

Endoscopic Lipoabdominoplasty

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Summary: Endoscopic lipoabdominoplasty is the surgical technique utilizing endoscopy, as in a conventional abdominoplasty, to repair acquired abdominal wall defects, such as diastasis recti or ventral hernias. A conventional liposuction is carried out through 4 ports, which shall be used later to place the laparoscopic trocars for fat removal and supra-aponeurotic undermining. Three trocars are introduced through these ports, one for the camera and the others to introduce surgical instruments. A CO₂ insufflation is carried out; the supra-aponeurotic space is undermined up to the xiphoid process. Then a rectus muscle plication is carried out with slow-absorbing sutures in 2 or 3 sections. Two Jackson Pratt drains are placed, and the incisions are closed. The objective of this article is to describe the technique and establish the necessary safety criteria to obtain good results in patients with minimal skin laxity, with moderate fat tissue distribution, with musculofascial diastasis, with ventral hernias, and who do not need or do not accept a visible surgical scar. (*Plast Reconstr Surg Glob Open* 2021;9:e3346; doi: 10.1097/GOX.0000000000003346; Published online 26 January 2021.)

INTRODUCTION

Abdominal wall defects are one of the most frequent consultations in a routine surgical practice; the most frequently used repair techniques are liposuction and abdominoplasty.¹

There are numerous abdominoplasty procedures, and most of them combine circumferential liposuction, rectus plication, and redundant dermo-fat flap resection.² Its practice has been refined over the years, with a decrease in the associated morbidity and mortality rates.³⁻⁷ Nevertheless, there are a significant number of patients who do not need skin resection but present abdominal wall weakness, such as rectus diastasis with or without concomitant ventral hernias. In some of these patients, it is not necessary to remove a dermo-fat flap and they are not willing to accept the rectus plication scar, especially if they have not undergone a cesarean section. The endoscopic technique was used to repair these defects and was combined with circumferential definition liposuction.

PATIENTS AND METHODS

Adequate patient selection is a key element for success, because if the indication is not correct, the abdominal

wall defect may be repaired but not the flaccidity nor the redundant abdominal flap.⁸

Indications are divided into absolute and relative. Absolute indications are those in which the technique is performed and there is no need to convert to a conventional abdominoplasty, and the relative indications are those in which the technique may be substituted by a conventional technique because a small dermo-fat flap resection would be needed in any case.⁹

Indications

Absolute Indications

Patients without minimal skin laxity and moderate fat tissue distribution with:

- small umbilical hernias which can be repaired,
- small epigastric hernias which can be repaired,
- congenital or acquired abdominal wall defects, and
- rectus musculofascial diastasis less than 5 cm.

Relative Indications

Patients with a long distance between the xiphoid and the pubis presented with the abdominal wall defects as mentioned above, but with a small abdominal flap that can be minimally excised and allow for umbilical transposition.

Surgical Technique

Positioning the Patient

The patient is placed supine, using the French laparoscopic cholecystectomy technique; the surgeon stands between the patient's legs (Fig. 1).¹⁰

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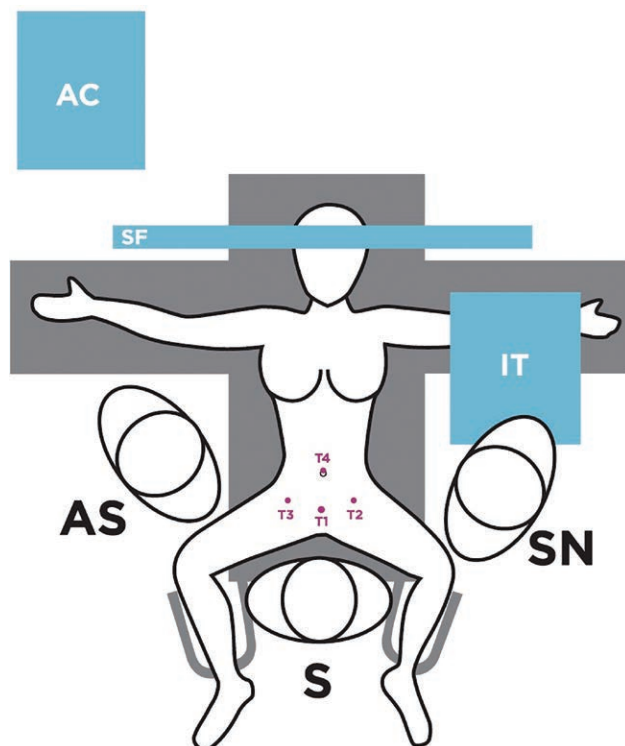


Fig. 1. The French position. T1 is an optic port, and T2 and T3 are instrument ports. AC, anesthesia console; AS, assisting surgeon; IT, instrument table; S, operating surgeon; SF, single flat screen; SN, scrub nurse.

Liposuction with Tumescent Technique under General Anesthesia

Four incisions are done: 1 (T1) on the pubic symphysis; 2 (T2) and 3 (T3) in both iliac fossae; and finally (T4) 1 at the umbilical level.^{2,11–13} A conventional liposuction is carried out to remove local fat; this is a key to visualize the space for supra-aponeurotic undermining.

Trocar Placement and Cavity Insufflation

A 10-mm trocar is placed through T1, and an angulated camera is introduced; 2 additional 5-mm trocars are placed through T2 and T3. (See figure, **Supplemental Digital Content 1**, which displays trocar placement and cavity insufflation. A 10-mm trocar placed through T1, and 2 additional 5-mm trocars placed through T2 and T3, <http://links.lww.com/PRSGO/B539>.)

A supra-aponeurotic pneumatic dissection is carried out with a laparoscopic insufflator. It operates at a 10–30 mm Hg low-flow range and a maximum pressure level of 10–12 mm Hg. (See figure, **Supplemental Digital Content 1**, <http://links.lww.com/PRSGO/B539>.) Periodic deflation is recommended to prevent residual subcutaneous emphysema.

Supra-aponeurotic Undermining

The procedure begins at suprapubic level, sectioning the connective tissue and some perforators. It can be carried out with a monopolar hook, scissors, or harmonic

Table 1. Data of 17 Patients Undergoing Endoscopic Lipoabdominoplasty, Characteristics, and Complications

Cases Analysis (n = 17)	Value (%)
Age, y	
Mean	38
Range	31–58
Surgical time, min	
Mean	69
Range	35–180
Previous abdominal surgery	
Without cesarean scars	12 (70.59)
Cesarean scars	5 (29.41)
Characteristics	
Postpregnancy recti diastasis	10 (58.82)
Postpregnancy recti diastasis and umbilical hernias	6 (35.29)
Postpregnancy recti diastasis and epigastric hernia	1 (5.88)
Complications	
Seroma	1 (5.88)
Minor surgical wound infection	1 (5.88)

scalpel. Undermining is continued cephalad; the rectus aponeurosis is identified and detached from the connective tissue up to the external dihedral rectus angle.¹⁴ (See **Video 1 [online]**, which displays the main steps of endoscopic lipoabdominoplasty shown by the angulated camera.)

The incidental ventral hernias are repaired, and the gaps are closed with absorbable sutures (polyglactin).¹⁵ The umbilicus is detached up to the xiphoid process. Undermining is completed when both rectus muscles are exposed. (See **Video 1 [online]**.)

Medial Rectus Plication

Monofilament synthetic absorbable sutures, such as 1.0 polydioxanone, are advised.¹⁵ Closure begins at the xiphoid process advancing caudally with uninterrupted sutures. Closure is carried out in 3 sections united by intracorporeal knots. The medial rectus plication is completed at the pubic symphysis. (See **Video 1 [online]**.)

Umbilical Reinsertion

Umbilical reinsertion can be performed endoscopically or through T4 with absorbable sutures.¹⁶

End of the Procedure

In general, we perform a medium to high definition liposuction for better results and leave a drain which is removed through T2 and all incisions are closed.^{16–18}

Endoscopic Conversion Rationale

- Intractable hemorrhage
- Defects not amenable to laparoscopic closure
- Abdominal organs injury
- Intracorporeal laparoscopic knot tying not possible

Postoperative Follow-up

Compression garments and a foam vest are indicated in all cases for 30–90 days.¹⁸ Ultrasound and periodic manual lymphatic drainage massages are essential therapies and complement the surgery. It is indicated to start physiotherapy on the fifth postoperative day.¹⁹

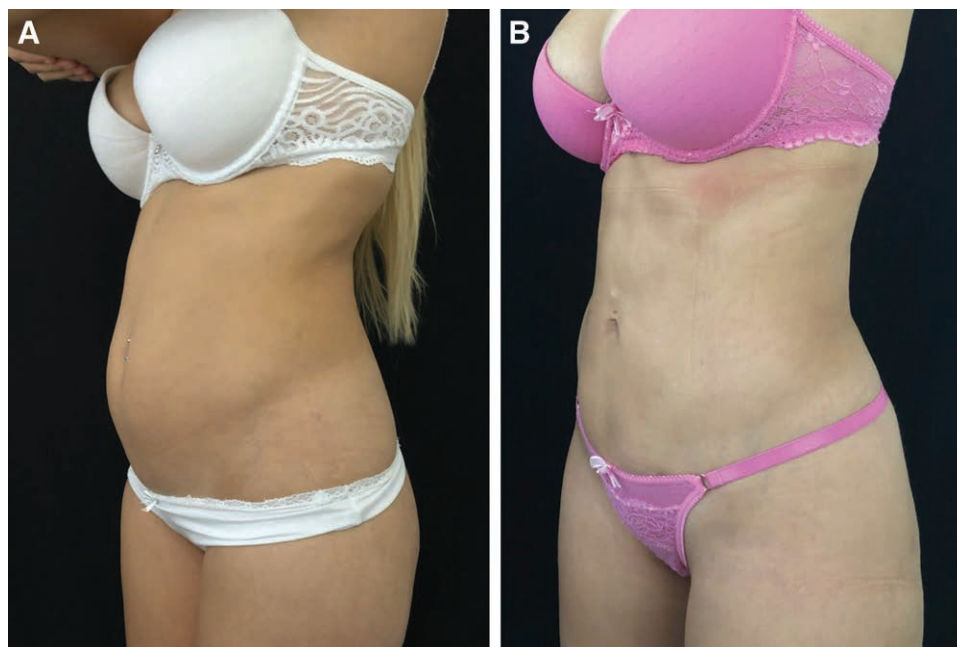


Fig. 2. Before and after endoscopic lipoabdominoplasty. A 31-year-old woman who underwent endoscopic lipoabdominoplasty with a muscle-enhancing liposuction, before (A) and 2 months after surgery (B).

RESULTS

A total of 17 patients were treated with this technique between 2017 and 2020 ($n = 17$). Mean age was 38 years old. All were women with postpregnancy recti diastasis (100%). Five had cesarean scars (29.41%). Six presented with concomitant umbilical hernias (35.29%). One presented with an umbilical hernia with an epigastric hernia (5.88%). Definition liposuction was combined in all cases (100%).

Surgical time was estimated excluding liposuction time; therefore, average time was estimated from trocar placement to skin closure. Mean operative time during the learning curve (6 cases) was 113 minutes, and subsequently it dropped to 45 minutes; therefore, the average operative time in this series is 69 minutes.

There were some minor complications. One patient presented with a seroma that required puncture drainage (5.88%), and 1 had a surgical wound infection (5.88%). There were no major complications nor secondary diastasis. All patients showed a high level of satisfaction. The cases analyzed are listed in Table 1.

CONCLUSIONS

This technique shortens operative time, as there are no extensive skin incisions, and reduces postoperative care and postoperative pain. One of the limitations of the procedure is the learning curve, as the operator needs experience and laparoscopic expertise. Loss of the vascular dermal flap is reduced by avoiding extensive skin incisions. As an additional advantage, it provides a better aesthetic result that significantly increases patient's satisfaction (Fig. 2).

In all cases, it was possible to perform a muscle-enhancing liposuction for better results. (See Video 2 [online],

which displays the patient 1 year after surgery: A 38-year-old woman who underwent endoscopic lipoabdominoplasty with a muscle enhancing liposuction.)

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