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# Evaluation of Boomerang Pattern with J Torsoplasty for Correction of Gynecomastia After Massive Weight Loss

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## Abstract

*Background:* Various degree of gynaecomastia with excessive ptosis, nipple malposition, overstretched skin, poorly defined inframammary fold, and prominent axillary and lat chest rolls, male chest deformity following significant weight loss is complicated and difficult to treat, so correction methods should allow for the technically correct removal of extra tissue without jeopardizing the blood and nerve supply to the nipple-areola complex.

*Aim of the work:* To ascertain whether J torsoplasty with boomerang excision pattern correction of gynecomastia will result in well-hidden scars and adequate male chest contouring.

*Patients and methods:* The study included 15 patients of bilateral gynecomastia with lateral chest roll redundancy following a drastic weight loss. To remove the excess skin in both the horizontal and vertical directions, J torsoplasty and the boomerang pattern were combined for treatment of all patients. Every patient underwent a standard preoperative evaluation and examination.

*Results:* All 15 boomerangs with J torsoplasty showed satisfactory improvement, major Complications were limited and only hematoma seen in one patient. Partial nipple areolar complex necrosis in form of (superficial epidermolysis) in another patient, asymmetric scar in two patients cases. Scar maturation with time improved the result and the patients were very satisfied.

*Conclusion:* In cases of severe gynecomastia following significant weight loss, boomerang excision pattern correction and a J torsoplasty can be done safely together. This procedure improves postoperative aesthetic results while maintaining the same functional results for the nipple areolar complex when compared to other procedures.

*Keywords:* Boomerang, Chest landmarks, Gynecomastia, J torsoplasty, Male breast, Massive weight loss

## 1. Introduction

As the most effective long-term treatment for clinically severe obesity, bariatric surgery has become increasingly popular in recent years. Common procedures include gastric bypass, laparoscopic adjustable gastric banding, gastric sleeve, and bilio pancreatic diversion.<sup>1</sup>

A weight loss of at least 50 % is referred to as massive weight loss. Following bariatric weight loss, there may be a variety of unexpected manifestations of contour deformities that could affect any part of the body. A sudden change in BMI occurs after a

rapid and significant weight loss, which causes excess skin and soft tissue and poor skin tone.<sup>2</sup>

A region that represents manhood and strength is the male breast.<sup>3</sup>

Larger breasts can lead to functional issues, psychosocial discomfort, anxiety, self-consciousness, and embarrassment, as well as fear of cancer. Therefore, it is not surprising that gynecomastia is the most typical reason that men seek medical advice for a breast condition.<sup>4</sup>

Particular chest wall contour deformities still present a significant challenge for surgeons. Male breasts are among the most unsettling body parts

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after MWL because of various degrees of ptosis, nipple malposition, excessive parenchyma/fat, loss of the inframammary fold, and a general loss of definition or shape.<sup>5</sup>

Gynecomastia is a word derived from Greek with two parts 'Gyne' meaning woman and 'mastos' meaning breast, in another word the woman breast in a male, which means abnormal development of mammary glands in males with afeminine look that can be emotionally devastating, feelings of shame and embarrassment. There is a multitude of pathological reasons for this deformity; some are due to hormonal imbalance between the stimulatory effect of estrogen and the inhibitory effect of androgen<sup>6</sup>

The ideal method of gynecomastia correction must provide a technical means of removing the excess breast tissue without compromising the blood and nerve supplies to the nipple-areola complex, at the same time it should also provide a method of recon touring the breast mound and handling the problem of skin excess without leaving unsightly or long scars.<sup>6</sup>

A number of classification schemes have been developed for gynecomastia. Similar to that, there are numerous ways to treat gynecomastia, though it can be difficult to maximize outcomes in patients with the most severe grades of deformity.<sup>7</sup>

Grade III gynecomastia looks similar to pseudo-gynecomastias and thoracic sequelae brought on by extreme weight loss, and both conditions can be treated similarly for the anterior chest region. Such deformations are surgically corrected using a variety of techniques, all of which result in an acceptable scar.<sup>8</sup>

Treatment of the male breast region after drastic weight loss can be challenging. In these patients, it is imperative to correct the deformity without, if at all possible, leaving unsightly scars on the anterior surface of the chest.<sup>3</sup>

Even though obese people tend to have large breasts, gynecomastia after massive weight loss typically has mild to moderate excess volume and ptosis. When the midtorso laxity is similar to that of the gynecomastia, these patients require a comprehensive approach. For moderate to severe chest skin laxity, a boomerang and J torsoplasty is performed. Liposuction, glandular pull through resection through a periareolar incision, and possibly mastopexy are used to treat isolated gynecomastia.<sup>9</sup>

The purpose of this study is to assess the effectiveness of boomerang pattern with J torsoplasty for

treating gynecomastia following significant weight loss.

## 2. Patients and methods

This intervention case-series study was conducted during the period from March 2019 to January 2023 at Department of Plastic Surgery and Burn, Al-Azhar University Hospitals (Al-Hussein Hospital and Sayed Galal Hospital) and Al-Ahrar Teaching Hospital on 15 patients of bilateral gynecomastia (30 male breast) with lateral chest roll redundancy after massive weight loss (post bariatric surgery or self-induced weight).

**Inclusion criteria:** Age: Above 20 years old, **Grade of deformity:** Gynecomastia grade II (nipple-areola complex and inframammary fold below the ideal inframammary fold, lateral chest roll, and minimal upper abdominal laxity) and III( nipple-areola complex and inframammary fold below the ideal inframammary fold, lateral chest roll, and significant upper abdominal laxity (according to Gusenoff *et al.* classification).

**Type of patient:** Patient with post massive weight loss (until weight loss is complete and has been stable for minimum of 6 month).

### 2.1. Exclusion criteria

Age: below 20 years old, Unfit for surgeries, Low grade gynecomastia, Patient with drug-induced secondary gynecomastia, liver disease, or hormonal imbalance, Psychological disorders and unrealistic expectation.

### 2.2. Methods

All patients were subjected to the following pre-operative measures: Complete history taking, general examination to determine the patients' overall health, as well as, to search for any signs of medical disease such as anemia, hepatic or cardiac disorders, Local examination of the breast, axillary LN, NA complex, discharge, pain and tenderness in order to define type of gynaecomastia, Laboratory tests (complete blood count, coagulation profile, tests for thyroid and liver function), Ultrasound of both breast.

### 2.3. Marking process

Marking had been tailored for each patient's anatomy and deformity to attain optimal results.

While the patient is standing, the markings were done on anterior chest, and lateral chest roll (Fig. 1).

**Surgical technique (Fig. 2):** 2–3 L/patient of tumescent infiltration were injected subcutaneously and along the skin markings until the tissue was firm, containing 1 mg epinephrine in 1 L of Ringer's Lactate Solution and 40 ml 1 % xylocaine.

A lateral incision and above NEC at The excised portion enabled axillary roll liposuction and thoracic area thinning of the breast flaps, with moderate Liposuction under NEC and the inferior flap to thinning the flap, using a 4-mm cannula. We do liposuction for 6 patients before excision with amount of 1 L–1.5 L of fat and fluid.<sup>7</sup> Cases undergoing liposuction before ellipse excision.

The inferior incision that almost completely encircles the NAC is where the boomerang pattern excision starts. We began electro-cautery-assisted undermining of the ellipse over the pectoral fascia. The NAC and the inferiorly based chest flap are several centimeters undercut. The IMF and the area outside the costal margin are then indirectly attacked, along with the rest of the chest. The flap's end is firmly advanced towards the clavicles while being held in place by towel clamps to confirm or adjust the superior incision line and NAC inset. Through the skin and vertically through the subcutaneous tissue to the pectoralis fascia, the superior incision is made. Excess chest skin and gynecomastia

are excised from the pectoralis fascia between these boundary incisions.

Hemostasis was secured using Electrocautery or ligation of perforators with vicryle if needed. The NAC is then placed into the receiving dome using several important stitches. The closure on each side is supported by a number 18 Redivac drain.

The boomerang pattern is layered and enclosed. A three-plane stitching procedure was used: 0 braided absorbable thread was used for deep sutures, 3-0 absorbable monofilament was used for subcutaneous reversed sutures, and 4-0 absorbable monofilament or 4-0 Prolene and tape was used for intradermal sutures. Over the course of two months, compression chest clothing was used.

**Postoperative care and follow up:** All patients were subjected to the following postoperative measures; Medication: Antibiotics, analgesics, anti-oedematous drugs and fluid therapy. Patient mobilisation was compelled on day 1 after surgery, and compression garments were worn for 8 weeks, day and night, while managing drains. The compression was reduced during the first 48 h after surgery. Follow up of the drain, nipple areolar complex. Drain removal was based on  $\leq 40$  cc/day. Activity was slowly increased as tolerated over the first 2 weeks, with most patients being able to return to non-physical work in 2 weeks, and return to physical work after 4 weeks.

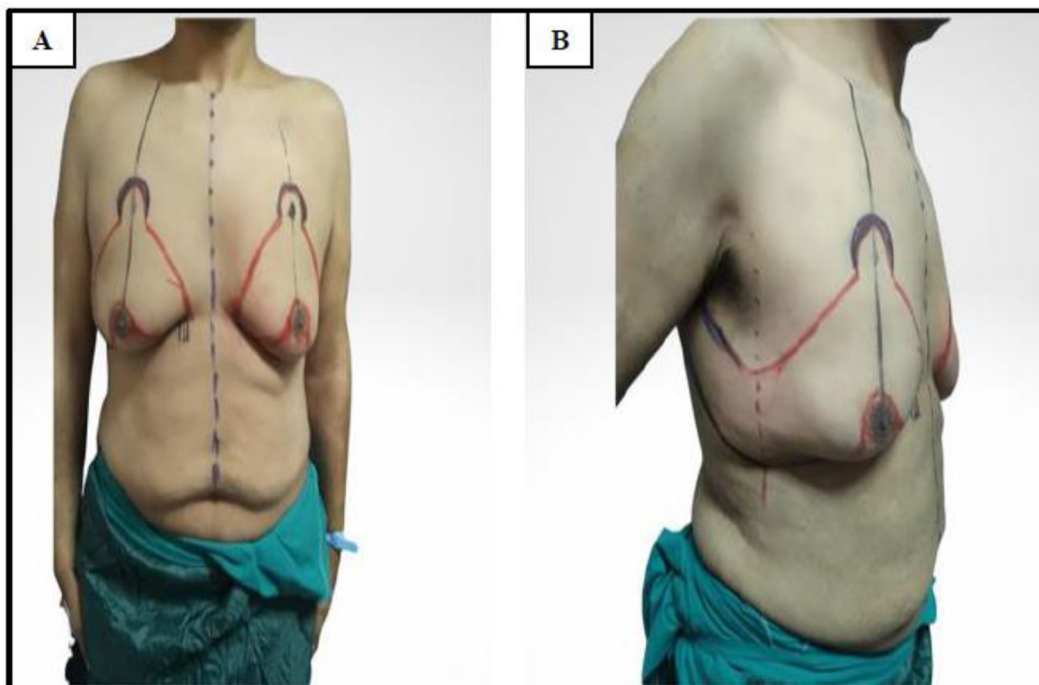


Fig. 1. Preoperative drawing on standing position (a) anterior marking (anterior chest). (b) lateral marking lateral chest roll.

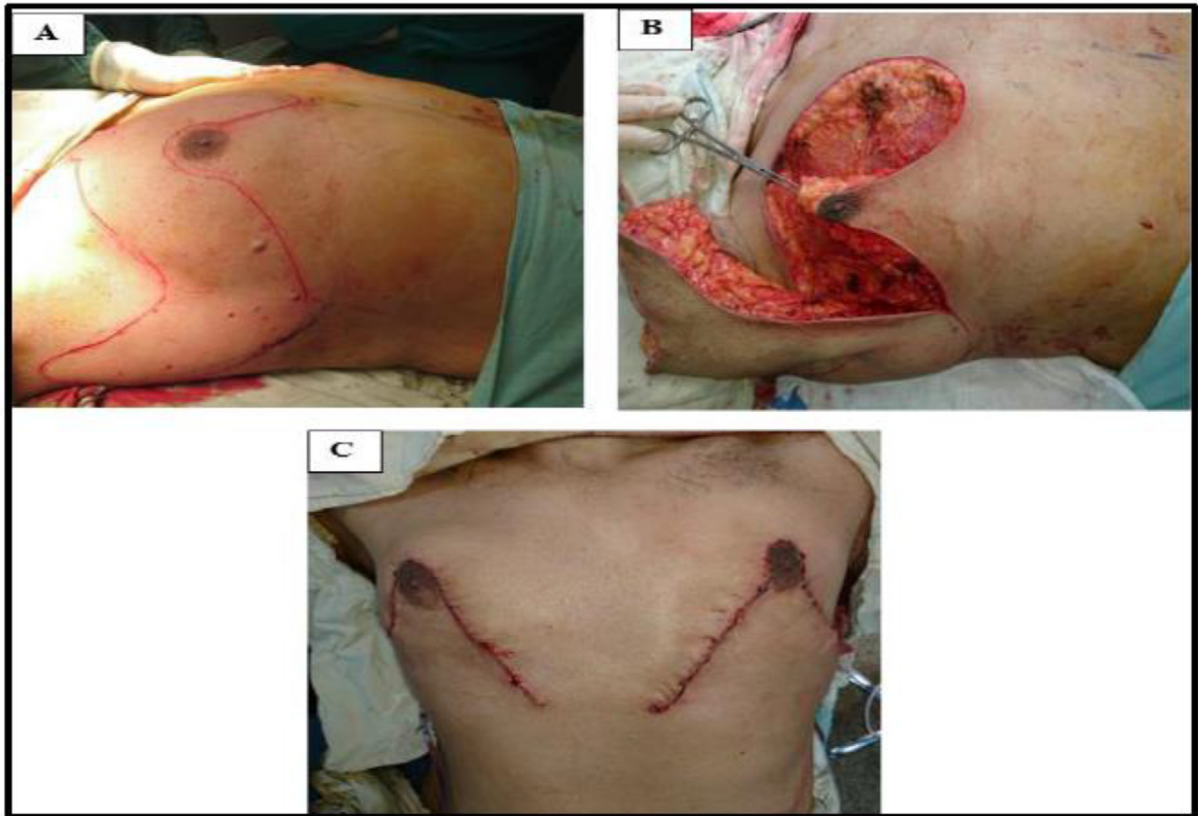


Fig. 2. Boomerang pattern and J torsioplasty (A) Intraoperative marking. (B) Excision of redundant skin at ant chest and lat chest rol. (C) Transposition and fixation of nipple-areola complex and fixation of two suction drain.

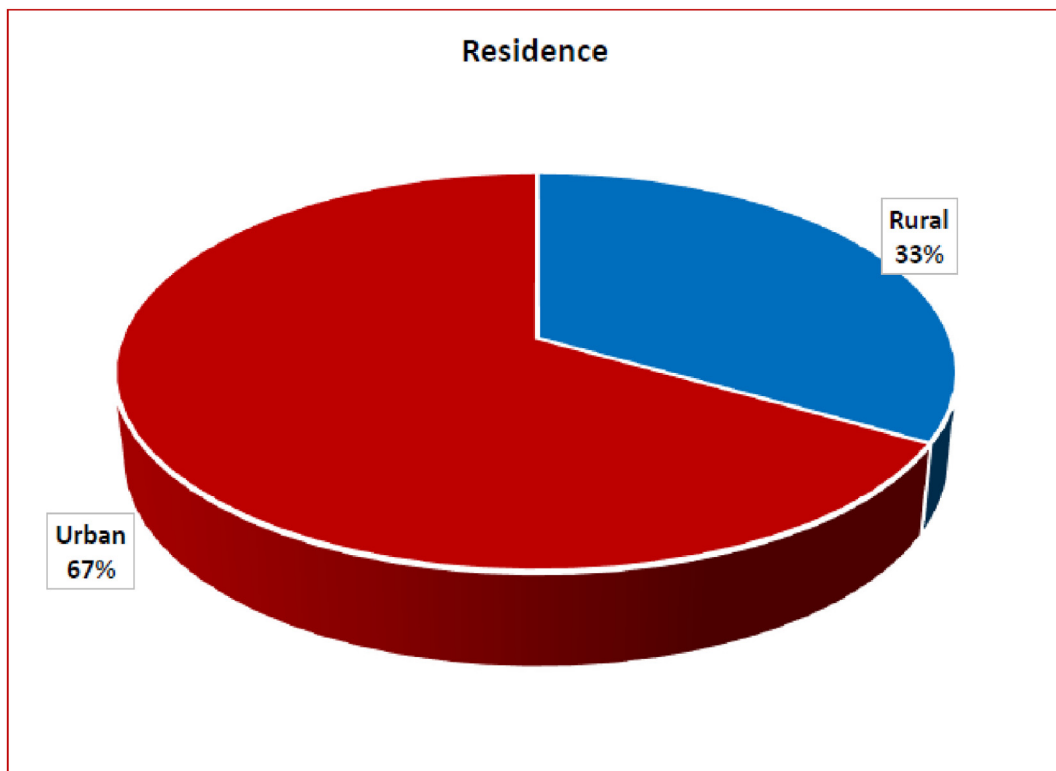


Fig. 3. Distribution of patients as regard residence.

Table 1. Data on the study participants' anthropometric measurements as considered preoperative.

Anthropometric measures:	(Range) Mean $\pm$ SD
Weight (Kg)	(84–114) 98.88 $\pm$ 9.07
Height (m)	(1.66–1.83) 1.77 $\pm$ 0.05
BMI (Kg/m <sup>2</sup> )	(28–34) 31.61 $\pm$ 2.01

Follow up wound healing and dealing with scar and evaluation of skin redundancy. Follow up to 6 month as most patients were not attain their final contour for at least 6 months.

**Postoperative evaluation;** All patients were evaluated for the following: Chest contour, Size of breast., Availability NAC, Nipple sensitivity, Scars, Symmetry of both breast, Patient satisfaction, in comparison to preoperative data.

#### 2.4. Statistical analysis

The commercial statistical software for Windows (IBM SPSS Statistics version 26.0; IBM Corporation, Armonk, New York, USA) was used for statistical analysis and data processing. For categorical variables, patient characteristics were tabulated as numbers and percentages, and for continuous variables, as means, ranges, and standard deviations (SD). The chi-square test was used to evaluate distributions of categorical variables, and the student *t*-test was used to evaluate mean comparisons of continuous variables. The demographic information of the patients under study, the clinical presentation

Table 2. Objective evaluation of the study patients.

Objective evaluation:	(Range) Mean $\pm$ SD
Operation time (hours)	(2.30–3.30) 2.56 $\pm$ 0.29
Hospital stay (days)	(1–2) 1.24 $\pm$ 0.13
Rehabilitation time (days)	(10–25) 13.2 $\pm$ 2.49
Liposuction volume (ml)	(750–1300) 968.06 $\pm$ 203.54
Bilateral excision weight (g)	(650–1200) 895.29 $\pm$ 187.53
Average day of removing drain (days)	(4–7) 5.13 $\pm$ 1.22
Average total drainage volume (ml)	(150–420) 260.29 $\pm$ 86.58

of the nasal abnormality, and the patients' satisfaction were all evaluated using the Mann-Whitney *U* test and Pearson's correlation coefficient test. *P* values less than 0.05 were used in all statistical analyses, and these were considered significant.

### 3. Results

This study involved 15 patients who underwent Boomerang pattern and J torsoplasty for breast reduction after being diagnosed with bilateral gynecomastia. The patients' ages ranged from 23 to 58 years old, with a mean of 32.13  $\pm$  3.74 years. Urban dwellers made up the majority of patients 10 (66.7 %), as shown in Fig. 3.

As regard anthropometric measures of the study patients, their weight ranged from 84 to 114 Kg with a mean of 98.88  $\pm$  9.07 Kg, their height ranged from 1.66 to 1.83 m with a mean of 1.77  $\pm$  0.05 m, and their BMI ranged from 28 to 34 kg/m<sup>2</sup> with a mean of 31.61  $\pm$  2.01 kg/m<sup>2</sup>, As can be seen in Table 1.

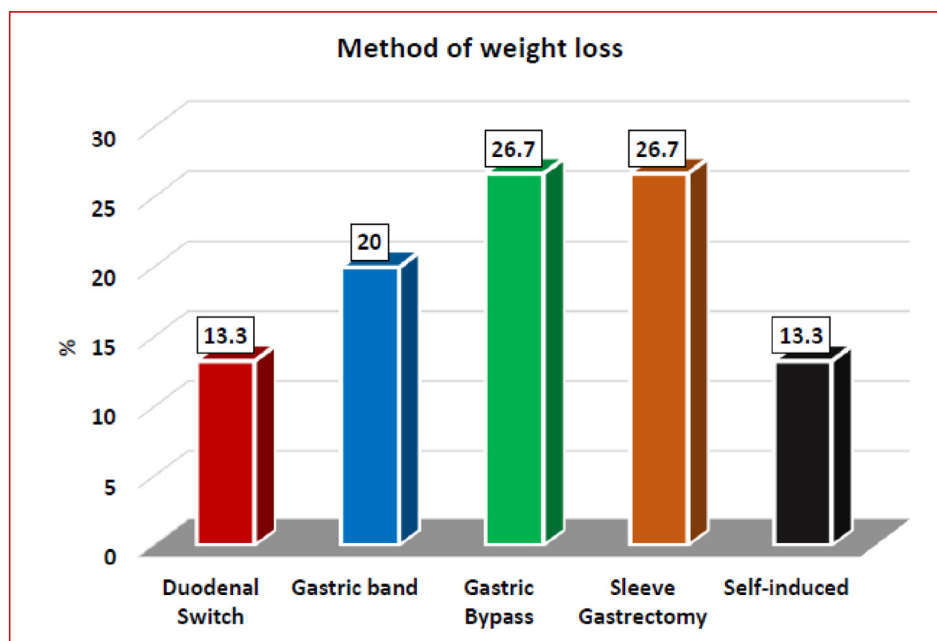


Fig. 4. Distribution of patients as regard method of weight loss.

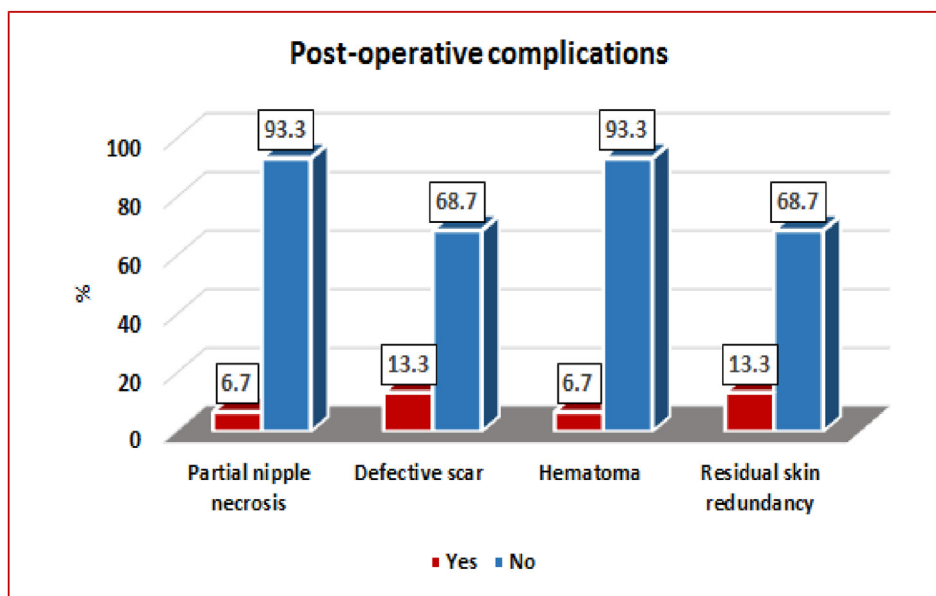


Fig. 5. Distribution of patients as regard postoperative complications.

As regard clinical data of weight loss, they lost about 36–54 Kg with a mean of  $45.24 \pm 8.21$  Kg. Gastric bypass and sleeve gastrectomy showed the highest rate among the method of weight loss 4 (26.7 %) for each, followed by gastric band in 3 (20 %) of patients, then Duodenal Switch and Self-induced 2 (13.3 %) for each, as shown in Fig. 4.

Operation time ranged from 2.30 to 3.30 h with a mean of  $2.56 \pm 0.29$  h, hospital stay ranged from 1 to 2 days with a mean of  $1.24 \pm 0.13$  days, and Rehabilitation time ranged from 10 to 25 days with a mean of  $13.2 \pm 2.49$  days. Average volume of liposuction was  $968.06 \pm 203.54$  ml (range 750–1300 ml). The average bilateral excision weight was

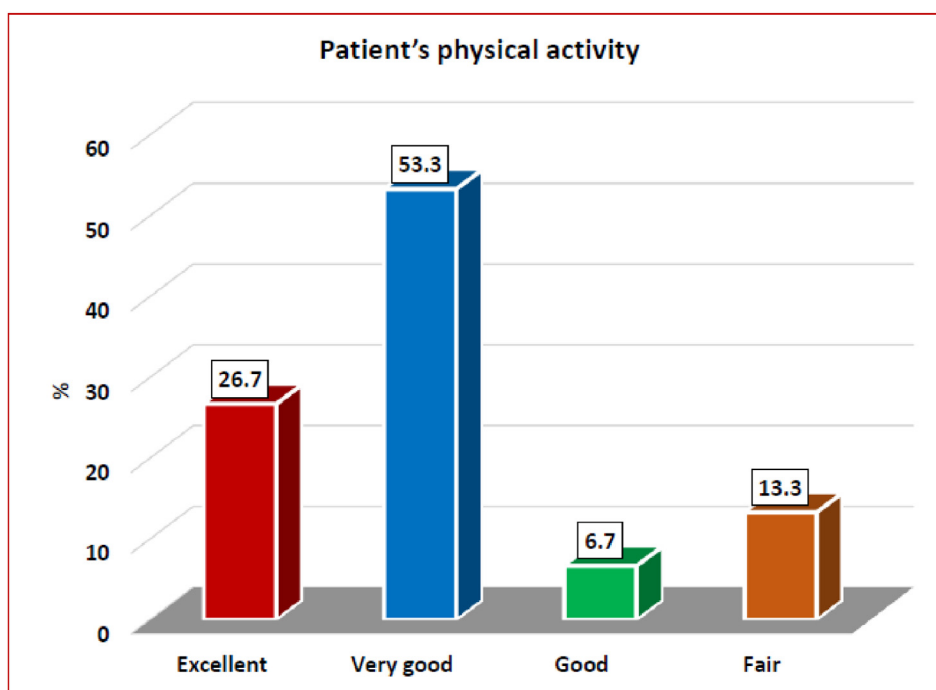


Fig. 6. Distribution of patients as regard physical activity.

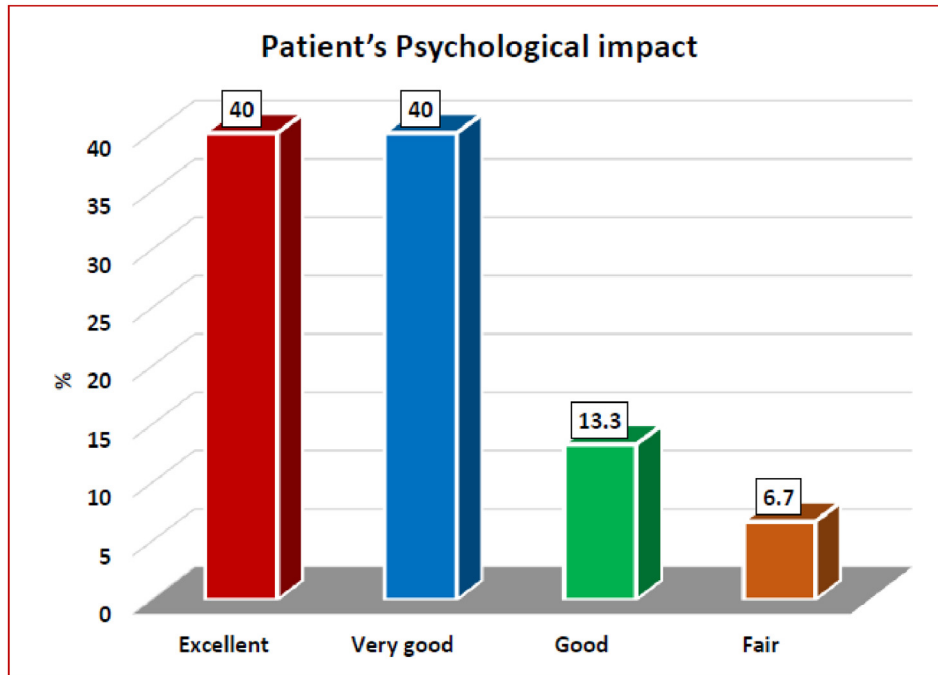


Fig. 7. Distribution of patients as regard psychological impact.

895.29 ± 187.53 g. Regarding blood loss, 10 patients had postoperative Hb 11.5 and 5 patients had postoperative Hb 10.5. Once the drained volume was less than 40 cc/24 h, the suction drains were removed. The average removal day was 5.14 ± 1.22

days. The total drainage volume was on average 260.29 ± 86.58 ml (Table 2).

As regard postoperative complications, asymmetric scar, hematoma treated by evacuation and follow up, residual skin redundancy were observed

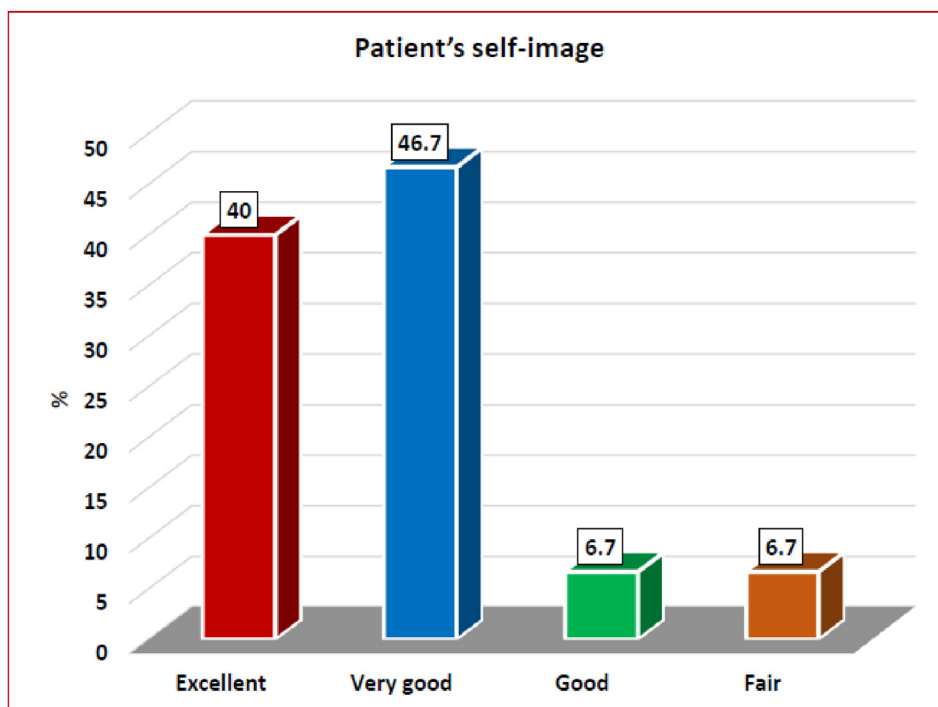


Fig. 8. Distribution of patients as regard self-image.



in 2 (13.3 %) patients disturbed chest contouring, one of them undergoing 2nd revision. Partial nipple necrosis (superficial epidermolysis) was observed in one (6.7 %) patient only and dealt with follow up & dressing, as shown in . No patients had seroma, infection, wound dehiscence nor dysesthesia. No patients needed blood transfusion. (Fig. 5).

Patient's physical activity was excellent in 4 (26.7 %) of patients, very good in 8 (53.3 %) of patients, good in one (6.7 %) patient and fair in 2 (13.3 %) of patients (Fig. 6).

Patient's psychological impact was excellent in 6 (40 %) of patients, very good in 6 (40 %) of patients too, good in 2 (13.3 %) of patients and fair in one (6.7 %) patient (Fig. 7).

Patient's self-image was excellent in 6 (40 %) of patients, very good in 7 (46.7 %) of patients, good and fair in one (6.7 %) patient each (Fig. 8).

Patients' satisfaction had been done by using a quartile grading system (1 poorly satisfied, 2 satisfied or 3 very satisfied). As regard patient's satisfaction, 11 (73.4 %) of patients were very satisfied, 2 (13.3 %) of patients were satisfied and 2 (13.3 %) of patients were poorly satisfied (Fig. 9).

### 3.1. Cases

Figs. 10 and 11.

## 4. Discussion

During weight gain, the thorax and the soft tissues that cover it grow both circumferentially and vertically. After losing weight, the rib cage similarly deflates, creating an excess in two dimensions that is circumferential and vertical. Fat deposition between the skin and bony anatomy is constrained during weight gain because of the fascial attachments (adhesion zones) at the anterior and posterior midline of the rib cage. Adhesion zones serve as suspension hooks for the sagging breast tissue as the patient loses weight, which causes a complex deformity of the male breast and nearby axilla.<sup>10</sup>

Ultra-sonic liposuction was the preferred method of treatment by Rohrich *et al.* for his most severe gynecomastia deformities. Less than half of his patients were happy with the corrections they received, and numerous patients needed additional excisions to properly treat the deformity.<sup>11</sup>

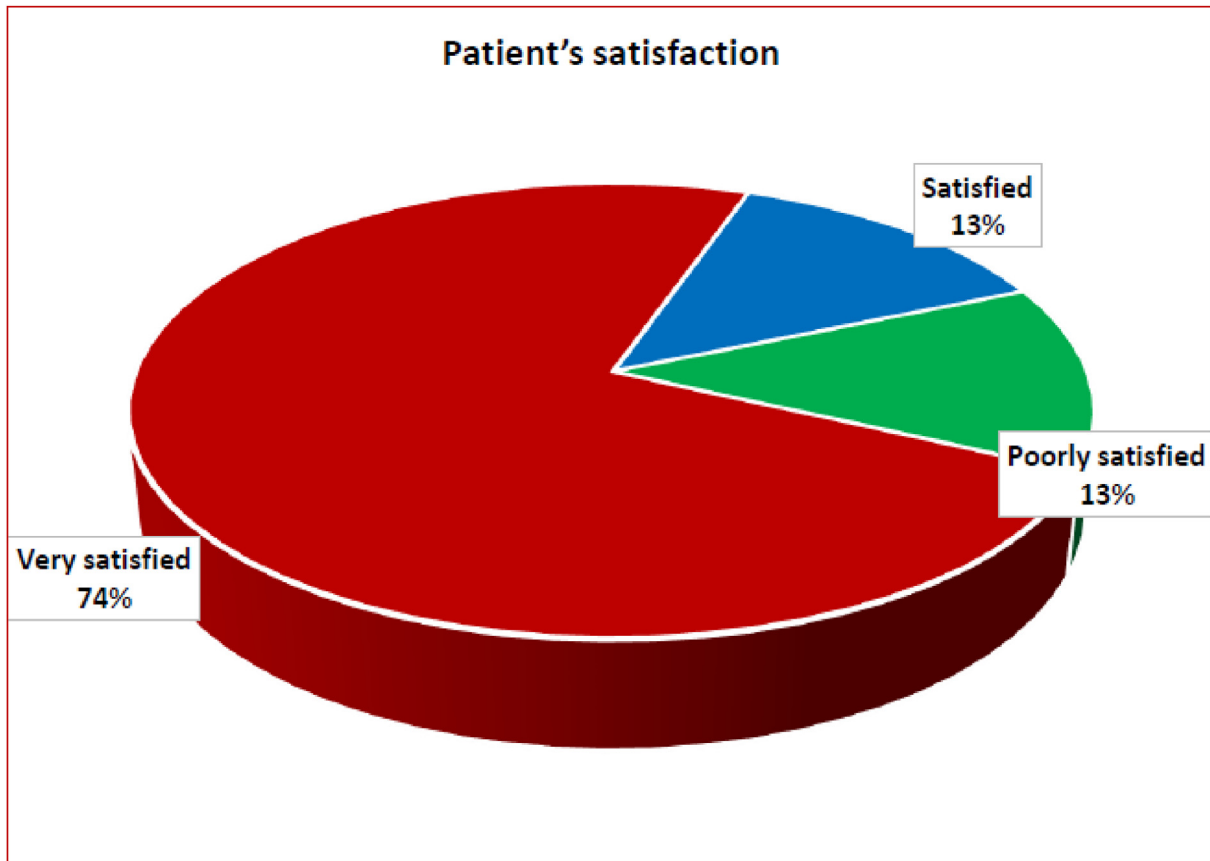


Fig. 9. Distribution of patients as regard satisfaction.



Fig. 10. Case 1: A 32 years old male with massive weight loss (175 kg–100 kg) by bypass surgery (a) Preoperative case: Grade III gynecomastia, anterior and lateral views. (b) Intraoperative procedures. (c) Postoperative views from the front and side. (d) Eight months follow up: Postoperative views from the front and side.

For the management of grade III gynecomastia, numerous surgical techniques have been described; NAC free transfer is one of the most frequently used surgical techniques. The primary benefits of this technique include short operating times, easy NAC repositioning, excellent exposure, and maximum glandular tissue removal that reduces postoperative chest projection. Its main drawbacks include loss of NAC sensitivity, an increase in the incidence of NAC necrosis and hypopigmentation, patch effect of NAC, and prolonged time for NAC healing.

Because of this, numerous other surgical techniques have been documented in order to protect the neurovascular pedicle of NAC, thereby

maintaining its vitality and sensitivity. Though this technique preserves the NAC sensitivity and vascularity, it results in an inverted T scar that is not acceptable in males. The superior pedicle technique involves lifting a superior based flap while resecting the remaining gland.<sup>12</sup>

Our method, in contrast, keeps the nipple-areola complex's neurovascular function intact. Additionally, it lowers the possibility of hypopigmentation, lowers the risk of patch effect, and raises the likelihood of maintaining nipple sensitivity. Additionally, nipple projection is kept. Additionally, lateral chest roll redundancy and, in some instances, upper abdomen fullness are treated.

There are several pedicular techniques, one of which is the superior pedicle technique. A superior flap is raised, just like with women receiving treatment for mammary hypertrophy. Using the mastectomy method, the remaining gland is removed. The inverted 'T' scar that results from this procedure is very noticeable and runs the risk of feminising the male chest, despite the fact that it has the neurovascular benefits of flap techniques.<sup>6</sup>

Boomerang-shaped closures over the chest are created by removing excess skin in both the horizontal and vertical directions. As it encircles the superior nipple-areola complex, the undulating scar seems to be broken up. The body lift scar under the armrest is covered by the continuation through a lateral torsoplasty. Oblique excisions have also been recommended by others as the most aesthetically pleasing method of gynecomastia correction. However, there is a chance of persistent hypertrophy in the oblique scar that runs between the sternum and the nipple-areola complex.<sup>9</sup>

An unfavourable IMF is reinstated by a lengthy transverse excision, which may require crossing the sternum. Unsettling inferior fullness is left by an inferior pedicle that is buried beneath the NAC's deepithelialized flap. Most vertical excess is removed during midchest transverse excisions. A new inframammary fold appears to be imitated by the long transverse excision and scar that were placed along the previous inframammary fold. When the patient leans over, the skin's remaining redundancy depressingly hangs.

Our patients experienced no complete nipple necrosis only one case seen a partial nipple necrosis presented as partial upper rim superficial epidermolysis compared to patients treated by a supero or inferior dermal pedicle. In comparison to other pedicle techniques and free transplantation of the nipple-areola complex technique, which is frequently complicated by loss of NAC sensitivity, increase in the incidence of NAC graft necrosis and



Fig. 11. Case 2: A 32 years old male with massive weight loss (180 kg–110 kg) by diet regulations. (a) Preoperative case: Grade III gynecomastia, anterior and lateral views. (b) Intraoperative procedures. (c) Postoperative: anterior and lateral views.

hypopigmentation, patch effect of NAC, and increased time of NAC healing.

#### 4.1. Conclusion

In cases of severe gynecomastia following significant weight loss, boomerang excision pattern correction and a J torsoplasty can be done safely

together. This procedure improves postoperative aesthetic results while maintaining the same functional results for the nipple areolar complex when compared to other procedures.

#### Conflicts of interest

There is no any conflict of interest.

## References

1. Elder KA, Wolfe BM. Bariatric surgery: a review of procedures and outcomes. *Gastroenterology*. 2007;132:2253–2271.
2. Shermak MA, Rotellini-Coltvet LA, Chang D. Seroma development following body contouring surgery for massive weight loss: patient risk factors and treatment strategies. *Plast Reconstr Surg*. 2008;122:280–288.
3. Atiyeh BS, Dibo SA, Hayek SN. Contouring of the male anterior chest following bariatric surgery and massive weight loss. *Aesthetic Surg J*. 2008;28:688–696.
4. Khallaf AM, Mostafa H. Gynaecomastia liposuction vs surgical excision of the glandular tissue. *AAMJ (Alpe Adria Microbiol J)*. 2014;12:4.
5. Claudio C, Rodrigo V, Marmuse JP. Torsoplasty after important weight loss. *Aesthetic Plast Surg*. 2006;30:667–671.
6. Gheita A, Atiyeh BS. Gynecomastia and male chest contouring. In: *Body Contouring Following Bariatric Surgery and Massive Weight Loss Post-Bariatric Body Contouring*. Bentham Science Publishers; 2012:112–120. <https://doi.org/10.2174/978160805238711201010112>.
7. Gusenoff JA, Coon D, Rubin JP. Pseudogynecomastia after massive weight loss: detectability of technique, patient satisfaction, and classification. *Plast Reconstr Surg*. 2008;122:1301–1311.
8. Thiénot S, Bertheuil N, Carloni R, et al. Postero-inferior pedicle surgical technique for the treatment of Grade III Gynecomastia. *Aesthetic Plast Surg*. 2017;41:531–541.
9. Hurwitz D. Enhancing masculine features after massive weight loss. *Aesthetic Plast Surg*. 2016;40:245–255.
10. Wilson SC, Morrison SD, Anzai L, et al. Masculinizing top surgery: a systematic review of techniques and outcomes. *Ann Plast Surg*. 2018;80:679–683.
11. Rohrich RJ, Ha RY, Kenkel JM, Adams JrWP. Classification and management of gynecomastia: defining the role of ultrasound-assisted liposuction. *Plast Reconstr Surg*. 2003;111:909–923.
12. Maetz B, Bodin F, Abbou R, Wilk A, Bruant-Rodier C. Management of weight loss consequences in the male chest: the amputation grafting technique with a L scar. *Annal Chirur Plast Esthet*. 2012;58:650–657.