

# Surgical Correction of Gynecomastia in Thin Patients

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## Abstract

**Background** Gynecomastia refers to a benign enlargement of the male breast. This article describes the authors' method of using power-assisted liposuction and gland removal through a subareolar incision for thin patients.

**Methods** Power-assisted liposuction is performed for removal of fatty breast tissue in the chest area to allow skin retraction. The subareolar incision is used to remove glandular tissue from a male subject considered to be within a normal weight range but who has bilateral grade 1 or 2 gynecomastia.

**Results** Gynecomastia correction was successfully performed for all the patients. The average volume of aspirated fat breast was 100–200 ml on each side. Each breast had 5–80 g of breast tissue removed. At the 3-month, 6-month, and 1-year follow-up assessments, all the treated patients were satisfied with their aesthetic results.

**Conclusions** Liposuction has the advantages of reducing the fat tissue where necessary to allow skin retraction and of reducing the traces left by surgery. The combination of surgical excision and power-assisted lipoplasty also is a valid choice for the treatment of thin patients.

**Keywords** Gynecomastia · Liposuction · Power-assisted liposuction · Surgical treatment

Gynecomastia refers to the condition of breast enlargement in males, which occurs for 65% of adolescents [1–3]. The increase in breast volume may be due to glandular tissue, fat (pseudogynecomastia), or a combination of both.

Pseudogynecomastia is the proliferation of soft subcutaneous fat, which gives males the appearance of developing breasts. Treatment for this pathology depends on the nature of the breast enlargement. With obese patients, it is possible to decrease the glandular tissue or its prominence by a weight-loss program as a first-line treatment [4].

Gynecomastia is clinically represented by the presence of a rubbery, firm mass that extends concentrically from the nipples. To the touch, this subareolar disk of glandular tissue can be similar to a corded rope [5]. However, clinical evaluation of the breast parenchyma varies depending on the amount of fat tissue surrounding it.

The pathophysiology of gynecomastia is thought to be an imbalance of estrogens and androgens, with a decreased testosterone-to-estradiol ratio [6]. This imbalance can occur in different ways and can directly affect breast tissues [7]. The altered ratio of estrogens and androgens or the increased breast sensitivity to normal circulating estrogen levels results in ductal hyperplasia, elongation, and branching, together with fibroblast proliferation and increased vascularity [8–11].

According to the breast size and redundant skin, we can distinguish the following gynecomastia categories: grade 1 (small breasts without skin excess), grade 2a (moderate breasts without skin excess), grade 2b (moderate breasts with excess skin), and grade 3 (large breasts with excess skin) [12].

Although gynecomastia is a benign condition, the associated psychological trauma can have long-lasting effects on the emotional and social behavior of the patient. For these reasons, restoration of a normal body image may

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become increasingly important once adolescence begins. However, an optimal correction of the body is hard to achieve [13].

The aim of the treatment is to resect the extra fat and fibroglandular breast tissue, remove the extra skin (if it occurs), and restore a normal chest contour with minimal scarring. Several techniques using a variety of incisions, excisions, suction-assisted lipectomy, power-assisted lipoplasty, ultrasound-assisted liposuction, and recently, a power-assisted arthroscopic-endoscopic cartilage shave all have been used to treat gynecomastia, and in a majority of the cases, a combination of these techniques has been used [12–17].

In 1946, Webster [14] described a subareolar approach for the removal of male breast gland. This technique still is important in the treatment of true gynecomastia, and if performed properly, ensures good results. This technique was proposed for patients who have a diagnosis of gynecomastia without the fatty component. Thus, patients with gynecomastia and a body mass index (BMI) of 18.5–21.5 kg/m<sup>2</sup> usually underwent gland removal without liposuction [12–14].

Currently, a combination of subcutaneous fat and breast tissue excision is performed in different ways by making a preliminary small incision or just a scar in the inflammatory fold using the cartilage shaver. In any case, care must be taken to avoid thinning the subareolar area too much and thus creating a depression [17].

This report describes a technique that combines power-assisted liposuction (PAL) and gland removal by a subareolar incision needed in cases without evident fat tissue.

## Materials and Methods

### Patients

During the past 10 years, a chart review of 159 consecutive patients (94 breasts) was performed in the Department of Plastic, Reconstructive, and Aesthetic Surgery at the “Sapienza” University of Rome. For this study, 37 males received a diagnosis and underwent surgery for bilateral grade 1 or 2 gynecomastia. Their ages ranged from 18 to 43 years, and all were within a somewhat normal weight range (BMI, 18.5–21.5 kg/m<sup>2</sup>). Areolar diameters ranged from 2.5 to 4.1 cm.

The patients were first evaluated by an endocrinologist, and only those cases without a hormonal component were submitted to surgery. Before surgery, an ultrasound study was performed to evaluate gland morphology and the fatty component.

The patients were treated with a technique that combined PAL and gland removal via a subareolar incision. All

the patients had postoperative follow-up assessment at 5 days, 2 weeks, 6 months, and 12 months. The following data were collected: age, BMI, volume aspirated per breast using PAL, amount of tissue excised per breast by using subareolar excision; and the number of complications encountered.

### Surgical Technique

Preoperative markings are made while the patient is in the upright position, allowing better evaluation of the amount and limits of extra tissue to be removed. The operation is performed with the patient under general anesthesia and with administration of preoperative antibiotic prophylaxis. The breast is infiltrated with anesthetic via the superwet technique using approximately 500 ml of Ringer’s lactate solution mixed with 20 ml of 2% lidocaine, 20 ml of Naropin, and 1 ml of 1:1000 epinephrine [18]. Two small skin incisions are made bilaterally along the anterior axillary line: one in the inframammary fold and one at the base of the axilla.

Using the PAL-200E MicoAire power-assisted lipoplasty device (MicroAire Surgical Instruments LLC, Charlottesville, VA, USA), PAL is performed. We prefer to use PAL because it helps pass the liposuction cannula through the fibrous parenchymal framework of the breast.

Before performing liposuction, we suture a skin protector to the skin incision to protect the surrounding skin from injury due to friction. Pneumatic pressure is set at 5.5 bar/kg/cm to power a reciprocating movement at 4,000 cycles/min. Suction pressure is set at 600 mmHg in a continuous mode [14, 18].

Liposuction is performed using 0.75-mm triple-hole cannulas over the chest wall, 2/3 cm beyond the marked breast boundaries, within and below the inframammary line. Superficial liposuction is performed first using the 3-mm cannula to dissect the breast parenchyma from the skin to favor skin retraction. Deep liposuction then is performed using the 4-mm cannula, with dissection of the gland from the pectoralis fascia.

The glandular tissue is resected using a subareolar approach. Surgical excision of the breast mass is performed using a Webster incision [14]. A skin incision is made below the areolar edge. The incision can be extended in a radial direction from one or both ends (inverted  $\Omega$ ) in case it is necessary to remove a significant amount of breast tissue through a small-diameter areola. The incision then is deepened into the subcutaneous plane up to the gland. By lifting the nipple–areola flap on top with a hook, it is possible to dissect the glandular tissue for 360°. The mammary gland is sharply excised under direct vision. The dissection is made much easier by the previous liposuction.

The excised breast tissue is submitted to the pathologist. A careful hemostasis is performed. To avoid

overcorrection, a small deep purse-string suture below the nipple, is performed if necessary [14, 18]. Two small drains coming out from the lower liposuction incisions are left in place for 1 or 2 days. The areola incisions are closed using an interrupted dermal 4/0 resorbable suture and a subcuticular 4-0 nylon suture. A pressure garment is applied at the end of the surgery and kept in place for 4 weeks.

## Results

Gynecomastia correction combining PAL and mastectomy through a semicircular subareolar incision was performed successfully for normal-weight patients (Figs. 1, 2, 3). In all cases, PAL was used, and the average volume aspirated per breast was 100–200 ml.

For the patients who received the subareolar incision, we were able to remove 25–80 g of gland parenchyma from each breast. The average operative time was 60 min (range, 40–87 min). Histology confirmed their condition to be benign. By using this technique, we were able to treat 37 patients (63 breasts) successfully. No chest contour deformities were observed.

Complications occurred for 1 (1.5%) of the 63 breasts treated with this technique in this series. One patient experienced a hematoma after a few days, because, a blunt trauma to the chest treated by needle aspiration. No other complications occurred, and no patients required any

revision. At the 1-year follow-up assessment, all the treated patients expressed satisfaction with the aesthetic results achieved.

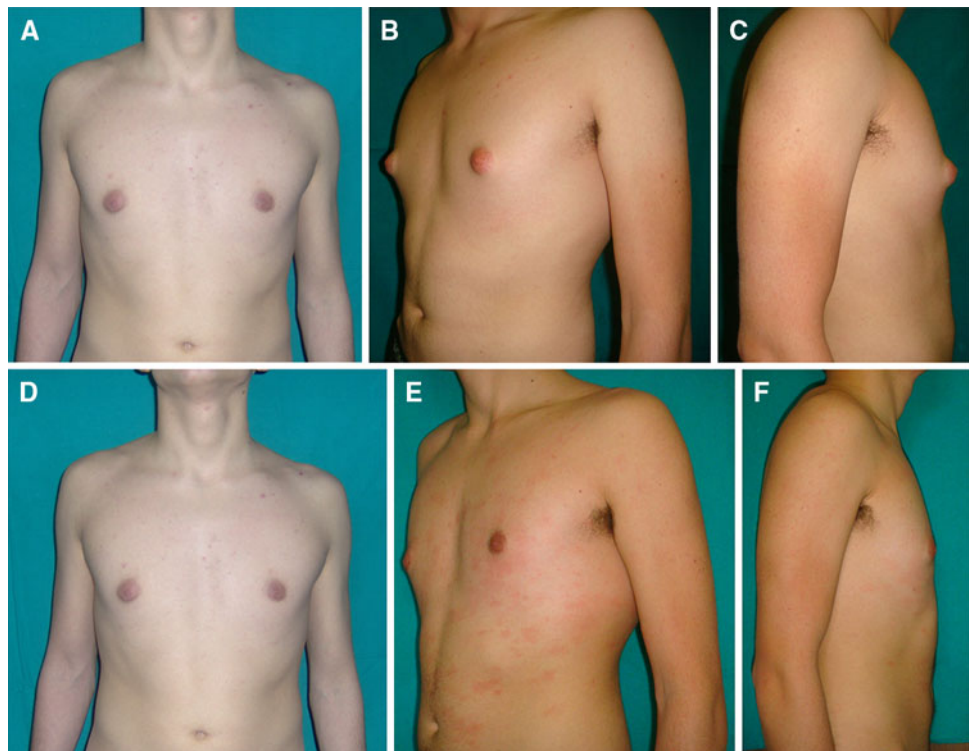
Table 1 presents a comparison between the complications in our patients and those reported in the literature for other surgical techniques. The combination of power-assisted lipoplasty and mastectomy in our study caused a complication (a hematoma) in only 1 (2.7%) of 37 patients. The notable difference in the number of complications between our technique and others is evident.

Table 2 shows that when the open excision technique alone was used, 86.6% of the patients had no complications, and 50% of those who had complications underwent reoperation. When open excision technique plus liposuction was used, 78.5% of the patients had no complications; 50% of those who had complications experienced a seroma; and 25% of those with complications underwent reoperation.

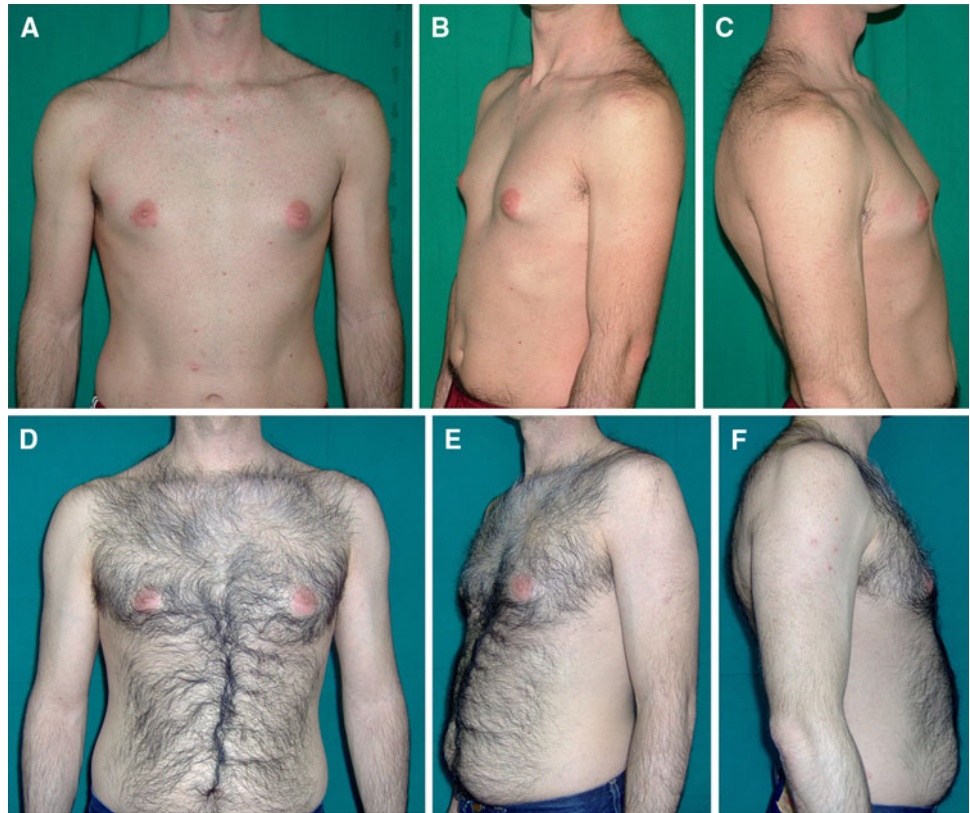
The use of liposuction alone caused no complications for 88% of patients. However, more than 50% (66%) of the complications required reoperation. The same thing happened when liposuction plus arthroscopic shaver was used, with almost 50% of the total complications requiring reoperation.

Power-assisted liposuction and mastectomy have shown an almost total absence of complications (97.3%). Only 1 of 37 patients experienced a hematoma, giving a 2.7% total complications rate.

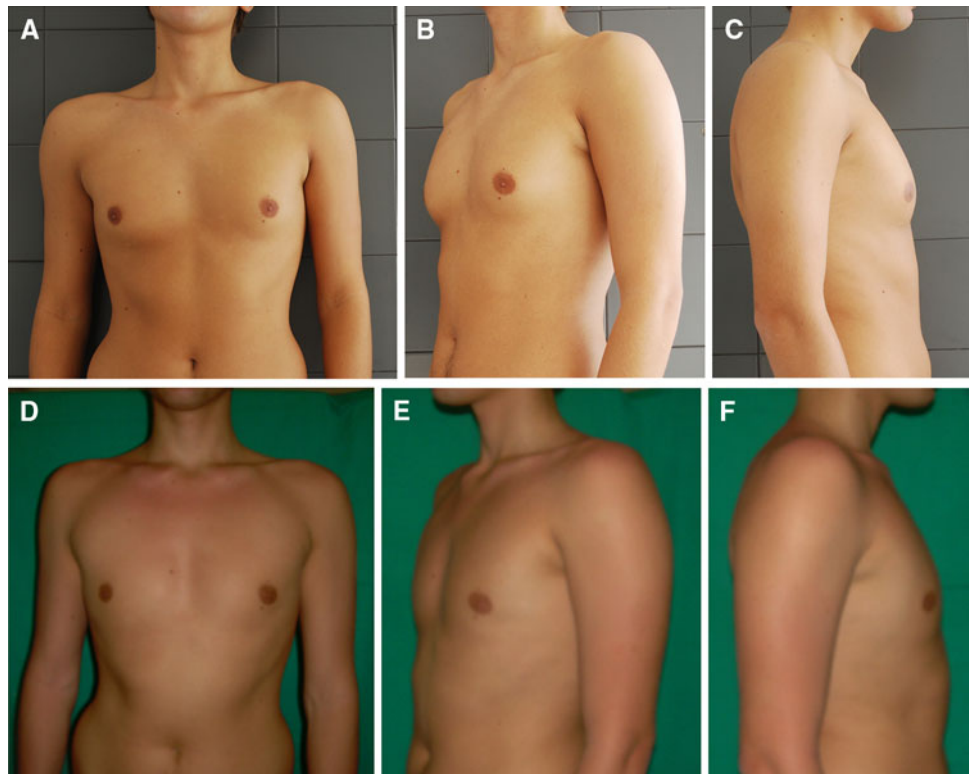
**Fig. 1** A 24-year-old thin patient (case 1) treated with power-assisted liposuction and gland removal through a subareolar incision. **a–c** Preoperative views. **d–f** Postoperative views after 12 months



**Fig. 2** A 35-year-old thin patient (case 2) treated with power-assisted liposuction and gland removal through a subareolar incision. **a–c** Preoperative views. **d–f** Postoperative views after 12 months



**Fig. 3** A 19-year-old thin patient (case 3) treated with power-assisted liposuction and gland removal through a subareolar incision. **a–c** Preoperative views. **d–f** Postoperative views after 12 months



**Table 1** Comparison between complications experienced by our patients and those of patients undergoing other surgical techniques for gynecomastia treatment previously reported in literature

Technique	Open excision only <sup>a</sup> n (%)	Open excision plus liposuction <sup>a</sup> n (%)	Liposuction only <sup>a</sup> n (%)	Liposuction plus arthroscopic shaver <sup>a</sup> n (%)	Power-assisted liposuction and mastectomy <sup>b</sup> n (%)
No. of patients affected by gynecomastia	45	56	50	74	37
Complications					
Seroma	1	6	1	2	0
Hematoma	0	2	1	1	1
Abscess	1	0	0	0	0
Partial nipple necrosis	1	1	0	0	0
Burn scar revision by ultrasonography	0	0	0	1	0
Skin buttonhole	0	0	0	1	0
Reoperation	3	3	4	4	0
Total patient complications	6 (13.3)	12 (21.4)	6 (12%)	9 (12.1)	1 (2.7)

<sup>a</sup> Ref. [19]<sup>b</sup> Our technique**Table 2** Statistical analysis of complications

Technique	No. of patients affected by gynecomastia	Patients without complications (%)	Patients with complications						
			Seroma (%)	Hematoma (%)	Abscess (%)	Partial nipple necrosis (%)	Burn scar revision by ultrasonography (%)	Skin buttonhole (%)	Reoperations (%)
Open excision only <sup>a</sup>	45	86.6	2.2	0.0	2.2	2.2	0.0	0.0	6.8
Open excision plus liposuction <sup>a</sup>	56	78.6	10.7	3.6	0.0	1.8	0.0	0.0	5.3
Liposuction only <sup>a</sup>	50	88.0	2.0	2.0	0.0	0.0	0.0	0.0	8.0
Liposuction plus arthroscopic shaver <sup>a</sup>	74	87.9	2.6	1.4	0.0	0.0	1.4	1.4	5.3
Power-assisted liposuction and mastectomy <sup>b</sup>	37	97.3	0.0	2.7	0.0	0.0	0.0	0.0	0.0

<sup>a</sup> Ref. [19]<sup>b</sup> Our technique

## Discussion

Gynecomastia is a breast enlargement due to glandular augmentation with or without fat addition. Surgeons aim to reduce the breast size to normal contours, to eliminate painful tissue, and to restore a normal body image, with a minimal scar [20].

Different surgical techniques using hemircumareolar, periareolar, circumareolar, or transareolar incisions as well as distal incisions to the areola skin have been reported

[14, 21–25]. In 1946, Webster [14] described a subareolar approach for gynecomastia treatment, and Pitanguy reported a transareolar incision in 1966 [21]. These two main techniques have been extensively modified to obtain the same aesthetic results. A combination of gland removal and liposuction in the treatment of glandular and fat tissue also has been reported [24].

Liposuction can correct abnormal and excessive collections of adipose tissue. It is considered by many investigators to be one of the most effective treatments for

gynecomastia. However, in the literature, it is underscored that liposuction probably is less effective for patients with true glandular gynecomastia due to the firmness of the male glandular tissue [24, 25].

Standard suction-assisted liposuction, ultrasound-assisted liposuction, and PAL are methods developed to improve and facilitate fat aspiration or disruption. Liposuction removes fat tissue. It has been used as an adjunct to surgery to remove the glandular tissue. This combined approach enables a smooth chest profile and has been associated with a low incidence of postoperative complications and high levels of patient satisfaction [26, 27].

Traditional suction-assisted lipoplasty is a safe and effective procedure. Recently, new methods have been introduced not only to improve aesthetic results but also to facilitate fat extraction [26–28]. Ultrasound-assisted liposuction has proved to be successful in the management of gynecomastia. It eliminates the need for adjunctive surgery to remove fibrous or glandular tissue.

Hodgson et al. [27] reported a series of 13 patients with moderate or severe gynecomastia who underwent ultrasound-assisted lipectomy. None of these patients required intraoperative conversion to open surgery to achieve a satisfactory chest contour and breast consistency [27]. Moreover, the authors reported that ultrasound-assisted liposuction promotes skin retraction and is particularly useful for obese patients and those with very large breasts [27].

First introduced by Fodor, PAL appeared to offer real advantages. It decreased the surgeon's effort in suctioning adipose tissue through the dense parenchymal framework of the breast, thereby decreasing the time required to perform the procedure [28].

The PAL advantage consists of an increased interface between the cannula and tissue from the reciprocating motion. A larger surface means a greater number of cells that can be treated. Indeed, several studies [28–30] comparing PAL with suction-assisted lipectomy have shown that PAL reduces the surgery time with a faster rate of suctioned fat. As a new method, PAL was introduced to simplify and standardize the surgical results of traditional suction-assisted lipoplasty, with helpful application in glandular areas that have harder and fibrotic tissues [30].

However, suction technique has always been considered an adjunctive procedure in true gynecomastia cases and a procedure of choice for obese, formerly obese, or bariatric patients.

The large subcutaneous removal obtained by liposuction promotes skin retraction, if needed, with a better contour of the chest wall, after removal of glandular tissue. On the other hand, a deep and reabsorbable suture, if needed, can be performed just below the nipple with the goal of avoiding a depression of the areola and reducing the

dead space [28–30]. This point is particularly important for patients who may subsequently increase their BMI, thus avoiding possible future depressions.

Liposuction itself has advantages related to the volume of removed tissue, but it also can be used successfully for thin patients with gynecomastia by not removing glandular tissue, thus promoting skin retraction and preventing the appearance of areas of skin depression in patients who have gained weight in the meantime.

## Conclusions

Our technique for the correction of gynecomastia in thin patients is easy to perform. It combines PAL of the pectoral area with breast tissue removal through a subareolar approach, allowing the surgeon to achieve a very good aesthetic result applicable to thin patients as well.

**Conflict of interest** None.

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