

# Immediate Nipple-Areolar Complex Reconstruction for Patients Undergoing Implant-Based Reconstruction or Therapeutic Mammoplasty

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**Background:** We report a technique of immediate nipple-areolar complex (NAC) reconstruction for patients undergoing skin-sparing mastectomy and implant-based breast reconstruction or therapeutic mammoplasty with central excision.

**Methods:** Immediate nipple reconstruction is performed using a modified C-V flap planned along the edge of the incision. The areola is reconstructed using a full-thickness skin graft taken from skin usually discarded during the procedure. Immediate NAC reconstruction using this technique was performed on 32 breasts in 21 patients. This included 19 risk-reducing mastectomies, 9 therapeutic mastectomies, and 2 major revisions to existing implant reconstruction. Reconstruction was direct to implant in 29 breasts and by expander in 1 breast. The device was placed in a pre- or post-pectoral plane utilizing dermal sling and/or acellular dermal matrix as determined on a case-by-case basis. Immediate NAC reconstruction was also performed on 2 patients undergoing therapeutic mammoplasty with central excision.

**Results:** Mean follow-up is 12 months (5–27 months), and cosmetic results have been good. There have been no significant complications, and no revisional surgery has been required.

**Conclusion:** The application of simple techniques for NAC reconstruction in the primary procedure allows reconstruction of the whole breast in a single stage. There is an immediate focal point to the reconstruction to improve cosmesis, patient satisfaction, and psychosocial function without delay. (*Plast Reconstr Surg Glob Open* 2017;5:e1243; doi: 10.1097/GOX.0000000000001423; Published online 20 September 2017.)

## INTRODUCTION

The nipple-areolar complex (NAC) is the primary landmark of the breast. NAC reconstruction is a fundamental component of reconstruction of the whole breast to achieve good cosmesis and symmetry. Although it is a relatively simple surgery, NAC reconstruction greatly increases patient satisfaction and psychosocial function.<sup>1</sup>

Numerous local flap techniques have been described for surgical nipple reconstruction, including the C-V flap,<sup>2</sup> S flap,<sup>3</sup> star flap,<sup>4</sup> and skate flap. A major limitation is the loss of projection in the long term, and techniques includ-

ing the insertion of cartilage<sup>5</sup> have been described in an attempt to address this problem. Alternatively, a nipple sharing graft is an option for patients with large contralateral nipples.<sup>6</sup>

In the majority of cases, areolar reconstruction is achieved with tattooing. However, it can be difficult to achieve a realistic areolar texture with this technique. An alternative method is areolar reconstruction using a full-thickness skin graft (FTSG),<sup>7</sup> which replicates the texture of the areolar and may be subsequently tattooed. Alternatively, to minimize the need for tattooing, a graft may be taken from the contralateral areolar or distant skin liable to pigmentation such as the labia minora or inner thigh. However, donor-site morbidities are inevitable with these techniques.

Aside from a report on immediate nipple reconstruction in autologous latissimus dorsi flap<sup>8</sup> or deep inferior epigastric perforator flap<sup>9</sup> reconstruction, historically NAC reconstruction is a secondary procedure performed

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months after initial breast reconstruction.<sup>10</sup> The patient has a period without NAC and a delay in the completion of reconstruction. Although subsequent reconstruction is a minor procedure, the patient must take time out for a further admission and recovery period. Patient satisfaction and psychosocial function may be diminished in the intervening period.

We report a technique for immediate NAC reconstruction for patients undergoing skin-sparing mastectomy and implant-based reconstruction or therapeutic mammoplasty.

### TECHNIQUE

Preoperatively, the site of the nipple is planned at the desired height with reference to the usual measurements and landmarks. This includes the breast meridian, the inframammary fold (Pitanguay's point), and the midhumeral point. The nipple is sited no higher than 23 cm to avoid high placement.

A modified C-V flap is designed at this location (Fig. 1). In the majority of cases, the flap was located along 1 vertical limb of a Wise pattern incision, but the technique may also be incorporated into a periareolar incision if an adequate amount of skin is available.

A doughnut of skin for areolar reconstruction is marked within the area of skin to be excised. We gener-

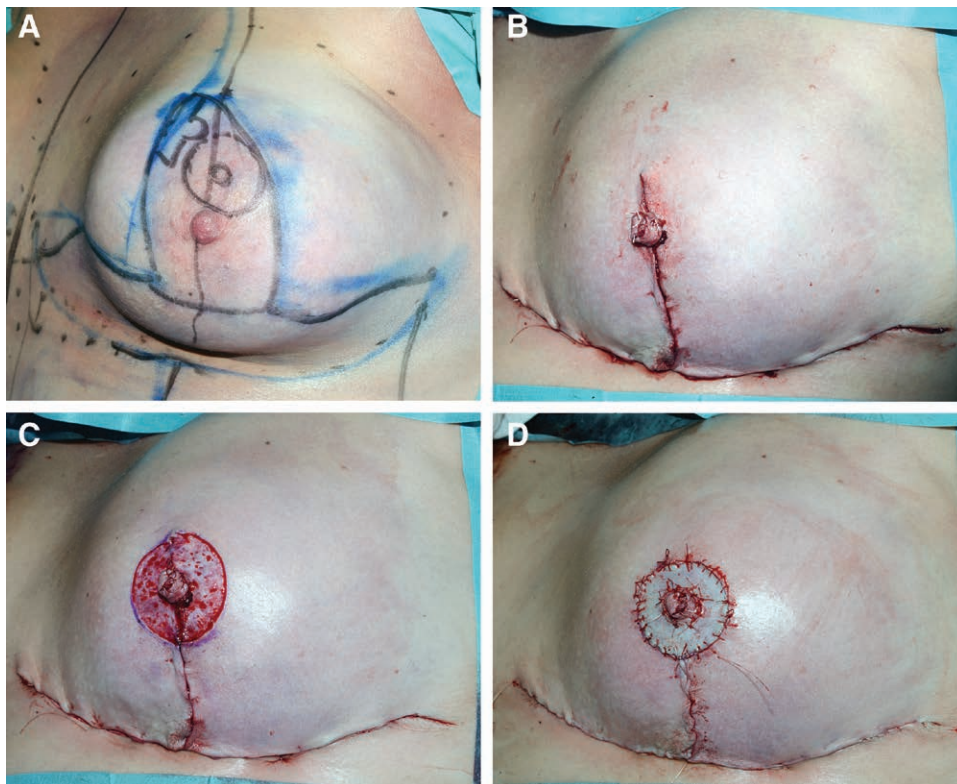
ally harvest the FTSG distant from the areolar, certainly in therapeutic cases, to avoid oncological concerns. The FTSG is harvested and stored in saline during the procedure. Alternatively, an areolar graft may be harvested.

The C-V flap is elevated in the mastectomy plane. Skin-sparing mastectomy and implant-based breast reconstruction are performed, and the majority of the wound is closed. The modified C-V wings meet, and subcutaneous fat may be trimmed as required. The C-shaped cap completes the nipple reconstruction.

The location of the new areola is marked and deepithelialized. To preserve the dermal blood supply, cauterization of bleeding points is minimized. Importantly, the reconstructed nipple is secured on top of a dermal platform to minimize loss of projection in the future. The FTSG is secured to the margins, and quilting may be performed. A standard doughnut dressing of paraffin gauze and sponge is applied to protect the NAC reconstruction. NAC tattooing may take place 3 months following the procedure if desired.

### RESULTS

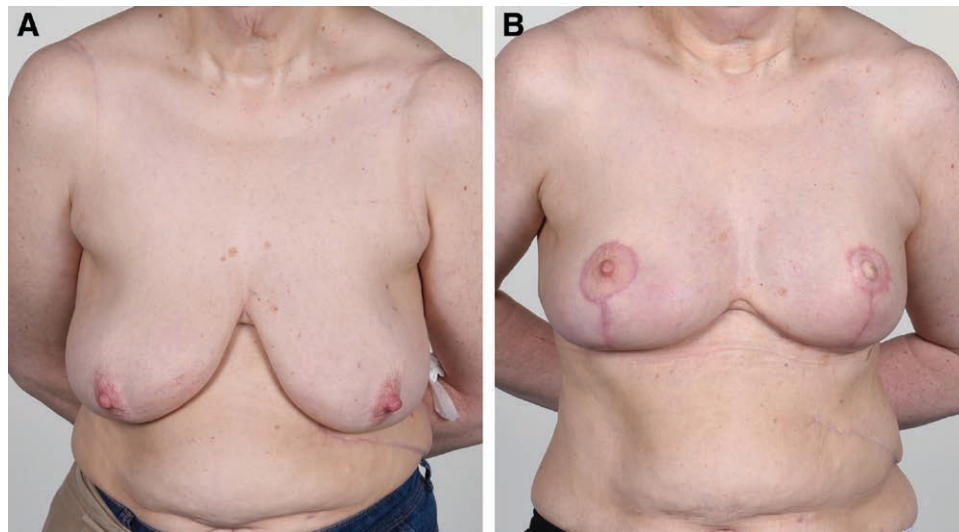
We have performed this procedure on 32 breasts in 21 patients. This included 19 risk-reducing mastectomies, 9 therapeutic mastectomies, and 2 major revisions to existing implant reconstructions (Figs. 2–4). The technique



**Fig. 1.** A patient undergoing bilateral risk reducing mastectomies, with a background of prior breast augmentation for congenital asymmetry. Wise pattern skin-sparing mastectomies planned, with reconstruction using subpectoral implants and lower pole Strattice™. A, A modified C-V flap is designed along a vertical limb, and an areolar graft is marked. B, The C-V flap is elevated in the mastectomy plane, and nipple reconstruction is performed. C, The new areolar is deepithelialized. D, The harvested full-thickness skin graft is secured.



**Fig. 2.** A patient who underwent right therapeutic wise-pattern skin-sparing mastectomy and immediate prepectoral implant reconstruction with total Strattice cover and immediate NAC reconstruction, followed by left risk-reducing mastectomy with an identical reconstruction 1 year later. A, Patient preoperatively with preexisting breast asymmetry. B, Postoperatively following right therapeutic procedure. C, Postoperatively following bilateral procedures illustrating short-term (left side at 3 months) and longer term (right side at 15 months) results.



**Fig. 3.** A patient who underwent left therapeutic wise-pattern skin-sparing mastectomies and immediate subpectoral dermal sling implant reconstruction, with immediate NAC reconstruction. A right symmetrizing mastopexy was performed concurrently. A, Patient preoperatively. B, Results at 2 months postoperatively.

was also used in 2 patients undergoing therapeutic mammoplasty with central excision, an oncoplastic technique combining wide local excision of breast cancer and breast reduction “(Fig. 5).”

The incision was wise pattern in 29 breasts and peri-areolar in 3 breasts. Reconstruction was direct to implant 29 breasts (10 prepectoral with total ADM cover, 8 subpectoral with lower pole ADM, 7 subpectoral with dermal sling, 4 prepectoral with total dermal sling cover) and by subpectoral expander with lower pole strattice in 1 case.

Mean follow-up is 12 months (5–27 months). Tumor excision was complete in all therapeutic cases with no local recurrence to date. One patient experienced partial graft loss, which healed with dressings, but there have

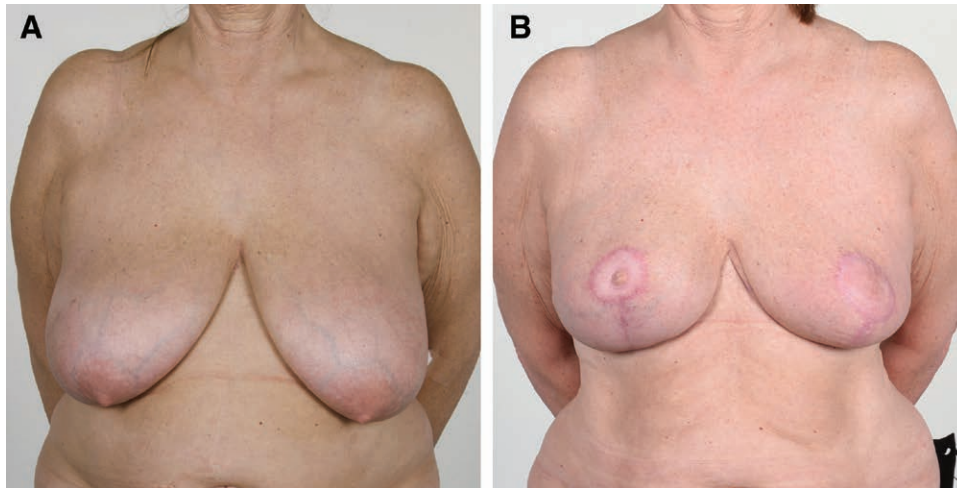
been no further complications in this series. Cosmetic results have been good to date, and no revisional surgery has been required.

## DISCUSSION

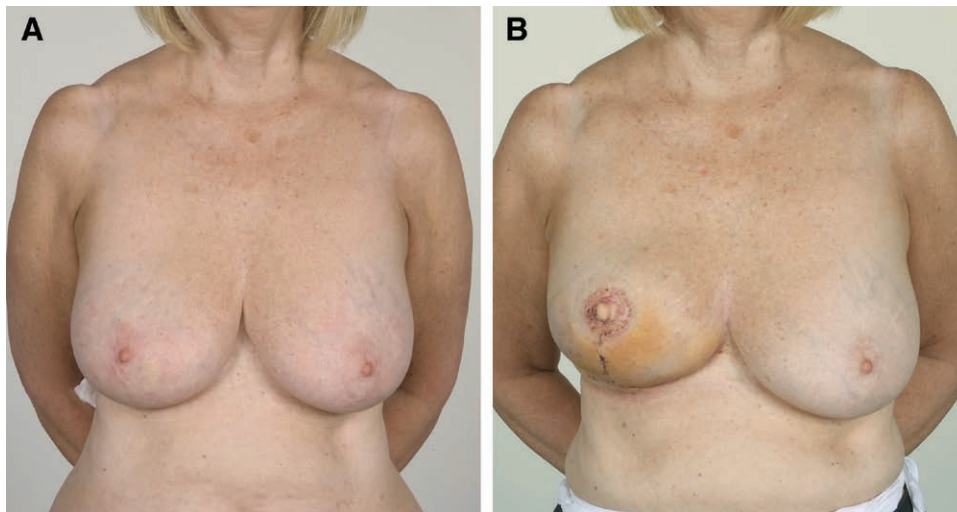
Immediate NAC reconstruction is a reliable technique in patients undergoing skin-sparing mastectomy and implant-based breast reconstruction. This technique is considered for patients undergoing NAC excision due to oncological reasons or at the patient’s request. The technique is feasible if a degree of skin envelope reduction is required.

A free NAC graft is an alternative option for immediate reconstruction. However, in our experience, nipple projection is better maintained with the described technique. Delayed nipple reconstruction remains an alternative and





**Fig. 4.** A patient who underwent right therapeutic wise-pattern skin-sparing mastectomy and immediate prepectoral Strattice and inferior dermal sling implant reconstruction, with immediate NAC reconstruction. A left symmetrizing reduction was performed concurrently. A, Patient preoperatively. B, Results at 5 months postoperatively.



**Fig. 5.** A patient who underwent therapeutic mammoplasty with central excision for high grade ductal carcinoma in situ with immediate NAC reconstruction. A, Patient preoperatively. B, Results at 2 weeks postoperatively.

undoubtedly the surgeon has more control over the final nipple position. The limitation is a period without the NAC and the need for a further procedure.

Nipple-sparing mastectomy is the preferred option for many patients. A number of techniques have been described to extend nipple-sparing mastectomy to patients with ptotic breasts.<sup>11,12</sup>

Our method employs the conventional techniques of local flap nipple reconstruction and full-thickness skin graft areolar reconstruction. However, application in the primary procedure gives a focal point to the breast to improve patient satisfaction and psychosocial function. This is particularly beneficial in patients undergoing bilateral risk-reducing mastectomies and reconstruction, who have high expectations in terms of cosmetic outcome. Reconstruction is complete in a single stage to avoid delays and further inconvenience for the patient and improve efficiency.

Careful preoperative planning is required to avoid NAC malposition. To avoid superior placement, we use reference points of the inframammary fold (Pitanguay's point), the mid-humeral point, and site the nipples no higher than 23 cm. A further challenge is the potential for the breast implant to displace inferiorly over time. This should also be accounted for during planning by tending to site the nipples around 1 cm lower than for a breast reduction or mastopexy and avoiding excessively long vertical limbs with wise pattern incisions.

Technically, the nipple reconstruction sits on top of a dermal platform, which improves nipple projection and minimizes flattening in the long term. The texture of the areolar skin is reconstructed with a full-thickness skin graft taken from an area usually discarded during the procedure, avoiding additional donor-site morbidity for areolar reconstruction.

Patient and surgeon satisfaction with the cosmetic results have been high with this procedure. We await longer term follow-up and patient-reported outcome data to corroborate this.

### CONCLUSIONS

Immediate NAC reconstruction is a reliable technique with good cosmetic outcomes for patients undergoing skin-sparing mastectomy and implant-based breast reconstruction or therapeutic mammoplasty. This approach allows single-stage reconstruction of the whole breast without delay to increase patient satisfaction.

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