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# *Prospective Analysis and Comparison of Periareolar Excision (Delivery) Technique and Pull-Through Technique for the Treatment of Gynecomastia*

## *Protocol of Thesis*

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*By*

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# Introduction

Gynecomastia is described as the excessive breast enlargement in males, mimicking that of females. The term is derived from two Greek words, *ctme* (female) and *larso1* (breast). The incidence as reported in the literature ranges from 32 to 36% among adult males, sometimes even as high as 60% in adolescent boys. Gynecomastia results from an absolute or relative imbalance between estrogens (which stimulate the development of breast tissue) and androgens. Estrogen stimulates breast development, whereas androgens act as an antagonist. Early in the development of gynecomastia, ductal epithelium proliferates and stromal and connective tissue hyperplasia and edema occur. Gynecomastia is classified into physiological, pathological, pharmacological and idiopathic according to the etiology, with the most common being idiopathic. Three histological patterns have been described according to the different degrees of stromal and ductal proliferation: the florid pattern, the fibrous pattern and the intermediate one. The three types represent the stages of evolution of the pathology. After one year, hypertrophic breast tissue becomes irreversibly fibrotic. Thus, medical treatment usually has limited success.

Depending on morphology and volume, Simon in the year 1973 classified it into four different groups. a) I—Minor breast enlargement without skin redundancy b) IIa—Moderate breast enlargement without skin redundancy c) IIb—Moderate breast enlargement with minor skin redundancy d) III—Gross breast enlargement with skin redundancy mimicking female breast ptosis. Simon's classification provides a simple guideline for diagnosis and management. The different amounts of adipose tissue, parenchyma and skin redundancy are paramount in selecting patients and planning surgical strategies. Various treatment modalities have been described that accomplish the removal of involved tissue by direct open excision, liposuction or some combination. Direct excision of the male breast may result in irregular contour defects and unsightly scarring that can be esthetically worse than the presenting problem.

Liposuction easily removes adipose tissue but is less effective in treating the fibrous parenchymal component of the breast. Combining traditional liposuction with direct pull-through surgical excision of the breast bud has been described by Morselli. Some modify his technique to incorporate ultrasonic liposuction, which more effectively treats fibrous fatty tissues. This method permits both liposuction and sharp resection of breast parenchyma through a single 1-cm incision placed strategically along the inferior margin of the areola or in the inframammary fold. Liposuction in gynecomastia is performed using two small incisions on either side of the chest and gland excision through a periareolar incision. A drain was introduced via the liposuction port or through a separate incision. Liposuction is comparatively rapid, less invasive, and essentially non-scarring and has fewer risks. Many studies have documented the results and outcome of standard liposuction through a periareolar incision in gynecomastia. The present study was thus planned to compare cases of gynecomastia treated by standard liposuction with the periareolar excision (delivery) technique versus liposuction with the pull-through technique. We designed this study to evaluate the operative results with both the techniques and compared the functional and esthetic outcomes among both the techniques. Anthropometric analysis and patient satisfaction were assessed and compared.

## **Aim of the work**

The aim of the current study was to

- Primary to compare the effectiveness of the Periareolar Excision (Delivery) Technique versus the Pull-Through Technique in treating gynecomastia.
- Secondary to evaluate postoperative complications, aesthetic outcomes, and patient satisfaction between the two techniques.

# **Patients and Methods**

## **Study design and setting:**

This study will utilize a prospective cohort design. Randomized controlled trial (RCT).

## **Population:**

The study group consisted of consecutive patients diagnosed of gynecomastia of duration greater than 12 months. All procedures were performed in the same hospital and by the same surgical team.

## **Duration**

The study will be conducted over a period of 12 months, including follow-up.

### **Inclusion Criteria:**

- Male patients aged 18-50 years.
- Clinical diagnosis of gynecomastia confirmed by physical examination and ultrasonic studies.
- No prior surgical intervention for gynecomastia.
- Ability to provide informed consent.

### **Exclusion Criteria:**

- Patients with contraindications for surgery.
- Patients with a history of breast cancer or other malignancies.
- Significant comorbidities that may interfere with recovery.

## **Consent:**

An informed consent will be taken from all the patients subjected to the study.

## **Preoperative methodology:**

All patients will be subjected to the following preoperative assessment including;

- Full history
  - Personal history including age, occupation and habits like smoking and alcoholism.
  - Present history including symptoms i.e. onset and duration of enlargement, breast symptoms (pain, tenderness, discharge).
  - Past history including :
    - Medical co-morbidities as diseases (i.e. DM, malignancy).
    - Drugs i.e. antipsychotics, spironolactone, verapamil, and cimetidine ,steroid or immunosuppression drugs, or recreational drug use
    - Surgical history (i.e. previous cardiothoracic surgery, chest trauma)
  - Social/psychological effects of breast enlargement.
  - Family history and reproductive history should also be obtained
  
- General examination:

Signs/symptoms of liver disease, malnutrition, kidney failure, hyper- or hypothyroidism, weight changes, adrenal disease, and malignancy (i.e. thyromegaly, exophthalmos, hepato- or splenomegaly, abdominal masses, ascites or cirrhotic stigmata)
  
- Local examination:

Breasts should be assessed for

Symmetry, bilateralism, nipple position and abnormalities, glandular or fat predominance, skin excess, degree of ptosis, and nodules or masses.

Axillary and supraclavicular lymph node basins should be examined in the setting of a suspicious mass.

- Standardized color digital photography of the cases
- Investigations
  - Routine preoperative investigations: CBC, coagulation profile, liver function tests, kidney function tests
  - Ultrasonography assessment of breast.
  - ECHO if the patient has cardiogenic disease history.
  - Biopsy is indicated if findings on physical examination are consistent with a breast neoplasm.
  - Laboratory testing should be directed by abnormalities identified on history and physical exam i.e. thyroid profile test in hyperthyroidism.

## **Operative methodology:**

Prophylactic antibiotics covering skin flora are administered 2 hours prior to skin incision

### **• Preoperative Planning**

- Preoperative markings are performed with the patients in the upright sitting or standing position.
- Breast tissue is marked with its boundaries and topographic heights by circular shape pattern
- The inframammary fold, sternal midline and two small incisions on both sides of the chest for liposuction cannula introduction were marked. These were marked on the anterior axillary line as follows: one at the level of the inframammary fold and a second one at the superior border of breast.

- **Positioning**

Surgery is performed under general anesthesia as an outpatient procedure. Patients are positioned supine with arms abducted and secured to padded, adjustable arm boards. The hips are centered over the bed break, and the patient is secured with a safety strap.

- Intraoperative assessment of adequate/symmetric resection requires sitting the patients fully upright in the operating room and they should be secured in a manner that enables this to be safely accomplished.
- Sequential compression devices or elastic stocking are applied to the lower extremities.
- The entire anterior chest is prepped into the field to allow intraoperative symmetry assessment.

- **Operative technique**

The breast was infiltrated with tumescent fluid (1 L Ringer lactate with 20 ml of 2% lignocaine, 1 ml of 1:1000 adrenaline). A 3-mm-diameter liposuction cannula with a Mercedes Benz tip was inserted through the inframammary incision, and liposuction of the ipsilateral breast was done. It was followed by the liposuction from the superior incision done in a crisscross manner with the aim to break the inframammary fold. The similar procedure was performed on the opposite breast as well. A power-assisted device was used for the liposuction. At the end of this step of liposuction, the sub-areolar part of both the breasts remains unaddressed. The liposuction was done, and a 5-mm-thick layer of fat was left underneath the skin at all the regions. The aspirated fat volume from each side was measured.

**Group A “Liposuction with Periareolar Excision (Delivery) Technique”**

A periareolar incision was given from the three to nine o'clock position in a semicircular manner, and this was followed by excision of glandular elements. A small sliver of gland is preserved underneath the nipple–areola complex to preserve the vascularity. The periareolar incision was closed in

two layers. The inner subcutaneous layer was closed with intermittent delayed absorbable suture, and the skin was closed with subcuticular absorbable suture. The liposuction stab incisions were kept open to allow drainage of fluids. It was followed by sterile padded dressing, and a pressure garment was applied immediately. Drains were not used.

### **Group B “Liposuction with Pull-through Technique”**

Parenchymal excision was difficult to estimate on physical examination. To surgically excise the gland, we introduced a long Kocher forceps through the inferior incision made for liposuction. By grasping the lateral aspect of the gland, we pulled it toward the incision site and excised it. This maneuver is repeated in different directions. To excise the established amount of parenchyma and to shape the remaining gland, we palpated the breast after each gland removal. We left a small amount of gland behind the areola to avoid the depression underneath the nipple–areola complex. The liposuction stab incisions sites were not closed, to allow drainage of any fluid. Sterile padded dressing was applied followed by immediate application of a pressure garment.

- **Post-operative methodology:**

These cases are performed as ambulatory procedures with patients going home the same day.

The dressing was changed after 24 h.

Patients are instructed to wear a chest compression garment or Ace wrap for 2 to 4 weeks postoperatively. This maintains pressure on the chest to minimize hematoma and seroma formation.

Postoperative follow-up visits are scheduled at 1 week, 4 weeks, and 4 to 6 months.

## Follow-Up

Every patient will be assessed of symmetry and nipple areola complex and clinical assessment of both breast tissue and complications i.e. hematoma, seroma, infection and undesired scar.

Photography at the regular follow-up visits. The photography will be under uniform lighting at a fixed distance (one arm span of the observer) with the same standard background.

The following profiles will include for each patient: frontal, oblique and side view (right and left). The person will be placed in the frame in the same position, with arms by their sides, or in the same position, for both before and after surgery.

## Outcome Measures

- Primary Outcome:

Reduction in Gynecomastia is measured by pre- and post-operative photographs and clinical assessments.

- Secondary Outcomes:
  - Complications: Rates of infection, hematoma, seroma, and other adverse effects.
  - Aesthetic Results: Assessed by standardized photographic evaluation and patient satisfaction surveys.
  - Recovery Time: Time to return to normal activities and any post-operative discomfort.

## Data Collection

- **Preoperative Data:** Patient demographics, baseline gynecomastia severity.
- **Intraoperative Data:** Details of the surgical procedure and any complications.
- **Postoperative Data:** Complications, recovery timeline, aesthetic outcomes, and patient satisfaction.

Photography will be collected at the course of the study

Anthropometric analysis and patient satisfaction were assessed and compared.

Electronic case report forms will be used to ensure accurate and consistent data entry.

## **Sample Size Calculation**

Sample size was calculated using G\*Power (v3.1) to detect a moderate effect (Cohen's  $d = 0.65$ ) in total BODY-Q satisfaction (80% power,  $\alpha = 0.05$ ), requiring 31 patients per group. Sixty-four patients were randomized 1:1 to:

- Group A: Periareolar Excision (n= 32)
- Group B: Pull-Through Technique (n= 32)

## **Randomization and Blinding**

Randomization was performed using computer-generated random list, and sealed opaque envelopes were used to hide allocation.

## **Statistical Analysis**

Data were analyzed using SPSS v26. Normality was assessed with Shapiro–Wilk testing. Parametric data were compared using independent t-test (Welch correction as needed); nonparametric data with Mann–Whitney U test; categorical variables with Chi-square or Fisher's exact test.

Effect sizes were reported as Cohen's  $d$ ,  $r$  ( $Z/\sqrt{N}$ ), and partial  $\eta^2$ . Two-way ANOVA assessed Technique  $\times$  Simon Grade interaction. A two-tailed  $p < 0.05$  was considered statistically significant.

# **Ethical Considerations**

The study will be conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Boards (I.R.B.) of Kafrelsheikh University Hospital, and a written informed consent will be obtained from all participants before enrollment in the study.

## **Results**

Using appropriate statistical methods, all collected data will be presented in tables, suitable graphs, and analyzed by computer software according to methods.

## **Discussion**

The discussion will be done later, depending on the results.

## **Conclusion and recommendations**

Will be derived from the findings of the study

# References

1. Tripathy S, Likhyan A, Sharma R et al (2020) Prospective analysis and comparison of periareolar excision (delivery) technique and pull-through technique for the treatment of gynecomastia. *Aesthet Plast Surg*
2. Kim DH, Byun IH, Lee WJ, Rah DK, Kim JY, Lee DW (2016) Surgical management of gynecomastia: subcutaneous mastectomy and liposuction. *Aesthet Plast Surg* 40:877–884
3. Brown RH, Chang DK, Siy R, Friedman J (2015) Trends in the surgical correction of gynecomastia. *Semin Plast Surg* 29:122–130
4. Yordanov Y, Lasso JM, Shef A (2015) Combined surgical treatment of gynecomastia. *Acta Med Bulg.* 42(1):43–48
5. Murali B, Vijayaraghavan S, Kishore P, Iyer S, Jimmy M, Sharma M, Paul G, Chavare S (2011) Cross-chest liposuction in gynaecomastia. *Indian J Plast Surg Off Publ Assoc Plast Surg India.* 44(1):81
6. Li CC, Fu JP, Chang SC, Chen TM, Chen SG (2012) Surgical treatment of gynecomastia: complications and outcomes. *Ann Plast Surg* 69(5):510–5
7. Tolba AM, Nasr M (2015) Surgical treatment of gynaecomastia: a prospective study in 75 patients. *Surg Sci.* 6(11):506
8. Yordanov Y, Lasso JM, Shef A (2015) Combined surgical treatment of gynecomastia. *Acta Med Bulg.* 42(1):43–48
9. Ridha H, Colville RJ, Vesely MJ (2009) How happy are patients with their gynaecomastia reduction surgery? *J Plast Reconstruct Aesthet Surg* 62(11):1473–1478
10. Morselli PG, Morellini A (2012) Breast reshaping in gynecomastia by the “pull-through technique”: considerations after 15 years. *Eur J Plast Surg* 35(5):365–371
11. Khalil AA, Ibrahim A, Afifi AM (2017) No-drain single incision liposuction pull-through technique for gynecomastia. *Aesthetic Plast Surg* 41(2):298–303
12. Narula HS, Carlson HE (2007) Gynecomastia. *Endocrinol Metab Clin North Am* 36(2):497–519
13. Hammond DC (2009) Surgical correction of gynecomastia. *Plast Reconstruct Surg.* 124(1):61e–8e.
14. Rohrich RJ, Ha RY, Kenkel JM, Adams WP Jr (2003) Classification and management of gynecomastia: defining the role of ultrasound-assisted liposuction. *Plastic and reconstructive Surg* 111(2):909–23
15. Bracaglia R, Fortunato R, Gentileschi S, Seccia A, Farallo E (2004) Our experience with the so-called pull-through technique combined with liposuction for management of gynecomastia. *Ann Plast Surg* 53(1):22–6
16. Ramon Y, Fodor L, Peled IJ, Eldor L, Egozi D, Ullmann Y (2005) Multimodality gynecomastia repair by crosschest powerassisted superficial liposuction combined with endoscopic-assisted pull-through excision. *Ann. Plast. Surg.* 55:591
17. Gasperoni C, Salgarello M, Gasperoni P (2000) Technical refinements in the surgical treatment of gynaecomastia. *Ann Plast Surg* 44:455–458
18. Boljanovic S, Axelsson CK, Elberg JJ (2003) Surgical treatment of gynecomastia: liposuction combined with subcutaneous mastectomy. *Scand J Surg* 92:160–162
19. Lista F, Ahmad J (2008) Power-assisted liposuction and the pullthrough technique for the treatment of gynecomastia. *Plast Reconst Surg* 121(3):740–7
20. Hammond DC, Arnold JF, Simon AM, Capraro PA (2003) Combined use of ultrasonic liposuction with the pull-through technique for the treatment of gynecomastia. *Plast Reconstruct Surg* 112(3):891–5

