

# Immediate Nipple Reconstruction in Skin-sparing Mastectomy with A Modified Wise-pattern Design

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**Summary:** This article discusses a novel approach to immediate nipple reconstruction during skin-sparing mastectomy with Wise-pattern design, a common procedure in direct-to-implant breast reconstruction. Traditionally, nipple reconstruction is performed as a second procedure, incurring additional costs and potential complications. This novel technique involves a simple modification to the Wise-pattern flap during the initial mastectomy, allowing for one-step reconstruction. The procedure includes preoperative markings of the Wise-pattern design, with a U-shaped flap added at the top angle to create the nipple position. This U-shaped flap, containing both skin and subcutaneous tissue, is then folded over itself and sutured, resulting in an inverted T-shaped incision with the reconstructed nipple at the apex. This article emphasizes the avoidance of a secondary operation for nipple reconstruction, avoiding additional costs and potential complications associated with flap loss, especially in postradiation patients. The technique was applied to five consecutive cases, with patient satisfaction reported as very high. Follow-up at 6 months showed no venous congestion or flap loss, and in patients without adjuvant radiation, the reconstructed nipple maintained almost all its initial postoperative height. Minor loss of nipple protrusion over time was comparable to traditional nipple reconstruction (eg, skate flap), and the construction of the new nipple required only an average of 10 extra minutes. Although larger-scale studies are needed for a comprehensive evaluation, the preliminary results suggest promising outcomes and encourage larger-scale safety and outcomes studies of this technique in Wise-pattern skin-sparing reconstructions. (*Plast Reconstr Surg Glob Open* 2024; 12:e5979; doi: [10.1097/GOX.0000000000005979](https://doi.org/10.1097/GOX.0000000000005979); Published online 18 July 2024.)

## PRESENTATION OF SURGICAL TECHNIQUE

Skin-sparing mastectomy without nipple preservation using a Wise-pattern design is a common procedure in immediate implant-based reconstruction. The Wise pattern design is sometimes preferred in patients with breast ptosis to improve contour and projection and has a similar complication profile to other techniques.<sup>1,2</sup> Following this operation, the patient has an inverted T-shaped incision without any nipple, but with good ptosis correction. A second-stage nipple reconstruction can be done in

these patients at a later time, incurring additional costs and reoperation risks. We describe a novel approach to immediate nipple reconstruction during the initial mastectomy reconstruction by a simple modification of the traditional Wise-pattern flap. The flap design is depicted in [Figure 1](#).

Preoperatively, the Wise-pattern design is made with the patient sitting up. Three points are made at the sternal notch and the bilateral midclavicular points. Two lines are then drawn from the midclavicular points inferiorly, ending at the inframammary fold. Approximately 18 cm inferior to the midclavicular point, a mark is made superficial to the highest projection point of the implant to denote the final position of the reconstructed nipple. We also measure the distance from the sternal notch to the marked nipple position bilaterally (~22 cm), to ensure that the nipples are symmetric bilaterally in both

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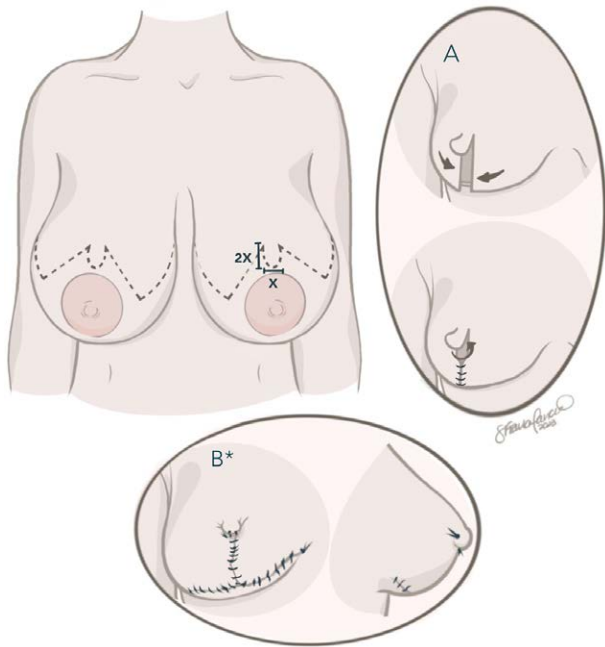
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**Fig. 1.** Depiction of our modified Wise-pattern flap. A, Closure of vertical incision to 1 cm below the nipple flap (top) and folding the U-shaped flap over itself horizontally to construct the new nipple (bottom). B, The stitched incision in the frontal and lateral views. B\*, The inferior incision is stitched in the inframammary fold. The depiction in this bubble is slightly higher to illustrate the suture line. Illustration created by S. Francalancia.

horizontal and vertical dimensions. These measurements are approximate and vary with patient height and weight.

With this design, the apex of the incision will be the center of the nipple. During the initial marking, the top angle (apex of the triangle) is modified by creating a full-thickness U-shaped flap containing both skin and the underlying subcutaneous tissue from mastectomy. This superiorly based U-shaped flap has the same base diameter as the contralateral nipple, and the length is measured as two times the width of the flap base. These dimensions achieve the best height and width symmetry with the contralateral nipple while anticipating postoperative shrinkage. Postoperative shrinkage is common in any nipple reconstruction but is most notable in postradiation patients.<sup>3</sup>

The basic principles of implant-based reconstruction are unchanged. The nipple reconstruction is performed at the end of the breast reconstruction, before closing the final incision. The T-shaped incision is closed, leaving a centimeter opening at the base of the U-shaped flap. The U-shaped flap is folded over itself and then stitched using two to three sutures of 4.0 Nylon into this gap at the apex of the incision (Fig. 1A, top). After the U-flap is folded on itself, the open lateral edges are sutured so that the flap takes on a tubular appearance (Fig. 1A, bottom).

The result has the typical inverted T-shaped incision, with the reconstructed nipple at the apex of the inverted T, and sutures placed on the posterior and lateral surfaces of

### Takeaways

**Question:** Can single-stage nipple reconstruction be achieved by modifying a Wise-pattern mastectomy flap, and can it achieve comparable surgical and cosmetic outcomes to secondary reconstruction?

**Findings:** Five patients had nipple reconstruction concurrent with direct-to-implant subpectoral reconstruction after skin-sparing mastectomy using this technique with no major complications. Cosmetic outcomes at 6 months paralleled secondary reconstruction with minimal loss of nipple height and protrusion. The additional nipple reconstruction adds only 10 minutes of operative time.

**Meaning:** By modifying the Wise-pattern mastectomy flap and using this technique, nipple reconstruction can be done concurrently, avoiding the complications and costs associated with a second procedure.

the new nipple (Fig. 1B). Patients can have nipple areolar complex tattooing or grafting in the future if they desire.

### PATIENT SELECTION

Five consecutive cases of unilateral mastectomy with subpectoral direct-to-implant reconstruction using this procedure have been done at our institution without any flap loss. Two of five patients received adjuvant radiation therapy, and three did not. Comprehensive patient characteristics are found in Table 1.

### RESULTS

In the three patients without adjuvant radiation, the reconstructed nipple height remained satisfactory at 6 months. In two patients who had adjuvant radiation therapy, the nipple seemed to flatten slightly, though protrusion loss was comparable to that expected in secondary nipple reconstruction. None of our patients required secondary revision. [See figure, Supplemental Digital Content 1, which shows the 1 week (left) and 6 month (right) follow-up appearance of a patient who sustained minor loss of protrusion following adjuvant radiation. <http://links.lww.com/PRSGO/D352>.]

Patient satisfaction in all five cases was extremely high at 6 month follow-up. This was determined by two patient-reported outcome measures (PROMs) administered at our institution. Patients were asked, “would you advise someone else to have this procedure done?” and shown a photograph of a standard Wise-pattern mastectomy reconstruction without nipple reconstruction. They were then asked if their result was superior to the result shown in the photograph. (See figure, Supplemental Digital Content 2, which shows the standard photograph shown to patients to compare their result with the nonnipple reconstructed Wise-pattern result used in the patient satisfaction survey. <http://links.lww.com/PRSGO/D353>.) Five out of five patients responded “yes” to both questions. We await longer term follow-up and PROMs to corroborate our initial data on patient satisfaction.

**Table 1. Demographic and Operative Characteristics of Each Patient Included in the Study**

Pt	Age	Family History	Smoking	Preoperative Dx	Procedure	Morbidity	Follow-up	Adjuvant Radiation	Satisfaction*
1	52	None	Nonsmoker	DCIS	R mastectomy/L reduction mammoplasty	None	1 y	Yes	2/2
2	47	None	Nonsmoker	DCIS	R mastectomy	None	9 mo	Yes	2/2
3	55	None	Nonsmoker	LCIS	R mastectomy	None	9 mo	No	2/2
4	75	Mother Breast CA Age >50	Nonsmoker	DCIS	L mastectomy/R mastopexy	None	6 mo	No	2/2
5	69	None	Nonsmoker	DCIS	R mastectomy	None	6 mo	No	2/2

\*2/2 satisfaction score corresponds to answering “yes” to both PROMs, as outlined in the text. DCIS; ductal carcinoma in-situ; LCIS, lobular carcinoma in-situ.

Although minor loss of nipple protrusion was noticed over time in our patients, it is comparable to that expected in traditional secondary nipple reconstruction. When done as a second procedure, nipple projection loss is estimated to be between 45% and 75%, with most of the loss occurring within the first 2 postoperative months.<sup>4</sup> At 6 month follow-up for each of our five patients, no projection loss greater than 25% was observed. There were no complications related to delayed healing. Lastly, reconstruction of the nipple from the modified flap required only an average of 10 minutes of extra time. This was measured by comparing the average operative time for a subpectoral implant-based reconstruction at our institution (90 min) with the average operative time in these five cases (100 min).

## DISCUSSION

The principal advantage of this technique is the avoidance of a secondary operation. Secondary nipple reconstruction has its associated complications, including flap loss, loss of height, and increasing complexity in postradiation patients.<sup>5</sup> Moreover, a second operation for nipple reconstruction entails additional costs for the patient, and insurance coverage can be difficult to obtain.<sup>6</sup> Nipple reconstruction has been shown to result in increased personal satisfaction with reconstructed breasts.<sup>7</sup>

Previous reports of immediate nipple reconstruction have been described, but these techniques have focused on reconstructing the entire nipple areolar complex with a different flap design and different incisional pattern.<sup>8</sup>

An important consideration in applying the described technique is mastectomy flap quality and perfusion. Wise-pattern incisions already require excellent quality mastectomy flaps to avoid ischemic complications of the skin envelope.<sup>9</sup> Therefore, this technique cannot be loosely applied to all cases, and a critical evaluation of mastectomy flap quality is needed to determine appropriateness. Mastectomy skin flap thickness may be evaluated before reconstruction using clinical examination, breast ultrasound, magnetic resonance imaging, or mammography, and indocyanine green angiography may be used to evaluate flap perfusion.<sup>10</sup>

In summary, though larger-scale and more formal studies are needed to fully characterize outcomes and

compare this technique with a traditional second-stage nipple reconstruction, our preliminary results are promising and encourage larger-scale safety and outcomes studies of this technique in Wise-pattern skin-sparing reconstructions.

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## DISCLOSURE

*The authors have no financial interest to declare in relation to the content of this article.*

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