

Liposuction: A Remedy From Obesity

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Abstract:

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems. Body mass index (BMI), a measurement which compares weight and height, defines people as overweight (pre-obese) if their BMI is between 25 kg/m² and 30 kg/m², and obese when it is greater than 30 kg/m². Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, breathing difficulties during sleep, certain types of cancer, and osteoarthritis. Obesity is most commonly caused by a combination of excessive dietary calories, lack of physical activity, and genetic susceptibility, although a few cases are caused primarily by genes, endocrine disorders, medications or psychiatric illness. Evidence to support the view that some obese people eat little yet gain weight due to a slow metabolism is limited; on average obese people have a greater energy expenditure than their thin counterparts due to the energy required to maintain an increased body mass. Dieting and physical exercise are the mainstays of treatment for obesity. Moreover, it is important to improve diet quality by reducing the consumption of energy-dense foods such as those high in fat and sugars, and by increasing the intake of dietary fiber. To supplement this, or in case of failure, anti-obesity drugs may be taken to reduce appetite or inhibit fat absorption. In severe cases, surgery is performed or an intragastric balloon is placed to reduce stomach volume and/or bowel length, leading to earlier satiation and reduced ability to absorb nutrients from food. Obesity is a leading preventable cause of death worldwide, with increasing prevalence in adults and children and authorities view it as one of the most serious public health problems of the 21st century. Obesity is stigmatized in much of the modern world (particularly in the Western world), though it was widely perceived as a symbol of wealth and fertility at other times in history, and still is in some parts of the world. **Liposuction** can often provide very substantial improvements, but it must be emphasised that it is neither a weight loss technique nor a solution for obesity. It is also not an effective treatment for cellulite, a condition that gives your skin an uneven, dimpled appearance. However, liposuction is a successful procedure for spot fat reduction. Fat deposits which cannot be removed by diet or exercise usually occur in areas such as the chin, chest, stomach, sides, back and thighs. Liposuction is a fat removal procedure that aims to eliminate excess stubborn fat from these hard to shift areas. The liposuction sites may be the following: thighs, hips, knees, arms, neck, back, chin or buttocks. Liposuction should be thought of as a sculpting procedure that can change the contours of your body or face. Liposuction can be ideal for patients who have reached physical maturity, are at or near their ideal body weight, and have stubborn, localized deposits of fat they want removed. Both men and women can be excellent candidates for liposuction.

Approximately eighty per cent of patients are female and they most commonly have liposuction performed on the abdomen, buttocks and thighs. About twenty per cent of patients are men, the most common location for liposuction being the "love handles". Extremely obese individuals who have failed to lose weight through diet and exercise will not benefit from liposuction. The ideal candidate for liposuction will be in good health, exercise regularly and be within twenty-five pounds of their ideal weight. Patients with much localized exercise and diet resistant fatty deposits will obtain the best results. They should also be psychologically stable, preferably non-smokers and desire reshaping rather than weight loss. Other desirable qualities in a liposuction patient are firm, elastic skin with no frequent fluctuations in weight, with an acceptance of any possible limitations, as discussed with their surgeon. Always consult with a qualified physician before deciding to undergo any liposuction procedure. The teenage years can be extremely tough for children who are teased about their weight, leading some teenagers to seek surgical options; however, liposuction and tummy tucks are not the answer for very young people, especially when they have not finished growing. There is no doubt that some teenagers may physically and psychologically benefit from having plastic surgery. For example, surgery to pin back the ears or to reduce an overly large nose may dramatically improve a teenager's self-esteem and body image. In contrast, the desire to be thin, no matter how strong, does not justify the use of liposuction to treat childhood obesity. Furthermore, there is no scientific evidence supporting the use of body contouring procedures to fight childhood obesity. Proper diet and exercise will always be the best ways to slim down. Besides, the teenage years are the optimum time to engage in sports and other form of exercise, as well as healthy eating, to manage their body weight. In addition, their metabolic rate will be higher than at any future time in their lives, making weight loss easier to manage.

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cannula assisted liposuction, External ultrasound-assisted liposuction, Water-assisted liposuction, Liposculpture, Smart Lipo-Laser Liposuction, Cool Lipo-Laser Liposuction, Pro Lipo PLUS–Laser-Assisted Liposuction, Lipo Lite-Laser Liposuction, Lipo Therme and Lipo Control-Laser Liposuction

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Lipotomy is a lipodissolution technique of aesthetic medicine which aims at dissolving undesirable greasy clusters without the use of harsh techniques or surgery. Towards the end of the 1990s, Bernstein (Paris) was the first to carry out clinical trials and to try to codify the technique. He coined the term "Lipotomie". Others followed (Haddad in Paris), trying to bring each one their contribution, for example by using lecithin of soya injections, but without, however, obtaining convincing results. Several meetings remained necessary and the results were inconsistent from the quality point of view. The

fatty cells can indeed easily present unpleasant and unaesthetic scars called lipodystrophies. The first to have standardized and to optimize the results, on large scale, was Pirmez with his team in 2002. Pirmez developed a formulation of infiltration liquid of combining effectiveness and innocuity. The basic concept took again the action of the osmolarity, potentiated by the use of a facilitator agent. For the first time the technique was codified and duly recorded near the European medical authorities. With his collaborator, Durand, they have at the present time a series of more than 800 clinical cases, showing a completely convincing rate of satisfaction.



Figure-1: Lipotomy



Figure-2: Liposuction

Liposuction, also known as **lipoplasty** ("fat modeling"), **liposculpture suction lipectomy** or simply **lipo** ("suction-assisted fat removal") is a cosmetic surgery operation that removes fat from many different sites on the human body. Areas affected can range from the abdomen, thighs and

buttocks, to the neck, backs of the arms and elsewhere.

Suction-assisted lipectomy of bilateral outer thighs

Several factors limit the amount of fat that can be safely removed in one session. Ultimately, the operating physician and the patient make the decision. There are negative aspects to removing too much fat. Unusual "lumpiness" and/or "dents" in the skin can be seen in those patients "over-suctioned". The more fat removed, the higher the surgical risk.

While reports of people removing 50 pounds (22.7 kg or around 3.6 stone) of fat has been claimed, the contouring possible with liposuction may cause the appearance of weight loss to be greater than the actual amount of fat removed. The procedure may be performed under general or local ("tumescent") anesthesia. The safety of the technique relates not only to the amount of tissue removed, but to the choice of anesthetic and the patient's overall health. It is ideal for the patient to be as fit as possible before the procedure and not to have smoked for several months.¹

History

Doctors Giorgio and Arpad Fischer, two Italian-American surgeons working in Rome, Italy, invented the liposuction procedure in 1974. The roots of liposuction, however, date back to the 1920s. Relatively modern techniques for body contouring and removal of fat were first performed by a French surgeon, Charles Dujarier. A tragic case that resulted in gangrene in the leg of a French model in a procedure performed by Dr. Dujarier in 1926 set back interest in body contouring for decades to follow. Liposuction evolved from work in the late 1960s from surgeons in Europe and was pioneered in the United States by the European surgeon Leon Forrester Tcheupdjian using primitive curettage techniques which were largely ignored, as they achieved

irregular results with significant morbidity and bleeding. Modern liposuction first burst on the scene in a presentation by the French surgeon, Dr Yves-Gerard Illouz, in 1982. The "Illouz Method" featured a technique of suction-assisted lipolysis after infusing fluid into tissues using blunt cannulas and high-vacuum suction and demonstrated both reproducible good results and low morbidity. During the 1980s, many United States surgeons experimented with liposuction, developing some variations, and achieving mixed results.

In 1985, Klein and Lillis described the "tumescent technique", which added high volumes of fluid containing a local anesthetic allowing the procedure to be done in an office setting under intravenous sedation rather than general anesthesia. Concerns over the high volume of fluid and potential toxicity of lidocaine with tumescent techniques eventually led to the concept of lower volume "super wet" tumescence. In the late 1990s, ultrasound was introduced to facilitate the fat removal by first liquefying it using ultrasonic energy. After a flurry of initial interest, an increase in reported complications tempered the enthusiasm of many practitioners. Technologies involving the use of laser tipped probes (which induce a thermal lipolysis) have been introduced in recent years and are being evaluated to examine any potential benefit over traditional techniques. Overall, the advantages of 30 years of improvements have been that more fat cells can more easily be removed, with less blood loss, less discomfort, and less risk. Recent developments suggest that the recovery period can be shortened as well. In addition, fat can also be used as natural filler. This is sometimes referred to as "autologous fat transfer" and in general, for these procedures, fat is removed from one area of the patient's body (for example, the stomach), cleaned and then re-injected into an area of the body where contouring is desired, for example, to reduce or eliminate wrinkles.

Popularity

Removal of very large volumes of fat is a complex and potentially life-threatening procedure. The American Society of Plastic Surgeons defines "large" in this context as being more than 5 liters (around 8½ pints). Most often, liposuction is performed on the abdomen and thighs in women, and the abdomen and flanks in men. According to the American Society for Aesthetic Plastic Surgery, liposuction was the most common plastic surgery procedure performed in 2006 with 403,684 patients.

Candidacy

Not everyone is a good candidate for liposuction. It is not a good alternative to dieting or exercising. To be a good candidate, one must usually be over 18 and in good general health, have tried a diet and exercise regime, and have found that the last 10 or 15 pounds persist in certain pockets on the body. Diabetes, any infection, heart or circulation problems, generally nullify one's eligibility for the procedure. In older people, the skin is usually less elastic, limiting the ability of the skin to readily tighten around the new shape. Liposuction of the abdominal fat should not be combined with simultaneous tummy tuck procedures due to higher risk of complications and mortality. Laws in Florida prevent practitioners combining liposuction of the upper abdomen and simultaneous abdominoplasty because of higher risks.²

Approaches

The basic surgical challenge of any liposuction procedure is:

- ❖ To remove the right amount of fat
- ❖ To cause the least disturbance of neighboring tissue, such as blood vessels and connective tissue
- ❖ To leave the person's fluid balance undisturbed
- ❖ To cause the least discomfort to both patient and surgeon

As techniques have been refined, many ideas have emerged that have brought liposuction closer to being safe, easy, painless, and effective.

Areas of the body where liposuction is performed

- ❖ Abdomen
- ❖ Hips
- ❖ Outer thighs (saddlebags)
- ❖ Flanks (love handles)
- ❖ Back
- ❖ Inner thighs
- ❖ Inner knees
- ❖ Upper arms
- ❖ Submental (chin)
- ❖ Gynecomastia (male breast tissue)

Techniques

Power-assisted liposuction Cannula.

In general, fat is removed via a cannula (a hollow tube) and aspirator (a suction device). Liposuction techniques can be categorized by the amount of fluid injection and by the mechanism in which the cannula works.

Amount of fluid injection

Dry liposuction



Figure-3: Dry liposuction

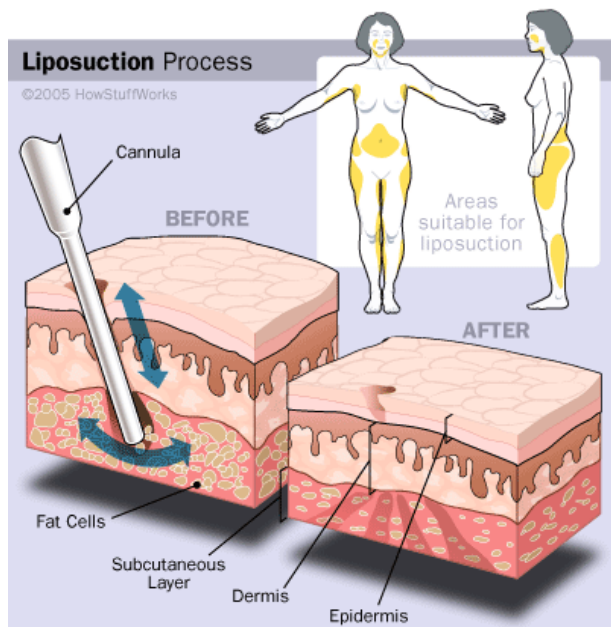


Figure-4: Wet liposuction



Figure-5: Super-wet liposuction

The dry method does not use any fluid injection at all. This method is seldom used today.

Wet liposuction

A small amount of fluid, less in volume than the amount of fat to be removed, is injected into the area. It contains lidocaine as a local anesthetic, adrenaline to contract the blood vessels and thus minimize bleeding, and a salt solution to make the solution isotonic. This fluid helps to loosen the fat cells and

reduce bruising. The fat cells are then suctioned out as in the basic procedure.

Super-wet liposuction

Liposuction procedure using the Super-wet technique being performed on female patient. In this method, the infusate volume is in about the same amount as the volume of fat expected to be removed. This is the preferred technique for high-volume liposuction by many plastic surgeons as it better balances homeostasis and potential fluid overload (as with the tumescent technique). It takes one to three hours, depending on the size of the treated area/ areas. It may require either IV sedation as well as the local lidocaine, or complete anesthesia.



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Figure-6: Tumescent liposuction

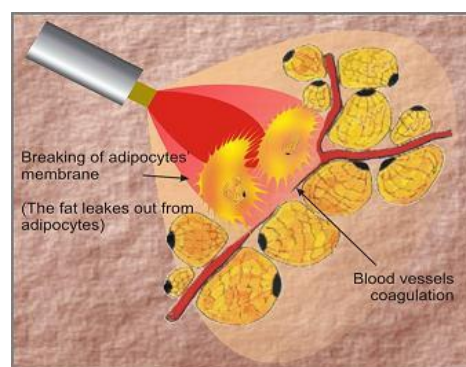


Figure-7: Laser assisted liposuction

Tumescent liposuction

Tumescent The surgeon injects high volumes of a solution containing a local anesthetic and vasoconstrictor (often lidocaine and epinephrine

respectively) directly into the subcutaneous fat to be removed. Due to a potentially large total volume of local anaesthetic injected into the tissue, systemic toxicity from lidocaine is a potentially fatal complication which must be considered with larger volume cases.

Laser assisted liposuction (LAL)

Laser assisted liposuction uses thermal and photomechanical energy to affect the lipolysis. The addition of a laser to traditional liposuction possibly increases skin tightening effects through tissue coagulation. The procedure involves either the use of the Erchonia or Nd: YAG powered devices. The first FDA-approvals came for laser assisted lipolysis units in 2006, but FDA-approved studies using Nd: YAG date back as early as 1994. The efficacy of this technique as opposed to traditional SAL is still being debated.

Mechanism of liposuction



Figure-8: Suction-assisted liposuction



Figure-9: Ultrasound-assisted liposuction

Suction-assisted liposuction (SAL)

Suction-assisted liposuction is the standard method of liposuction. In this approach, a small cannula (like

a straw) is inserted through a small incision. It is attached to a vacuum device. The surgeon pushes and pulls it in a forwards and backwards motion, carefully through the fat layer, breaking up the fat cells and drawing them out of the body by suction.

Ultrasound-assisted liposuction (UAL)

In ultrasound-assisted or ultrasonic liposuction, a specialized cannula is used which transmits ultrasound vibrations within the body. This vibration bursts the walls of the fat cells, emulsifying the fat (i.e. liquefying it) and making it easier to suction out. UAL is a good choice for working on more fibrous areas, like the upper back or male breast area. It takes longer than traditional liposuction, but not longer than tumescent liposuction. There is slightly less blood loss. There appears to be slightly more risk of seromas forming (pockets of fluid) which may have to be drained with a needle. After ultrasonic liposuction, it is necessary to perform suction-assisted liposuction to remove the liquified fat. Ultrasound-assisted liposuction techniques used in the 1980s and 1990s were associated with cases of tissue damage, usually from excessive exposure to ultrasound energy.³ Third-generation UAL devices address this problem by using pulsed energy delivery and a specialized probe that allows physicians to safely remove excess fat.

A 40-year old woman undergoing a combination liposuction and abdominoplasty. Power-assisted liposuction: the cannula is inserted to about 80% of its full length.



Figure-10: Power-assisted liposuction

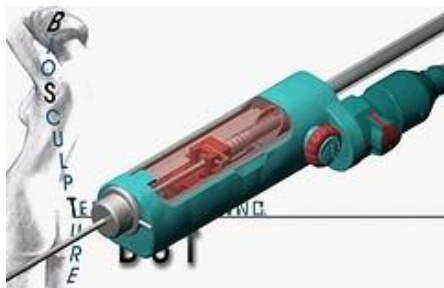


Figure-11: Twin-cannula assisted

liposuction

Power-assisted liposuction (PAL)

PAL uses a specialized cannula with mechanized movement, so that the surgeon does not need to make as many manual movements. Otherwise it is similar to traditional SAL.

Twin-cannula assisted liposuction (TCAL or TCL)

Twin cannula (assisted) liposuction uses a tube-within-a-tube specialized cannula pair, so that the cannula which aspirates fat, the mechanically reciprocated inner cannula, does not impact the patient's tissue or the surgeon's joints with each and every forward stroke. The aspirating inner cannula reciprocates within the slotted outer cannula to simulate a surgeon's stroke of up to 5 cm (2 in) rather than merely vibrating 1–2 mm (1/4 in) as other power assisted devices, removing most of the labor from the procedure. Superficial or subdermal liposuction is facilitated by the spacing effect of the outer cannula and the fact that the cannulas do not get hot, eliminating the potential for friction burns.

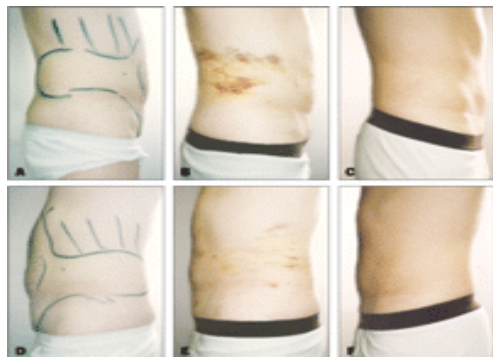


Figure-12: External ultrasound-assisted liposuction (XUAL or EUAL)



Figure-13: Water-assisted liposuction External ultrasound-assisted liposuction (XUAL or EUAL) XUAL

It is a type of UAL where the ultrasonic energy is applied from outside the body, through the skin, making the specialized cannula of the UAL procedure unnecessary. It was developed because surgeons found that in some cases, the UAL method caused skin necrosis (death) and seromas, which are pockets of a pale yellowish fluid from the body, analogous to hematomas (pockets of red blood cells). XUAL is a possible way to avoid such complications by having the ultrasound applied externally. It can also potentially cause less discomfort for the patient, both during the procedure and afterwards; decrease blood loss; allow better access through scar tissue; and treat larger areas. At this time however, it is not widely used and studies are not conclusive as to its effectiveness.⁴

Water-assisted liposuction (WAL)

WAL uses a thin fan-shaped water beam, which loosens the structure of the fat tissue, so that it can be removed by a special cannula. During the liposuction the water is continually added and almost immediately aspirated via the same cannula. WAL requires less infiltration solution and produces less edema from the tumescent fluid. The utility of this technology is under study and is currently not widely used.



Figure-14: Liposculpture



Figure-15: Smart Lipo-Laser Liposuction

Laser Liposuction, Laser Lipolysis or Liposculpture

Laser liposuction was developed as an alternative to the manual method used in tumescent and traditional liposuction. It was also developed to help cosmetic surgeons target specific body parts that were difficult to access with the more traditional methods, but are perfectly suited to laser body sculpting. Laser liposuction, which is also known as liposculpture and laser lipolysis is somewhat different than traditional liposuction. In some techniques of laser liposuction, suction is used, while in others no actual suction is actually used. Instead of using the cannula to remove fatty deposits beneath the skin, the cannula actually houses a laser and the laser is used to literally melt the fat of the target area away. Once the fat has been liquefied using laser liposuction, it is drained from the body using tiny incisions or gently suctioned away. The procedure is

considered gentler than other liposuction techniques because of the smaller cannula used and because of the smaller size of the incisions. This also means less scarring. Because of the heat used in the laser liposuction procedure, the body naturally reacts by contracting the tissues near procedure which causes the skin to tighten and become smoother. These liposuction lasers are specially designed to target only fat cells, protecting muscle and nerve tissue. This precision often means less pain, faster healing and very little bruising after the procedure. Additionally, different companies have created liposuction lasers that use specific wavelength frequencies for optimal results. Because of the advanced technology and the high caliber of cosmetic surgeons that use the laser liposuction procedure, it can be more costly. Laser liposuction offers the same contouring and visual improvement of traditional liposuction and is actually being used more often in small areas of treatment. Specifically, many liposuction surgeons opt to use laser liposuction on the chin, jowls or face of a patient because of the precision of the procedure and the great success. The excess pockets of fat that can develop in this area can be melted with precision and the tightening of the skin operates almost as a face or neck lift. It's important to understand the mechanics and some of the science behind laser liposculpture if you're going to opt for this type of procedure. You should understand which technology your doctor plans to use and why it is beneficial and safe. There are a number of companies who have developed different liposuction lasers, each of which has a specialty.

Smart Lipo-Laser Liposuction

Smart Lipo is actually where laser liposuction began. Brought to the marketplace by Cynosure, the Smart Lipo system offers all the benefits of a high quality laser lipolysis system and the benefit of experience in the market. The Smart Lipo system has truly been tested and proven successful and is an established technology with an excellent reputation. When a

doctor uses Smart Lipo, the small cannula and powerful laser offers precise targeting of even the smallest body part. This means a doctor can target pockets of fat that would otherwise be untreatable with traditional liposuction. The laser not only melts the fat and facilitates its removal; it also causes small blood vessels to coagulate immediately which reduces bruising and the chance of blood loss. Finally, that same laser stimulates collagen retraction and skin tightening which are optimal for shrinking the skin once fat has been melted and removed. Smart Lipo is often used in conjunction with cellulite treatments and can be used with only local anesthetic, which reduces patient health complications from general anesthetic. What is really interesting is that different laser wavelengths actually stimulate optimal results. For example the 1064 nm wavelength is known to be excellent at liquefying fat cells while the 1320 nm wavelength is known to be the best for stimulating collagen rejuvenation. In the case of Smart Lipo, they have come up with several products to help doctors maximize the benefits of laser liposuction, so you should know which version of smart liposuction you'll be getting before you go in for your procedure. Cynosure now offers three different systems to liposuction doctors, which include:

- ❖ The original SmartLipo in three wattages (6W, 12W and 18W).
- ❖ The Smart Lipo MPX that combines multiple laser wavelengths for improved results. By using both 1064 nm and 1320 nm wavelengths, the Smart Lipo MPX maximizes fat removal and tissue firming through coagulation.
- ❖ The Smart Lipo Triplex that combines three different wavelengths including 1064 nm, 1320 nm and 1440 nm. The 1440 nm wavelength has been added to the Triplex because of its powerful absorption of fatty tissues. If you choose a doctor who plans to use Smart Lipo technology be sure to understand which system they use and how

the technology will be employed. By being a well-educated patient you'll have a much better experience and result from your Smart Lipo.



Figure-16: Cool Lipo-Laser Liposuction



Figure-17: Pro Lipo PLUS-Laser-Assisted Liposuction

Cool Lipo - Laser Liposuction

Cool Lipo, like other laser lipo systems is a technology that uses laser wavelengths to dissolve fat and firm the skin. Cool Lipo candidates are in good health and are not planning to use liposuction as a weight loss technique, but rather for body contouring and sculpturing. Cool Lipo by Cool Touch, Inc. is designed specifically for smaller areas of treatment in the face, chin and neck areas. This includes fat deposits that are particularly stubborn and resistant to any kind of weight loss or traditional liposuction. In these areas on the face, many people assume the only option is a face lift or neck lift when in fact Cool

touch Lipo is also a viable solution. The idea is that getting laser lipolysis is less invasive than a full face or neck lift and that the recovery time will be substantially shorter. Also, traditional liposuction is very difficult to use in these areas of the body because of the small volume of fat and all the other anatomical structures and tissues that need to be protected. The cannula and laser are used in the fatty portions of the jowls, chin or neck to remove, very carefully, excess or fatty tissue. The Cool lipo laser is specifically designed to protect tissues other than fat. Because Cool Lipo is designed for contouring the face and neck, the laser also maximizes the other benefit of laser lipo-the skin tightening and collagen renewal. Cool Lipo laser liposuction uses a 1320 nm wavelength that is known to have maximum benefit for collagen rejuvenation and skin firming. The Cool Lipo also uses a short pulse width that ensures maximum fat removal and that non fatty tissues are protected. This laser liposuction technology also uses a high peak power for gentle but thorough “fat disruption”. Once the fat is disrupted and removed, the skin in the face and neck firms and tightens so you get the look of a facelift in an outpatient procedure, with minimal healing time in most cases. Cool Lipo laser lipolysis can be performed in a doctor’s office and with only local anesthetics. This reduces risk to the patient and the overall cost of the procedure. Also, because of the gentler nature of laser liposculpture, the procedure time and downtime post procedure are both very short. If you’re looking for a facial rejuvenation through liposuction, Cool Lipo may be an excellent option for you.⁵

Pro Lipo PLUS Laser-Assisted Liposuction

Cosmetic surgeons using Pro Lipo PLUS by Sciton are using laser-assisted liposuction for specific and precise contouring of the body. Like other laser liposuction technologies, Pro Lipo PLUS laser liposuction uses a small laser housed in a cannula to melt and dissolve fatty tissues that are resistant to

diet and exercise. Laser liposuction is also often used in parts of the body where traditional liposuction is not available or not optimal for the best possible results. Like other laser liposculpture, Pro Lipo PLUS can be used under local anesthetic and the use of the laser typically reduces bleeding and bruising. By eliminating the need for general anesthesia, the cost of the procedure is lowered and the risk to patients is substantially lowered. In some cases, Pro Lipo PLUS is performed under general anesthesia, especially if it is being used in conjunction with other cosmetic procedures, but the areas of the body treated with Pro Lipo PLUS will be quick to heal. In some cases, a patient may have fatty deposits that are fibrous, difficult to get to, or otherwise challenging to traditional laser lipolysis. Offering your doctor the wavelengths and flexibility they need to get your results is what Sciton Pro Lipo PLUS is all about. Pro Lipo PLUS is a laser lipolysis technology that offers multiple wavelengths during the course of your laser lipo procedure. This means your cosmetic surgeon can use the correct wavelength and laser power for each individual situation and body part being treated. The cosmetic surgeon can remove more fatty deposits or focus on tightening the skin or do these things simultaneously. Pro Lipo PLUS uses two wavelengths, the 1064 nm and a 1319 nm. The 1064 nm is used to disrupt and melt the fatty tissue. The 1319 wavelength is extremely effective for promoting collagen regeneration and skin tightening and can be used in conjunction with the 1064 nm wavelength or each can be used separately. This ability to use the wavelengths separately or together is a powerful benefit to the patient, and you should talk to your doctor about how he or she typically uses the technology during a treatment. The object of Sciton’s Pro Lipo PLUS is to give your doctor maximum flexibility and precision in your treatment. Pro Lipo PLUS is known to have excellent results in areas that are traditionally resistant to traditional liposuction including part of the thighs, the upper abdomen, the

lower abdomen, the upper arms and the chin and neck. In some cases, cosmetic surgeons have also been known to use Pro Lipo PLUS in conjunction with traditional liposuction for the best results. In other words, they may use traditional liposuction for larger areas of treatment and then follow it with Pro Lipo PLUS for specific liposculpture. Pro Lipo PLUS has an excellent reputation as a top notch laser-assisted lipolysis technology.



Figure-18: Lipo Lite - Laser Liposuction



Figure-19: Lipo Therme and Lipo Control-Laser Liposuction

Lipo Lite-Laser Liposuction

Lipo Lite is a laser liposuction technology available to patients who are in good health and who are not

using liposuction as a measure for weight loss. Lipo Lite laser has been used very successfully in body sculpting and contouring—and like other laser liposuction techniques is particularly good with small areas that don't work well for traditional liposuction and are resistant to weight loss and exercise. The Lipo Lite laser liposuction technique uses the 1064 nm wavelength to melt away and remove fat from beneath the skin. The tiny cannula and fiber optic laser make for minimal invasiveness during the procedure. In fact, many physicians will use traditional liposuction techniques for the larger sites being targeted on a patient's body and then will follow up with laser lipolysis from a technology like Lipo Lite. The Lipo Lite laser liposuction difference is in their SelectPulse™ technology. Basically, doctors can use this technology to deliver short pulses of low energy or longer pulses of higher energy, either of which can be necessary depending on the patient and the body part being treated. This means that Lipo Lite laser liposuction can treat areas that are fibrous or have tissue that would be traditionally resistant to laser lipo and that this technology is adopted to destroy fat cell membranes for maximum results. It's of critical importance that your laser liposuction doctor has maximum control and flexibility during treatment for optimal results. They need the proper wavelength and power to successfully melt and dissolve fats while protecting other tissues and anatomical structures. The Select Pulse technology used in Lipo Lite laser fat removal enables your cosmetic surgeon to do their best work and give you the best contoured liposuction results. Like other laser lipolysis treatments, Lipo Lite is considered an outpatient procedure and is often conducted in a cosmetic surgeon's office using only local anesthesia. Procedures usually last between 30 and 60 minutes per body part being treated. The incision and treatment is typically very small and the recovery time is short. Lipo Lite is most often used on parts of the body like the face, neck, bra line, belly, male chest

and stubborn areas of the thighs. Many surgeons will use traditional liposuction and do “the detail work” with laser lipolysis. Understanding the procedure is of paramount importance, so when you meet with your doctor you can ask questions and truly understand the treatment.

Lipo Therme and Lipo Control-Laser Liposuction

Lipo Therme by Osyris Medical is another well regarded laser lipolysis technology. Using a small laser housed in a cannula, fatty deposits are disrupted with heat, facilitating their removal and the look and contour you desire. Laser lipolysis like the Lipo Therme is often used in areas where traditional liposuction would not be successful and in parts of the body where diet and exercise will not be able to reduce the fatty deposit. In the case of the Lipo Therme, a 980 nm wavelength is used to target and emulsify fatty deposits below the skin. They have a specially designed and patented cannula that houses the laser and offers smooth and consistent contouring and results and a tiny incision that heals quickly and results in less scarring. Lipo Therme laser liposuction offers control and precision to cosmetic surgeons, allowing them to target the smallest and most stubborn pockets of fat. The real difference that Osyris Medical has brought to the market is in their Lipo Control technology, which is used in conjunction with their Lipo Therme laser liposuction treatment. Lipo Control offers an actual on screen image of the patient’s area of treatment, beneath the skin, so the surgeon can see exactly where they are and what they are doing. The technology uses heat imaging to map the location of the laser and cannula and the laser power strengthens and weakens as the surgeon moves the cannula beneath the skin. In fact, if the surgeon stops movement altogether, the Lipo Control will turn off the laser. This kind of control and protection is a great advance in laser liposuction. When Lipo

Control and Lipo Therme are used together, cosmetic surgeons are able to offer the best possible results to patients. This kind of laser liposuction is perfect for small, precise areas like the face, neck, back, parts of the abdomen and arms. In most cases, like other laser liposuction, Lipo Control and Lipo Therme are used in outpatient procedures and the use of the laser technology reduces bruising and bleeding. Typically only a local anesthetic is needed, which reduces both cost and risk to the patient. Lipo Therme and Lipo Control have a good reputation for helping cosmetic surgeons achieve desired results. If your doctor uses Lipo Therme and Lipo Control for their laser liposuction treatment, be sure to ask questions about how they plan to use the technology and fully understand the procedure and treatment.⁶

Sutures

Since the incisions are small, and the amount of fluid that must drain out is large, some surgeons opt to leave the incisions open, the better to clear the patient’s body of excess fluid. They find that the unimpeded departure of that fluid allows the incisions to heal more quickly. Others suture them only partially, leaving space for the fluid to drain out. Others delay suturing until most of the fluid has drained out, about 1 or 2 days. In any case, while the fluid is draining, dressings need to be changed often. After one to three days, small self-adhesive bandages are sufficient.

Preparation

Before receiving any of the procedures, no anticoagulants should be taken for two weeks before the surgery. If general anesthesia or sedation will be used and the surgery will be in the morning, fasting from midnight the night before is required. If only local anesthesia will be used, fasting is not required. Smoking must be avoided for about two months prior to surgery, as nicotine interferes with circulation and can result in loss of tissue.

The procedure

in all liposuction methods, there are certain things that should be done when having the procedure:

- ❖ The candidate and the surgeon will agree ahead of time on exactly which area(s) will be treated and both will discuss what outcome to expect.
- ❖ A consent form is signed on the day of surgery.
- ❖ An antibiotic will be given about an hour beforehand, or afterwards.
- ❖ The targeted areas are marked on the body while the candidate is in a standing position.
- ❖ Sometimes photos will be taken of the area to be treated, so the patient will have before and after photos.
- ❖ In the operating room, a sterilizing solution such as Betadine, is applied to the relevant areas.
- ❖ Local anesthetic is injected and the patient may be given a sedative, either orally, or through an IV injection.
- ❖ Incisions are small, about a quarter to a third of an inch.
- ❖ The patient will probably have an IV fluid line, since they will be losing fluid with the fat, and the fluid balance must be kept intact.
- ❖ There will be some monitoring devices attached to the body to keep track of the blood pressure, heart rate, and blood oxygen level.
- ❖ The patient will feel only a scraping or rasping sensation from the cannula movement.
- ❖ Usually the patient can get up, walk around, and go home the same day if they did not receive general anesthesia, although they would need someone else to drive them.

Recovery

Depending on the extent of the liposuction, patients are generally able to return to work between two days and two weeks. A compression garment which can easily be removed by the patient is worn for two to four weeks; this garment must have elasticity and allow for use of bandages. If non-absorbable sutures are placed, they will be removed after five to ten days.

Any pain is controlled by a prescription or over-the-counter medication, and may last as long as two weeks, depending on the particular procedure. Bruising will fade after a few days or maybe as long as two weeks later. Swelling will subside in anywhere from two weeks to two months, while numbness may last for several weeks. Normal activity can be resumed anywhere from several days to several weeks afterwards, depending on the procedure. The final result will be evident anywhere from one to six months after surgery, although the patient will see noticeable difference within days or weeks, as swelling subsides. The suctioned fat cells are permanently gone. However, if the patient does not maintain a proper diet and exercise regimen, the remaining fat cell neighbors could still enlarge, creating irregularities.

Side effects

A side effect, as opposed to a complication, is medically minor, although it can be uncomfortable, annoying, and even painful.

- ❖ Bruising: can be painful in the short term, and should fade after a few weeks.
- ❖ Swelling: should subside gradually over a month or two.
- ❖ Scars: will vary in size depending on the particular procedure, and should fade over the weeks. Scarring is an individual thing, partly dependent on heredity. For some, scar healing may take as long as a year.
- ❖ Pain: should be temporary and controlled by either over-the-counter medication, or by a prescription.
- ❖ Numbness: sometimes persists for a few weeks.
- ❖ Limited mobility: will depend on the exact procedure.
- ❖ There could be various factors limiting movement for a short while, such as:
 - ❖ Wearing a compression garment.
 - ❖ Keeping the head elevated.

- ❖ Temporary swelling or pain.

The surgeon should advise on how soon the patient can resume normal activity.

Possible complications

As with any surgery, there are certain risks, beyond the temporary and minor side effects. The surgeon should mention them during a consultation. Careful patient selection minimizes their occurrence. Their likelihood is somewhat increased when treated areas are very large or numerous and a large amount of fat is removed. During the 1990s there were some deaths as a result of liposuction, as well as alarmingly high rates of complication. By studying more and educating themselves further, surgeons have reduced complication rates. A study published in *Dermatologic Surgery* (July 2004, pp.967–978), found that "The overall clinical complication rate [for liposuction] ... was 0.7% (5 out of 702)", the minor complication rate was 0.57%, and the major complication rate was 0.14% with one patient requiring hospitalization.⁷

The more serious possible complications include:

- ❖ Allergic reaction to medications or material used during surgery.
- ❖ Infection: any time the body is incised or punctured; bacteria can get in and cause an infection. During liposuction, multiple small puncture wounds are made for inserting the cannula that can vary in size depending on the technique.
- ❖ Damage to the skin: most surgeons work on the deeper levels of fat, so as to avoid wounding the skin any more than they must for the insertion of the cannula.
- ❖ Sometimes the cannula can damage tissue beneath the skin, which may show up as a spotted appearance on the skin surface.

- ❖ Skin necrosis (dead skin) is a rare complication, in which the skin falls off in the necrotic area. The problem can vary in degree. The resulting wound then needs to heal typically requiring extended wound care.
- ❖ Puncture of an internal organ: since the surgeon can't see the cannula, sometimes it damages an internal organ, such as the intestines during abdominal liposuction. Such damage can be corrected surgically, although in rare cases it can be fatal. An experienced cosmetic surgeon is unlikely to puncture any internal organ.
- ❖ Contour irregularities: sometimes the skin may look bumpy and/or withered, because of uneven fat removal, or poor skin elasticity. Not all patients heal in the same way, and with older patients the healing may be slower and a bit imperfect. Sometimes a small touch-up procedure can help.
- ❖ Thromboembolism and fat embolisation: although liposuction is a low-risk procedure for thromboembolism including pulmonary embolism, the risk can't be ignored.
- ❖ Burns: sometimes the cannula movement can cause friction burns to skin or nerves. Also, in UAL, the heat from the ultrasound device can cause injury to the skin or deeper tissue.
- ❖ Lidocaine toxicity: when the super-wet or tumescent methods are used, too much saline fluid may be injected, or the fluid may contain too high a concentration of lidocaine. Then the lidocaine may become too much for that particular person's system. Lidocaine poisoning at first causes tingling and numbness and eventually seizures, followed by unconsciousness and respiratory or cardiac arrest.
- ❖ Fluid imbalance: since fat contains a lot of fluid and is removed in liposuction, and since the surgeon injects fluid for the procedure, even a very large amount of it for tumescent liposuction, there is a danger of the body's fluid balance being

disturbed. This could happen afterwards, after the patient is at home. If too much fluid remains in the body, the heart, lungs and kidneys could be badly affected. The cosmetic surgeon should give the participant a written list of symptoms to watch for, along with instructions for post-op self-care.

Combined with other procedures

Liposuction and tightening / lifting skin

The removal of quantities of fat from under the skin allows the elastic skin to potentially retract after SAL. Good examples of this effect are seen after liposuction to the arms, stomach areas and breasts. The level of skin retraction following liposuction is affected by the age of the patient, quality of skin, presence of underlying disease or smoking and the presence of previous skin damage such as caused by childbirth and surgery. Liposuction techniques such as subdermal undermining using fine cannulas can stimulate further skin retraction but are more frequently associated with contour irregularity. While subdermal undermining may help the skin contract, patients with severe elasticity loss and heavy stretch marks prior to liposculpture may require removal of redundant skin by surgical means after liposculpture. Usually this can be performed after 6 months. Surgical lifts such as a rhytidectomy (facelift), mastopexy (breast lift), abdominoplasty (tummy tuck), or lower body lift, thigh lift, or buttock lift can be utilized when sagging skin alone is the issue or after massive weight loss when the combination of large amounts of skin and shrunken fat cause significant skin droop. Large volume Liposuction (SAL) in combination with other surgery is common, but may have higher complication rates. When done simultaneously, SAL is done minimally in the areas of the undermined tissues to minimize further insult to the blood supply, however a new techniques in tummytuck surgery involves vigorous liposuction first before excising the redundant skin.

Non-surgical alternatives

Cryolipolysis

Cryolipolysis refers to the external application of controlled cooling to reduce limited fat bulges.

Shapewear

One non-surgical alternative that has gained in popularity is the use of shapewear garments. Although shapewear cannot provide patients with the same level of results as liposuction, body scans have shown that they can remove bulges and slim the waist, hips, and thighs. Most shapewear products are similar to the post-surgical compression garments but unlike the post-surgical garments, shapewear is designed for long-term daily use.

Diet and exercise

A healthy eating habit combined with regular exercise has also been proven to cause weight loss. However, the process can take much longer compared to liposuction. However, losing weight via exercise and eating a healthy diet carries much less risk than liposuction. Liposuction does not significantly improve the metabolic abnormalities associated with obesity, and does not achieve the general health benefits (such as increased cardiovascular health) associated with weight loss.

Liposuction Benefits

Liposuction is one of the most popular plastic surgery procedures because it offers safe, effective fat and cellulite removal and can easily be combined with other cosmetic surgery techniques. Some of the main liposuction benefits include improved health associated with fat loss, improved overall appearance, and the reduction in the appearance of cellulite.

Improved Health

Fat removal, whether through dieting or plastic surgery such as liposuction, can have beneficial effects on your overall health and well-being. Most doctors agree that weight loss is the best way to reduce your risk of heart disease, diabetes, and even certain types of cancer. Although liposuction cannot be used to remove large quantities of fat, it can be used for removal of stubborn pockets of fat of 10 pounds or less that resist dieting and exercise. Doc Shop can help you [find a cosmetic surgeon](#) in your area today. Liposuction also benefits those in need of [breast reduction](#). This type of [breast surgery](#) is often used when disproportionately large breasts cause health problems such as back pain, neck pain, and headaches, including migraines.

Improved Appearance

Problem areas that are resistant to diet and exercise can often be dramatically improved through liposuction. The body smoothing and contouring available with liposuction can make an individual look and feel better by simple virtue of the fact that their clothes fit better. Plastic surgery patients who undergo liposuction may even find unexpected benefits of the procedure as they begin to partake in activities that they had previously shied away from because they were unhappy with their appearance.

Fat Removal

Every cell in the body has a specific function that is vital to the body's overall health and well-being. Fat cells are designed to store any unused energy from the food we eat. The body uses fat for insulation, shock absorption, and an emergency source of fuel. The specific body areas where fat is stored depend on your body type, which is largely determined by genetics. Liposuction is an effective fat removal treatment and can help eliminate unwanted pockets of fat that accumulate disproportionately in various areas of the body, contributing to a more desirable overall appearance.

Cellulite Removal

Cellulite is caused by fat cells pushing through the collagen connective tissue directly beneath the skin's surface, causing a dimpled appearance. The appearance of cellulite is not related to the amount of body fat an individual has and is prevalent even in healthy and underweight people. Cellulite is more common in women because men have a tighter collagen mesh pattern beneath their skin. Liposuction can help aid cellulite removal in both men and women, but it is important to remember that there is no permanent "cure" for cellulite. The success of cellulite removal is dependent on many factors, including genetics. Because of this, liposuction should not be expected to eliminate cellulite from the body.

Locate a Liposuction Surgeon in Your Area

To maximize your liposuction benefits, it is vital that you choose the liposuction procedure best suited to your case and find a surgeon capable of delivering excellent results and follow-up care. [Locate an experienced liposuction surgeon in your area](#) to discuss how fat and cellulite removal through liposuction will affect your body's appearance.

Advantages and Disadvantages of Liposuction

Liposuction deals with the removal of fat from certain areas of the body. While fat is good for the body because it insulates the body, too much fat can hamper fluid body movement and increases the body's exposure to disease such as heart attack and stroke. When excess fat is removed from your body, it improves the overall health and makes you feel good about yourself. The success of a liposuction surgery does not lie alone on the skills and techniques of a plastic surgeon. There are also several things that you can do to help make a liposuction procedure easier for your surgeon. Prior to a liposuction surgery, you need to steer clear of anti-inflammatory and anticoagulant drugs to avoid any complications. The

back of a female comprises of several areas that are prone to the unhealthy accumulation of fat. The infra scapular fat on the back of a female is also called the female flank and refers to the fat that is found just above the waist and below the shoulder blades. If you have fat jutting out from your back each time you wear a bra, your female flank is a tad too fat and can be taken care of through liposuction. Swelling is one of the features commonly seen in patients who undergo liposuction. If your experience swelling in any part of the body where liposuction is carried out, do not panic because it is normal. Such swelling only lasts for a short time. Generally, swelling subsides between two weeks and two months. There are different forms of liposuction. Each of them has a degree of efficiency and safety. The method often adopted depends solely on the surgeon. The form that proves more effective is often used. If a liposuction patients changes eating habit there is hope of an appreciable life span. People with excessive weight have been discovered to have different health complications. These complications sometimes limit lifespan. There is no pleasure without pain. Liposuction surgery eventually gives you the body you may have dreamed of all your life but you have to remember that the healing process can be quite painful. Before you embark on a liposuction procedures ask yourself how much I am willing to go through to get the body of my dreams. Lipodissolve is a procedure that will be hazardous to people who have active cancer or AIDS. If you are pregnant, a lipodissolve will do you more harm than good. Always make sure that a particular cosmetic option it right for you before you settle on it.⁸

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