An Ameliorated Approach for Sharp Resection in Gynecomastia Surgery

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Abstract Surgery has become the accepted standard for the majority of patients with gynecomastia to get rid of feminine-looking breast enlargement. Many surgical techniques have been proposed according to grade of gynecomastia. The sharp resection of glandular tissues is a keystone for most of them. However, technical difficulties in application and inexperience in mastectomy often lead to poor cosmetic outcomes. Over excision and saucer-like deformity, under resection, and asymmetries are most common ones among them. The author presents an ameliorated subcutaneous mastectomy method to facilitate the learning curve and to improve the esthetic results avoiding saucer-like deformity and other breast contour deformities. This method consists of an en bloc tissue dissection via superior periareolar incision and excision of fatty glandular tissue in suprafascial plan, with slicing and trimming procedure. It is possible to adjust the degree of tissue reduction during surgery; hence, it may be labeled as a “cut-as-you-go” technique. Between 2008 and 2012, 23 male patients were operated with this technique. Medical photographs and drawings were used to describe the technique. The operation resulted in smooth, symmetric breasts befitting to men in all 23 patients. No major complications were observed in any of the cases. None of the patients reported a discomfort in sensation of nipple–areolar complex. The presented technique provides high degree of patient satisfaction and excellent esthetic outcomes and is a promising choice in gynecomastia surgery with extremely low recurrence rates and easy learning curve.

Keywords Gynecomastia · Surgery · Suprafascial slicing · Liposuction · Cut-as-you-go procedure

Introduction

Gynecomastia is the most common benign and palpable enlargement of the mammary gland in men with a high incidence of 32–65 % [1]. Surgical therapy is considered for patients with gynecomastia that does not regress spontaneously or, with medical therapy, is causing considerable discomfort or psychological distress or is long-standing (beyond a 18–24-months period) [2–4]. The surgical options for gynecomastia are subcutaneous mastectomy, suction-assisted lipectomy, or a combination of these approaches that are performed with different technologic devices and surgical methods [5]. Superior pedicle pull-through technique via classic semicircular periareolar inferior incision generally proved to be a valid access in Simon's [6, 7] grades I–IIB gynecomastia in the literature [8, 9]. Skin resection is generally added to the surgical procedure in Simon's grade III gynecomastia [4].

The challenge to achieve the ideal esthetic result lies behind the variety of methods and tools used in gynecomastia surgery. However, some postoperative frustrating problems still cannot be completely eliminated. The most frequent of these are a saucer-like deformity (over resection under areola), residual gynecomastia (under resection), inversion or necrosis of nipple–areola complex, persistence of inframammary fold, contour irregularities, and asymmetries between breasts. Underlying causes of these complications are the technical difficulties in application of sharp resection part of the presently used conventional surgery procedure and the long-standing learning curve. The success of gynecomastia surgery is highly dependent on the surgeon's insight and experience about glandular resection procedure.

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This article describes an alternative submastectomy method for gynecomastia to overcome the most distressing surgical complications that are mentioned above. Our method improves the mastectomy step of surgery by making the resection easier and controllable, thus allowing to obtain the best esthetic results. It also accelerates the learning curve by minimizing the effect of surgeon skill. This method is suitable for patients with Simon's grades I to IIB gynecomastia that does not require skin resection.

Technique

A. Preoperative Preparations and Liposuction Aspirin, smoke, vitamin E, and nonsteroidal anti-inflammatory drugs are instructed to be discontinued 2 weeks prior to the procedure. Surgery was performed under general anesthesia. One intravenous dose of a broad-spectrum antibiotic was administered preoperatively.

The breast tissue was infiltrated with a tumescent solution comprising 1,000 ml of Ringer's lactate solution mixed with 40 ml of 2 % lidocaine, 1 ml (one amp) of 1:1,000 epinephrine, and 12.5 ml of 8.4 % sodium bicarbonate. Generally, 250–400 ml of fluid was injected into each breast until a very tense, swollen, and firm consistency is reached. The infiltrate is allowed to settle for 15–20 min before the procedure begins. Liposuction holes were created in two different points: at infero-lateral side of the breast in anterior axillary line and into superior periareolar line so as to be covered by the superior periareolar incision. Finally, the liposuction procedure was carried out in two different directions (cross-tunneling) using Mercedes-type cannulas. The use of adjunctive lipoplasty is beneficial in almost all patients to help smoothly contouring the peripheral area and defining the glandular tissue. After determining the limits of the fibrotic mass and its total amount, the resection procedure can be made safely.

B. Surgical Technique

- Step 1. Surgical approach was made via superior semi-circular periareolar incision. If desired, a crescentic skin excision can be added to the procedure. Superficially, an even 1 cm skin flap is dissected in all the marked areas with a long Metzenbaum scissors freeing the skin from the underlying fatty glandular tissue (Fig. 1). At the end of superior limit of fibrotic gland tissues, the dissection plane was changed sharply toward pectoral fascia.
- Step 2. From this point, all fibro-fatty tissues are dissected just over the pectoral fascia (Fig. 2) until the inferior limit of dissection is reached. Surgical release should be terminated at a distance of 1–2 cm above the inframammary crease so as to protect the blood supply of pedicle. In order to facilitate the glandular tissue dissection, the tissue may be held with long clamps or suspensory sutures. Then, the harvested tissues are totally delivered outwardly from the incision line (Fig. 3).
- Step 3. Peripheral reduction is achieved by a “cut-as-you-go” manner of the delivered peripheral tissue (Fig. 4). Suturing the reduced tissues to the former place results in elimination of significant sagging by a lifting effect. Peripheral reduction and lifting in combination with supra-areolar crescentic skin excision results in a more natural appearance of inframammary fold and allows easy repositioning of nipple–areolar complex.
- Step 4. Slicing process soon follows the peripheric reduction procedure. For this purpose, the undersurface of released tissues is reduced layer by layer with a scalpel (Fig. 5). Slicing procedure, in many ways, is similar to escharotomy (tangential excision) with humby knife. During slicing procedure, the contours

Fig. 1 Blue lined circle indicates the skin area that will be released from underlying tissue. Blue dotted line shows the course of optional subcutaneous back-cut incision (left). Subcutaneous fatty glandular tissue is elevated as a peninsular flap with inferior pedicle (right)

Fig. 2 Fatty glandular flap dissection from pectoral fascia inferiorly. *D* Elevated part of fatty tissue from fascia pectoralis, *F* fat, *G* gland, *FP* fascia pectoralis, *P* pedicle

must be checked frequently by replacing all delivering tissues into the skin pocket.

- Step 5.** After achieving hemostasis with cautery and irrigating the pocket with saline, a vacuum drain is placed to the lateral suction hole. Then, the reduced fibrofatty tissues are sutured to former position (Fig. 6). Finally, periareolar incision line is sutured, and patient's chest region is wrapped with elastic bandages.

C. Postoperative Care Suction drainage is maintained for 1–3 days. The sutures are removed on the 10–15th postoperative day. Compressive garments for chest region are used for 4 weeks to avoid bruising, swelling, seroma, and hematoma formation in the surgical area.

Fig. 3 Frontal (*left*) and dorsal (*right*) views of harvested fatty glandular flap

Fig. 4 Superior portion of harvested subcutaneous tissue is reduced using a Metzenbaum scissors as a cut-as-you-go procedure (*left*). Lateral view of trimming procedure (*right*)

Patients and Method

Twenty-three male patients aged between 15 and 42 years were operated on from January 2008 to September 2012 using the author's technique. Preoperative grading according to the Simon classification included patients with stage I ($n=3$), stage IIa ($n=14$), and stage IIb ($n=6$) gynecomastia. The mean follow-up was 12.13 months (range of 4–27 months). The preoperative evaluation for all the patients included a thorough history, physical examination, and laboratory evaluation. No evidence of pathologic changes was found in all patients, and none had any previous history of drug abuse. The gynecomastia was classified as idiopathic based on this evaluation in all cases.

Indications This method is suitable for patients with grades I, IIA, and IIB gynecomastia according to Simon's classification. Grade III patients who had excessive skin and ptosis were

Fig. 5 Intraoperative view of slicing procedure (*left*) and the drawing of the lateral aspect of slicing procedure (*right*)

excluded. There were no other exclusion criteria. Suction-assisted lipectomy was performed as needed routinely for all grade II patients to achieve a smoother chest contour.

Fig. 6 Drawings demonstrate the preoperative (*left*) and postoperative lateral views of gynecomastic breast (*right*). Note the tissue gap in the superior portion of reduced gland (*right*). This gap will be closed by suturing procedure

Assessment of Patient Satisfaction The degree of patient satisfaction was evaluated by a subjective self-administered questionnaire. A three-point scale was used in questionnaire, namely, 1 (poor), 2 (good), and 3 (excellent). In the questionnaire, the patients were asked to provide their own opinions with respect to breast appearance and surgical scar quality.

Results

Twenty-three male patients (mean age was 26.3 years, range 15–42 years) were operated on using this method. The mean follow-up period was 12.13 months (range of 4–27 months). No complications like infection, hematoma or seroma, asymmetry, and chest contour deformity were observed in any of the cases. Transient local ecchymosis was observed in two patients for a week. Only partial areolar suture dehiscence was observed as an early complication in one patient who was a heavy smoker. None of the patients reported a discomfort in sensation of nipple–areolar complex.

The questionnaire was sent to 23 patients; 21 completed forms were obtained, and the response rate was 91 %. Good [4 (19 %)] to excellent [17 (81 %)] results were achieved in 21 patients in the parameter of breast appearance (shape). In terms of scar appearance, the results were as follows: excellent [16 (76 %)], good [3 (14 %)], and poor [2 (10 %)]. Long-term follow-ups demonstrated a good success with high degree of patient satisfaction (Fig. 7).

Discussion

Today, surgical resection of excessive glandular tissue (subcutaneous mastectomy) with or without skin resection is the mainly used technique in reduction of gynecomastic breast. Most often, the conventional procedure starts with an inferior periareolar incision. After incision, a cuff of tissue 1.5 to 2 cm in thickness is left behind the nipple–areola complex. On the other hand, it is suggested that a small layer of fatty tissue should be left over the pectoral muscle in order not to expose bare muscle. These maneuvers prevent postoperative nipple–areola depression and adherence of the skin flap and NAC to the chest wall [9].

This classical technique is similar to removing a piece of smooth slice from through a loaf of bread, and it requires an intense attention and experience. Otherwise, unwanted complications such as breast surface irregularities, saucer-like deformity, nipple–areolar complex problems, under-resection, and asymmetric breast appearance may occur [7].

Even the most experienced surgeon may encounter such mentioned complications. Therefore, different methods based on technological devices have been introduced in the literature in order to minimize the effect of both human

Fig. 7 Preoperative (*upper*) and postoperative (*lower*) patient photographs of grade IIA gynecomastia

skill and surgical trauma. The most popular of them are the following: ultrasonic liposuction [10], endoscopic approach [11, 12], cartilage shaver [13, 14], and ultrasound-guided mammotome [15].

Although satisfactory results have been published, these require a specific surgical instrument (this is an important problem in developing countries) and a coercive learning curve as a disadvantage. In addition, the potential risk of skin injury and hemorrhage may limit the use of mammotome. Celebioğlu et al. [16] have proposed a new surgical technique using subareolar glandular pedicle combining with circumareolar en bloc breast tissue excision. Although this technique provided excellent exposure and homogenous breast surface, it has some drawbacks in practice. Firstly, experience is needed to determine the pedicle girth because a wide pedicle leads to subareolar bulk, whereas a thin pedicle may cause partial areola necrosis. In addition, not leaving any tissue on the prepectoral area may result in adhesions to pectoral muscle. Another procedure to achieve good cosmetic results in gynecomastia is pull-through mastectomy technique [17]. This is a promising method when combined with suction lipectomy. However, it takes more time than sharp excision through the areola because, to avoid excessive and irregular reduction, a small amount of tissue must be removed with each pull-through maneuver.

We presented an ameliorated subcutaneous mastectomy technique to prevent the troublesome esthetic complications of gynecomastia surgery. In this technique, except basic surgical instruments, there is no need for any special tools. Since my procedure allows for the use of cut-as-you-go technique in

one side (suprafascial surface), it is suitable even for inexperienced surgeons. After the subcutaneous fibro-fatty tissues are totally released from the pectoral fascia, surgical resections can be made easily by using cut-as-you-go technique.

Unlike some techniques (i.e., ultrasonic liposuction or endoscopic cartilage shaver procedure), author's technique allows obtaining ample tissues for histopathological analysis. The vast majority of gynecomastia patients (75–80 %) are grades I and II patients according to Simon's classification [3, 8]. Therefore, this method is a feasible procedure for the majority of gynecomastia patients.

Some researchers claim that the entire original skin of gynecomastia with Simon's grade IIB or higher can be completely preserved. They have shown that the redundant skin shrinks and disappears with time in all patients [12, 18]. On the basis of this information, it can be said that our procedure is eligible for all gynecomastia patients, even those Simon's grade III. However, this subject requires further studies.

In the presented technique, access to the surgical plan is easy, and dissection procedure is very fast. Because resection procedure was performed on exteriorized tissues, a very controlled resection can be performed. Since resection was made from partially avascular suprafascial plane, except from a few perforator vessels, excessive bleeding does not occur, and bleeding foci can be seen and cauterized easily. As a result, the amount of postoperative bleeding is less than conventional methods. In this technique, the breast skin does not separate from adjacent fibro-fatty tissues in the inferior half of breast. So, in addition to supra-areolar lift of skin (depending on crescentic excision), internal tissue

lift is also applied via superior repositioning of fibro-fatty tissues. With combining these two procedures, nipple–areolar complex moves superiorly, and deep inframammary fold disappear. Thus, this method eliminates the need to wait for the shrinkage process of skin during early postoperative period. Unlike some other techniques that remove all subcutaneous tissues on pectoral fascia, our technique retains anatomic mammary fullness, giving an esthetically pleasant appearance fit for men.

Our technique represents an improved surgical approach to cope with the most troublesome postoperative complications of gynecomastia such as saucer-like deformity, over/under resection, doughnut deformity, nipple necrosis, nipple inversion, chest contour deformity, and asymmetry. This study presents the initial experience with our technique as a promising alternative technique for gynecomastia surgery.

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