

Surgical Treatment of Gynecomastia, Clinical Experience with 42 Cases

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ABSTRACT

Gynecomastia is a benign enlargement of the male breast resulting from a proliferation of the glandular component of the breast. Gynecomastia is defined clinically by the presence of a rubbery or firm mass extending concentrically from the nipples. During puberty, there is often a transient relative imbalance between estrogen and testosterone, leading to gynecomastia. This condition usually resolves by age 18 years when adult androgen/estrogen ratios are achieved. Although gynecomastia is usually bilateral, it can be unilateral, and mostly idiopathic. We have treated 42 patients (78 breasts; 6 patients presented with unilateral gynecomastia), their mean age was 29 years (range 18-58 years), and in all patients gynecomastia was idiopathic. Twenty out of 42 patients (48%) were operated through a small infra-areolar incision without need for any modification. Eight patients (19%) were operated with vertical scar subcutaneous mastectomy. 12% (5/42) ended with inverted T scar. Six patients (14%) were treated with conventional liposuction while the remaining three patients (7%) were operated with liposuction assisted mastectomy. 88% (37/42) of patients found the cosmetic result good or excellent.

INTRODUCTION

Gynecomastia is defined as benign proliferation of male breast glandular tissue [1]. Asymptomatic gynecomastia is very common and has a trimodal age distribution, occurring in neonatal, pubertal, and elderly males. The prevalence of asymptomatic gynecomastia is 60% to 90% in neonates, 50% to 60% in adolescents, and up to 70% in men aged 50 to 69 years [2-5].

The imbalance between estrogen action relative to androgen action at the breast tissue level appears to be the main etiology of gynecomastia [6]. Elevated serum estrogen levels may be a result of estrogen-secreting neoplasms or their precursors (e.g., Leydig or Sertoli cell tumors, human chorionic gonadotropin [hCG]-producing tumors, and adrenocortical tumors) but more commonly are caused by increased extragonadal conversion of androgens to estrogens by tissue aromatase (as

occurs in obesity). Levels of free serum testosterone are decreased in patients with gonadal failure, which can be primary (Klinefelter syndrome, mumps orchitis, castration) or secondary (hypothalamic and pituitary disease). Androgen resistance syndromes due to impaired activity of enzymes involved in the biosynthesis of testosterone can also be associated with gynecomastia [7].

Treatment of any underlying cause is important, but may fail to resolve the breast development, especially if it has been present for some time. The imbalance is between the stimulatory effect of estrogen and the inhibitory effect of androgen. Estrogens induce ductal epithelial hyperplasia, ductal elongation and branching, proliferation of the periductal fibroblasts, and an increase in vascularity [8].

The dilemma in the diagnosis of the gynecomastia is to separate men with underlying endocrinopathies from those of idiopathic disorders. Symptomatic gynecomastia is evaluated by mammography, ultrasonography or both [9]. The diagnosis of gynecomastia can be made by a work up that includes careful drug history, a detailed physical examination including the testis, evaluation of liver functions and endocrine work up including measurement of plasma dehydroepiandrosterone (DEHA) or urinary 17-ketosteroids, Lutenizing Hormone (LH), Follicle Stimulating Hormone (FSH), prolactin, estrogen and testosterone.

Asymmetric gynecomastia is common, and unilateral gynecomastia may actually represent a stage in the development of bilateral disease. The histologic picture is similar in male and female breast tissue after exposure to estrogen [10].

Simon et al. [11] grouped the patients into categories according to the size of the gynecomastia (Table 1).

Gynecomastia scale used by the American Society of Plastic Surgeons ASPS [12], describes four grades of male breast enlargement (Table 2).

Specific treatment of the enlarged breast is indicated if the gynecomastia causes sufficient pain, embarrassment or emotional discomfort to interfere with the patient's daily life. The two treatment options are medical therapy and surgical removal. Medical therapy is probably most effective during the active proliferative phase of gynecomastia. Danazol, clomiphene, testolactone and tamoxifen have been used. If a trial period of medical therapy is unsuccessful or if the gynecomastia has been present for several years and is bothersome to the patient, then the breast glandular tissue should be removed surgically [10].

Webster [13] described an operation with a semicircular intra-areolar incision which has become the standard operation for excision of gynecomastia. This technique, however, is of limited use in larger breasts, notably those with skin excess. Over the following years, numerous approaches to resect the excess skin were described. Skin has been removed as an ellipse, and the nipple transposed on a pedicle [14,15] or repositioned as a full-thickness graft [16]. To avoid extra-areolar scars the redundant skin has also been excised concentrically around the nipple, leaving it on a superior [17,18] or central [19] pedicle.

The introduction of suction-assisted lipectomy by Illouz [20] improved the treatment of gynecomastia because it enabled the contouring of diffusely enlarged breasts, creating only small scars. Zocchi [21] developed ultrasound-assisted liposuction, a technique that allows selective destruction of adipose tissue. Despite the advances in surgical knowledge and technology, techniques that lead to unacceptable cosmetic results continue to be widely used [22].

PATIENTS AND METHODS

We have treated 42 patients (78 breasts), 36 patients were treated bilaterally, and 6 unilaterally. Mean age was 29 years (range 18-58 years). In all patients gynecomastia was idiopathic. Twenty out of 42 patients (48%) were seeking treatment because of cosmetic and psychological problems. Local pain was the reason in five patients (12%) while in six patients (14%) the indication was a combination of these problems. In the remaining patients fear of cancer was the reason for seeking treatment.

Detailed clinical examination revealed that 81% (34/42) of patients had considerable fat deposition combined with glandular hypertrophy, while the remaining 19% (8/42) had predominantly glandular hypertrophy with modest fat deposition. Thorough physical examination of the breasts was done noting their size, consistency and fixity to skin and underlying structures. Presence of any nipple discharge or axillary lymphadenopathy was also noted. Pre-operative laboratory investigations including hormonal assay and breast ultrasonographic scanning were carried out.

Twenty out of 42 patients (48%) were operated through a small infra-areolar incision without need for any modification. Eight patients (19%) were operated with vertical scar subcutaneous mastectomy. 12% (5/42) ended with inverted T scar. Six patients (14%) were treated with conventional liposuction alone while the remaining three patients (7%) were operated with liposuction-assisted mastectomy. All patients were treated under general anesthesia on a day-case basis. Preoperatively, they were marked in the upright sitting position.

Following the procedure, a pressure dressing was applied and the patient was instructed to wear it day and night for 4 weeks. All surgical samples were examined histopathologically. During follow-up, clinical examination was carried out one week, one month, six months, one year and two years after surgery.

Operative techniques:

Patients were categorized into four groups according to the surgical technique used (Table 3).

The following surgical techniques were used singly or in combination:

Open excision: Twenty patients were treated with open excision alone. A semicircular incision from a three o'clock to nine o'clock position was made along the inferior margin of the nipple-areolar complex. The incision was extended to the subcutaneous tissue until the whitish, firm disk of the mammary gland was exposed. The glandular tissue was dissected laterally from the subcutaneous fat until its edge was reached and its deeper surface was dissected medially for some centimeters from the pectoralis fascia. Then the same dissection procedure was repeated medially and subcutaneously until the subareolar ductal tissue was identified and freed from the areola around the attachment to the nipple. It is very important to cut the ductal tissue leaving a 3 to 4-mm-thick piece attached to the nipple. After removal of the disk and

careful control of bleeding, the wound was closed by approximating the margins and a compressive dressing was applied. The dressing was removed after 48 hours and the sutures were removed after seven days.

Skin reduction: Thirteen patients with skin redundancy required skin reduction at the expense of a vertical scar (8 cases) or an inverted T scar (5 cases). The skin around the nipple was marked in a concentric or LeJour pattern and de-epithelialised. If the position of the nipple needed to be elevated, the concentric pattern was changed to be more eccentric. With the LeJour reduction pattern, the breast tissue including the skin in the vertical limb was resected, leaving the two LeJour pillars, which were then approximated.

Conventional liposuction: Nine cases were treated with liposuction, (6 cases treated with liposuction alone, and 3 patients in adjunct to mastectomy). The breast tissue was infiltrated through a single stab incision in the medial inframammary crease, using a superwet/tumescent technique (Ringer's lactate, one litre + 30ml of 1% lidocaine and 1ml of 1:1000 adrenaline), the mean infiltration volume per breast was 358ml (range: 100-600ml) and the mean aspiration volume per breast was 416ml (range: 125-900ml). After infiltration, a suction cannula was inserted through the medial inframammary crease. A 5.2mm Mercedes cannula was used for the initial suction by the palm down and pinch techniques. The final contouring was performed with a 3.7mm Mercedes cannula. During suction, contour changes were constantly assessed by direct observation. Once a satisfactory contour was obtained, the surrounding fat was aspirated to avoid a significant saucer deformity and the infra mammary fold was obliterated.

Case presentation:

Cases number I, II, III and IV are treated with open mastectomy through a semicircular incision made along the inferior margin of the nipple-areolar complex with a satisfactory result (Figs. 1-4). Case no. IV is an example of unilateral gynecomastia.

Cases number V, VI and VII were treated with the LeJour reduction pattern; the breast tissue including the skin in the vertical limb was resected, leaving the two LeJour pillars, which were then approximated yielding a very satisfactory result (Figs. 5,6,7).

Case number VIII was treated with conventional liposuction (Fig. 8), while case number IX is an example for a patient treated with open excision with suction-assisted mastectomy with a very adequate result (Fig. 9).

RESULTS

Overall, 42 patients with 78 gynecomastia underwent surgery; we found that 37 patients (88%) were very satisfied with their cosmetic outcome. There were no hematomas, seromas, infections or other early postoperative complications, apart from moderate bruising in two patients.

Apart from one patient developed marginal nipple necrosis, and managed conservatively, the scars of all breasts treated by open excision and skin reduction were satisfactory for nearly all patients.

Patients who underwent skin reduction tended to have less-optimal scars with varying degrees of hypertrophy. In one breast treated by circumareolar skin reduction the skin around the nipple-areolar complex was mildly wrinkled.

Following liposuction, one patient had residual lump, and two breasts showed undercorrection; one of these patients underwent further surgical correction by liposuction and open excision, others were satisfied and the lump slowly resolved by time. Two patients treated with conventional liposuction were not satisfied with the results. The reason for the dissatisfaction in these patients was insufficient volume of tissue removed; they were also less satisfied with the improvements in their chest shapes and self confidence.

Local tenderness found in 19% of patients preoperatively was not found in any patient at 6 months follow-up.

Table (1): Gynecomastia groups (Simon et al.) [11].

Group 1	Minor but visible breast enlargement without skin redundancy.
Group 2A	Moderate breast enlargement without skin redundancy.
Group 2B	Moderate breast enlargement with minor skin redundancy.
Group 3	Gross breast enlargement with skin redundancy that simulates a pendulous female breast.

Table (2): Gynecomastia scale (ASPS) [12].

Group I	Small breast enlargement with localized button of tissue that is concentrated around the areola
Group II	Moderate breast enlargement exceeding areola boundaries with edges that are indistinct from the chest
Group III	Moderate breast enlargement exceeding areola boundaries with edges that are distinct from the chest with skin redundancy present
Group IV	Marked breast enlargement with skin redundancy and feminization of the breast

Table (3): Patient groups and surgical procedures.

	Surgical procedure	Number of patients	Presenting cases
Group I	Open excision	20	Cases no. 1,2,3,4
Group II	<i>Skin reduction:</i> Vertical scar Inverted T scar	8	Cases no. 5,6,7
		5	
Group III	Conventional liposuction	6	Cases no. 8
Group IV	Suction-assisted mastectomy	3	Case no. 9

CASE I

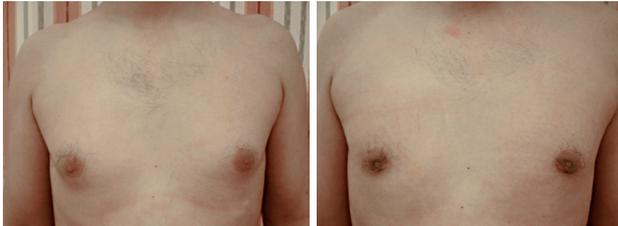


Fig. (1) A: Bilateral gynecomastia treated with open excision. B: 3 Months post operatively.



Fig. (1) C: Preoperative right lateral view. D: Post operative (same view).

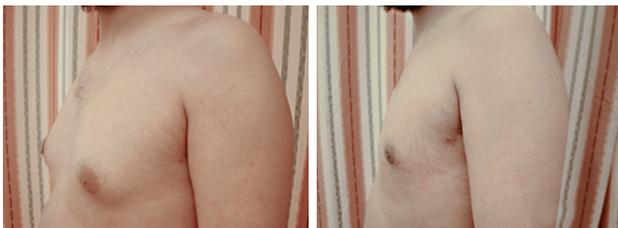


Fig. (1) E: Preoperative left lateral view. F: Postoperative result.

CASE II



Fig. (2) A: Bilateral gynecomastia, with marking of breast boundaries. B: Postoperative view.



Fig. (2) C: Preoperative left lateral view. D: Postoperative result (same view).

CASE III



Fig. (3) A: Bilateral gynecomastia managed by open excision. B: Postoperative view.

CASE IV

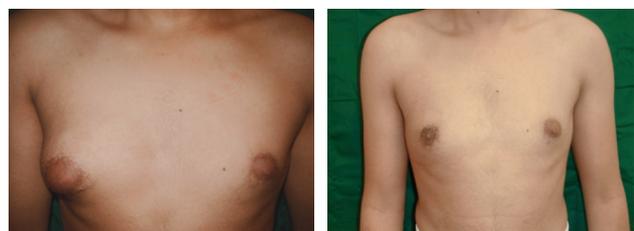


Fig. (4) A: Right mild to moderate breast enlargement treated with open excision. B: Postoperative view.

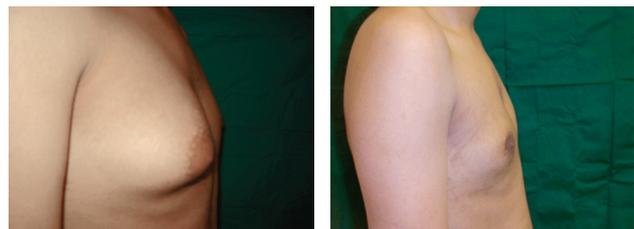


Fig. (4) C: Preoperative right lateral view. D: Postoperative view.

CASE V



Fig. (5) A: Bilateral moderate to large gynecomastia, Preoperative view. B: Marking of LeJour pattern mastectomy.



Fig. (5) C: Post operative view.



Fig. (5) E: Post operative result. D: Right lateral view.



Fig. (5) F: Left lateral view. G: Post operative result.

CASE VI



Fig. (6) A: Huge bilateral gynecomastia. B: Preoperative marking.

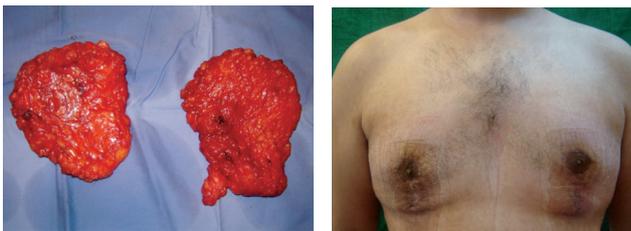


Fig. (6) C: Excised breast tissues. D: Post operative view.



Fig. (6) E: Right lateral view. F: Post operative result.



Fig. (6) G: Left lateral view. H: Post operative result.

CASE VII



(A) (B)



(C)

Fig. (7) A: Bilateral large gynecomastia, preoperative view. B: Marking of LeJour pattern mastectomy. C: Postoperative result.

CASE VIII

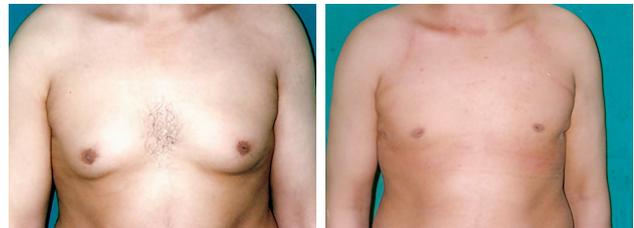


Fig. (8) A: Bilateral symmetrical breast enlargement, preoperative view. B: After liposuction.

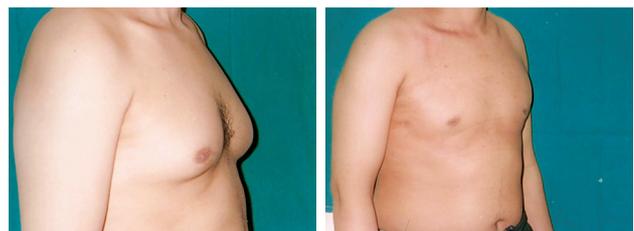


Fig. (8) C: Right lateral, preoperative view. D: Postoperative result.

CASE IX



Fig. (9) A: Bilateral moderate to large gynecomastia, preoperative view. B: After suction assisted mastectomy.

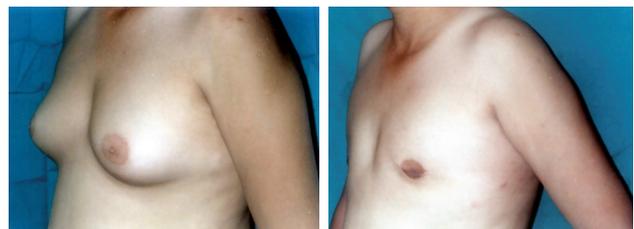


Fig. (9) C: Left lateral preoperative view. D: Post operative result.

DISCUSSION

Surgery is the mainstay of treatment for gynecomastia. Although a wide range of surgical techniques have been described, surgeons often find it difficult to choose the technique that will achieve the best results for a given patient. If well performed, open excision can give excellent results in smaller breast enlargements with distinct subareolar nodules. In more diffuse enlargements and larger breasts it is more difficult to achieve a good result without liposuction. The pre-tunnelling and suction achieved with liposuction prior to open excision are beneficial, because they help to taper the peripheral contour, define the glandular tissue and make the excision easier [23].

LeJour [24] has popularised a vertical mammoplasty technique without submammary scar for mastopexy and reduction of the female breast. Apart from the circumferential scar, the breast is left with only a small vertical scar. This technique was applied to eight breasts. The resulting scars are certainly more obvious, but are accepted in exchange for a flatter chest contour.

Conventional liposuction combined with open excision was first described as a treatment for gynecomastia by Teimourian and Perlman [25], and has become a widely accepted method, because of the frequent difficulty of removing breast parenchyma by suction alone [23,26-28].

The combination of liposuction with surgical excision of the glandular tissue offers various advantages compared to surgical excision alone. The operation is performed through a shorter incision, and liposuction ensures accurate contouring of the periphery [29]. This contributes to achievement of a better cosmetic result using a minimally invasive technique.

In our study we utilized the open excision technique for treating 20 patients, skin reduction was done for 13 patients, liposuction for 6 cases, and liposuction assisted mastectomy for 3 cases, and our results were comparable to those mentioned in literatures [7,14,18,19,22,23,29,30].

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