Introducing oncoplastic breast surgery in a community hospital

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Summary

Oncoplastic breast surgery (OPBS) has been shown to increase breast-conserving surgery with improved oncologic and cosmetic outcomes, but access to OPBS in Canada varies greatly. This article summarizes the impact of introducing OPBS in a community hospital. All breast oncology surgery cases performed before and after the introduction of OPBS by a single surgeon were reviewed. After implementing OPBS in our centre, breast conservation increased from 30% to 50%, and the positive margin rate decreased from 25% to 10%. The completion mastectomy rate was lower in patients who received OPBS, and this group had a slightly higher readmission rate for postoperative hematoma. This review suggests OPBS can be performed safely in the community setting with appropriate training and improve outcomes in breast surgery for patients in smaller centres.

Breast-conserving surgery (BCS) has emerged as the gold standard for most women with early-stage breast cancer; however, eligibility for BCS can be limited by several factors. Oncoplastic breast surgery (OPBS) is a group of techniques that use plastic surgery principals to expand the feasibility of BCS for more women without compromising the oncologic and cosmetic outcomes.

Interest in OPBS is growing; however, large discrepancies in its use and access exist.[1] Until recently OPBS was performed primarily at tertiary and academic centres but, with increasing acknowledgement and training opportunities,[2] more surgeons are providing OPBS in regional and rural centres. The purpose of this article is to present the practicalities of learning and performing OPBS in a community hospital.

Case review

The cases of all patients who received OPBS performed by a single surgeon (H.H.) at Vernon Jubilee Hospital, a 186-bed hospital in Vernon, British Columbia, between October 2018 and October 2019 were retrospectively reviewed. We compared this cohort (post-OPBS period) with patients who received BCS performed by the same surgeon between March 2015 and January 2016 (pre-OPBS period), whose outcomes have been described previously.[3] All patients were adult (> 18 yr) women with a diagnosis of invasive or in situ breast cancer. There were no exclusions. Procedures included BCS (partial mastectomy/lumpectomy with sentinel lymph node biopsy) or BCS with level 1 or 2 oncoplastic techniques the surgeon performed after completing an accredited introductory OPBS skills course. Demographic, diagnostic, perioperative, pathologic, and 6-month follow up data were analyzed. Primary outcomes included positive margin, reoperation, and completion mastectomy rates. Secondary outcomes included operative time, specimen mass, postoperative complications, and readmission rate. Statistical analysis was performed using a Student *t* test for

continuous variables and χ^2 test or Mann–Whitney *U* tests for categorical variables where appropriate. Calculations were performed using Excel (Microsoft) and R software version 3.6.1. A *p* value less than 0.05 was considered statistically significant.

Cohort comparison

Our comparison includes a total of 32 breast oncology cases: 12 patients in the pre-OPBS period and 20 in the post-OPBS period. Demographic characteristics, diagnoses and staging comparisons are summarized in Table 1. The mean Charlson Comorbidity Index score for the pre-OPBS group was significantly lower.

Operative data, including frequency of oncoplastic techniques, are shown in Table 2. Operative duration was significantly longer in the group receiving OPBS. The mean tumour size was similar in the 2 cohorts. Specimen weight was significantly higher in the post-OPBS cohort. Three patients in the pre-OPBS group (25%) and 2 patients in the post-OPBS group (10%) had positive margins. Those in the pre-OPBS group were treated with completion mastectomy. One additional patient in that group with a negative but close margin for multifocal ductal carcinoma in situ underwent completion mastectomy. Both post-OPBS patients with positive margins were treated with revision partial mastectomy and repeat OPBS. The completion mastectomy rate was higher in the pre-OPBS group (33.3% v. 0%, $p = 0.014$). Fifteen and 20 total mastectomies were performed during the pre- and post-OPBS periods, respectively. These patients were either deemed not to be candidates for BCS or preferred to have a mastectomy. Overall, the breast conservation rate post-OPBS increased from 30% to 50% (8 of 27 v. 20 of 40, $p = 0.048$). One patient in each cohort had unsuccessful sentinel lymph node localization and required subsequent axillary lymph node dissections. One patient in the pre-OPBS group developed a recurrence with metastatic disease and died 6 months after surgery. No other recurrences were observed in the follow-up period in either group.

Postoperative complications are shown in Table 3. No patient in the pre-OPBS group required readmission, whereas 2 patients in the post-OPBS group required readmission for hematoma evacuation.

Discussion

It is well established that OPBS, when indicated, results in improved outcomes in tertiary care settings[4]. Less established is whether these results can be replicated in community care settings. A recent 5-year case series by Knowles and colleagues[5] including 275 patients undergoing OPBS at a single advanced-level community hospital and regional cancer centre reported very favourable

Table 1. Demographic and histologic characteristics

Cohort	Pre-OPBS (*n* = 12)	Post-OPBS (*n* = 20)	*p* value
Age, mean (range), yr	65.2 (57–78)	66.7 (37–84)	0.70
CCI, mean (range)	1.08 (0–2)	1.90 (0–3)	0.024
Histology, no. (%)			0.52
Invasive ductal carcinoma	6 (50.0)	14 (70.0)	
Mixed ductal and lobular carcinoma	1 (8.3)	1 (5.0)	
DCIS	5 (41.7)	5 (25.0)	
Receptor status, no. (%)			0.53
ER/PR positive	10 (83.3)	15 (75.0)	
HER-2 positive	0 (0)	4 (20.0)	
Triple negative	1 (8.3)	1 (5.0)	
Unknown	1 (8.3)	3 (15.0)	
Nodal status, no. (%)			>0.99
Negative	11 (91.6)	18 (90.0)	
Positive	1 (8.3)	2 (10.0)	
Pathologic stage, no. (%)			0.70
pTis	4 (33.3)	5 (25.0)	
pT1	5 (41.7)	12 (60.0)	
pT2	3 (25.0)	3 (15.0)	
Overall stage, no. (%)			0.91
0	4 (33.3)	5 (25.0)	
IA	5 (41.7)	9 (45.0)	
IB	0 (0)	1 (5.0)	
IIA	2 (16.7)	4 (20.0)	
IIB	1 (8.3)	0 (0)	
IIIA	0 (0)	1 (5.0)	

CCI = Charlson Comorbidity Index; DCIS = ductal carcinoma in situ; ER = estrogen receptor; HER2 = human epidermal growth factor receptor 2; OPBS = oncoplastic breast surgery; PR = progesterone receptor.

Table 2. Operative and tumour characteristics

Characteristic	Pre-OPBS (*n* = 12)	Post-OPBS (*n* = 20)	*p* value
Fine wire localized, no. (%)	8 (66.7)	13 (65.0)	0.92
Operative time, mean (range), min	46.4 (20–70)	61.0 (34–95)	0.026
Tumour size			
Maximum dimension, mean (range), mm	28.8 (9–80)	24.0 (8–75)	0.85
Specimen mass, mean (range), g	33.0 (21–56)	107.6 (21–319)	0.037
Positive margin rate, no. (%)	3 (25)	2 (10.0)	0.26
Oncoplastic technique, no. (%)			
Crescent	0 (0)	7 (35.0)	
Hemibatwing	0 (0)	4 (20.0)	
Racquet mammoplasty	0 (0)	3 (15.0)	
Inframammary ellipse	0 (0)	1 (5.0)	
Peripheral incision	0 (0)	1 (5.0)	
Round block (doughnut mastopexy)	0 (0)	2 (10.0)	
Inverted T mammoplasty	0 (0)	1 (5.0)	
Reduction mastopexy	0 (0)	1 (5.0)	
Completion mastectomy	33.3% (4)	0 (0)	0.014
Re-excision of margins	0 (0)	2 (10.0)	0.52
Total no. of mastectomies performed within study period	15	20	
Breast conservation rate, no. (%)	8/27 (30)	20/40 (50)	0.048

OPBS= Oncoplastic breast surgery.

Table 3. Postoperative complications

Complication	Pre-OPBS (n = 12)	Post-OPBS (n = 20)	p value
Wound infection, no. (%)	2 (16.7)	2 (10.0)	0.52
Hematoma (conservative management), no. (%)	1 (8.3)	2 (10.0)	0.94
Hematoma (evacuation required), no. (%)	0 (0)	2 (10.0)	0.29
Readmission, no. (%)	0 (0)	2 (10.0)	0.29
Delayed healing, no. (%)	0 (0)	0 (0)	—
Skin/flap necrosis, no. (%)	0 (0)	0 (0)	—
Other, no. (%)*	0 (0)	1 (5.0)	0.18

OPBS = Oncoplastic breast surgery.

*One patient developed an intraoperative myocardial infarction and subsequently suffered a gastrointestinal bleed and wound hematoma after initiation of therapeutic anticoagulation.

outcomes, including a positive margin rate of 13.5%, local recurrence in 3.3%, distant recurrence in 0.7%, and overall survival of 99.3%. Our centre had a similar margin involvement rate (10% post-OPBS), which is consistent with other studies in the literature. Before the introduction of OPBS, we observed an 8.3% rate of postoperative hematoma development, which increased to 15% in the post-OPBS period, with 2 patients in the latter group requiring readmission for surgical evacuation. This may reflect the learning curve of adopting a new procedure, the importance of attending an accredited course or engaging a colleague mentor, and reflection on outcomes for quality improvement purposes. Our case review included follow-up data only up to 6 months, during which time there was 1 recurrence; however, given this limitation further comparisons of recurrence and long-term survival are not possible.

Our series shows that the introduction of OPBS in a community hospital setting is feasible and can deliver outcomes similar to those reported in the literature. Importantly, the introduction of OPBS was able to significantly increase our breast conservation rate.

Despite being limited to cases performed by a single surgeon at a single centre, our case review is a real-world example of how OPBS skill acquisition and practice incorporation can and does occur. Hopefully these findings will give other surgeons confidence and reassurance that these procedures are feasible in a community setting and that their patients could benefit from OPBS, knowing the potential increased operative time required and the risk of postoperative hematoma.

Conclusion

In future, we hope to complete long-term follow-up for these patients as well as examine the trends of OPBS in our centre over time. This work might help to add to research on the OPBS learning curve and its implications for surgeons newly adopting these techniques as well as their training programs and standards.

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