Double Incision Mastectomy with Free Nipple Graft for Masculinizing Chest Wall Surgery

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INTRODUCTION

Transgender and gender non-binary individuals have a gender identity that differs from their assigned sex at birth. They face mistreatment, discrimination, and disparities, and report significantly lower quality of life than the general population.¹ This patient population also has a high prevalence of comorbid mental illness, with high rates of depression and suicide.²³ A significant contributor to these mental health problems is gender dysphoria, which encompasses distress or difficulty functioning associated with the conflict between the way transgender people feel and conceptualize themselves and their physical bodies.⁴ Gender-affirming surgery refers to any surgical procedure that helps a person’s body align with their gender identity and expression. Over the past several years, there has been a significant increase in gender-affirming surgery in North America, driven by increased societal awareness and acceptance as well as expanding insurance coverage.

Although masculinizing chest wall surgery shares some similarities with gynecomastia treatment and oncologic mastectomy, it differs in significant ways. Top surgery techniques differ from the former because transgender patients typically have increased breast volume, skin excess, and ptosis, which collectively require skin excision and scar placement planning.² Excess skin laxity and ptosis are particularly challenging problems among transgender men who have practiced chest-binding. Chest binding entails tightly wrapping a piece of fabric or using a specially made garment to reduce the visibility of the breasts beneath clothing. Furthermore, both curative and prophylactic oncologic mastectomy produce contour deformities that are avoided in top surgery through an intentionally limited excision of parenchymal tissue.⁵

There does exist variation in the extent to which residual breast parenchyma is left on the chest wall, as the goal of this operation is not removal of all grossly identifiable parenchyma for oncologic purposes but rather chest wall contouring.

Various techniques have been described for top surgery, and multiple algorithms have been proposed for appropriate technique selection.⁶–⁸ The Double Incision with Free Nipple Graft (DI-FNG) technique is favored in patients with larger breasts, ptosis, and/or skin laxity. While this technique creates the most noticeable scarring of the various techniques described in the literature, it provides the best aesthetic outcomes for the described patient group and allows for optimal nipple placement. In a systematic review, this technique demonstrated the fewest reoperations and similar satisfaction compared with other techniques.⁹ Here, we review DI-FNG in detail, highlighting the key steps of the procedure that facilitate the successful creation of a masculine or androgynous chest wall, with particular attention to optimal scar and nipple graft placement. (See Video [online], which demonstrates a step-by-step approach to masculinizing chest wall surgery using a double incision mastectomy with free nipple graft technique.)

METHODS

In the preoperative holding room, markings are drawn with the patient in the sitting and standing positions. The inframammary fold (IMF) is marked inferiorly and curved up laterally to follow the pectoralis major muscle direction of a masculine chest wall. This prevents axillary skin excess and allows for eventual obliteration of the IMF. The patient is asked to contract their pectoralis major muscle, to palpate and mark the muscle insertion so that the final incision and subsequent scar will lie over this landmark.

The nipple–areolar complex grafts are marked as 3 cm by 2 cm transversely oriented ovals along the long axis of the nipple in an axial plane.¹⁰ They are harvested as full thickness grafts.

The proposed incisions and mastectomy upper flap and subglandular planes are injected with standard tumescent solution. The mastectomy begins with the cephalad incision and an upper mastectomy flap of skin and subcutaneous tissue is created. The thickness of the flap depends on the patient’s natural subcutaneous tissue thickness in the upper chest as well as the patient’s desired appearance. The breast is next lifted off the pectoralis fascia, without violating the fascia. The skin of the superior...
flap is brought down to the inferior incision to ensure that there is necessary skin laxity to close the proposed excision. Then, the inferior incision is next developed.

The IMF is undermined as well as radially scored to release and obliterate the IMF. The inferior flap is elevated to the level of the pectoralis major insertion, which is marked out. The inferior flap fascia is next anchored to this insertion. The superior and inferior flaps are next tailed and stapled to ensure symmetry and appropriate chest appearance. After drain placement, irrigation, and assessing hemostasis, the incisions are closed in multiple layers.

Markings for nipple transposition are made at the lateral border of the pectoralis major muscle and the fourth intercostal space (approximately 1.5–2 cm above the lower incision) with 3 cm by 2 cm ovals. They are angulated slightly factoring in the arm abduction on the arm boards. Symmetry is evaluated by visual inspection and through measurement of the distance from the suprasternal notch and midline to the areola. The nipple grafts are thinned and the site for transposition on the chest is deepithelialized. The free nipple grafts are sutured into place and appropriate nipple–areolar complex bolsters are placed.

RESULTS

This patient tolerated surgery without any intra- or post-operative complications. Dressings, bolsters, drains and all silk sutures were removed at the 1-week follow-up appointment. Chest wrapping continued for 6 weeks and the patient was seen in clinic for 2, 4, and 8-week follow-up appointments. The patient is evaluated at 6 months post-operatively for any revision procedures, including contour irregularities, scar revision, and any nipple–areolar complex asymmetry revision.

DISCUSSION

There exists no consensus on a single technique that is suitable for every patient who desires top surgery. Each patient’s chest characteristics are evaluated to decide which technique will give them the best chest contour that aligns with their desires and goals. The most commonly used technique, which is demonstrated in this video, DI-FNG, allows for the creation of a masculine chest wall. Aside from DI-FNG, 3 other main techniques predominated in the literature. The first category involves a semi-circular or transareolar incision without skin resection. It has a limited application to patients with small breasts and good skin elasticity. These types of top surgery are also associated with increased risk of hematoma that is thought to be secondary to poor exposure. The second category involves concentric incisions around the areola that can facilitate well-hidden scars. However, the concentric incision approach is often limited to those with small to medium sized breasts, and are sometimes complicated by wrinkling and scar burden similar to DI-FNG. Finally, the third technique employs an inferior pedicle mammoplasty, which can be used in place of a free nipple graft to preserve sensation and reduce graft loss, but is limited by nipple mobility and excess post-operative fullness and volume that limits masculine appearance of the chest.

Although the literature about top surgery continues to document advances in technique and aesthetic outcomes, there is still significant room for improvement in the development of patient-centered outcomes. The true impact of top surgery alone is challenging to assess in the context of the multi-disciplinary care offered in conjunction with gender-affirming surgery. Patient-reported outcomes regarding quality of life and psychosocial improvements following top surgery need to be further assessed. However, given the increasing number of gender-affirming operations in the United States and the increasing evidence indicative of significant positive change, continued improvement and understanding of top surgery and other gender-affirming surgeries are essential.

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PATIENT CONSENT

Patient consent was obtained for use of all pre-, intra-, and post-operative digital content and has been submitted along with this article.

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