

Treatment and Prevention of Umbilical Sagging with Laser-assisted Liposuction: The New Happy Protocol

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Summary: Sagging of the periumbilical skin, also known as the “sad umbilicus,” is one of the most common postoperative complications in liposuction. It is characterized by an increase in the width and decrease in the height of the umbilicus. Technological advances in power-assisted liposuction resulting in skin tightening have been central to improvements in the treatment of sagging skin. Laser-assisted liposuction is a procedure in which a laser fiber induces lipolysis and skin tightening. Laser treatment delivered using a 980-nm diode laser may result in up to 30% skin surface area contraction. The aim of this study was to describe a new technique called the “happy protocol” for the treatment and prevention of the sad umbilicus. The periumbilical region is treated using a 980-nm diode laser set to an output power of 20 W, with a total delivered energy of 5000 J. The developed technique may be applied to correct shape distortions or to create a natural-looking and aesthetically pleasant umbilicus during liposuction. A decrease in the width of the umbilicus followed by an increase in height are observed in the first postoperative days. Patients who were followed up for 7 months postoperatively showed positive aesthetic results. The final outcome was an oval-shaped umbilicus, with increased height and reduced sagging in the periumbilical region. (*Plast Reconstr Surg Glob Open* 2023; 11:e5022; doi: [10.1097/GOX.0000000000005022](https://doi.org/10.1097/GOX.0000000000005022); Published online 9 June 2023.)

PRESENTATION OF THE NEW TECHNIQUE

Attaining a natural-looking and aesthetically pleasant umbilicus is a major challenge in body contouring surgery. Ideally, the umbilicus should be small, without protrusion, oval-shaped, vertically oriented, with a slightly deep central depression and a discreet upper hood.^{1,2} The aspect ratio, defined by the proportional relationship between

the width (frontal axis) and height (longitudinal axis) of the umbilicus, is considered to be its most important aesthetic feature.^{3,4}

Umbilical sagging, also known as the “sad umbilicus,” is a common complication in liposuction. The loose skin in the periumbilical region leads to a decrease in the height and increase in the width of the umbilicus,⁵ making its shape similar to a frowning mouth. Several techniques for reconstruction of the umbilical shape, correction of periumbilical sagging, and treatment of the sad umbilicus are described in the literature.^{6–8} Many studies have suggested the creation of new scars, flaps, or the use of mechanical modifications through invasive sutures for repositioning and fixation of the sagging skin. A new technique for assessing sagging skin with tightening of the periumbilical region, resulting in little or no periumbilical scarring, may be used in the treatment and prevention of the umbilical sagging in liposuction.

Laser-assisted liposuction (LAL) is a procedure performed with the use of laser devices emitting at wavelengths ranging from 980 to 1460 nm that may result in up

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to 30% skin surface area contraction, providing a better outcome than traditional liposuction.^{9,10}

The purpose of this study was to describe the happy protocol, a new technique for prevention and treatment of umbilical sagging, using LAL for laser-induced skin tightening.

The InGaAlP diode laser (INNOVA CX 980, Highlas do Brasil Ltda, São Paulo, Brazil), emitting at 980 nm, and using a 600 or 800 μm optical fiber is recommended. The Nd:YAG diode laser (SP Dynamis, Fotona, Slovenia), emitting at 1064 nm, can also be used, as no clinically significant differences between outcomes obtained with the use of the two LAL devices were observed.

The procedure is indicated for the prevention or treatment of mild to moderate umbilical sagging after liposuction, pregnancy, or weight loss of up to 15 kg in patients with body mass index from 28 to 32 kg/m², and older than 40 years of age.

The happy protocol may be combined with tumescent liposuction, in which case the laser treatment is recommended to be performed after the fat aspiration, with the patient in the supine position and under general anesthesia. The procedure may also be performed alone (without liposuction) after infiltration with Klein solution in the periumbilical region and throughout the lower abdomen.

Liposuction preoperative markings are made independently and are not affected by the skin markings for the umbilical tightening procedure. The preoperative markings for the happy protocol consist of a square of 10 \times 10 cm (area, 100 cm²) drawn on the periumbilical region, with the deepest point of the umbilicus in its center. The square is then divided into four quadrants (upper-right, upper-left, lower-right, and lower-left) of 5 \times 5 cm each. The laser output power is set to 20 W and energies of 3000 J and 2000 J are delivered to the upper and lower quadrants, respectively, for a total delivered energy of 5000 J. (See Video 1 [online], which shows diagnosis of umbilical sagging and markings of the happy protocol.)

The optical fiber is inserted through 5-mm incisions made in the pubic region, at the most caudal projections of the bilateral linea semilunaris. The optical fiber movement should be slow and performed in the superficial layer of

Takeaways

Question: The study describes a simple technique that directs consistent scientific information toward a new approach for the treatment of umbilical sagging known as the “sad umbilicus.”

Findings: The new technique is based on the use of a 980-nm diode laser for laser-induced skin tightening and may be applied to correct shape distortions or to create a natural-looking and aesthetically pleasant umbilicus during liposuction.

Meaning: The happy protocol is an innovative, reproducible technique with a short-learning curve that uses laser-assisted liposuction for skin tightening and shows encouraging results.

the abdominal subcutaneous tissue. The goal is to reach an external skin temperature of 40°C and an internal temperature of 60°C. (See Video 2 [online], which shows a demonstration of the surgical technique of the happy protocol.) A thermal camera (FLIR T540-EST 42, FLIR Systems, Inc., Wilsonville, Oreg.) can be used to prevent overheating of the skin and increase the effectiveness of the technique. Skin closure is made using 5-0 monofilament nylon suture (Mononylon, Ethicon Inc., Summerville, NJ, USA), with stitches removed after 10 days of surgery. Dressings and bandages are removed 5 days postoperatively, when lymphatic drainage therapy starts, scheduled from 2 to 3 days a week for a 60-day period. The use of umbilical orthosis for skin contraction is not necessary.

An immediate reduction in the width of the umbilicus is observed during surgery. After the procedure, the umbilicus shows a gradual increase in height and decrease in width, leading to an oval shape with a pleasant appearance (Figs. 1 and 2).

As the aging process continues, the umbilicus will show some flaccidity after 18 to 24 months following LAL. However, this period of time justifies a small intervention such as the happy protocol and does not differ much from those of other cosmetic procedures, such as mastopexies, liposuctions, and some facelifts.

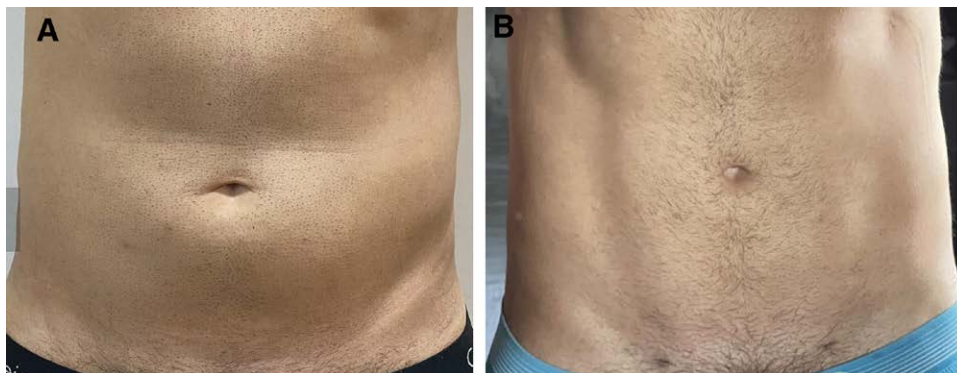


Fig. 1. Preoperative (A) and 1-month postoperative (B) photographs (frontal view) of a 36-year-old male patient who underwent LAL combined with happy protocol.

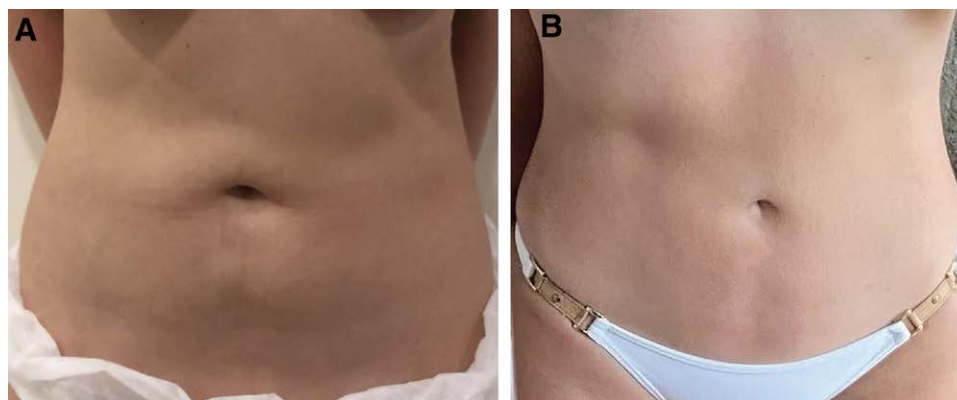


Fig. 2. Preoperative (A) and 3-month postoperative (B) photographs (frontal view) of a 38-year-old female patient who underwent LAL combined with happy protocol.

DISCUSSION

Various techniques for the treatment of umbilical sagging that suggest the creation of new scars, flaps, or the use of complex sutures are associated with long learning curves and relevant complications, including necrosis, unsightly scars, granuloma formation, and umbilical deformities.⁶⁻⁸

The proposed Happy Protocol is easily performed by either surgeons familiar with LAL or those surgeons who use other devices, as marking an area around the umbilicus and applying the laser treatment is almost intuitive. The output power and delivered energies described here are based on scientific literature,¹¹ and skin tightening associated with LAL has been previously described by several authors.^{9,10,12}

The innovation of the happy protocol consists in directing consistent scientific information toward a new approach for the treatment of umbilical sagging. This is a simple, reproducible technique with a short learning curve that shows encouraging results. The same rationale may be applied to the use of different devices for skin tightening in modern liposuction, opening exciting perspectives for prospective randomized studies.

The happy protocol is a new technique for treatment and prevention of umbilical sagging based on the use of a 980-nm diode laser for skin tightening. Complications associated with the procedure may include burns, seromas, pigmentation, and periumbilical fibrosis. When correctly indicated and applied, the technique improves periumbilical sagging by increasing the height and decreasing the width of the umbilicus, reversing the unsightly appearance of the so-called sad umbilicus.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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