

NAC Plaster Lifting Technique for the Management of Skin Redundancy in Severe Gynecomastia

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Background: Gynecomastia is found to be a common cosmetic problem. Many techniques are currently available for the surgical treatment of gynecomastia, reported to be effective, with limited scar formation. The main objective of our unique reproducible nipple-areola complex (NAC) lifting technique is the management of skin redundancy in severe gynecomastia and positioning the NAC at an aesthetically pleasing site on the chest, for men.

Methods: A retrospective study was conducted in 30 gynecomastia surgeries of grade III and IV done from January 2019 to December 2020. All these patients were treated by using the NAC lifting technique in our centre, and the results were assessed with patient and surgeon satisfaction scores. This lifting plaster technique is used after the skin closure of the Webster incision. The U slit in the lifting plaster prevents the wrinkling of the NAC and also avoids the second stage surgery for most of the cases of severe gynecomastia.

Results: A retrospective analysis showed that all patients were satisfied with the technique and none of the patients returned for the second stage surgery. Minimal residual skin redundancy was observed, but it was not severe to necessitate a secondary procedure. All patients were satisfied and comfortable with the final outcome. There was no incidence of contour deformity after the procedure.

Conclusion: This technique takes advantage of the elastic recoiling property of the skin and helps in re-draping the redundant skin on the chest wall and in positioning the NAC at an aesthetically pleasing position on the chest. (*Plast Reconstr Surg Glob Open* 2022;10:e4339; doi: [10.1097/GOX.0000000000004339](https://doi.org/10.1097/GOX.0000000000004339); Published online 19 May 2022.)

INTRODUCTION

Gynecomastia refers to physiologic or pathological enlargement of the male breast due to a proliferation of ductal, stromal, and/or fatty tissue, which can be physically uncomfortable, psychologically disturbing, and may have a negative impact on self-confidence and appearance. Prevalence of gynecomastia during adolescence is reported to be as high as 65% in 14-year-old boys and decreasing to less than 10% by the age of 17.¹ In adults the prevalence is reported to be around 40%–60%.²

Physiologic gynecomastia has three phases, depending on the patient's age. The initial phase occurs within the first few weeks of neonatal life. The second one occurs during puberty, and the final phase happens after the age of 50 years.² Pathologic gynecomastia can arise at any time

when there is an imbalance in the androgen–estrogen plasma levels. It is mostly bilateral, but 25%–30% may be unilateral (or one breast is larger than the other).^{3–6}

Gynecomastia has a great impact on the patient's quality of life. It leads the patient to avoid many social activities, and it also forces the patient to put on certain clothes to hide his embarrassing large breast.^{7,8}

A clinical evaluation must address the diagnostic confirmation, search for an etiological factor and classify gynecomastia into severity grades to guide the treatment. The two most widely accepted classifications of gynecomastia are Simon's and Rohrich's classification systems.^{9,10} Currently, there are various approaches for the management of high-grade gynecomastia, among which the following four are the key protocols:

1. Simple mastectomy with free nipple graft, accepting the long transverse scar and the grafted appearance of the nipple-areola complex.¹¹

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2. A single-stage procedure is performed in which subcutaneous mastectomy and circumareolar skin excision is done, wherein the purse string skin closure limits the scar to the circumareolar area.¹²⁻¹⁴
3. A modification of breast reduction is done with nipple transposition on a single dermal pedicle or vertical bipedicle. A visible chest scar is also present, but the blood supply of the nipple-areola complex is preserved.¹⁵⁻¹⁷
4. Liposuction and direct gland excision is performed first and after several months, few patients will require a second operation to excise the significant skin redundancy.^{10,18}

Here the authors propose a novel, simple, cost-effective, single-step technique called the NAC plaster lifting technique, to address the skin redundancy in severe gynecomastia with liposuction, direct gland excision with pull through technique as an alternative to the above-mentioned procedures. This simple reproducible technique does not produce a visible scar and proved to be beneficial to the patient.

MATERIALS AND METHODS

Study Design

In this retrospective study, we assessed the patients who underwent gynecomastia surgery by the NAC lifting technique between January 2019 and December 2020 at Chennai Plastic Surgery Centre, Chennai, India. The research proposal was submitted to the centre's ethical board and approved. Written consent was obtained from patients to use their photographs for research and publication. The subjects were first physically examined; a complete medical history of each patient is recorded at our centre. Patients with pharmacological and pathological causes were excluded, and patients with Simon's grade II B, III (Rohrich's grade III, IV) were included for the surgery. Assessment of symmetry and consistency of breast tissue was also done. In a majority of our cases, the gynecomastia was bilateral, although unilateral cases were also observed.

Procedure

The presurgical markings were made in the preoperative holding area with the patient in standing position. Midline of the chest is marked from sternal notch to xiphoid process. Gland and excess fat on the anterior and lateral chest wall marked. Pectoralis muscle lower border is identified and marked by asking the patient to tighten the muscle by pressing hands onto his hips. Chest measurements were taken at the level of inframammary fold and at the highest point on the breasts (in inches) and from the lower border of the pectoralis muscle to the nipple (in centimeters). These measurements guide in liposculpting a masculine chest.

The patient was positioned supine, with the arms abducted and given general anesthesia. A 4-mm stab incision made at the highest point on the anterior axillary line along the axillary crease to make it inconspicuous. Infiltration done with tumescent (1 L RL, 10 ml lidocaine

Takeaways

Question: Is there any way to avoid skin excision in severe gynecomastia?

Findings: We retrospectively studied the efficacy of the NAC plaster lifting technique in patients with severe gynecomastia.

Meaning: The NAC plaster lifting technique is an effective way to avoid skin excision in severe gynecomastia.

2%, 10 ml Sensorcane 0.5%, 2 ml adrenaline, 1 ml triamcinolone). Liposculpting of the chest was done by suctioning all the excess fat from the anterior and lateral chest wall. Periareolar incision was given from 6 o'clock to 9 o'clock position, through which direct gland excision was done by pull through technique. Hemostasis was secured. Skin was closed in layers with 4-0 Nylon. The procedure is repeated in a similar way on the opposite chest.

Lifting plasters are applied by lifting the NAC in two different vectors of pull. First, a plaster is applied obliquely on the chest above the NAC, with its vector of pull toward the suprasternal notch. The second plaster is applied horizontally above the NAC, with its vector of pull toward the clavicle, thus draping the redundant skin and NAC complex to be positioned at the desired and aesthetically pleasing position in men. The process of plaster application is shown in the supplementary video. (**See Video [online]**, which demonstrates the process of NAC lifting plaster application.) The NAC lifting plasters are held in place for 7 days in patients with Simon's grade II B (Rohrich's grade III), and in patients with Simon's grade III (Rohrich's grade IV), the lifting plasters are reapplied for another week after suture removal and reassessed on the seventh day. The suture removal is done on the seventh day, and all patients are instructed to wear compression garment for 30 days. Patients are advised to abstain from lifting hands for 10 days and heavy exercise for 45 days.

A topographic scale was used to assess preoperative and postoperative results at our centre. Each patient underwent a photographic assessment before and after surgery at each visit. The photographs taken before and after surgery were assessed by the surgeons who were not involved with the patients. The surgeon-assessed result was evaluated in a visual analog scale (scale 0–10, wherein 0 is the worst outcome and 10 is the best). The visual analog scale considered symmetry, scarring, and natural appearance as key parameters.

RESULTS

The grading of a total of 30 cases attended at our centre was as follows: grade III: 63%; grade IV: 37%. All 30 patients with severe gynecomastia of grade III and IV were postoperatively treated with the NAC lifting technique for the management of skin redundancy. It is interesting to note that none of the patients had a major complication such as infection, hematoma, or nipple-areola complex necrosis. In three of the patients, we had seromas, which were addressed with aspirations and compression dressings. In

five of the patients, we observed superficial skin necrosis at the Webster incision site, which eventually settled down after few weeks. Also, in most cases we observed ecchymosis, which gradually decreased without any intervention. None of these patients who underwent the NAC lifting technique have requested revision surgery for redundant skin after 6 months, which is the most significant result from the surgeon's point of view. The satisfaction rate was one of the main concerns of the study. All the patients were content with the results, especially the pleasing position of the NAC on the chest with this technique, as illustrated in Figures 1–12 (pre and postoperative images).

DISCUSSION

Because gynecomastia is a common problem in many men, the treatment options have been in a constant flux with a plethora of different surgical techniques described above. Surgery should be considered in patients with cosmetic concern, discomfort, and psychological stress with any grade of gynecomastia. Currently, a surgery that combines liposuction and glandular excision techniques is necessary to avoid an inadequate result and the burden of a reoperation. Also, in the surgery, it is advocated for a fine aesthetic result that the scars should be confined to the periareolar area. It is a great challenge to accomplish a good aesthetic result in patients with severe gynecomastia. The major issue is to clarify with major skin redundancy and the postoperative residual scarring. Patients with severe gynecomastia will usually require some form of skin resection. Many techniques utilizing various skin excision patterns and pedicles similar to those used in female mastopexy and reduction mammoplasty have been used.

In the 1970s, Letterman described the use of an oblique Dufourmentel-Mouly procedure based on an elliptical incision with an abipedicled dermal areolar flap.¹⁷ The consequence, however, was a large oblique extra-areolar scar extending laterally, much like a traditional mastectomy.



Figure 2. Patient 1 postoperative front.

Other techniques have described using Wise-pattern scars and glandular pedicles similar to those in traditional reduction mammoplasty. These techniques present many drawbacks for male patients. Not only do these procedures often leave excess glandular tissue behind, but the Wise pattern frequently causes coning of the breast and unacceptable scarring.

Huang et al recognized these issues, and in 1982 described a series of patients treated with a periareolar excision to allow for skin excision without extra-areolar scarring.¹⁹ This technique relies on a central mound with an intercostal blood supply through the prepectoral



Figure 1. Patient 1 preoperative front.



Figure 3. Patient 1 preoperative oblique.



Figure 4. Patient 1 postoperative oblique.



Figure 6. Patient 1 postoperative lateral.



Figure 5. Patient 1 preoperative lateral.



Figure 7. Patient 2 preoperative front.



Figure 8. Patient 2 postoperative front.

fascia. Similar techniques, as described by Botta, recognize nipple–areolar complex (NAC) viability on the subdermal plexus alone and utilize superiorly based dermo-glandular flaps, allowing for a more uniform excision of breast tissue.^{18,20} The most common complication encountered is hypertrophic scar due to excessive resection and too much tension on the circumareolar suture line. Longhue et al in their study reported that 27.5% patients were not satisfied because of hypertrophic scar or breast asymmetry.²¹ There is no need for skin excision in our technique, which reduces the possibility of a hypertrophic scar. Holzmer et al in their review reported a revision surgery in up to 14.1% of cases. There was no revision surgery in our study.²² The



Figure 10. Patient 2 postoperative oblique.



Figure 9. Patient 2 preoperative oblique.



Figure 11. Patient 2 preoperative lateral.



Figure 12. Patient 2 postoperative lateral.

patient satisfaction rate in our study was comparable with the study conducted by Shirol et al.²³

Our unique approach, the NAC plaster lifting technique, is applied after the skin closure of the Webster incision. We assume that this technique avoids NAC necrosis by counteracting the gravitational force of the loose skin there by preventing the stretch injury to the subdermal plexus supplying the NAC. It utilizes the advantage of the elastic recoiling property of the skin and helps in re-draping the redundant skin on the chest wall and enables positioning the NAC at an aesthetically pleasing position on the chest.

The main disadvantage of the technique was the mild residual skin redundancy, which was noted in all 30 patients. This redundancy, however, was never severe enough to require a secondary procedure. All patients were satisfied with the final result, which is a major advantage over the two-stage approach of liposuction followed by skin excision several months later.

CONCLUSIONS

Finally, it may be concluded that the application of the NAC plaster lifting technique can be a valuable tool as it is simple, reproducible, and cost-effective in the management of severe gynecomastia. It has many advantages, which will be highly beneficial to the patients to a large extent as it re-drapes the redundant skin on the chest wall and positions the NAC at an aesthetically pleasing position on the chest. This adjuvant technique can help accomplish better symmetry and aesthetic appearance, and excludes the need for second stage surgery in most of the cases of severe gynecomastia.

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REFERENCES

1. Nydick M, Bustos J, Dale JH, et al. Gynecomastia in adolescent boys. *JAMA*. 1961;178:449.
2. Nuttall FQ. Gynecomastia as a physical finding in normal men. *J Clin Endocrinol Metab*. 1979;48:338–340.
3. Narula HS, Carlson HE. Gynecomastia. *Endocrinol Metab Clin North Am*. 2007;36:497–519.
4. Eckman A, Dobs A. Drug-induced gynecomastia. *Expert Opin Drug Saf*. 2008;7:691–702.
5. Mathur R, Braunstein GD. Gynecomastia: pathomechanisms and treatment strategies. *Horm Res*. 1997;48:95–102.
6. Neuman JF. Evaluation and treatment of gynecomastia. *Am Fam Physician*. 1997;55:1835–1844, 1849.
7. Davanço RA, Sabino Neto M, Garcia EB, et al. Quality of life in the surgical treatment of gynecomastia. *Aesthetic Plast Surg*. 2009;33:514–517.
8. Rahmani S, Turton P, Shaaban A, et al. Overview of gynecomastia in the modern era and the Leeds gynecomastia investigation algorithm. *Breast J*. 2011;17:246–255.
9. Simon BE, Hoffman S, Kahn S. Classification and surgical correction of gynecomastia. *Plast Reconstr Surg*. 1973;51:48–52.
10. Rohrich RJ, Ha RY, Kenkel JM, et al. Classification and management of gynecomastia: defining the role of ultrasound-assisted liposuction. *Plast Reconstr Surg*. 2003;111:909–923, discussion 924–925.
11. Murphy TP, Ehrlichman RJ, Seckel BR. Nipple placement in simple mastectomy with free nipple grafting for severe gynecomastia. *Plast Reconstr Surg*. 1994;94:818–823.
12. Smoot EC III. Eccentric skin resection and purse-string closure for skin reduction with mastectomy for gynecomastia. *Ann Plast Surg*. 1998;41:378–383.
13. Persichetti P, Berloco M, Casadei RM, et al. Gynecomastia and the complete circumareolar approach in the surgical management of skin redundancy. *Plast Reconstr Surg*. 2001;107:948–954.
14. Peled IJ. The concentric mastopexy and purse-string suture. *Plast Reconstr Surg*. 1991;87:385.
15. Ward CM, Khalid K. Surgical treatment of grade III gynecomastia. *Ann R Coll Surg Engl*. 1989;71:226–228.
16. Bretteville-Jensen G. Surgical treatment of gynecomastia. *Br J Plast Surg*. 1975;28:177–180.
17. Letterman G, Schurter M. Surgical correction of massive gynecomastia. *Plast Reconstr Surg*. 1972;49:259–262.
18. Bailey SH, Guenther D, Constantine F, et al. Gynecomastia management: an evolution and refinement in technique at UT southwestern medical center. *Plast Reconstr Surg Glob Open*. 2016;4:e734.
19. Huang TT, Hidalgo JE, Lewis SR. A circumareolar approach in surgical management of gynecomastia. *Plast Reconstr Surg*. 1982;69:35–40.
20. Botta SA. Alternatives for the surgical correction of severe gynecomastia. *Aesthetic Plast Surg*. 1998;22:65–70.
21. Longheu A, Medas F, Corrias F, et al. Surgical management of gynecomastia: experience of a general surgery center. *G Chir*. 2016;37:150–154.
22. Holzmer SW, Lewis PG, Landau MJ, et al. Surgical management of gynecomastia: a comprehensive review of the literature. *Plast Reconstr Surg Glob Open*. 2020;8:e3161.
23. Shirol S. Orange peel excision of gland: a novel surgical technique for treatment of gynecomastia. *Ann Plast Surg*. 2016;77:615–619.