

Wise-pattern Split-reduction Incision to Facilitate Mastectomy and Direct-to-Implant Reconstruction for Superficial Breast Cancers

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Summary: The split reduction allows for oncoplastic breast conserving surgery using a modified Wise-pattern closure in ptotic patients with cancers in close proximity to a skin margin. Although cancers involving skin within the Wise pattern are conveniently resected during closure, cancers in close proximity to skin outside the Wise pattern require a modified closure. This modified Wise-pattern closure preserves skin near the inferior pole of the breast which is normally resected and shifts this resection superiorly over the cancer. This also shifts the final medial or lateral inframammary scar onto the visible breast mound. Although this split-reduction Wise pattern has been well described for resecting advanced cancers in patients who undergo oncoplastic breast conserving surgery, this approach has not been described in patients who require mastectomy. Here, we report on 10 consecutive patients with ptosis and advanced breast cancers that require skin resection outside the standard Wise pattern, where we used the split-reduction incision to facilitate mastectomy and direct-to-implant reconstruction. (*Plast Reconstr Surg Glob Open* 2023; 11:e5324; doi: [10.1097/GOX.0000000000005324](https://doi.org/10.1097/GOX.0000000000005324); Published online 9 October 2023.)

INTRODUCTION

Wise-pattern skin-reducing mastectomy has been well described to facilitate immediate reconstruction in patients with ptosis.^{1,2} Recently, Silverstein described a series of patients who underwent Wise-pattern partial mastectomy for multifocal and multicentric breast cancers that would have been classically recommended to undergo mastectomy (“extreme oncoplasty”).³ To facilitate a clear anterior margin in these advanced breast cancers that encroached upon the skin outside the Wise pattern, he further described a “split reduction” pattern.^{4,5} The “split” refers to the vertical limb which is split into two segments, above and below the skin resection pattern (Figs. 1 and 2). (See Video 1 [online], which displays the markings we use in preparation for a split Wise-pattern mastectomy and direct-to-implant reconstruction.) This approach has been well described by others to facilitate oncoplastic breast conserving surgery.^{6–9} Here, we extend this approach to patients with ptosis and advanced cancers with skin involvement outside the Wise pattern undergoing mastectomy.

PATIENTS AND METHODS

Procedures and methods were in compliance with the 1964 Declaration of Helsinki and later amendments. Ten patients between January 2017 and July 2020 with cancers encroaching upon skin located outside the standard Wise pattern underwent mastectomy and reconstruction by the author and were offered this approach. Patients were marked in the standing position with the split-reduction pattern (Fig. 1). The unaffected vertical limb is drawn in conventional fashion. The split vertical limb is drawn starting from the superior areola point down along its normal course until the area of skin excision is encountered (Fig. 2). (See figure, Supplemental Digital Content 1, which displays a 43-year-old woman with left breast cancer seen in oblique position with markings for a Wise-pattern, nipple-sparing direct-to-implant reconstruction. The tumor, in the upper-outer quadrant, is in very close proximity to the skin and has an X mark over it. The upper-outer quadrant is the most common location for breast cancer and, as such, this is the most common incision for this type of surgery. Again, the skin resection is shifted superiorly from the lower-outer quadrant of the breast onto the breast, over the cancer, to facilitate a clear skin margin. We ensure

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Fig. 1. 52-year-old woman with a locally advanced right breast cancer invading the skin and nipple at 3 o'clock. Her left breast is marked with a standard Wise pattern in preparation for a nipple-sparing mastectomy with simultaneous mastopexy and DTIR. On the right, we use a split Wise-pattern reduction incision to both facilitate a clear anterior margin and correct her ptosis. Her right nipple will be immediately reconstructed with its pedicle located along the uninvolved lateral vertical limb. The shaded blackened area denotes the skin that will be resected. This skin resection zone has been shifted from its normal location in the inferomedial breast superiorly, over the cancer. The lateral vertical limb and extension to the inframammary fold are drawn in conventional fashion.

that the same amount of skin is resected using a split Wise-pattern incision as would be using a conventional Wise pattern to allow for safe closure. (<http://links.lww.com/PRSGO/C805>.) The remainder of the vertical limb is then drawn starting from the meridian at the inframammary fold (IMF) coursing superiorly toward the base of the skin excision pattern (Fig. 2). (Supplemental Digital Content 1, <http://links.lww.com/PRSGO/C805>.) In this way, the affected vertical limb is split between inferior and superior segments with an intervening excised triangular skin segment (Fig. 2). (Supplemental Digital Content 1, <http://links.lww.com/PRSGO/C805>.) This shifts the scar from the lateral or medial IMF (depending on which vertical limb is split) to the anterior breast (Fig. 3). (See figure, Supplemental Digital Content 2, which displays a postoperative view. We see the patient in the same oblique position after a split Wise-pattern, nipple-sparing mastectomy and direct-to-implant reconstruction. The lateral inframammary fold incision is shifted superiorly onto the breast to facilitate a clear anterior margin. <http://links.lww.com/PRSGO/C806>.)

The mastectomy is performed removing the skin island over the cancer. Gross intraoperative margin assessment is always performed to insure that we have removed enough skin to clear the cancer. Although nipple preservation is possible,¹⁰ we only attempted this once given the advanced

Takeaways

Question: How can we perform a Wise-pattern mastectomy when breast cancers invade or are in close proximity to skin outside the Wise pattern?

Findings: By extending approaches described by others for breast conservation, we use a “split reduction” Wise-pattern incision to excise the overlying skin that is in close proximity to the cancer and provide patients a Wise-pattern mastectomy.

Meaning: The split-reduction incision allows for a Wise-pattern mastectomy in patients with cancers that encroach upon or invade skin outside the Wise pattern, correcting their ptosis and ensuring wide clearance of their cancer.

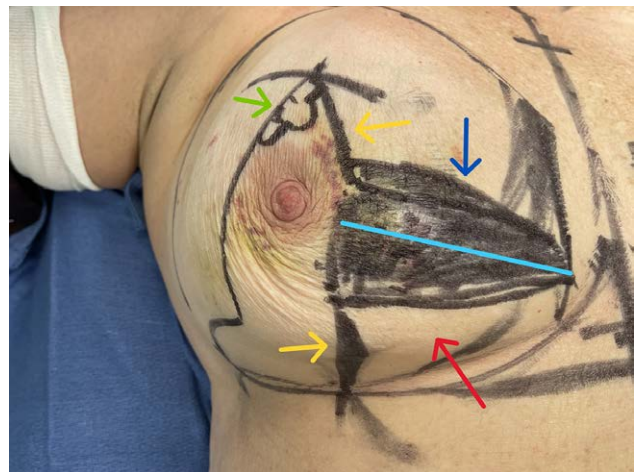


Fig. 2. This is the patient in Figure 1 in the supine position on the operating room table. The two yellow arrows depict the “split” vertical limb, above and below the skin resection zone. The dark blue arrow is pointing to the area of the skin that will be resected over the cancer. The green arrow demonstrates the area where the nipple is created. The red arrow points to the zone of skin that is normally resected or deepithelialized in a standard Wise pattern but here is saved and instead shifted superiorly over the cancer. The light blue line demonstrates the final medial scar, which is shifted over the cancer instead of lying in the inframammary fold.

nature of these cancers. Nipples were immediately reconstructed from skin within the Wise pattern, with their pedicle located along the unaffected vertical limb (Fig. 2). All patients underwent direct-to-implant reconstruction (DTIR) with Mentor (Sanata Barbara, Calif.) Memory Gel Xtra Smooth Moderate Plus Profile implants in the prepectoral plane with acellular dermal matrix [Cortiva 1 mm (RTI Surgical Inc, Alachua, Fla.), 16×20 cm]. Patients underwent either contralateral Wise-pattern mastectomy and reconstruction or Wise-pattern mastopexy/reduction. The incisions were then closed by bringing the two split segments of the vertical limb together, leaving a transverse scar on the anterior medial or anterior lateral breast (Figure 3 and Supplemental Digital Content, Figure 2). Two round Blake drains were placed. Patients were discharged and seen on postoperative day 6.



Fig. 3. This is the patient 8 weeks postoperative demonstrating the well-healed Wise-pattern incisions. The left breast has undergone a Wise-pattern nipple-sparing mastectomy with bipedicle adipodermal mastopexy and DTIR. The right side has undergone a split Wise-pattern mastectomy and immediate nipple reconstruction with DTIR. She has excellent symmetry despite the split Wise pattern on the right and conventional Wise pattern on the left. The medial inframammary scar on the right breast is shifted superiorly over the cancer to facilitate a clear anterior margin.

RESULTS

Patient age and body mass index ranged from 44 to 77 years (mean = 55.4, SD = 11.8) and 24.1 to 37.2 kg per m² (mean = 30.6, SD = 3.7), respectively. All patients underwent mastectomy and DTIR with at least 6 months follow-up. All margins were cleared without need for re-excision. Five patients required postmastectomy radiotherapy. There were no infections or reconstructive failures. One patient required return to the operating room for debridement and closure of her mastectomy flap without device removal. One patient returned to the operating room for a persistent seroma. In nine patients who underwent nipple reconstruction, all were successful. Additional intraoperative details, including oncological and reconstructive characteristics, are provided (Table 1).

DISCUSSION

Silverstein described the split-reduction pattern^{4,5} to allow for skin excision outside the Wise pattern for patients undergoing oncoplastic breast conserving surgery. This allowed surgeons to preserve skin near the inferior pole of the breast, which was normally excised or deepithelialized during a standard reduction, and instead excise skin over the cancer, allowing the cancer to dictate the scar pattern.

In mastectomy patients with ptosis and cancer encroaching upon skin outside the Wise pattern, we have used the split-reduction incision to facilitate a clear anterior margin and provide them a more ideal skin envelope for reconstruction. Another advantage to this approach is that cancers that do not invade the skin, but perhaps are close, often require an aggressive thinning out of the mastectomy flaps, which can lead to ischemic complications and reconstructive failure. The split-reduction pattern allows us to resect this skin, leaving behind better perfused mastectomy flaps that will more likely heal. Additional complexities arise when the tumor involves skin above the final superior areolar point, requiring further modification of the Wise pattern with a final scar in the superior pole of the breast.^{5,7}

This approach is most efficiently performed by a single surgeon trained in both surgical oncology and reconstructive surgery. Otherwise, close collaboration between the plastic surgeon and surgical oncologist is required during the preoperative marking and oncological resection, as sometimes the incision requires intraoperative modification. Special consideration should be paid to skin excisions in the upper-outer quadrant, as a separate axillary incision for the lymph node dissection may threaten the intervening skin. Here, we would recommend performing the lymph node dissection through the mastectomy incision with subsequent meticulous closure of the axillary space to prevent communication between the mastectomy cavity and the axilla. We also recommend routine use of intraoperative ultrasound to confirm that the area of skin excision planned is optimally placed over the tumor with intraoperative modification if required. After intraoperative confirmation by pathology of grossly clear margins, we de-epithelialize the remainder of the skin within the

Table 1. Demographics, Intraoperative Details, and Oncologic and Reconstructive Characteristics for Each Patient Who Underwent Wise-pattern Split-reduction Incision and DTIR

Age (y)	BMI (kg/m ²)	Tumor Location	Skin Island (cm)	Mastectomy Weight (g)	Tumor Size (cm)	Tumor Type	Lymph Node Dissection (# Positive)	Staging	Implant Volume (mL)	Reconstructed Nipple Projection (mm)	CTL Surgery
49	29.6	UIQ	5×8	546	3.7	ID	SLN (0)	T2N0	490	3	M
53	33.2	UOQ	6×12	635	4.0	ID	AD (6)	T2N2	545	1	R
42	25.7	UOQ	4×12	439	5.2	ID	AD (2)	T3N1	370	0	M
77	37.2	UOQ	5×13	765	3.5	ID	SLN (0)	T2N0	605	4	R
56	34.2	UOQ	6×12	545	6.4	IL	AD (3)	T3N1	465	2	M
49	24.1	UOQ	7×14	1150	7.0	IL	AD (5)	T3N2	645	1	R
44	32.6	UOQ	5×11	660	3.8	ID	SLN (0)	T2N0	525	NA	M
67	29.5	UIQ	3×7	640	4.5	ID	SLN (0)	T2N0	545	5	R
45	30.6	UOQ	6×12	545	5.2	ID	AD (7)	T3N2	490	2	M
72	29.0	UIQ	3×8	537	3.9	ID	AD (3)	T2N1	525	1	R

AD, axillary dissection; CTL, contralateral; ID, invasive ductal carcinoma; IL, invasive lobular carcinoma; M, mastectomy; N, node; NA, not applicable; R, reduction; SLN, sentinel lymph node; T, tumor; UIQ, upper-inner quadrant; UOQ, upper-outer quadrant.

modified Wise pattern to protect the incisions from dehiscence and implant exposure.

CONCLUSIONS

The split-reduction incision is useful in patients undergoing mastectomy and reconstruction who require skin excision outside the Wise pattern. This improves their aesthetic result, facilitates a clear anterior margin, and leaves behind better perfused mastectomy flaps, improving the odds of a successful reconstruction.

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DISCLOSURE

The author has no financial interest to declare in relation to the content of this article.

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