Circumareolar Inferior Pedicle Mammaplasty for Treatment of Gynecomastia with Breast Ptosis

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Abstract

Gynecomastia is a benign enlargement of the male breast due to physiological or pathological factor that interferes with the balance between estrogens and androgens in the serum. Gynecomastia itself requires no treatment unless the persistent enlargement of the male breast is a source of embarrassment and/or distress for the adolescent or adult man. Indications for surgical treatment of gynecomastia are founded on two main objectives: (1) Restoration of male chest shape and (2) diagnostic evaluation of suspected breast lesions. The diagnosis begins with an adequate history and a thorough breast examination helped by laboratory tests and instrumental research. Several approaches for surgical treatment have been described in the literature. Some problems arise in patients who have significant enlargement and ptosis of the breast that will require skin reduction and in some patient requiring nipple-areola complex reduction. The complete circumareolar technique creates the best aesthetic results, with fewer complications in patients with moderate and severe ptotic glandular breast enlargement that have skin redundancy combined with areolar enlargement. From 2007 through 2009, a total of 28 patients with moderate to severe gynecomastia were treated surgically using a complete circumareolar approach. All patients achieved a good aesthetic contour of the chest. Only one-patient had slightly skin retraction that resolved spontaneously and another patient developed a seroma that resolved after a single aspiration.

Key Words: Gynecomastia – Ptosis – Mammaplasty – Inferior Pedicle.

Introduction

GYNECOMASTIA presents as a persistent enlargement of the breast with variable excess of skin, fat, and breast parenchyma. It is the most common breast problem in men [1].

Occurring in a bimodal pattern of distribution affecting pubertal and elderly male patients. Pubertal male patients are most successfully treated with patience and reassurance, because the vast majority of these patients will experience complete resolution with time. Gynecomastia that persists past puberty or presents in an elderly patient deserves more aggressive management to restore normal body habitus, relieve associated pain, and rule out the rate possibility of malignancy [2,3].

Gynecomastia is of two types:

1- True gynecomastia is due to proliferation of ducts and periductal tissues.

2- Pseudogynecomastia is due to deposition of adipose tissue or to the presence of an excessive amount of skin [4].

The mammary gland is composed of glandular ductal epithelium and the periductal connective tissue. More recent onset gynecomastia is associated with the proliferation of the ductal epithelium as well as hyperplasia and edema of the surrounding stroma and connective tissue gynecomastia of longer duration, on the other hand, results in the replacement of epithelial growth by periductal fibrosis and hyalinization [5].

Gynecomastia arises primary from an imbalance between estrogen-androgen levels (e.g., an elevated estrogen-to-androgen ratio). Decreases in free serum androgen concentrations are found in older men as part of aging, primary or secondary hypogonadism, testicular enzymatic defects or drugs such as spironolactone which inhibit the biosynthesis of testosterone. On the other hand, increases in serum estrogen concentrations results from testicular tumours, and feminizing adrenocortical neoplasm’s as well as nonmalignant conditions such as obesity, liver disease, and hyperthyroidism.

Other less common mechanisms for gynecomastia include a relative insensitivity to androgen
due to defective androgen receptors and an increased sensitivity of the breast tissue to a normal estrogen level [6].

However, in most cases of gynecomastia, a cause cannot be identified, and the problem usually is idiopathic [7].

In pseudogynecomastia the amount of breast tissue is normal. But there is an excess of fat present. This is often the result of excessive weight gain during childhood or puberty. Many of these men continue to maintain the excess fat in their breast even when the rest of the body has become slender [8].

The most common symptom of the patient with gynecomastia is being self-conscious about the appearance of his enlarged breasts [9]. The common complaints are embarrassment, concern about out word appearance (Body image), and occasionally tenderness or even pain [10] in 1934, Webster classified gynecomastia into 3 types which are glandular, fatty glandular and simple fatty.

Another classification was described by Simon in 1973, according to the size of gynecomastia [11]. Three grades were defined; Grade I is minor but visible breast enlargement without skin redundancy. Grade IIA is moderate breast enlargement without skin redundancy; Grade IIB is moderate breast enlargement with minor skin redundancy; Grade III is gross breast enlargement with skin redundancy that simulate pendulous female breast.

Successful medical management is directed at finding the underlying cause and treating the condition if possible. Treatment with various drugs has been tried, but serious side effects have limited the utility of drug therapy. The indication of surgery is the presence of persistent mass that becomes embarrassing to the patient [12].

Most patients request treatment for psychological reasons the goal in treating these patients is resection of the abnormal tissue that restore the normal male breast contour and minimizes scarring or residual deformity of the breast and nipple areola complex [7].

Rohrich [13] advised that patients in grade I and II require no skin excision. Patients with predominant glandular component require surgical removal of the gland. When it is fatty-glandular surgery combined with liposuction allows good contouring. In cases that are primarily fatty in nature, liposuction alone provides good results. In grade III the excess skin must be removed. The surgical technique of subcutaneous mastectomy for the treatment of gynecomastia was first developed by Thorek and then later by Webster. Subcutaneous mastectomy was the treatment of choice until the early 1980s. Tie mourian and Pearlman introduced liposuction assisted mastectomy in 1984, and ultrasonic liposuction was developed in late 1990s [13].

The choice of surgical technique depends on the likelihood of skin redundancy after surgery. Patients of grade III require skin excision. Generally, skin shrinkage is greater in younger individuals than in older individuals [14].

Many techniques are available for surgical correction of gynecomastia. Surgery is planned depending on the grade and histopathology of gynecomastia. Webster's intraareolar incisions, periareolar or circumareolar incisions, letterman's technique, and suction-assisted lipectomy are commonly used in treatment of grade I and 2A gynecomastia superiorly or inferiorly based pedicle areolar flaps and free nipple techniques are preferred for grades 2B and 3 gynecomastia [7].

Male Breast Anatomy:

The normal male breast is typically flat, with some fullness around the nipple areola complex. Glandular tissue is limited to the area directly beneath the nipple and areola and is usually not palpable as discrete mass. A muscular male chest may exhibit superior fullness with transition to a flat inferior chest near the inframammary fold. The nipple-areola complex is normally 2 to 4cm in diameter and located over the fourth intercostal space. Nipple-to-sternal notch distance is 20cm on average [15].

Patients and Methods

The study was conducted in Beni-Swif University Hospital in the period between March 2007 and June 2009.

On 28 male patients of gynecomastia Simon grade two and three. Their age ranged from 18 to 33 years old.

Pre-operative assessment:

The age of the patient and the onset of the condition were recorded. Adolescent cases and those above 40 years were excluded. Patients were examined clinically to define if true gynecomastia or pseudogynecomastia. This was determined by local examination of the breast. If the mass was firm, rather localized, this was considered glandular mass (true gynecomastia). On the other hand if the mass was soft and rather diffuse, this was consid-
ered fatty mass (pseudogynecomastia) cases of true gynecomastia were examined clinically and investigated to determine the aetiology. A detailed history, through physical examination, and laboratory assessment were performed to rule out any drug administration, neoplasm, hormonal imbalance, or liver disease cases with endocrinopathies were excluded and only idiopathic cases were included in the study. The studied cases were evaluated as regards the characteristics of their breasts in term of size consistency, skin quality, presence or absence of ptosis and degree of inframammary fold development (Table 1). Patients were considered about scarring and body shape. Preoperative and postoperative photographs were taken.

**Table (1): Clinical data of the studied cases.**

<table>
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<tr>
<th>Patient</th>
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S.a : Supra-areolar
I.a : Infra-areolar

**Marking:**

Preoperative planning and marking must be carefully performed so that the correct amount of skin is present to cover the reassembled anterior chest wall. Insufficient skin at any point will tend to pull the areolar, leading to loss of proper contouring and compromise the final result.

Marking is carried out by defining the four cardinal points that will automatically bring the nipple areola complex to its new position (Fig. 1).

Point A (superior cardinal point) defines the upper border of the future NAC. Its precise location depends on individual thoracic shape and lies anywhere from 16-20cm from the sternal notch.

Point B corresponds with the inferior border of the future NAC and is normally placed 6cm from the inframammary fold IMF.
Point C represents the medical border of the future NAC and should be at least 9 cm from the midline to guarantee the new NAC maintains its slightly lateralized normal position.

Point D corresponds with the lateral border of the future NAC and should be placed at least 11-12 cm from the breast's lateral border.

Because of the forces of gravity, the final shape of the marking resembles a teardrop with the patient standing and a circle if the patient lies down. After marking it is important to joint he four points manually (or by purse string suture after anaesthesia) in an attempt to predict the tension induced by the skin resection to predict the tension induced by the skin resection. If too much tension is anticipated, the markings can be changed so that the result is safe and aesthetically pleasing.

An important observation is that glandular asymmetries will lead to asymmetric markings. Also the resulting teardrop will be larger in larger breasts, reflecting the increased amount of skin to be resected. Because the markings are based on fixed points on thorax (sternal notch, midline, inframammary fold, and lateral breast border).

**Anaesthesia:**
A general anaesthetic is administered and the patient is positioned supine with the arms abducted.

Subcutaneous infiltration of wetting solution (in the intermediate fat layer breast, parenchyma, and prepectoral plane using a standard infiltration pump and a 3 mm cannula using a solution containing 1 L of lactated ringer's solution mixed with 1 ampule of 1:1000 epinephrine and 15 cc of 2% xylocain. It is important to infiltrate all treatment areas in multiple layers uniformly.

**Surgical technique (Fig. 2, A-G):**

The procedure begins by defining the diameter of the future areola and the inferior pedicle is deepithelialized, leaving a margin of skin around the areola. The areola diameter is designed about 3 cm in diameter. The dissection of the pedicle is carried down and the skin flap is beveled so that the thickness of adipose tissue under the skin increases progressively leaving a 0.5 cm layer of subcutaneous adipose tissue attached to the dermis, which preserves the subdermal vascular plexus responsible for flap viability.

The teardrop line is incised reaching the subcutaneous plane except at the site of the inferior pedicle. The dissection of the superior skin flap is beveled so that the thickness of adipose tissue under the skin increases progressively.

The medial flap is kept uniformly thin throughout its elevation, and dissection is interrupted 1.5 cm before reaching the pectoralis fascia to preserve the perforating vessels that supply the flap. The inferior flap is also kept thin until dissection reaches the IMF.

The lateral flap is dissected until the lateral border of the breast is reached; dissection is then prolonged upward until the lateral border of the pectoralis major appears and communication with the dissection of the superior pole occurs.

The breast tissue is shaved by diathermy from prepectoral fascia as one piece of rounded tissue and sent to the pathology laboratory to rule out the rare possibility of malignancy. Proper hemostasis is done and suction drain is inserted through small stab incision in anterior axillary line.

**Closure:** The quality of the periareolar scar is related to suture tension. Therefore the external covering of skin should be abundant to avoid widening of the areola. At first the NAC is fixed by single vicryl stitch to prepectoral fascia at midclavicular line in the fourth intercostal space and skin closure is carried out using two layers of sutures the inner layer is closed using interrupted vicryl and the external cutaneous lining, which will determine the diameter of the new areola, is closed using a noninterrupted 2/0 prolene purse string suture. A straight 7 cm needle is used to keep the suture line always in the intradermal position. This suture should be tied around a 3 cm tube and distributed at a ratio of 4 mm external tissue to 1 mm of NAC dermis to minimize the formation of periareolar wrinkles. Gauze dressing and a compression garment are then applied. All patients were instructed to keep the garment on constantly, for the first 7 days, and then to continue wearing it except for bathing, for a total of 6 weeks. Postoperatively, the patient was discharged from the hospital after 24 hours. Broad spectrum antibiotic was given for one week and drain removed after 5 days, twice weekly visits were arranged. During these visits, the wounds were checked for gaping, infection, or discharge, the dissected flaps were examined to exclude seroma or hematoma and the areola was examined for viability. Interrupted sutures were removed after 5-7 days and the running subcuticular sutures after 14 days.

After the last dressing postoperative visits were scheduled 4, 8 and 12 weeks at which patient were photographed.
Fig. (2-A): Preoperative marking.

Fig. (2-B): Infiltration with wetting solution.

Fig. (2-C): Defining new areolar size.

Fig. (2-D): Deepitheliaization.

Fig. (2-E): Inferior pedicle.

Fig. (2-F): Breast tissue.

Fig. (2-G): Closure in layers.

Fig. (2-H): Final scar.
Results

28 consecutive patients with bilateral gynecomastia, aged 18 to 33 years, were treated. All had diffuse breast enlargement without discrete, hard subareolar lumps. Follow-up time ranged from one day to 24 months with an average follow-up time of months.

The patients were routinely photographed at about 3 months after surgery. All patients were asked to fill in a self-assessment sheet consisting of linear analogue scales for four categories on which they rated their surgical results (Fig. 3).

<table>
<thead>
<tr>
<th>I Overall satisfaction</th>
<th>Not happy at all</th>
<th>Happy</th>
<th>Very happy</th>
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<tr>
<td>II Scars</td>
<td>Poor</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>III Shapes of chest</td>
<td>Worse</td>
<td>Average</td>
<td>Improved</td>
</tr>
<tr>
<td>IV Self confidence</td>
<td>No change</td>
<td>Improved</td>
<td>Vastly improved</td>
</tr>
<tr>
<td>V Other comments</td>
<td></td>
<td></td>
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</table>

Fig. (3): Self assessment sheet.

Fig. (4): Evaluation of self assessment sheet.

Fig. (5-A): Grade III gynecomastia.

Fig. (5-B): Rt. lateral view.

Fig. (5-C): Lt. Lateral view.

Fig. (5-D): Marking.

Fig. (5-E): Post operative.
Fair result
There were no early postoperative complications of hematoma, infection, or marginal necrosis of areola. Similarly, there were no treatment induced asymmetries or contour deformities from over treatment. There were no residual lumps or irregularities detected in any of the patients during their post operative assessment one of the patients had skin fold, that he did not find distressing the periareolar incision added benefit of a strategically camouflaged scar in the margin of the areola, thus minimizing the stigma of breast surgery.

One patient had a slight skin retraction at the incision site that resolved spontaneously another patient developed a seroma that resolved promptly after a single aspiration. Although nipple-areola complex sensitivity was not specifically assessed, only two patients reported a decrease in sensation in this area. Each of the complications listed was minor and did not compromise the final result. No revisions were necessary.

Histologic analysis of the resected specimens revealed a benign hypertrophy consistent with gynecomastia. There was no evidence of malignancy in any of the specimens.

Evaluation of self assessment sheets revealed that the average score out of 10 for all but the improvement in self confidence were greater than 9 overall satisfaction 9.4 scars 8.6 improvement of chest contour 9.2 and improvement of self confidence 9.
Discussion

Treatment of gynecomastia presents the dual challenge of adequate treatment of the disease while minimizing the perceptible stigma of breast surgery [16] excisional surgery in gynecomastia aimed at removal of glandular tissue and reduction of excess skin keeping the viability of nipple areola complex. Different techniques treated Simon grade II and III gynecomastia by transfere the nipple areola complex to its proper position on different pedicles of glandular flaps [17,18] in an attempt to minimize scarring.

Many surgeons prefer subcutaneous mastectomy for the treatment of true gynecomastia [7,19,20]. Various incisions and techniques have been described for the treatment of gynecomastia by subcutaneous mastectomy. Pitanguy [21] described a transareolar incision. Letterman and Schurter [22] described a superior semicircular, intra areola incision. Also among these incisions, Webster’s intraareolar incision, the periareolar, and circumareolar incisions are the most commonly used techniques because the final scars are almost inconspicuous.
Webster’s intraareolar incision is placed inside the inferior border of the nipple-areola complex, whereas the periareolar incision is made along the inferior margin of the areola. Bilateral extensions can be added to both Webster’s and the periareolar incisions to obtain additional exposure, but this may result in conspicuous scars.

Through these incisions, the breast skin and nipple were undermined for breast tissue removal. It was important to leave enough tissue under the nipple to avoid distortion and depression of the areola as stated by Celebioglu and colleagues [7].

Great enthusiasm has greeted the introduction of suction assisted lipectomy to gynecomastia surgery because the technique is easy and does not impair areolar vascularity or sensation, and because the postoperative scars are excellent [7]. It permits more rapid, efficient and controlled tissue removal, facilitating consistently good results. Although established for lipomatous pseudo-gynecomastia, value of liposuction for treating true glandular hypertrophy in male breasts is controversial [23].

Some authors believe that the use of suction assisted lipectomy alone for true gynecomastia is a misnomer [7].

Ultrasonic liposuction offers several advantages in the treatment of gynecomastia its physically less strenuous and much more effective in treating fibrous areas then traditional liposuction [24-26]. It also is reported to enhance skin contractility, which, if true, may be advantageous in reducing skin redundancy associated with more severe cases of gynecomastia [25,26].

In this study 56 male breasts (28 patients) complaining of gynecomastia grade II and III all of them treated by subcutaneous mastectomy via complete circumareolar incision with inferiorly based pedicle of NAC this technique provide the main two tasks of surgery which are adequate restoration of the chest shape and minimizing the perceptible stigma of breast surgery the incision provide easy approach for complete excision of breast tissue and proper hemostasis, the NAC with small tissue underneath fixed to the new position with proper size, the purse string suture prevent widening of new areola, a skin redundancy is totally removed with preservation of adequate skin coverage and finally the scar is circumareolar and camouflaged in this site.

All patients achieved a good aesthetic contour of the chest only one patient had a slightly skin retraction that resolved spontaneously and another patient developed a seroma that resolved after a single aspiration.

References