is the first step with the Smartlipo to break up the fat cells, causing the cell walls to separate thus achieving a liquification of that layer, as well as a coagulation of the blood vessels in the layer to reduce bleeding or ecchymosis (black and blue bruises). "This first



Thighs before Tx
Photos courtesy of Christopher Lomboy, M.D.



Thighs after Smartlipo Tx

process is based on energy being applied to a cubic volume of tissue," explained Dr. DiBernardo, a clinical associate professor of plastic surgery at the University of Medicine and Dentistry of New Jersey, in Newark, N.J. "You can use 1 to 2000 joules per centimeter of thickness for a particular sector." The second step involves employing the laser right under the skin and heating the skin to 42° C to stimulate fibroblast production of collagen and elastin. The final step is using a very small cannula (between 2 and 3 mm) for suction removal of byproducts such as oils and cellular debris from step one.

In reality, the degree of fat melting attained with laser lipolysis has not met the high expectations of some practitioners, according to Robert Weiss, M.D., an associate professor of dermatology at Johns Hopkins University School of Medicine (Hunt Valley, Md.). "Some people thought they could just do two minutes of laser and achieve the equivalent of tumescent standard liposuction. This has not turned out to be the case." Dr. Weiss believes the technology is still evolving into better fiber designs and higher energy units with the goal of a "viable procedure."

For example, the new Aspire platform from Palomar Medical Technologies, Inc. (Burlington, Mass.) is



Neck before Tx
Neck after Smartlipo Tx
Photos courtesy of Cheryl Karcher, M.D.

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a 920 nm diode pumped laser that features "impressive engineering to make liposuction faster and an easier procedure overall," Dr. Weiss said. "This laser has a very high selectivity for fat. In fact, its affinity for fat is seven times greater than for water." Preliminary results of a 20 woman study led by Dr. Weiss, in which subjects were treated once for abdomen or thighs, "were excellent for patient satisfaction, improvement in contour and smoothness. Aspire prevents the streaking from a liposuction cannula by more evenly melting the fat, thus fulfilling the promise of laser lipolysis."



Robert Weiss, M.D.
Associate Professor of Dermatology
Johns Hopkins University
School of Medicine
Hunt Valley, MD

"Aspire prevents the streaking from a liposuction cannula by more evenly melting the fat, thus fulfilling the promise of laser lipolysis."

Aspire also includes a blend mode that combines the 920 nm and 980 nm wavelength for maximizing skin contraction. "For skin contraction, you actually want absorption by water more than fat," Dr. Weiss noted. "The 980 wavelength is absorbed preferentially by water and the 920 wavelength is absorbed preferentially by fat."

CoolLipo from CoolTouch Inc. (Roseville, Calif.) uses the 1320 nm wavelength to "enhance the removal of fat and tissue tightening, both in the subcutaneous compartment and the skin itself," explained Douglas Key, M.D., a dermatologist in private practice in

Portland, Ore., who has been performing some form of liposuction since its introduction in the U.S. nearly 25 years ago. A study of about 70 patients by Dr. Key comparing traditional mechanical aspiration alone to using the CoolLipo with the laser fiber and minimal aspiration found that photographic results were twice as good with CoolLipo for lipo-sculpting of the jowl, neck and under the chin. "Patient satisfaction was enormous." High volume cases can now be accomplished with laser fibers integrated into the aspiration cannulas, according to Dr. Key. But he finds no valid scientific understanding of the need for a dual wavelength.



Douglas Key, M.D.
Dermatologist
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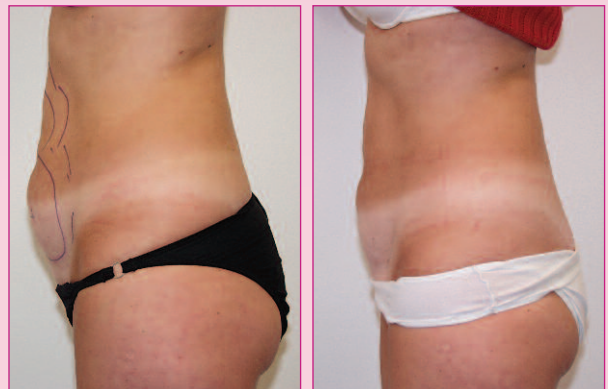
In April, MedSurge Advances (Carrollton, Texas) received FDA clearance for Lipotherme, a continuous wave 980 nm diode with 6 to 25 W of power. "I think the most important feature of this laser is skin tightening," conveyed Dr. Victor. In contrast to skin tightening technologies, which require penetration through the top layer of skin without burning it, "with Lipotherme, we place the laser under the skin and heat the reticular dermis directly. So when my hand is on the patient's skin, I can actually feel the skin heat up."



Before Tx
Photos courtesy of Douglas Key, M.D.

As with traditional liposuction, patients undergo one treatment only. "There are some immediate results in about two to four weeks because fat has been removed," Dr. Victor said. "Swelling and fat continue to decrease over 90 days. A tremendous amount of skin tightening also occurs over this period." In essence, patients can expect to shed roughly two to four inches around the waist. "I've also done necks, faces, anterior, posterior (bra fat), arms, love handles, stomachs, backs, saddlebags, inner and outer thighs, buttocks and ankles," he added. "Cellulite also responds really well to treatment."

To treat one area takes about 45 minutes, but most patients have a minimum of two areas treated such as stomach and love handles, and some opt for up to five or six. "The most time is spent setting up," Dr. Victor explained. "We can do five areas in two to three hours, depending on the size of the patient." Dr.



Abdomen before Tx
Photos courtesy of Steven Victor, M.D.

Victor's office based setting uses only local anesthesia (no sedation or general anesthesia). "However, I do not treat obese patients," he said.

Prolipo from Sciton, Inc. (Palo Alto, Calif.) is the "most powerful laser system" for performing laser-assisted lipolysis, stated Roger Hogue, M.D., a cosmetic laser surgeon in private practice in Maple Grove, Minn. Initial FDA clearance was for 20 W, "but the laser can go as high as 40 W. By adding a second module, the laser could achieve 80 W, therefore I don't feel I'm purchasing an antiquated piece of equipment. I believe the system is designed to stand the test of time as the market demands more power. The faster you can deliver your power, the faster your procedure time."



Roger Hogue, M.D.
Cosmetic Laser Surgeon
Maple Grove, MN

"By adding a second module, Prolipo could achieve 80 W, therefore I don't feel I'm purchasing an antiquated piece of equipment."

Using larger laser fibers may also increase efficacy. "I use 1000 micron



Before Tx
Photos courtesy of Roger Hogue, M.D.



Before Tx (without markings)
Photos courtesy of Roger Hogue, M.D.



Before Tx (with markings)



After Prolipo Tx

diameter fibers as opposed to 600 micron diameter fibers," Dr. Hogue advised. "I feel that the larger fiber is not only faster but allows delivery of more power and energy. Due to its larger size, the fiber is also less likely to gouge or cut its way into the undersurface of the dermis."

Despite his enthusiasm, Dr. Hogue still considers laser-assisted lipolysis primarily as an adjunctive treatment as opposed to first-line or stand-alone therapy. "It's mostly used in combination with some type of suction lipoplasty like tumescent liposuction," he said. "This technique uses tumescent local anesthesia to entirely anesthetize the various fat layers. "The patient is completely awake, without an I.V.," said Dr. Hogue, who commonly uses intraprocedural ultrasound guidance during infiltration. The intermediate and deep layers of fat are suctioned first.



After Prolipo Tx

"I am of the mindset that laser lipolysis should be the very last step," Dr. Hogue commented. "It is not a predominant fat removing technique. I view it purely as a fine tuning adjunctive procedure that serves multiple purposes, including smoothing and contouring the most superficial fat layer just beneath the dermis, thereby hiding any evidence of passage from larger liposuction cannulas and covering any evidence of the tunnels being replaced." Laser-assisted lipolysis also enables transitioning between suctioned and non-suctioned areas. In addition, treatment of the subdermal space permits "skin tightening and improvement of cellulite."

Dr. Hogue's goal is to restore a normal and natural look, "so that few, if any people, will be able to tell that liposuction or liposculpting was done. Maintaining natural looking results is much more important than just achieving a reduced body silhouette," he explained.

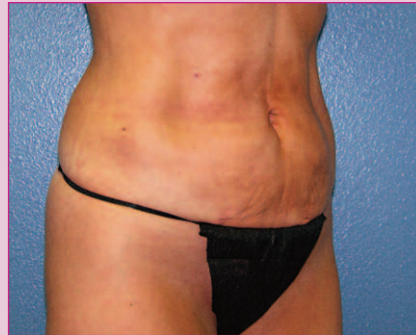
"This is certainly cutting edge laser technology that affords minimally invasive procedures and can employ the safest anesthesiologic technique, which is tumescent anesthesia," Dr. Hogue continued. "This allows procedures to be performed

Laser-Assisted Lipolysis



Before Tx

Photos courtesy of Tracy Hankins, M.D., F.A.C.S.



After Lipolite Tx

in-office by physicians with essentially no risk of morbidity or mortality. With the majority of liposuction deaths occurring as a result of general anesthesia and systemic or I.V. sedation, adopting standards utilizing tumescent anesthesia will basically eliminate mortalities within the elective cosmetic surgery arena."

Syneron, Inc. (Irvine, Calif.) entered the laser-assisted lipolysis field this spring with Lipolite, a compact YAG 1064 nm laser with pulse optimization to enhance the mechanical breakdown of target tissue and the thermal destruction of fat cell membranes. A range of pulse energy and pulse durations are incorporated to provide physicians with precise control.

"The goal is to apply the energy as quickly and as safely as possible to limit operating room time, or if performed in the office, surgeon time," noted Tracy Hankins, M.D., F.A.C.S., a plastic surgeon in private practice in Las Vegas, Nev. "One thing we've come to realize, however, is that we need to heat the dermis to the point where we start to see collagen regeneration and skin contraction. With Lipolite, you can treat in that superficial plane with the setting that provides you with the fastest heating. Then, if you have more fibrous tissue in the deep plane, you can change the energy settings and the pulse length durations."



Tracy Hankins, M.D., F.A.C.S.
Plastic Surgeon
Las Vegas, NV

"Lipolite allows treatment in some areas that might not be conducive for liposuction alone."

Dr. Hankins noticed early on that laser alone was not achieving the desired effects, so now he almost always combines laser liposuction with tumescent liposuction. His most popular areas to treat are abdomen, flanks, medial and lateral thighs, knees and the neck. Lipolite also allows treatment in some areas that might not be conducive for liposuction alone (even with small cannulas), such as medial thighs on a thin patient with slightly loose skin, especially in those female patients who have had some children. "We will treat the superficial plane to try to attain skin tightening,



Before Tx

Photos courtesy of Tracy Hankins, M.D., F.A.C.S.

followed by very small cannula liposuction to remove the deep fat," Dr. Hankins explained. "You're able to avoid irregularities much better with the laser."

Dr. Hankins has also had success treating fatty faces with Lipolite, then possibly following up with aspiration employing a 1 mm or 2 mm cannula. "Skin can also be tightened from the laser's photothermal effect." Dr. Hankins also noted that Lipolite has a lower entry price than other systems. Syneron also provides an attractive pay per energy model — with payments applying to purchase — that allows lower cost and lower risk entry into the field.

Within the next 18 months, Dr. Victor expects an instrument on the market to actually measure the amount of heat delivered to the skin. "Right now, we're relying on touch," he said. "I'm always afraid of getting the skin too hot. Some kind of sensor or monitor on the outside of the skin will allow for maximum skin contraction."

Dr. DiBernardo is also optimistic about future improvements in laser-assisted lipolysis. "I think we will have more efficient and effective targeting of the fat, and more efficient and safer tightening of the skin," he said. "However, I believe that what we're really looking at in this arena is not only placing a laser fiber under the skin to shoot the fat, but to target whatever else we've done with lasers, without nearly as much energy and disruption of the outer skin." ■



After Lipolite Tx