



Contents lists available at ScienceDirect

The American Journal of Surgery

journal homepage: www.americanjournalofsurgery.com

Do surgeons convey all the details? A provincial assessment of operative reporting for breast cancer

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ARTICLE INFO

Article history:

Received 6 November 2019

Received in revised form

25 February 2020

Accepted 26 February 2020

Keywords:

Breast cancer

Synoptic reporting

Surgery

Quality indicators

Operative report

ABSTRACT

Introduction: A breast cancer synoptic operative report was developed using a modified Delphi process
Methods: Data from the British Columbia Cancer Breast Cancer Outcomes Unit (BCOU) was used to analyze the association between the completion of a synoptic operative report and reporting of operative details and The American Society of Breast Surgeons quality indicators.

Results: 3662 patients had surgery for breast cancer by 185 surgeons. 2281 reports were narrative and 1007 synoptic. Requested surgical details were more commonly reported with synoptic reports for both posterior (96 vs 58%, $p < 0.0001$) and anterior margins (96 vs 5%, $p < 0.0001$). This was true for high and low volume surgeons. Quality Indicators were higher in those cases with an associated synoptic report for high and low volume surgeons.

Conclusion: Communication of operative details is improved with synoptic reporting. Investment in platforms to facilitate synoptic reporting could improve patient care through improved multidisciplinary communication.

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Introduction

The operative report serves as the official documentation for surgical procedures and provides a medicolegal record of a patient's care during the surgery. Although there are general guidelines for elements of a procedure that are expected to be documented, these reports are traditionally dictated by the surgeon in a narrative fashion and often lack standardization in the level of detail recorded. With recent advances in diagnostic modalities, surgical approaches, and adjuvant treatments, contemporary breast cancer management has become increasingly complex and specialized, frequently requiring a multidisciplinary approach.^{1,2} Some of the details in a surgeon's operative report will determine

the necessity for postoperative adjuvant treatment. Since many reports are narrative, certain details are not always dictated and this may result in delayed post-operative treatment or lead to medical errors.

There is currently limited research related to standardized recordkeeping in the context of breast cancer surgery, although several investigations in other areas of medicine have implemented medical report templates and demonstrated improved efficiency, completeness, and reliability compared to non-synoptic reporting.^{3–8} The purpose of the current study was to compare the completeness in reporting of requested surgical details in synoptic and narrative operative reports for breast cancer surgery. The second objective was to analyze the association of the type of report with the American Society of Breast Surgeons (ASBrS) quality indicators.

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<https://doi.org/10.1016/j.amjsurg.2020.02.053>

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Material and methods

Development of synoptic operative report

The British Columbia Cancer Surgeon Network⁹ is tasked with promoting and advancing Surgical Oncology throughout our province. The SN Breast Surgical Tumor Group (BSTG)¹⁰ is composed of subspecialty and community breast surgeons from across the province. In 2009 the BSTG started several initiatives to improve breast cancer management in BC including development of a synoptic operative reporting template and adoption of Quality Indicators (QIs) for breast cancer surgery. The “Breast Cancer Surgery Checklist” (BCSC)¹¹ was developed using a modified Delphi process with input from surgeons, and medical and radiation oncologists from across British Columbia.⁹ Initially, a proposal of a “minimum data set” of 18 essential data elements, as well as a “complete synoptic report” template which included an additional 15 elements, was developed and sent out to surgeons and oncologists across the province for feedback in the form of a 1–5 Likert scale rating survey on the level of importance for each element.¹² The breast synoptic reporting survey received responses from 57% (64/113) surgeons and 30% (17/56) oncologists. The BSTG reviewed these responses and included elements rated greater than 4/5 by either surgeons or oncologists. Through multiple iterative discussions with the BSTG as well as the Provincial Multidisciplinary Breast Tumor Group, the template was revised and the finalized BCSC¹¹ was established.¹² Notably, the oncologists specifically emphasized the importance of communicating the posterior and anterior margin in the operative report, as this has direct implications in determining postoperative radiation therapy.

At the same time, the BSTG adopted the 2009 ASBrS three QIs for breast cancer surgery: 1) was needle biopsy performed before surgery, 2) was the surgical specimen oriented, and 3) if a non-palpable lesion was localized with image guidance, was there intraoperative confirmation of its removal.¹³ These three QIs were therefore included as elements in the BCSC.

In terms of its use, the BCSC was designed as a template which could be used electronically or used as a cue card from which surgeons would refer to while dictating reports through the telephone transcription service. At the time of this study, the vast majority of operative reports in our province were dictated.

The British Columbia Breast Cancer Outcomes Unit (BCOU)¹⁴ manages a prospectively collected database containing demographic, staging, pathology and treatment information, the dates and location of the first local, regional and/or distant recurrence and, if deceased, the date and cause of death for patients diagnosed in BC and referred to BC Cancer for treatment or assessment of in situ and invasive breast cancer. Since 2010 the BCOU has data elements that allow for calculation of the ASBrS quality indicators and beginning in 2016, the BCOU recorded the completion of a provincially endorsed synoptic operative report in this database. The information coded in the BCOU comes from all reports available in the chart, and would not be limited to the information available in the operative report. Some details would be available in other reports (radiology, pathology) but some details such as the breast tissue remaining anteriorly and posteriorly would not be expected to be found in other reports.

Study design

This study was approved by the BC Cancer Research Ethics Board. Patients diagnosed with invasive or in situ breast cancer between January 1, 2016 and December 31, 2016 and subsequently referred to BC Cancer Agency were identified from the BCOU database, where the information was de-identified and coded.

Inclusion criteria required that a surgical procedure was part of treatment and the field for type of operative report was completed. Patients with a first diagnosis of breast cancer, bilateral breast cancer, as well as patients with a contralateral new primary breast cancer were included in the study, while recurrent cancers were excluded. The QIs were calculated from the data in the BCOU database that was extracted from the charts by the BCOU coders. Patients that had a BCSC were compared to those that had a narrative operative report using the Chi-square test for reporting of the oncology requested margin details and ASBrS QIs. Significance was set at $p < 0.05$.

Results

During the study period, 3662 patients had surgery for breast cancer by 185 surgeons from across the province. Eighteen high volume surgeons (defined as performing more than 50 cases/year)¹⁵ performed 1951 cases. Table 1 summarizes the distribution of clinical patient variables in this study population. Of these operative reports, 2281 were narrative (160 surgeons), 1007 were synoptic (99 surgeons), and the remaining 374 were either unknown type of report or the report was not available. Table 2 summarizes the association between the type of operative report with report completeness looking at surgical margin details and QIs for all surgeons and for the subgroup of high volume surgeons. These surgical margin details were more commonly reported with synoptic reports for both posterior (96% vs 58%, $p < 0.00001$) and anterior margins (96% vs 5%, $p < 0.0001$) for lumpectomy for all surgeons and for the high volume subgroup. The three ASBrS quality indicators were higher for cases associated with a BCSC for all surgeons (oriented 99.5 vs 96% $p < 0.00001$, FWL confirmation 96 vs 93% $p < 0.033$, core biopsy 97 vs 93% $p < 0.00001$) and for high volume surgeons (oriented 99.6 vs 96% $p < 0.00001$, FWL confirmation 98 vs 92% $p < 0.0011$, core biopsy 97 vs 92% $p < 0.00001$).

Further analysis was undertaken looking at the 18 high volume surgeons. Narrative reports were completed for 61% of cases with surgeons using narrative reports 3–100% of the time. These surgeons were then grouped by the type of operative report they most commonly completed. Eleven of these surgeons were classified as traditional “narrative reporters”, while 7 used mostly synoptic reporting and were deemed “synoptic reporters.” Table 3 compares operative report completeness of both narrative and synoptic

Table 1
Distribution of patient variables.

Variable	Number of patients (n = 3662)
Median (range) age (years)	63 (21–96)
Median (range) tumour size (cm)	1.8 (0.1–7)
Female (%)	3638 (99%)
Stage 0 (%)	472 (13%)
Stage I (%)	1539 (42%)
Stage II (%)	1245 (34%)
Stage III (%)	324 (9%)
Stage IV (%)	63 (2%)
Stage Unknown (%)	19 (0.5%)
Node Positive (%)	1117 (31%)
LVI Positive (%)	580 (15%)
ER Positive (%)	3105 (85%)
PR Positive (%)	2520 (65%)
Her2 Positive (%)	474 (13%)
Breast-conserving surgery (%)	1986 (54%)
Mastectomy (%)	1668 (46%)
Radiation Therapy (%)	2123 (58%)
Chemotherapy (%)	1214 (33%)
Hormonal Therapy (%)	2358 (64%)

LVI, lymphovascular invasion; ER, estrogen receptor; PR, progesterone receptor; Her2, human epidermal growth factor receptor.

Table 2

Association of type of operative report with report completeness using margin reporting and breast cancer Quality Indicators Is.

Quality Indicator		Narrative Report, All surgeons	Synoptic Report, All surgeons	<i>p</i> value	Narrative Report, HV surgeons	Synoptic Report, HV surgeons	<i>p</i> value
Posterior deep margin N (%)	Reported	1287 (58%)	966 (96%)	<0.00001	663 (61%)	652 (97%)	<0.00001
	Not Reported	987 (42%)	40 (4%)		420 (39%)	17 (3%)	
Anterior tissue N (%)	Reported	59 (5%)	583 (96%)	<0.00001	24 (4%)	378 (98%)	<0.00001
	Not Reported	1198 (95%)	22 (4%)		566 (96%)	7 (2%)	
Specimen oriented N (%)	Yes	2184 (96%)	1000 (99.5%)	<0.00001	1038 (96%)	666 (99.6%)	<0.00001
	No	90 (4%)	5 (0.5%)		45 (4%)	53 (0.4%)	
FWL confirmation N (%)	Yes	827 (93%)	456 (96%)	0.033	382 (92%)	317 (98%)	0.0011
	No	63 (7%)	20 (4%)		33 (8%)	8 (2%)	
Core biopsy N (%)	Yes	2091 (93%)	965 (97%)	<0.00001	980 (92%)	637 (97%)	<0.00001
	No	155 (7%)	29 (3%)		88 (8%)	22 (3%)	

FWL, fine wire localization.

HV, high volume subgroup.

operative reports by surgeon, stratified as to whether they were “narrative reporters” vs “synoptic reporters”. Posterior and anterior margins were more commonly reported both when the narrative (91% vs 61%, $p = 0.0048$) and synoptic reporters (98% vs 59%, $p < 0.0001$) used the BCSC.

Discussion

A recent systematic review by Stogryn et al.¹⁶ analyzed 16 studies that compared synoptic operative reports to traditional narrative operative reports across multiple surgical specialties and concluded that synoptic reports were significantly more complete in reporting operative details, tended to take less time to complete, had improved reliability, and may have a cost benefit. Eryigit et al.¹⁷ conducted a similar systematic review at around the same time, also analyzing 16 slightly different studies comparing synoptic and narrative operative reports across multiple surgical specialties. This review also concluded that synoptic reports demonstrated higher completion rate and were faster to complete compared to narrative reports. Our finding of increased reporting of requested details with the BCSC is consistent with the findings of these reviews.

Eng et al.¹⁸ conducted a retrospective review evaluating the uptake and impact of synoptic reporting for breast cancer surgery of 37 surgeons across 10 community hospitals in British Columbia between 2011 and 2012 and concluded that synoptic operative reports had a higher degree of overall completeness compared to narrative reports. This study additionally performed paired analysis comparing synoptic and narrative reports of individual surgeons who produced both report types and found that six of the seven surgeons had higher overall operative report completeness when using the synoptic report. It is, however, notable that only 12.5% of the total number of operative reports analyzed in this study were synoptic and 74% of them were produced by a single surgeon. Our

study has a larger sample size, looks at the reports of 185 surgeons, has synoptic reports from 99 surgeons and further supports these findings.

Our study is different from many studies of synoptic reports in that we chose not to study all the elements of the synoptic report but rather focused on margin reporting and QIs as we felt these would be reflective of clinical practice. Although details of anterior and posterior margins are not QIs, these items were requested to be included in the operative report by oncologists as they affected adjuvant therapy planning and the BSTG then undertook educational initiatives to convey this request to surgeons.^{19–21} These had the highest discrepancy in importance ranking between surgeons and oncologists during the development of the synoptic report so we felt they would be a good clinical indicator of the effectiveness of the BCSC as a communication tool. Reporting of anterior tissue remaining following lumpectomy showed the largest discrepancy between the narrative and synoptic reports (96% vs 5%) and demonstrates the value of the BCSC to optimize reporting of details relevant to other care providers. We do not have data to know if the changes in reporting with the BCSC result in changes in patient management.

QIs for breast cancer surgery have been outlined by many groups,^{13,22,23} but there are no specific Canadian standards. When we review the QIs for preoperative core needle biopsy, specimen orientation, and x-ray confirmation of removal of image detected lesions we see that rates are over 90% overall, but are higher when associated with a synoptic operative report. The preoperative biopsy rate has improved over previous results showing a provincial rate of 59% in 2006.²⁴ Although rates of over 90% suggest high quality care, ASBrS recommends x-ray confirmation and specimen orientation for all cases and we have adopted a target of 95% for preoperative core needle biopsy, so we will continue to monitor these QIs. The QIs were calculated based on the data in the BCOU

Table 3

Comparison of High Volume Surgeons' narrative versus synoptic report completeness stratified by type surgeon.

Quality indicator		Narrative reporter		<i>p</i> value	Synoptic reporter		<i>p</i> value
		Narrative	Synoptic		Narrative	Synoptic	
Posterior deep margin N (%)	Reported	611 (61%)	20 (91%)	0.0048	52 (59%)	632 (98%)	<0.0001
	Not Reported	384 (39%)	2 (9%)		36 (41%)	15 (2%)	
Anterior tissue N (%)	Reported	15 (3%)	14 (88%)	<0.0001	9 (16%)	364 (99%)	<0.0001
	Not Reported	518 (97%)	2 (13%)		48 (84%)	5 (1%)	
Specimen oriented N (%)	Yes	950 (96%)	22 (100%)	0.308	88 (100%)	644 (99.5%)	0.522
	No	45 (5%)	0 (0%)		0 (0%)	3 (0.5%)	
FWL confirmation N (%)	Yes	333 (91%)	15 (100%)	0.224	50 (100%)	302 (97%)	0.250
	No	33 (9%)	0 (0%)		0 (0%)	8 (3%)	
Core biopsy N (%)	Yes	908 (93%)	20 (95%)	0.652	72 (82%)	617 (97%)	<0.0001
	No	72 (7%)	1 (4.8%)		16 (18%)	21 (3%)	

FWL, fine wire localization.

that was extracted by the coders and we did not go to the original charts to verify whether or not needle biopsy, specimen orientation, or specimen x-ray had occurred. Additionally, because the coders had access to all information in the chart other reports would have been reviewed to code the data element, such as pathology reports for orientation of specimens and radiology reports for specimen x-rays. With the ASBrS QI information included in the BCSC we believe that it would be easier for a coder to extract that information from a chart with a BCSC. The higher QI rates for synoptic reports raises the question of whether it is better care or better documentation.

Our study has analyzed both the operative reports from the entire group of surgeons in BC, as well as the subset of reports from high volume surgeons. We believe that the analysis by high volume surgeon is unique to our study. This allowed us to look at results in a group of surgeons that would be expected to be familiar with clinical pathways, thus decreasing the likelihood of knowledge gaps in practice standards affecting results. That is, a high volume surgeon would be less likely to omit important details from the operative report that would impact patient care. We expected that the high volume surgeons would have more complete reports whether they were dictated narratively or synoptically. Interestingly, the results for the entire group are almost identical to the results for the high volume surgeons (Table 2). This suggests to us that our results could be reflecting more the reporting of information rather than actual performance; demonstrating the effectiveness of the BCSC tool, even for an expert.

The analysis in Table 2 looks at the completeness of operative reports based on the type of operative report completed. When the high volume surgeons were classified as “narrative” and “synoptic” reporters and grouped by surgeon (Table 3), we see that surgeons who usually dictate synoptic reports do not include all of the elements when they dictate a narrative report, and similarly, if a usual narrative reporter dictates using a synoptic template the number of details covered in the report increases. This is similar to the findings of Eng et al.¹⁸ and further supports the effectiveness of the BCSC as a communication tool and suggests that our results are reflecting documentation rather than practice.

Although operative reports have traditionally been used to document the details of a surgical procedure, these reports are being viewed and evaluated by more physicians to make decisions about further patient care and are also being used to evaluate the quality of care provided. The authors of this study do acknowledge that there are certain advantages associated with a well dictated traditional narrative report, particularly in regards to readability. Narrative reports may offer the reader a more logical flow and progression of information, providing the reader a good sense of the patient’s “big picture” issues without being bogged down in small details that may or may not be relevant to the particular physician reading the report. However as demonstrated in this study, the subjective nature of this type of documentation causes communication of details important in the overall care of the patient to be highly dependent on the attention to detail of the reporter. Given the increasingly high volume of patients and demands on the time of surgeons, this may be a small sacrifice as we continue to implement procedures that improve patient safety. Our findings demonstrate that reporting can be improved with the use of a synoptic template, even for expert surgeons.

Conclusion

Operative reports serve an important communicative role in maintaining continuity of care for breast cancer patients. Traditionally, these reports have been narrative in nature and thus lack standardization between surgeons and procedures performed. This

study demonstrated that requested surgical details and the ASBrS breast cancer surgery quality indicators were more likely to be reported with synoptic reports compared to narrative reports, even for high volume surgeons. Investment in platforms to facilitate synoptic reporting could improve patient care through improved multidisciplinary communication.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

The authors of this manuscript declare no conflicts of interest for this publication.

Acknowledgements

We would like to acknowledge Fatima Cengic, Yasmin Miller, the surgeons and staff of the Surgeon Network BSTG, BC Breast Surgeons, and BC Cancer oncologists for input and assistance with the development of the BCSC and Mabel Zhang for assistance with manuscript preparation.

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