

# Improved Outcomes with Pedicled Nipple-sparing Mastectomies Using a New Surgical Delay: Mastectomy through Wise Incisions

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**Summary:** Nipple-sparing mastectomy (NSM) is challenging in patients with significant ptosis and skin excess. We previously described the first use of a surgical delay (a supraareolar incision with undermining off the breast mound) to facilitate a second-stage pedicled NSM and reconstruction. Here, we present an improvement in our surgical delay technique—a total skin and NSM through Wise incisions. This technique obviates concerns regarding delays in cancer care and more aggressively delays the nipple, allowing for more reliable and extreme NAC transpositions. This strategy also delays the Wise pattern flaps resulting in better wound healing, which is critical in implant-based reconstructions. (*Plast Reconstr Surg Glob Open* 2017;5:e1259; doi: 10.1097/GOX.0000000000001259; Published online 8 March 2017.)

Surgeons continue to extend the indications for nipple-sparing mastectomy (NSM) and reconstruction.<sup>1,2</sup> Despite these triumphs, significant ptosis and skin excess is a relative contraindication for NSM and reconstruction. These patients are at risk for wound-healing problems and implant extrusion, unpredictable nipple asymmetry, malposition, and necrosis.<sup>3</sup> We previously described a supraareolar incision with undermining of the nipple areola complex (NAC) off the breast mound as a delay before proceeding with pedicled NSM and reconstruction 4 weeks later.<sup>4</sup> Although this technique successfully addressed many of the problems in these ptotic patients, it has several shortcomings. It delays definitive cancer treatment. It does not delay the Wise pattern flaps that are at high risk for breakdown in these patients with larger breast sizes, placing the underlying prosthetics at risk. It also results in a 20% rate of partial nipple necrosis, although none suffered complete nipple loss (unpublished results). To address these shortcomings, we modified our delay to that of a total nipple- and skin-sparing mastectomy through Wise incisions.

## SURGICAL TECHNIQUE

Ten patients underwent NSM without reconstruction through lateral Wise incisions at their initial surgery.

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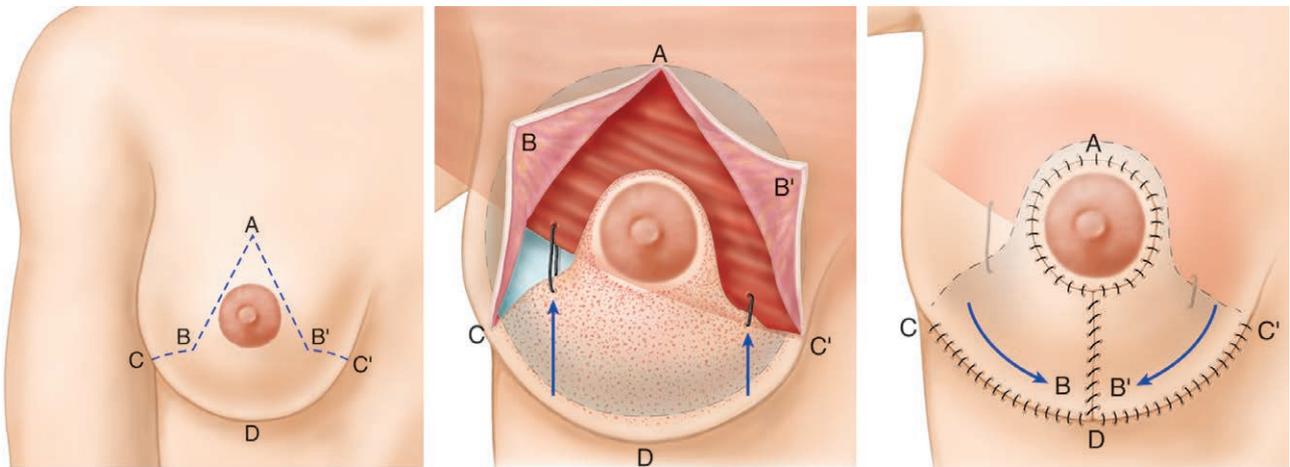
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In 5 patients, medial Wise incisions were also made at the initial mastectomy as we felt the chance of immediate nipple necrosis was low (healthy mastectomy flaps, moderate nipple-to-inframammary fold (IMF) distances of  $\leq 12$  cm, nondiabetic, ideal BMI, etc.; Fig. 1, far right panel). Four weeks later, reconstructive surgery followed involving deepithelialization of the inferior pedicle supporting the NAC and transposing it into its ideal position as determined by the incisions made at the first surgery (Fig. 1, middle panel). The pectoralis is completely released from its inferior attachments from lateral to medial. Tabbed tissue expanders are placed into the subpectoral location. The inferior pedicle supporting the NAC is then sutured to both the inferolateral and inferomedial edges of the free muscle, covering the expander completely with the autologous tissue. The central area of the inferior pedicle, where the NAC is located, is not sutured to the muscle to prevent distortion and vascular compromise and passively covers the expander and the muscle. The apex of the pedicle is sutured to the skin upon final closure to anchor it into position, and the medial and lateral Wise flaps are closed over the expander and the pedicle (Fig. 1, far left panel). A representative patient before delay is demonstrated (Fig. 2). Finally, tissue expanders are exchanged for definitive implants in a third surgery (Fig. 3).

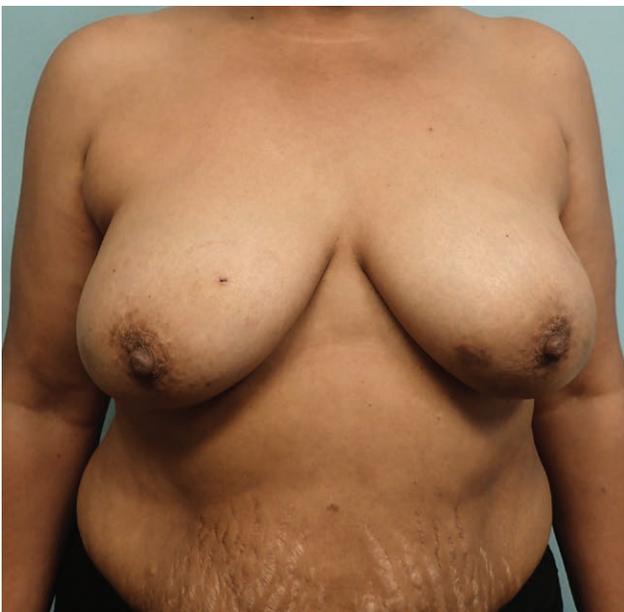
## DISCUSSION

The benefits of NSM have been well documented.<sup>5</sup> Unfortunately, many patients are poor candidates secondary

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**Fig. 1.** A, Schematic drawing of the lateral Wise incisions (A→B→C) that are made to delay the NAC and the mastectomy flaps. Medial incisions (A→B'→C') can also be made for a more aggressive delay, but this may threaten the immediate survival of the NAC. B, The deepithelialized inferior pedicle supporting the NAC is sutured to the fully released pectoralis both inferomedially and inferolaterally covering the tissue expander. The NAC is not sutured directly to the muscle to prevent retraction, distortion, and/or vascular compromise. C, The reconstruction is completed by bringing the medial and lateral Wise flaps down to the IMF covering the inferior pedicle and expander.



**Fig. 2.** Representative 60-year-old female with extensive left breast cancer and multiple areas of atypia in the right breast. She has a sternal notch-to-nipple and nipple-to-inframammary fold distance of 29 and 11 cm, respectively. She desired nipple preservation. Bilateral simple mastectomy through lateral Wise incisions is planned to confirm safe clearance of her cancer and to delay her nipple and flaps in preparation for implant-based reconstruction.



**Fig. 3.** Two months after exchange of her tissue expanders for definitive implants. Her nipple is preserved on an inferior pedicle of dermis and fat. Her excess inferior skin is deepithelialized and used to cover her prosthetic.

to their macromastia and ptosis, which results in high rates of vascular necrosis of the nipple and mastectomy flaps, unpredictable final nipple position and asymmetry, and poor accommodation of the skin and the prosthetic.<sup>3</sup> We previously described a surgical delay to facilitate a subsequent pedicled NSM and reconstruction.<sup>4</sup> This technique involved a supraareolar incision with undermining of the NAC off the breast down to the IMF. The subsequent pedicled NSM allowed for precise final nipple positioning

and retailoring of the skin envelope to accommodate the prosthetic. The issue of vascular compromise of the nipple was also addressed by the delay that presumably facilitated dilation of existing vessels and/or growth of blood vessels into the area of compromise.

This approach, however, had several shortcomings. It delayed definitive cancer care by 3 or 4 weeks. It did not allow for delay of the Wise pattern flaps, which made wound healing less predictable. These flaps are at high risk for breakdown in these larger patients, which can compromise the underlying prosthetic. Finally, we had a 20% partial nipple necrosis rate after NSM and reconstruction (unpublished results) after supraareolar delay. We felt that a more aggressive upfront delay would decrease our rate of nipple complications after pedicled nipple repositioning and reconstruction.

**Table 1. Patient Characteristics, Anatomical Variables, and Complications After Wise Pattern Mastectomy Delay**

Patient Age	Sternal Notch to Nipple (cm)	Nipple to IMF (cm)	Complications	Cancer
53	32	12	No	Yes
60	31	12	No	Yes
47	29	9	No	No
66	31	12	No	Yes
47	32	14	No	Yes
36	33	13	No	Yes
53	28	11	No	Yes
40	26	10	No	Yes
57	32	12	No	Yes
48	30	12	No	Yes

To address these concerns, we devised a delay that was composed of a total nipple- and skin-sparing mastectomy through Wise incisions. This allowed us to immediately address the cancer without waiting for the second stage. This also allowed us the luxury of a final pathology report to ensure that the nipple and skin flaps are cancer-free. In addition, placement of the incisions along the medial and lateral Wise vertical limbs with extensions to the inframammary fold resulted in excellent delay of the Wise pattern flaps and better healing in the second stage.

This aggressive delay resulted in no instances of nipple necrosis. The 10 patients had sternal notch-to-nipple distances ranging from 26 to 33 cm and nipple to inframammary fold distances of 9 to 14 cm (Table 1). There were no compromised mastectomy flaps, nor instances of implant loss. There have been no instances of delayed wound healing at the T-junction or incision lines that delayed reconstruction. We have had epidermolysis of the skin on the NAC in 2 of 18 nipples, all of which made a full recovery without aesthetic compromise or depigmentation. This is now our preferred method for performing nipple-sparing mastectomy and reconstruction in patients with significant ptosis.

Some have proposed addressing the surgical resection, nipple repositioning, and skin excess in one surgery—making surgical delay unnecessary. We have found that in patients with nipple-to-IMF distances of  $\geq 12$  cm, immediate nipple repositioning results in a rate of nipple necrosis

of 40% (4 of 10 nipples; unpublished results). In addition, in nearly 25% of these patients who undergo Wise pattern skin-reducing mastectomy, nearly 20% of the patients suffer from some type of wound compromise or mastectomy flap necrosis, delaying the reconstructive process and additional adjunctive cancer therapies. This rate of complication is consistent with that of others who have found that immediate reconstruction after Wise pattern mastectomy is associated with a high incidence of flap and nipple necrosis with subsequent reconstructive failure.<sup>6</sup>

## CONCLUSIONS

We present here a simple mastectomy through Wise incisions as an improved surgical delay that facilitates a more reliable second-stage pedicled nipple-sparing mastectomy and reconstruction. This delay allows us to immediately address the cancer, delays the Wise pattern flaps to ensure better wound healing over the prosthetic, and most aggressively delays the nipple.

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