

Understanding the Liposculpting Spectrum from Surgery to Cryolipolysis

Options for fat reduction and body contouring are numerous. Here's an update on the various old and new procedures.

By Linda Cooke, MD and Marguerite Germain, MD

As cosmetic procedures continue to soar in popularity, patients are seeking newer alternatives that don't interfere with their busy lives. Particularly, when it comes to liposuction, they want procedures that are less expensive, non-invasive, and don't require an extensive recovery period. Fortunately, technology is keeping up with demand. There is a large variety of procedures available for the choosing, all depending on each patient's profile of demands. Ahead, we will review and evaluate several liposuction procedures, from traditional liposuction to newer methods, notably cryolipolysis.

Liposuction Procedures

Traditional liposuction. Traditional invasive liposuction is performed under general anesthesia in a hospital operating room or surgery center. Incisions are required for the treatment areas with a large bore cannula being used to suction solid fat. This type of liposuction can be traumatic to surrounding tissues and is less precise than newer techniques. Risks mainly surround the required general anesthesia, but there is also significant downtime required for recovery and the need for compression garments to be worn after the procedure for one to four weeks. Post-liposuction bleeding and a lumpy appearance to the treated sites are also common risks. Swelling should subside in two

to four weeks, but may last four to six months. Normal activity may be resumed within a few days, but may not be feasible for several weeks. Tight fitting clothes should not be worn for eight weeks to avoid fat migration.

Tumescent Liposuction. Dermatologists have tended to gravitate towards tumescent liposuction. This procedure is less invasive, safer, and requires less recovery time. Large amounts of anesthetic fluid are injected into the fatty areas for this technique. The fluid causes the fatty tissue to swell (tumesce), making it easier to remove through a small bore cannula. It is performed using tumescent anesthesia and conscious sedation, resulting in decreased risks by eliminating general anesthe-

Take-Home Tips. There is a large variety of procedures available for fat reduction, all depending on each patient's profile of demands. Traditional liposuction has largely given way to less invasive procedures, such as tumescent liposuction, microliposuction, and laser liposuction. Now, a range of alternative options has emerged, including cold or low-level laser, ultrasound, and cryolipolysis. It is important to thoroughly investigate any new procedure—both from the patient's risk/benefit analysis and the physician's practice building perspective. The national media has increased public awareness of cryolipolysis, driving patients to the dermatologist's clinic where they can be assessed for liposculpting and other procedures in which they may be interested. ●

sia. The tumescent solution includes lidocaine with epinephrine, which helps to reduce bleeding and subsequent echymoses. The amount of lidocaine used and fluid displaced must be closely monitored to avoid toxicity. There is still some downtime after the procedure, requiring one to two days off work and limiting physical activity. Also compression garments should be worn for three to six days.

Microliposuction. Microliposuction is a minimally invasive procedure that uses a very small bore cannula to remove fat and contour hard-to-target areas such as cheeks, neck and jowls. The scars are very small, and the recovery time required is one to three days. However, echymoses may remain for one to two weeks.

Laser Assisted Liposuction. Commonly referred to by its most popular manufacturer name, SMART Lipo (Cynosure), laser-assisted liposuction melts and liquifies the fat, which is then removed through a very small cannula. It can be used alone to treat smaller areas of fat, such as below the chin, or in combination with liposuction on larger areas of fat, such as the abdomen and thighs. SmartLipo is an outpatient procedure that uses only local anesthesia, and patients can return to work within one to two days following treatment.

Lipodissolve. Injections claiming to result in fat reduction of treated sites have been referred to as lipodissolve, mesotherapy, lipozap, lipotherapy or injection lipolysis. The two drugs most often included in these injectable solutions are phosphatidylcholine and deoxycholate. Other ingredients, such as vitamins, minerals, and herbal extracts, may also be incorporated. Many claims have been made that lipodissolve could eliminate unwanted fat, has an outstanding safety record, and is superior to other fat-loss procedures. Although these procedures were popular over the past couple of years, there were no clinical trials to support their efficacy. On April 7, 2010, FDA issued warning letters about claims regarding lipodissolve, stating "FDA is not aware of any credible scientific evidence to support any of these medical uses. Furthermore, there is concern about

the short and long-term safety of the products used."

Adverse events associated with lipodissolve include injection site reactions, such as prolonged swelling, redness and pain; as well as skin reactions, such as panniculitis, ulceration, abscess, necrosis, scarring and skin infections. According to the FDA, these adverse events may be caused by the drug itself, the injection technique, and/or the formulation of the solution. In our opinion, lipodissolve is currently not an ethical or effective fat reduction treatment option.

Cold or Low Level Laser. Zerona laser (Erchonia Medical) is a non-invasive, cold laser that uses low-level diode laser technology to "flatten" fat cells. Theoretically, once fat cells are devoid of content and have lost their shape, they are released into interstitial space where they can be passed through the body during its normal course of detoxification. The treatment targets the waist, hips, and thighs and leads to a temporary or semi-temporary reduction in circumference. The treatments are provided in a series of laser procedures, and there is no down time following the procedures. As part of the treatment, the patients are encouraged to adhere to a low fat diet and take nutritional supplements provided by Erchonia Medical.

Ultrasound. Current devices use non-invasive, focused ultrasound technology to deliver targeted acoustical energy to cause fat cell disruption. Devices use a transducer that focuses energy in an adjustable range to a specific user-selected subcutaneous depth and have a pattern generator to increase treatment efficiency. Once the fat cells are broken down, they are ultimately removed from the body naturally. Clinical trials show the treatment is associated with pain and bruising and results in an average circumferential fat reduction of about 2.8cm that is appreciable after about three months. These devices are not yet FDA approved, yet they have been used widely abroad.

How Cryolipolysis Fits

Cryolipolysis. Cryolipolysis, or CoolSculpting (ZEL-

Photos courtesy of Dr. Cooke.



Patients are shown before and after Zeltiq therapy. Both women and men (bottom) seek treatment.

TIQ) is one of the most recent forms of non-invasive fat reduction to emerge and will be focus of the ensuing discussion. It consists of the non-invasive cooling of fat tissue to induce lipolysis—the breaking down of fat cells—without damage to other cells or tissue. Fat cells are more cold-sensitive than other cells,^{1,2} including those of the epidermis. This allows for prolonged, controlled tissue cooling, which results in selective fat damage, while sparing other tissues.

Cooling is applied for a pre-determined time period, causing the fat cells to undergo apoptosis.³ The fat cells begin to collapse and eventually die. The natural inflammatory process removes dead fat cells over time, resulting in reduction of the fat layer.⁴ Initial studies in pigs showed results of 1cm reduction of fat, or over 40 percent of the fat layer.

We both have been performing the CoolSculpting procedure for about 10 months and have found it provides excellent results not just for our patients, but also for our practices. The

CoolSculpting procedure using Cryolipolysis is fundamentally different from other non- or minimally-invasive modalities. Other methods of fat removal primarily involve necrotic cell death by damaging fat with heat, high-intensity focused ultrasound, or chemical injections. Each approach poses potential technical challenges, particularly with respect to targeting the right tissue depth and unintended damage to other structures close to or within the fat layer.

Predictability of efficacy using these other

techniques is also uncertain. For example, in ultrasound-assisted liposuction, the heat from the ultrasound device used to liquefy the fat cells may cause injury to the skin or deeper tissues.

Ultrasound-assisted liposuction has been performed successfully on several thousand people worldwide, however, the long-term effects of ultrasound energy on the body are not yet known. In contrast, the CoolSculpting procedure using Cryolipolysis induces apoptosis only in fat cells to gently and gradually reduce the fat layer while preserving all other tissue. This reduction of fat is permanent.

Evaluating the risk-benefit ratio is extremely important to patients. One of the most attractive features of the CoolSculpting procedure is that because it is non-invasive, there is very little discomfort and no downtime associated with it. This makes it more appealing to men than other procedures. Many men that are generally fit have a difficult time with love handles, particularly as they

The Liposculpting Spectrum

Photos courtesy of Dr. Cooke.



Patient is shown before and after (right) treatment of the sacral area with Zeltiq.

get older. They are attracted to a procedure that is painless and will allow them to leave the office and continue with all their regular activities.

CoolSculpting is also ideal for patients that have already gone through an extensive weight loss period but want assistance with small, persistent bulges. For example, Dr. Cooke had one patient that had significant weight loss followed by an abdominoplasty. However, she still had some trouble spots in the posterior love handle area, and a pocket of excess fat right above her sacrum. She had already undergone surgical procedures and wanted to avoid further anesthesia. She received one CoolSculpting treatment on each love handle and one on the pouch above her sacrum. She had excellent results at all three sites and is highly satisfied. She has now scheduled treatments for her inner thighs.

Expectations are extremely important with anything in cosmetic dermatology, and this is no exception. CoolSculpting is indicated for people who are relatively fit but want to reduce distinct fat bulges by about 25 percent, and that's really the maximum. We have successfully used it on the abdomen, love handles, upper arms, inner thighs, outer thighs, and right under the buttocks on the posterior thighs. Women are particularly interested in losing their "muffin top," post-pregnancy pouch or back fat bulges at the bra line.

While it's difficult to quantify 25 percent loss of

the fat layer, most patients note an appreciable difference in the fit of their clothes. We rely mainly on photos. We weigh and measure the patients as well. It is difficult to get the tape measurement in the exact same place to produce a true comparison. We have found that many patients lose weight, not because of the physical effects of the procedure but more of a psychological effect. When a patient is trying hard to lose a bulge and can't, they get very discouraged. Although the results aren't immediate, the improvement from therapy is encouraging, which motivates them to work harder at their fitness plan. We have both had the procedure ourselves as well as witnessed many patients' experiences. The patients are excited to have the procedure performed, and are happy afterwards that there is no recovery time, as well as being pleased with the results.

Some patients experience mild discomfort during the procedure. In addition, there is a "pins and needles" feeling and a dullness of sensation that can last for up to two months following the procedure. It is important to adequately inform your patients so they are prepared for these possibilities. Despite any discomfort, they can resume normal activity immediately.

CoolSculpting has been beneficial for our practices in a number of ways. First, are minimal risks and complications. In addition, CoolSculpting doesn't result in an increase in malpractice rates, as

any type of invasive liposuction does. Furthermore, there is little demand on the physician's time. After the patient consultation, the actual procedure may be delegated to a trained assistant. Although we both have dedicated exam rooms for the CoolSculpting machine, it is portable and we know other physicians who move it between exam rooms as needed.

Conclusion

It is important to thoroughly investigate any new procedure—both from the patient's risk/benefit analysis and the physician's practice building perspective. When we began to offer CoolSculpting, it was newly approved by the FDA and Cryolipolysis was relatively unknown. Now the national media has increased public awareness and patients are always intrigued by new and innovative procedures. Once they come in, they usually have a variety of procedures performed. Therefore, acquiring this cutting edge technology has been a

practice builder for us and has resulted in a good return on our investment. ■

Drs. Cooke and Germain have no relevant disclosures.



Linda Cooke, MD, FAAD provides medical, surgical and aesthetic dermatology services at Riverside Dermatology in Hannibal, MO.



Marguerite Germain, MD, FAAD provides medical, surgical, and cosmetic dermatology services at Germain Dermatology in Mt. Pleasant, SC.

1. Diamantis S, Bastek T, Groben P, Morrell D. Subcutaneous fat necrosis in a newborn following icebag application for treatment of supraventricular tachycardia. *J Perinatol* 2006;26:518-520.
2. Wiadrowski TP, Marshman G. Subcutaneous fat necrosis of the newborn following hypothermia and complicated by pain and hypercalcaemia. *Australias J Dermatol* 2001;42: 207-210.
3. Preciado JA, Allison JW. The effect of cold exposure on adipocytes: Examining a novel method for the noninvasive removal of fat. *Cryobiology* 2008;57:327.
4. Manstein D, Laubach H, Watanabe K, Anderson RR (2008) A novel cryotherapy method of non-invasive, selective lipolysis. *Lasers Surgery Med Suppl* 40: S20: 104 11/08.

Be a part of the fastest growing educational video resource for dermatology professionals!

dermtube

From the publishers of *Practical Dermatology*

