Dermal nipple-areola complex flap method in female to male gender affirming surgery

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SUMMARY
Subcutaneous mastectomy plays a major role in female to male (FtM) gender affirming surgery, and obtaining a flattering chest contour remains a challenge to the surgeon. We present an operative method using a dermal nipple-areola complex (NAC) flap, with the aim to create a naturally masculine appearance, while reducing the risk of NAC complications by maintaining sufficient neurovascularisation. This case report describes how the novel approach may potentially be applied as an alternative to the traditionally performed free nipple graft technique in FtM gender confirming surgery. The technique is simple, provides an aesthetically appealing outcome and presumably poses a low risk of NAC complications. Intraoperatively, it allows for good exposure and a uniform removal of breast tissue, as well as repositioning and/or resizing of the NAC where required.

BACKGROUND
Chest contouring is usually the first, and arguably most significant, step in female to male (FtM) gender confirming surgery. Obtaining a desirable masculine appearance importantly facilitates living in the male gender role, and significantly increases body satisfaction, quality of life and self-esteem.1–3 As the awareness and social acceptance of transsexualism has increased in later years, so has the demand for surgery and the expectations of its outcome.

Various methods are being developed, in aim to optimise the aesthetic results while decreasing the risk of complications. Subcutaneous mastectomy (SCM) using the free nipple graft technique is universally known as the gold standard in FtM transgender patients with medium to large breasts.2–4 The method allows for rapid contouring and removal of excess skin, and repositioning of the nipple-areola complex (NAC) and/or resizing where required. The main disadvantages to the technique are long residual mid-thoracic scars, the risk of NAC pigmentary and sensory changes, and graft necrosis.

We present our experience where SCM was performed in an FtM transsexual patient with medium size breasts, using the dermal NAC flap method. Our goal in applying this technique was to preserve sufficient neurovascular function of the NAC, in order to reduce the risk of sensitivity loss, hypopigmentation and necrosis, as well as to achieve optimal cosmesis in terms of a masculine appearance. The aim of this case description is to propose and show this alternative surgical approach, which may be implemented in future patients.

CASE REPORT
A 20-year-old FtM transsexual patient was referred to our department with the desire to undergo chest masculinisation surgery. The patient had undergone hormonal therapy prior to referral. The body mass index of the patient was 22.3 kg/m² and there were no concurrent medical conditions. Preoperative evaluation assessed a breast size of approximately 300 CC, and poor skin quality and elasticity due to the use of chest compression vests. There was no pronounced ptosis (figure 1).

Preprocedural markings were made with the patient standing. The breast meridian and the inframammary fold (IMF) were marked. The amount of excess skin was estimated by gently pulling the breast downward, and the superior margin was marked. Laterally, the line was curved slightly upwards, in order to create a rounded scar that would follow the inferior border of the pectoralis major muscle. The new position of the NAC was marked lateral to the breast meridian, with a reduced diameter of 25 mm (figure 2).

The skin was de-epithelialised after intra-dermal injection of local anaesthetic (lidocaine with epinephrine, 0.25% Amgros I/S). Incisions were made according to the superior margin, and SCM was carried out between the
subcutaneous fat and the glandular tissue, sparing a 5 mm rim underneath the NAC to avoid depression deformity. The amount of breast tissue removed was 302 g from the right breast and 312 g from the left. The de-epithelialised inferior dermal NAC flap was inserted beneath the superior full skin flap. A circular defect was created, into which the NAC was interpolated. Finally, the skin was closed with resorbable sutures.

OUTCOME AND FOLLOW-UP
The patient was seen for follow-up appointments 2 weeks and 4 months postsurgery. He reported being exceedingly satisfied with the cosmetic results, with no complaints of nipple hypersensitivity or hyposensitivity. The NAC was healed sufficiently with no pigmentary changes. The dermal flaps provided a uniform filling to the chest, avoiding the inversion effect sometimes seen when using the free nipple graft technique. There were no postoperative complications or need for corrective surgery.

As the preoperative breast size of our patient was moderate, we were unable to place the residual horizontal scars inferior to the pectoral muscles, as would have been possible with larger size breasts. The scars were situated approximately 2 cm superior to the inframammary line. Nonetheless, they followed the natural anatomy of the chest and were well tolerated by the patient. Overall, we were able to attain a uniform contour with a masculine aesthetic. The areola was reduced in size and lateralised according to the male anatomy (figure 1).

DISCUSSION
Our case shows that the dermal NAC flap method could be applied as an excellent approach in FtM chest contouring. The surgery delivered satisfactory results with an aesthetically pleasing masculine appearance and a high level of patient satisfaction. Since the NAC neurovascular bundles are preserved, they promote good sensation and blood supply, minimising the risk of complications. If nipple reduction is needed this can be performed in the same session, as the vascular supply is particularly reliable using this method.

According to existing algorithms, SCM consisting of the free nipple graft technique is the gold standard in FtM transsexual patients with medium to large breasts with poor skin elasticity. Disadvantages to the method include NAC hyperpigmentation or hypopigmentation, sensibility impairment, the patch effect, depression deformities, and, in rare cases, complete or incomplete graft necrosis.2 4

Alternatively, the superior or inferior pedicle techniques have been proposed in aim to preserve adequate neurovascularisation to the NAC. Disadvantages include the long-term risk of ptosis and feminisation, as some breast tissue is left in the thorax, as well as a visible inverted T-scar.6 Although rare, there have been reports of FtM transsexual patients developing breast cancer after having undergone SCM,7 6 and one must assume this risk naturally increases with mammary tissue left in the chest.

Cely et al presented an alternative incision outline with the purpose to hide the inverted T-scar, resulting in simple horizontal scars inferior to the pectoral muscles, similar to those seen in our study.1 However, the issue of thorax feminisation still remains, as a sufficient amount of tissue inevitably is left in the pedicle in order to maintain blood supply to the NAC, which is carried on the only 6 cm in width pedicle. Due to this, additional liposuction is often needed in order to attain a natural and flat contour.

Our technique differs from the aforementioned, in that the subcutaneous tissue of the entire width of the breast is maintained as an inferior flap, while simultaneously mostly all of the glandular tissue is uniformly removed. The inferior dermal flap conveniently creates an even filling effect to the chest, which is especially suitable to the male anatomy where the pectoralis major muscle is typically more developed as compared with the woman.

One could argue that the breast size of our patient was on the smaller range in using the dermal NAC flap method, and rather could have benefited from the concentric circular technique in order to minimise the extent of postoperative scars.3 However, with the present skin laxity of our patient the tissue may not have sufficiently contracted, potentially resulting in excess skin and/or undesirable positioning of the NAC. Contrarily, applying the method in breasts too large or ptotic would not be ideal, as the extended distance between the IMF and NAC will result in an oversized flap.

The main focus with our paper is to propose an alternative operative approach to the free nipple graft technique, which could be implemented in and benefit future patients. A similar technique has previously been applied in patients with grade III gynecomastia,8 8 and as the hammock technique in immediate breast reconstructive surgery.9 10 To our knowledge, it has not previously been reported in SCM in FtM transsexual patients.

CONCLUSION
This is, to our awareness, the first described case using the dermal NAC flap method in FtM gender affirming surgery. Our case demonstrates that the technique could provide a flattering and natural chest contour, by preserving the dermal and fatty layer as well as the NAC neurovascular bundles. Consequently, the risk of NAC complications is low. The technique allows for a good exposure window for dissection.
Patient’s perspective

I have always felt like I was born in the wrong body in terms of my gender. After reaching puberty, my chest area began to bother me in particular, as this was apparently visible to the people around me. To cover my discomfort I began binding my chest, which would give me some temporary relief. After undergoing psychological evaluation and hormonal therapy, I was finally qualified for surgery. I was evaluated by two plastic surgeons and together we found the best surgical option for me.

Following surgery, I finally felt like myself. There was some pain and healing to go through, but today I am ecstatic over the results and feel happy and confident in my own skin. I am particularly glad that I have normal sensation in both my nipples. The overall appearance is extremely natural and the scars don’t bother me, especially since I have grown some hair in the area. Overall, I am truly pleased and would recommend this operative method to other patients.

Learning points

- The dermal nipple-areola complex (NAC) flap method is a novel surgical technique, which may be implemented in future female to male (FtM) gender affirming upper surgery. Presumed advantages include complete and well-demarcated removal of mammary tissue, convenient repositioning and possible reduction of the NAC, a natural filling provided by the dermal flap, and a low risk of NAC depression deformity, sensory or pigmentary impairment and necrosis.
- Thorough evaluation and preoperative assessment of the patient is recommended in order to determine the most suitable and personalised method, to achieve optimal aesthetic results as well as to reduce the risk of complications. The dermal NAC flap method could potentially be incorporated in the standard treatment algorithm in future patients, presumably in those with medium to large size breasts.
- This case description illustrates a young FtM transsexual patient where the above technique was performed. The cosmetic outcome was satisfactory and patient gratification high. There were no postoperative complications, those related to the NAC included. Further studies need to be undertaken in order to fully determine the results of this method.

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