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ORIGINAL ARTICLE – BREAST ONCOLOGY

Oncoplastic Central Partial Mastectomy and Neoareolar Reduction Mammoplasty with Immediate Nipple Reconstruction: An Initial Report of a Novel Option for Breast Conservation in Patients with Subareolar Tumors

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ABSTRACT

Background. Breast-conserving therapy (BCT) has been associated with better quality of life and cosmetic outcomes than mastectomy. However, subareolar cancers abutting the nipple–areolar complex (NAC) present a unique cosmetic and oncologic challenge. Oncoplastic central partial mastectomy and neoareolar reduction mammoplasty with immediate nipple reconstruction is a novel technique that can permit BCT for these patients.

Methods. This study enrolled consecutive patients with central tumors during 2017–2018 who underwent central partial mastectomy reconstructed with neoareolar reduction mammoplasty and immediate nipple reconstruction. Patient demographics, imaging and pathology size, margin width, mastectomy and reexcision rates, and cosmesis were evaluated.

Results. The study identified 23 sequential patients. The average patient age was 60.5 ± 12.3 years, and the average body mass index was 29.4 ± 5.7 kg/m^2. The mean lesion size was 51.5 ± 43.0 mm on preoperative imaging, and the average disease span shown by the final pathology was 59.5 ± 45.3 mm. "No ink on tumor" was achieved for 22 patients (95.7%). In 13 patients (56.5%), the margins were inadequate for ductal carcinoma in situ (DCIS) (n = 12) or invasive cancer (n = 1). Good to excellent cosmetic results were achieved for 21 patients (95.5%). Complications occurred for six patients (26.1%), including three patients with ischemia of the reconstructed NAC.

Conclusion. The single-stage operation described in this report can allow patients with cancers abutting the NAC to consider BCT. This technique allows patients to avoid mastectomy and to minimize the number of operations required for reconstruction while maximizing cosmetic outcomes. In the study cohort, the presence of extensive DCIS resulted in a significant need for reexcision, which could be performed successfully without compromise to cosmetic outcome.

Multiple landmark prospective randomized trials have confirmed equivalent disease-free and overall survival rates for patients who undergo breast-conserving therapy (BCT) and mastectomy.[1–4] As a result, BCT, comprising partial mastectomy with axillary staging in combination with adjuvant radiation therapy and appropriate systemic therapy, has become a standard treatment option for patients with early-stage breast cancer. In addition to providing excellent local control with low rates of local recurrence, BCT also offers advantages including better patient-reported outcomes than mastectomy with reconstruction.[5–8]

Despite these documented advantages, some patients are not traditionally considered candidates for breast conservation. Early studies demonstrated higher rates of multiple ipsilateral lesions among patients with central breast cancers, generating concern that breast conservation would lead to unacceptably low rates of local control for these patients.[9–13] Consequently, patients with centrally located breast cancers involving the nipple–areolar complex (NAC) are notably absent from the large randomized trials that have established BCT as the preferred treatment option

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for early-stage breast cancer.[14] In addition to the paucity of data demonstrating acceptable long-term oncologic outcomes, perceptions of unacceptable cosmesis with resection of the NAC have limited the application of breast conservation for patients with central cancers that abut or involve the NAC.[15–18]

Oncoplastic surgery is a burgeoning field that combines wide local excision with plastic surgery incisions and tissue transfer techniques and has helped to improve oncologic and aesthetic outcomes in BCT.[19–25] The American Society of Breast Surgeons recently issued a consensus definition for oncoplastic surgery, describing it as "breast conservation surgery incorporating an oncologic partial mastectomy with ipsilateral defect repair using volume displacement or volume replacement techniques with contralateral symmetry surgery as appropriate".[26] Among the advantages of this approach is its association with lower rates of inadequate margins and a reduced rate of perioperative complications, and therefore, timely initiation of adjuvant therapies.[19–25,27] Oncoplastic reduction mammoplasty has the added advantages of decreasing symptoms of macromastia, improved patient-reported outcomes, and cost-effectiveness versus mastectomy with reconstruction.[28–30] Additionally, oncoplastic surgical techniques have allowed BCT for some patients traditionally recommended to undergo mastectomy, such as patients with multiple ipsilateral lesions and patients with a disease span larger than 5 cm, with promising early results.[31,32]

Given our experience with oncoplastic techniques and increased patient desire for BCT, we endeavored to offer breast conservation to patients with central cancers abutting or involving the NAC. Drawing on our success in achieving adequate margins and favorable cosmesis with neoareolar reduction mammoplasty,[33] we hypothesized that we could maximize both the oncologic and aesthetic outcomes by performing an oncoplastic central partial mastectomy with neoareolar reduction mammoplasty and immediate nipple reconstruction using a C–U flap.[34] The current study aimed to demonstrate our initial short-term oncologic and cosmetic outcomes for patients with central cancers abutting or involving the NAC who underwent BCT using this approach.

METHODS

This observational cohort study included consecutive patients with central invasive or in situ breast cancer abutting or involving the NAC who underwent oncoplastic central partial mastectomy with neoareolar reduction mammoplasty and immediate nipple reconstruction at Virginia Mason Medical Center between January 2017 and June 2018. This study was approved by our Institutional Review Board. Patients were identified from the prospectively collected Multidisciplinary Breast Cancer Database. All clinicopathologic and recurrence data were entered prospectively and analyzed retrospectively. Additional data were obtained from review of the medical record.

All the patients underwent the standard preoperative imaging workup, which included mammogram, ultrasound, and breast magnetic resonance imaging (MRI) for surgical planning. Radiologists placed radiopaque localization clips into the breast lesions and any suspicious lymph nodes at the time of core needle biopsy. Appropriateness for breast conservation was determined by breast surgical oncologists based on imaging studies, clinical exam, and patient desire for breast conservation. Patients were not excluded based on smoking history or presence of comorbidities but were counseled regarding increased perioperative risks and encouraged to attempt smoking cessation.

The patients were offered symmetry procedures, including mastopexy or reduction mammoplasty, on the contralateral side. Each patient was reviewed by the multidisciplinary breast cancer team to determine adjuvant treatment recommendations and need for additional testing, including Oncotype DX. Adjuvant whole-breast radiation therapy was recommended to each patient as an integral component of BCT, except for patients who previously had received whole-breast or chest wall radiation. Patients who met the institutional criteria for intraoperative radiation therapy (IORT) were offered IORT as a single 20-Gy dose to the partial mastectomy site at the time of surgery with additional whole-breast radiation therapy in the setting of inadequate margins, high-risk features, or both shown by the final surgical pathology.

Breast surgical oncologists performed the oncoplastic partial mastectomy and symmetry procedures for all the patients. Palpation, intraoperative ultrasound, and/or wire-localization techniques were used to identify the cancer intraoperatively. Partial mastectomy, including resection of the native NAC, was performed. Reconstruction of the partial mastectomy defect was accomplished using a neoareolar reduction mammoplasty with standard Wise-pattern incisions, which we have described previously.[33] A neoareola and nipple were reconstructed using a C–U nipple flap on an inferior pedicle. The inferior pedicle then was deepithelialized except for the neoareola. The position of the neoareola was selected based on tumor location and ability to rotate the inferior pedicle into the desired position in the partial mastectomy defect to achieve symmetry with the contralateral side (Fig. 1). Contralateral mastopexies or reduction mammoplasties were performed on the contralateral side in patients who elected to undergo symmetry procedures (Fig. 2).

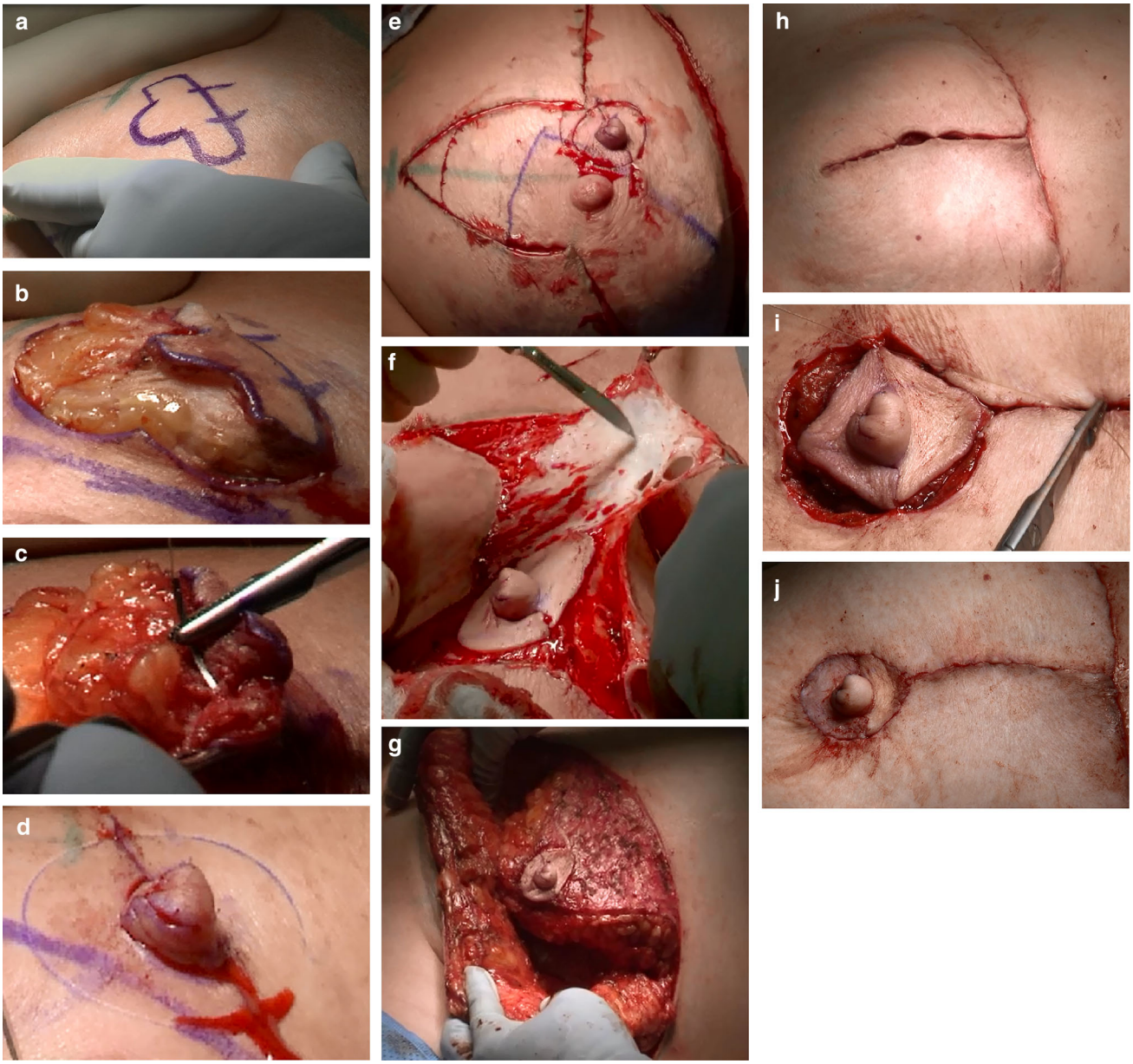

FIG. 1 Stepwise approach to nipple reconstruction. (**a**) A C-U nipple flap pattern is marked and (**b**) skin flap elevated with electrocautery. (**c**) The new nipple is then reapproximated and (**d**) neoareola is marked with nipple sizer. (**e**) The wise-pattern incisions are made. (**f**) The inferior pedicle is deepithelialized with exception of the reconstructed NAC. (**g**) The partial mastectomy is performed with resection of the native NAC. (**h**) The mobilized skin flaps are then approximated and closed over the inferior pedicle. (**i**) Nipple position is marked and the reconstructed NAC elevated. (**j**) Skin closures to complete the procedure

The operating surgeon inked all surgical specimens, which were sent to pathology for intraoperative evaluation. Intraoperative specimen radiograph and gross evaluation by pathologists guided further tissue resection. The tumor bed was circumferentially marked with surgical clips to allow for accurate identification of the resection cavity on follow-up imaging and to help radiation oncologists appropriately target adjuvant radiation therapy.

Adequate margins were defined as "no ink on tumor" for invasive cancers and as 2 mm or wider for DCIS per the Society of Surgical Oncology–American Society of Radiation Oncology–American Society of Clinical Oncology consensus guideline on margins.[35] Patients with inadequate margins were counseled to undergo additional surgery except when the inadequate margin was resected skin anteriorly or resected pectoralis major fascia posteriorly.

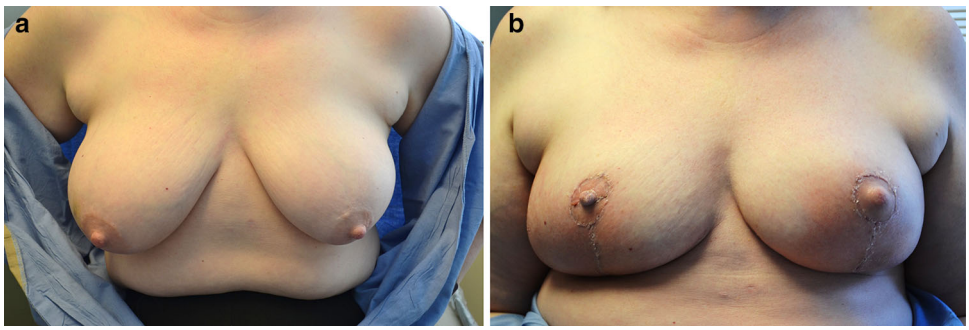

FIG. 2 Photos of a 56-year-old woman with extensive right breast ductal carcinoma in situ (DCIS) abutting the nipple–areolar complex who underwent right oncoplastic central partial mastectomy with neoareolar reduction and immediate nipple reconstruction and contralateral mammoplasty reduction for symmetry. **a** Preoperative photo. **b** Photo 2 weeks after surgery

Additional surgery was recommended for patients with DCIS less than 2 mm from margins in the setting of invasive cancer on a case-by-case basis by the multidisciplinary tumor board. When additional surgery was recommended, both reexcision and mastectomy were offered. Patients were offered operative dates within 2 weeks after the index operation, and patients were counseled regarding risks for potential delay of initiation of adjuvant therapy. Intraoperative identification of the surgical clips and the meticulously mapped pathology report from the index operation helped to direct reexcision.

Patients were admitted for overnight observation postoperatively and had clinical follow-up visits 1–2 weeks after surgery, every 6 months for 2 years, and then annually. As previously described, the operating surgeon assigned cosmesis scores at the 6-month follow-up visit and at subsequent visits using the Harvard Breast Cosmesis Scale.[32,36] An annual clinical exam, including a comprehensive breast exam and appropriate imaging surveillance, was performed to monitor for locoregional recurrence.

Pearson's chi-square tests were used for comparison of categorical variables, and unpaired *t* tests were used for comparison of continuous variables. All *p* values lower than or equal to 0.05 were considered statistically significant.

RESULTS

In this study, 23 patients underwent oncoplastic central partial mastectomy with neoareolar reduction and immediate nipple reconstruction. Of these 23 patients, 22 (95.7%) elected to undergo a contralateral procedure for symmetry. One patient (4.8%) had a BRCA-1 mutation and bilateral breast cancer. The average patient age was 60.5 ± 12.3 years, and the average body mass index (BMI) was 29.4 ± 5.7 kg/m^2. Six patients (26.1%) had recent smoking histories, and 2 patients (8.7%) were diabetic. Detail tumor characteristics are listed in Table 1.

The traditional criteria for mastectomy was met by 19 patients (82.6%), who had either multifocal lesions or a unifocal lesion with a disease span larger than 5 cm. The average disease span was 51.5 ± 43.0 mm on preoperative imaging and 59.5 ± 45.3 mm shown by the final pathology. Nine patients (39.1%) had multiple ipsilateral lesions, with an average of 5.4 lesions per breast. At presentation, 12 patients (52.2%) showed nipple retraction or indentation of the areola on the clinical exam. The average imaging distance from the nipple was 3.3 ± 4.8 mm, and preoperative imaging showed 15 cancers directly involving the nipple.

All 23 patients were admitted for overnight observation (< 24-h stay) and discharged to home on postoperative day 1. The average specimen weight was 220.4 ± 216.2 g. "No ink on tumor" was achieved for 22 patients (95.7%). The margins were inadequate in 13 patients (56.5%), 12 patient had DCIS close to margins and 1 had invasive cancer at a margin. The 13 patients with inadequate margins included 9 patients (69.2%) with multiple inadequate margins and 4 patients (30.8%) with a single inadequate margin. Of these 13 patients, 12 (92.3%) elected to undergo reexcision, and 1 (7.7%) chose mastectomy. The patient who underwent mastectomy had multiple inadequate margins and was not a candidate for adjuvant whole-breast radiation therapy given her history of chest radiation. The final pathology of her mastectomy specimen demonstrated no residual disease.

Nine patients (69.2%) with inadequate margins had invasive carcinoma with "no ink on tumor" but had close DCIS margins. All nine patients were counseled to undergo additional surgery given their young age, multiple close margins, or both. Of the 13 patients who underwent additional surgery for inadequate margins, 6 (46.2%) were found to have residual invasive or in situ disease at reexcision. All four patients with a single inadequate margin had benign pathology at reexcision. Six (66.7%) of the nine patients with multiple inadequate margins had residual in situ or invasive carcinoma at reexcision ($p = 0.07$).

TABLE 1 Patient, tumor, and surgery characteristics

	Patients $n = 23$	%
Patient characteristics		
Age (years)	60.5 ± 12.3	
BMI (kg/m^2)	29.9 ± 6.0	
Smoking history	6	26.1
Diabetes	2	8.7
Tumor characteristics		
Side		
Left	13	56.5
Right	10	43.5
Imaging size (mm)	51.5 ± 43.0	
Pathology size (mm)	59.5 ± 45.2	
T stage		
Tis	4	17.4
T1	13	56.5
T2	3	13.0
T3	3	13.0
N stage		
N0	10	43.5
N1	6	26.1
N2	2	8.7
N3	1	4.3
Nipple retraction	12	52.2
Distance from nipple on imaging (mm)	3.3 ± 4.8	
Direct involvement of nipple on imaging	15	65.2
Histology		
Invasive ductal carcinoma	15	65.2
Invasive lobular carcinoma	2	8.7
DCIS	4	17.4
DCIS with microinvasion	1	4.3
Invasive mucinous carcinoma	1	4.3
Grade		
Grade 1 (low)	1	4.3
Grade 2 (intermediate)	12	52.2
Grade 3 (high)	10	43.5
Receptor status		
ER-positive	17	73.9
PR-positive	10	43.5
HER2-positive	4	17.4
Triple-negative	2	8.7
Multifocal	9	39.1
Presence of lymphovascular invasion	8	34.8
Presence of extensive intraductal component	14	60.9
Surgery characteristics		
Specimen weight (g)	220.4 ± 216.2	
No ink on tumor	22	95.7
Margins for DCIS < 2 mm	11	47.8
Reexcision	12	52.2
Mastectomy	1	4.3
Axillary surgery		
None	3	13.0
SLNB	14	60.9
ALND	6	26.0
Contralateral symmetry procedure	22	95.7
Good to excellent cosmesis	21	95.5
Adjuvant therapies		
Chemotherapy	13	56.5
Adjuvant	12	52.2
Neoadjuvant	1	4.3
Radiation therapy	21	91.3
Endocrine therapy	14	60.9
Time to adjuvant therapy (days)		
Overall	48.2 ± 18.9	
Patients with reexcision	51.1 ± 19.5	
Patients with complications	62.2 ± 27.4	
Patients w/o complications	43.4 ± 13.8	
Patients w/o reexcisions or complications	41.4 ± 20.2	

BMI body mass index, *DCIS* ductal carcinoma in situ, *ER* estrogen receptor, *PR* progesterone receptor, *HER2* human epidermal growth factor receptor 2, *SLNB* sentinel lymph node biopsy, *ALND* axillary lymph node dissection

TABLE 2 Complications

Complication type	$n = 23$ *n* (%)
Seroma	1 (4.3)
Reconstructed NAC ischemia	3 (13.0)
Dehiscence	2 (8.7)
Total	6 (26.1)

NAC nipple–areolar complex

Of the 12 patients who underwent reexcision, 10 achieved adequate margins with a single reexcision. The average tumor size was more than double in the patients with inadequate margins compared with those who achieved adequate margins in a single operation (77.6 ± 41.6 vs. 36.1 ± 40.3 mm; $p < 0.01$), whereas the specimen size was similar (222.0 ± 305.2 g vs. 219.2 ± 190.6 g; $p = 0.84$). Multifocality and the presence of an extensive intraductal component were not associated with an increased rate of inadequate margins.

Good to excellent cosmetic results were achieved for 21 (95.5%) of the 22 patients who achieved breast conservation. Complications occurred for six patients (26.1%), all on the cancer side (Table 2). No complications on the contralateral side were reported. No patients required readmission for management of complications. Half of the

complications occurred for smokers. Three patients (13%) had ischemia of the reconstructed NAC, and all three of these patients were smokers. Two patients (8.7%) with complications underwent operative debridement in conjunction with reexcision of inadequate margins. One of these debridements involved a reconstructed NAC, and the other involved a dehisced reduction mammoplasty incision at the triple point. No other complications required interventions. Five (83.3%) of the six patients with complications achieved good to excellent cosmetic outcomes. Of the 12 patients who underwent reexcision, 11 (90.9%) had good to excellent cosmetic outcomes.

The average time to initiation of adjuvant therapies was 48.2 ± 18.9 days for the overall cohort. For the patients who did not require additional surgery or experience any complication, the time to initiation of adjuvant therapy was 40.1 ± 10.4 days compared with 51.1 ± 19.5 days ($p = 0.50$) for the patients who required additional surgery for inadequate margins.

The patients with complications started adjuvant therapy within 62.2 ± 27.4 days, whereas those without complications required 43.4 ± 13.8 days ($p = 0.06$). One patient who had NAC ischemia failed to start adjuvant radiation therapy within 8 weeks, but this was due to patient preference and not failed wound healing. The remaining 22 patients (95.7%) started adjuvant radiation therapy within 8 weeks or adjuvant chemotherapy within 12 weeks after their index operation.

One patient (4.3%) declined adjuvant radiation therapy. However, 21 (95.4%) of the 22 patients who achieved breast conservation completed adjuvant radiation therapy. Of 11 patients (47.8%) who underwent chemotherapy, 10 (43.5%) received it in the adjuvant setting, and 1 (4.3%) received it in the neoadjuvant setting. Adjuvant chemotherapy was recommended for two patients based on a high (≥ 26) Oncotype DX recurrence score.[37] The remaining indications for adjuvant chemotherapy were locally advanced disease (2 patients), extranodal extension (2 patients), triple-negative breast cancer (2 patients), and human epidermal growth factor receptor 2 (HER2) positivity (2 patients). Of the 13 patients with inadequate margins, 6 (46.1%) underwent adjuvant chemotherapy. Additionally, 14 (87.5%) of the 16 patients counseled to take endocrine therapy adhered to that recommendation. One patient declined because of concern for fertility, and one patient declined because of concern regarding anticipated medication side effects.

Three patients (13%) had pure DCIS and did not undergo axillary staging. Of the 23 patients, 14 (60.9%) underwent sentinel lymph node biopsy, and 6 (26%) underwent axillary lymph node dissection (ALND). All six patients who underwent ALND had a biopsy-proven positive lymph node before surgery. Four patients who underwent ALND received adjuvant chemotherapy. Of these four patients, three were hormone receptor-positive and HER2-negative, and one was triple-negative. One of the patients who underwent ALND had undergone neoadjuvant chemotherapy, and one had a low OncotypeDx score[8] and did not require chemotherapy.

The mean and median follow-up times were 12 months (range, 6–22 months). During the short follow-up period, one patient (4.3%) experienced a distant metastasis, and no patients had locoregional recurrence.

DISCUSSION

Recently, some studies have focused on reevaluating contraindications to breast conservation. These studies range from single-institution studies evaluating BCT in large, multifocal cancers to the large ACOSOG Z11102 trial, which provides prospective data regarding the feasibility and oncologic safety of BCT for patients with multiple ipsilateral tumors.[32,33,38] The vast majority of the patients in our study cohort would traditionally be recommended to undergo mastectomy based on the large tumor size, the presence of multiple ipsilateral lesions, and the subareolar location. Oncoplastic central resection and neoareolar reduction mammoplasty with immediate nipple reconstruction allowed for successful breast conservation in 95.7% of the patients, with high-quality cosmetic results.

Although 95.7% of the patients had "no ink on tumor" shown by the final pathology, the rate of inadequate margins was high, with 56.5% of the patients having inadequate margins at the index operation. This rate of inadequate margins is consistent with that of other recent studies evaluating BCT for patients with multiple ipsilateral cancers and those with large disease spans. This speaks to the technical difficulty associated with achieving clear margins in patients with these complex cancers.[32,38] Additionally, larger tumor sizes were associated with an increased rate of inadequate margins, which also is consistent with recent studies.[39] As this technique evolves, with patient selection optimized and methods of intraoperative margin evaluation improved, we expect this inadequate margin rate to decrease significantly.

Some studies have shown breast MRI to be associated with a decreased rate of positive margins.[39,40] Despite the use of multiple imaging methods, including mammography, ultrasound, and MRI, close DCIS margins were responsible for the recommendation that additional surgery be performed for 84.5% of the patients in our series requiring reexcision.

The full extent of DCIS is notoriously difficult to appreciate on preoperative imaging, even with MRI, and our finding of higher rates for inadequate DCIS margins is

consistent with both our own recent studies and studies evaluating factors associated with inadequate margins in BCT.[32,41–43] In our study, the patients who had inadequate margins were offered reexcision as well as mastectomy and counseled about risks of inability to obtain clear margins despite reexcision, wound complications, and potential delays to initiation of adjuvant therapies. Despite these risks, our patients were highly motivated for breast conservation, and 12 of the 13 patients with inadequate margins elected to undergo reexcision rather than mastectomy.

Additional disease was found in the reexcision specimens from 46.2% of the patients who underwent additional surgery for inadequate margins. No patients with a single inadequate margin had residual disease present at reexcision, consistent with Fitzgerald et al.,[44] who found that the only significant predictor of residual tumor was the presence of multiple close or positive margins. Of the 12 patients who underwent reexcision, 11 (91.7%) achieved adequate margins in a single reexcision.

Of the 13 patients with inadequate margins, 7 (53.8%) were treated with chemotherapy, including 1 in the neoadjuvant setting. This raises the question whether more aggressive application of NAC may have reduced our inadequate margin rate. Of the six patients who underwent adjuvant chemotherapy, one was hormone receptor-negative and HER2-positive, one was triple-negative, one was hormone receptor-positive and HER2-positive, and three were hormone receptor-positive and HER2-negative. The ability to downstage tumors in the breast with neoadjuvant chemotherapy differs by subtype, with HER2-positive and triple-negative tumors achieving favorable pathologic complete response (pCR) rates compared with hormone receptor-positive tumors.[45] Two of our patients fell within the more favorable pCR group. However, Boughey et al.[46] found that the use of neoadjuvant chemotherapy did not reduce the reexcision rate despite the ability to downstage tumors.

Similarly, it is worth considering whether more liberal use of neoadjuvant chemotherapy would have changed axillary management, potentially obviating the need for ALND in these six patients. Two of these six patients required ALND given the preoperative finding of a positive lymph node. Both were hormone receptor-positive and HER2-negative, and this subgroup has repeatedly been shown to have the lowest rates of nodal pCR after NAC.[47–50] Given this constellation of findings, more aggressive application of neoadjuvant chemotherapy likely would not have provided significant benefit to our study cohort.

Patient adherence to adjuvant therapy recommendations was high, consistent with previous studies at our institution.[32,33] All but one patient who achieved breast conservation completed radiation therapy, and all but two patients who counseled to take endocrine therapy adhered to that recommendation. All the patients counseled to undergo chemotherapy completed the advised course of chemotherapy.

The follow-up period was short, with a mean and median of 12 months. In that period, there was one distant recurrence (4.3%) and no locoregional recurrence. The distant recurrence was a brain metastasis in a patient who presented with hormone receptor-negative, HER2-positive oligometastatic disease with a positive mediastinal node and had been treated with neoadjuvant chemotherapy.

Few studies have specifically evaluated rates of local recurrence in subareolar breast cancers. A small study of BCT for subareolar cancer demonstrated a local recurrence rate of 6%.[51,52] Similarly, Fowble et al.[53] demonstrated that subareolar cancers treated with BCT were no more likely to have local recurrence than tumors located elsewhere in the breast.

Pezzi et al.[51] demonstrated that patients who undergo resection of the NAC are more concerned with preserving the breast mound and contour than about preserving the native NAC, and that in retrospect, all respondents indicated that they would choose this approach again.

In our cohort, the cosmetic outcomes were favorable for the vast majority of the patients, with 95.5% of the patients who achieved breast conservation achieving good to excellent cosmetic outcomes. The patient who achieved a poor outcome was an active smoker and required debridement of an ischemic reconstructed NAC as well as a reexcision of inadequate margins. This study could have been strengthened by the inclusion of patient-reported outcomes, which, unfortunately, were not collected during the study period.

The rate of surgical site complications was high (26.1%), higher than we have reported previously.[30,32,33] All the complications occurred on the ipsilateral side, and half of the complications occurred in smokers. Three patients (13%) had ischemia of the reconstructed NAC, with one patient requiring operative debridement. One other patient required operative debridement of a dehisced mammoplasty reduction incision involving the triple point. The remainder of the complications did not require any interventions, and no patients required readmission for management of complications. Despite complications, 83.3% of the patients who had complications attained good

to excellent cosmetic outcomes. Similarly, good to excellent cosmetic outcomes were seen in 90.9% of the patients who required reexcision.

Studies have shown that delaying initiation of adjuvant radiation therapy beyond 8 weeks after the index operation is associated with higher rates of local recurrence.[54,55] Similarly, failing to initiate adjuvant chemotherapy within 3 months after the definitive operation has been associated with detrimental effects on survival.[56] The initiation of adjuvant therapies was timely for 95.7% of the patients, with all but one patient starting radiation therapy within 8 weeks or adjuvant chemotherapy within 3 months after their index operation. All the patients had healed adequately and were offered timely initiation of adjuvant therapy. The patient who failed to start adjuvant radiation within 8 weeks elected to delay radiation therapy because of her own scheduling preferences.

Silverstein et al.[31] contend that completion of BCT in a single operation is associated with improved quality of life as well as lower levels of pain and health care costs compared multiple operations. Although the majority of our patients required a second operation to achieve negative margins, 43.5% achieved adequate margins in a single operation. The remaining patients achieved adequate margins after a single reexcision, which compares favorably with mastectomy including reconstruction. Additional studies comparing time to initiation of adjuvant therapy, complication rates, readmission rates, hospital length of stay, and health care costs are warranted.

Because this was a single-institution series, it had several limitations. Only two breast surgical oncologists were included in the study, only one of which performed the NAC reconstruction. Furthermore, although the Harvard Breast Cosmesis is a validated scale in breast cosmesis, inclusion of patient-reported outcomes, including cosmesis, would have strengthened the study.[36] Finally, we routinely use breast MRI for operative planning at out institution. Access to this imaging method may be limited in other centers. These elements may reduce the generalizability of our study.

CONCLUSION

This study suggests that oncoplastic central partial mastectomy and neoareolar reduction with immediate nipple reconstruction can offer some patients traditionally denied BCT the option to consider breast conservation. Early oncologic and cosmetic results are encouraging. However, long-term outcomes associated with this approach remain to be seen.

DISCLOSURE We have no disclosures.

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