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The new laser liposuction for men

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ABSTRACT: Laser-assisted lipolysis with a medium-pulsed 1064-nanometer neodymium-doped yttrium aluminum garnet (Nd:YAG) system is a new FDA-approved method of removing localized areas of fat with the added benefit of skin tightening. This new method is particularly useful in treating the lower abdomen and submental areas where skin laxity may occur after the removal of adipose tissue. In addition, decreased bruising and scrotal edema after treating men is possible with use of the tumescent technique and the added benefit of coagulation produced by the laser. Experience in treating men with this modality is reviewed.

KEYWORDS: laser lipolysis, liposuction, male patient, SmartLipo, tumescent technique

Introduction

Liposuction is one of the most common cosmetic surgical procedures performed in North America with over 400,000 operations performed in 2006 (1). As technology improves, new modalities are developed to enhance safety, efficacy, and improve upon traditional techniques. Drawbacks following traditional liposuction include ecchymoses, long recovery times, skin laxity as well as pulmonary emboli, seromas, and visceral perforations.

In October of 2006, the United States FDA approved a 1064-nm Nd:Yag laser system (SmartLipo, Cynosure, Inc) for the surgical incision, excision, vaporization, ablation, and coagulation of all soft tissues (2). It is also indicated for laser-assisted lipolysis. This new device addresses the drawbacks mentioned above: ecchymoses, long recovery times, and skin laxity.

Cosmetic surgery was traditionally thought of as exclusively for females. Now, men are realizing that they too can benefit from the effects of cosmetic surgery. In the intensely competitive world of business, it may be a liability to look older, less healthy, or powerful. The introduction of liposuction has revolutionized body sculpting for men.

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Liposuction indications and history

Liposuction is a procedure for the removal of unwanted lumps, bulges, and areas of fat using thin cannulae that are placed into the fat through small incisions that are easy to conceal. The fat is then drawn out of the body with vacuum suction. Liposuction is usually not intended as a weight-loss technique. However, liposuction is commonly used to remove diet- and exercise-resistant fat deposits and to sculpt a slimmer profile.

Fat deposits may be formed beneath the chin and on the hips, abdomen, inner and outer thighs, knees, lower legs, upper arms, and upper trunk. Frequently treated areas in women are the abdomen, hips, thighs, and knees. In our experience, the most often treated areas in men are the hip rolls, abdomen, and breasts. Other areas treated in men include the arms and chin. Sweat glands in the axillae can be removed by liposuction to reduce excessive sweating.

Liposuction was first introduced in the United States in the early 1980s, and is now one of the most commonly performed cosmetic procedures in the United States. There are several different variations of liposuction technique. The tumescent technique was refined by dermasurgeon Jeffrey Klein, MD in the mid-1980s, and is still recognized as the safest method of liposuction (3).

The tumescent technique

The tumescent technique utilizes large volumes of saline solution with precise amounts of epinephrine, bicarbonate, and very dilute lidocaine, which is dispersed into the fatty tissue and minimizes bleeding and bruising. The injected area then becomes locally anesthetized and distended to ease the passage of small cannulae to aspirate the fat.

Postoperative discomfort is reduced with the tumescent technique since the local anesthesia remains in the treated tissue with residual numbness that may last for 18 hours or more after surgery. Many patients may walk out of the office without assistance and are back to their regular routine in a few days.

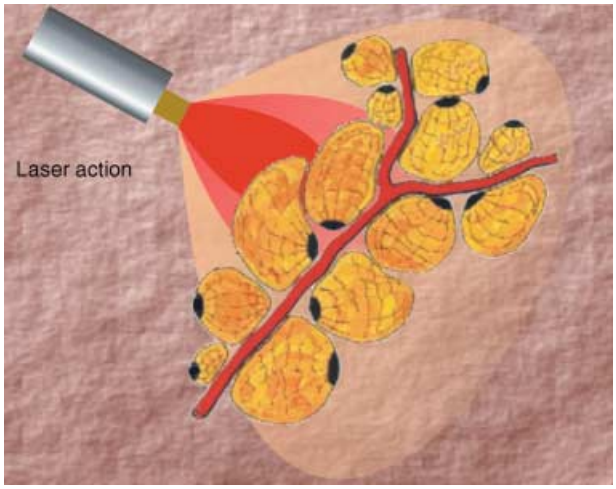

FIG. 1. Laser action.

Skin laxity and laser assisted lipolysis

When fatty deposits are removed by liposuction, the overlying skin must contract to smooth over the contoured area. In patients who are obese, have large fatty areas, or have stretch marks, the degree of contraction may not be enough to compensate for the treated area. This laxity may result in rippling or folds, and the removal of excess skin may be necessary to achieve a smooth result. Unfortunately, the surgical removal of excess skin may result in an unsightly scar which may or may not be more desirable than leaving the redundant skin fold.

The advent of laser lipolysis has recently made headlines with the recent FDA approval of a medium-pulsed 1064 nm Nd:YAG laser system, SmartLipo, that targets selected areas of fat for destruction whereas simultaneously tightening the skin (2). This technology is less invasive compared to conventional liposuction as it employs a 300 μm fiber in a 1-mm diameter cannula that is threaded under the skin, in comparison to the 3–5 mm cannulae used in traditional liposuction.

Localized adiposities to be treated are instilled with local tumescent anesthesia, and then the laser cannula is introduced through a small incision in the skin. Laser pulses are delivered to the treatment site as the cannula is moved throughout the subcutis in a reciprocating manner. The positioning of the cannula is visualized via trans-illumination for a red diode guiding beam coupled to the laser fiber. The ultra-short, high-peak power of the laser pulses generates a photoacoustic effect that selectively disintegrates adipocyte membranes for discharge of the cellular contents with minimal risk of tissue charring. The laser also coagulates

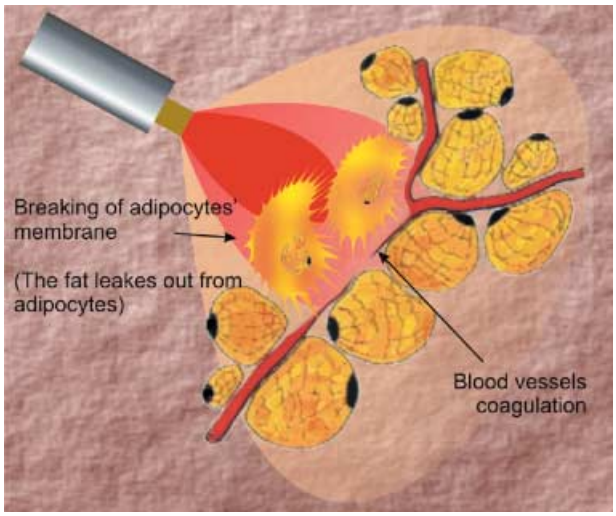

FIG. 2. Breaking of adipocyte membrane.

tissue to promote collagen tightening and hemostasis. The thermolysis of the laser will ablate the fat tissue that can then be aspirated by either syringe suction or peristaltic pump. The stages of laser lipolysis are illustrated in FIGS. 1–4.

Advantages of laser assisted lipolysis

This laser can treat areas of high vascularity or where large cannulae might be problematic. Because this laser combines fat melting with skin tightening, it can be used for areas where liposuction is indicated but skin laxity might be made worse by traditional methods. There is less bleeding, swelling, and bruising than traditional liposuction and thus a faster recovery time (4).

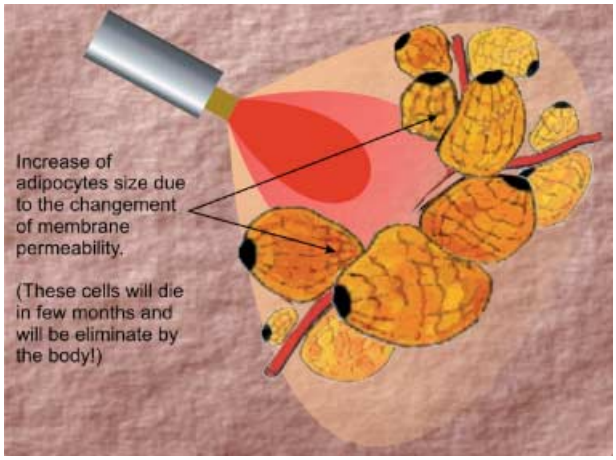

FIG. 3. Increase of adipocyte size due to alteration of membrane permeability (these cells will die in a few months and be eliminated by the body).

FIG. 5. (Top) Before SmartLipo; (Bottom) postoperative 6 months after SmartLipo, with good skin contour and skin retraction.

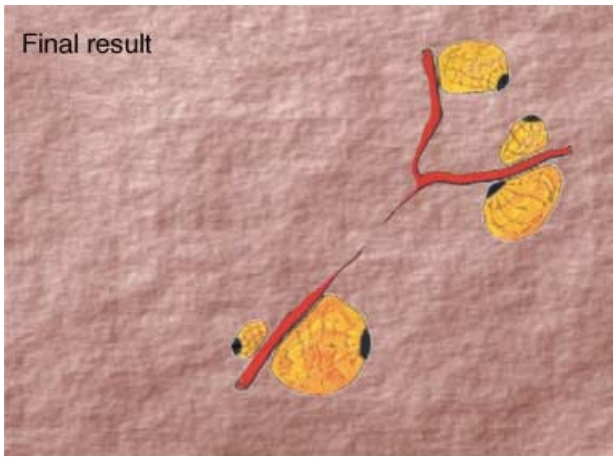

FIG. 4. Final result.

FIG. 6. (Top) Before SmartLipo; (Bottom) postoperative 6 months after SmartLipo, demonstrating tissue retraction.

In a study of 245 patients, six men and 239 women, where the average age was 35 (range 17–55), results showed that SmartLipo was less traumatic than conventional liposuction (5). The difference was attributed to the small diameter cannula, and the laser tissue interaction causing less bleeding from the coagulation of the small blood vessels. The conclusion was that laser lipolysis is less traumatic to tissues, causing less swelling and bruising. In addition, skin retraction improved when the technique was used in areas of flaccidity. This effect is shown in FIGS. 5 and 6.

Another study of SmartLipo had 1733 patients, 312 men and 1421 women ranging in age from 15 to 78. Ecchymoses were less as was blood loss, and patients had less postoperative discomfort (6).

On histology after laser irradation, scanning electron microscopy showed destructive changes surrounding tunnels of about 300 μm, degenerated cell membranes, and dispersed lipids (7).

Axillary hyperhidrosis

Axillary hyperhidrosis is excessive underarm sweating that is annoying and embarrassing for its sufferers. Hyperhidrosis affects 3% of the population and results from excessive sympathetic nerve stimulation of the eccrine sweat glands (8). Many treatments are available for this condition, including drying agents, anticholinergics, and botulinum toxin injections. Surgical treatments include sympathectomy, which involves ablation of the sympathetic

nerve supply to the sweat glands, or liposuction, which removes the sweat glands without affecting the body's overall ability to cool itself. SmartLipo may be a new and effective treatment for this condition.

Special considerations in the male patient

Liposuction in men is commonly applied to areas that may also be quite fibrous, such as the breasts, abdomen, and hip rolls. The use of conventional liposuction can often be traumatic in these fibrous areas. SmartLipo should be considered as an alternative as it can be less traumatic and lessen the recovery time. Laxity and jowling of the submental area can also benefit from the skin tightening properties of SmartLipo.

It is important to note that liposuction in the abdomen may cause swelling and ecchymoses of the testicles. In addition, patients should avoid strenuous exercise for the first two weeks after surgery since that may delay healing.

The actual technique of laser lipolysis involves the following steps: preoperative marking of the areas to be treated, infiltration of local anesthetic, and laser energy administered via a layer technique. Laser lipolysis can be readily combined with conventional liposuction for large fatty areas with skin laxity. In the postoperative period, patients should wear an elastic compression garment for 2 weeks to reduce swelling.

Conclusion

Laser lipolysis is a promising new procedure that is safe and effective and has great application for men in whom fat deposits are resistant to diet and exercise.

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