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Original article

Practice patterns and perceptions of margin status for breast conserving surgery for breast carcinoma: National Survey of Canadian General Surgeons☆

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ABSTRACT

Background: We surveyed Canadian General Surgeons to examine decision-making in early stage breast cancer.
Methods: A modified Dillman Method was used for this mail survey of 1443 surgeons. Practice patterns and factors that influence management choices for: preoperative assessment, definition of margin status, surgical techniques and recommendations for re-excision were assessed.
Results: The response rate was 51% with 41% treating breast cancer. Most (80%) were community surgeons, with equal distribution of low/medium/high volume and years of practice categories. Approximately 25% of surgeons "sometimes or frequently" performed diagnostic excisional biopsies while 90% report "frequently" or "always" performing preoperative core biopsies. There was marked variation in defining negative and close margins, in the use of intra-operative margin assessment techniques and recommendations for re-excision.
Conclusions: Responses revealed significant variation in attitudes and practices. These findings likely reflect an absence of consensus in the literature and potential gaps between best evidence and practice.

Introduction

Breast cancer (BC) accounts for approximately 26% of all malignancies and is the second leading cause of cancer mortality in women.[1] Surgical treatment of the primary tumour has evolved from radical mastectomy, to modified radical mastectomy (MRM), and to most recently, breast conservation surgery (BCS). Prospective randomized controlled trials (RCTs) and meta-analyses have demonstrated that BCS with adjuvant radiation and MRM are comparable in terms of survival, local control and distant recurrence.[2] While BC care is multidisciplinary in nature, the surgeons' functions are the point of entry for most patients into the continuum of BC care. Initial treatment decisions, optimal loco-regional control, and subsequent referral to medical/radiation oncologists are in the domain of the General Surgeon/Surgical Oncologist.

Despite the existence of a large body of evidence from RCTs, meta-analyses, cohort studies, and published guidelines, there exists considerable variation in surgical care of early stage BC. These variations can lead to concerns about quality of care.[3–6] Specific to BC surgery, issues such as method of preoperative diagnosis, margin definition, surgical technique and reoperation practices are all important to patient care. Surgeons' attitudes and factors that affect decision making are important to understand, and may be influenced by their type of practice, practice volume, experience, and interpretation of the medical literature. For example, while there is clear evidence that negative surgical margins are prognostically favourable, the definition of an adequate surgical margin varies among studies.[7,8] Major North American and European trials that demonstrated equivalence of lumpectomy plus radiation therapy and mastectomy used negative margin definitions that ranged from gross tumour excision with defined tissue rims,[9–12] to gross tumour excision,[13,14] to microscopic absence of tumour cells

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at the inked specimen edge.[15–17] Accordingly, recent studies have shown considerable variation in surgeons' perceptions of what defines an "adequate" margin.[7,8,18] Factors such as preoperative diagnosis methods and technical factors have also been shown to influence margin positivity rates.[5,19–23] However, few studies have examined surgeons' attitudes towards factors that can affect outcome. In a survey of American surgeons, Blair et al. found significant variation in intra-operative techniques and how surgeons processed their specimens, as well as variation in definitions of negative margins.[18]

The potential impacts of provider case volume and specialization have been studied extensively in BC care. High volume centres with specialized care have been associated with better outcomes, though the specific structures and/or processes responsible are not clear.[20,24–28] Some studies have suggested that specific technical considerations during surgery, are key factors in improved outcomes.[5,7,23] Accordingly, understanding surgeons' attitudes and how they relate to provider case volume and practice type, merit investigation. The primary objective of this survey was to examine key processes (e.g. methods of preoperative diagnosis, definition of adequate margin) associated with BCS in the management of BC. The secondary objective was to identify how such processes vary by provider volume, practice setting (academic versus community surgeon), and experience.

Methods

Survey methodology

The survey was developed collaboratively by researchers at McMaster University, Sunnybrook Health Sciences and Dalhousie University. Approval was obtained from the local Research Ethics Board. The survey was sent to a group of key experts to pre-test the questionnaire. The experts' comments were incorporated into the survey and a small pilot was conducted with surveys sent to 10 surgeons.

Demographic information collected included practice type (community or academic), number of years in practice, fellowship training and number of BC operations performed each month. Surgeons were asked to indicate if they did not perform breast surgery. The survey consisted of 27 questions on the following topics: method of preoperative diagnosis, definition of adequate margin, methods for intra-operative margin assessment, surgical techniques, extent of resection, reoperation, completion mastectomy and referral to radiation oncologists.

A list of practicing General Surgeons in Canada was obtained from MedSelect. A paper survey was sent out to 1486 surgeons between February and July 2009. The survey consisted of a 6 page, double-sided booklet coded for tracking responses. A stamped self-addressed envelope and personalized cover letter stating the purpose of the study and ensuring the confidentiality of responses were included. A modified Dillman Tailored Survey Design Method was used.[29] A reminder letter was mailed 4 weeks following the first mailout to all non-responders. Four weeks following this, a replacement survey was mailed to all non-responders, followed by two more reminder letters. Attempts were made to obtain a correct postal address for undelivered surveys. If the survey was returned undelivered a second time, no further attempts were made.

Statistics

Results of completed surveys were entered into a database and analysed using SPSS statistical software, version 18.0 (IBM). Percentages and frequencies with 95% confidence intervals (CI) using Wilson approach method were calculated. Group comparisons for non-parametric data used Mann Whitney-*U* Rank Sum test and Kendall's tau while categorical variables were analysed using chi square test. Results were included for individual questions even if the survey was only partially completed. The significance level was set at $p < 0.05$. Survey responses were categorized into volume groups based on reported number of operations performed each month: low volume: 0–2 surgeries; medium volume: 3–5 surgeries; and high volume: ≥6 surgeries per month. Years in practice were categorized as 0–10 years; 11–20 years; and >20 years.

To determine the number of respondents needed to sufficiently power our analysis, we assumed that approximately 50% of 1486 surgeons surveyed performed breast surgery. It was estimated that 301 completed questionnaires would be required to produce a 95% CI of ±5% around the percentages of estimations such as using preoperative diagnostic procedures (core biopsies) with an alpha level of 0.05.

Results

Response rate

Surveys were mailed to 1443 surgeons, 730 (51%; 95% CI: 48–53%) responded. There were no differences in demographics between responders and non-responders. Of the responders, 302 (41%; 38–45%) performed breast surgery and completed the survey, comprising the study cohort. The remaining 428 (59%) reported that they were not in practice (7%) or did not perform breast surgery (52%). Surgeon characteristics are shown in Table 1. The majority of surgeons (80%) reported working in a community setting and most (68%) did not complete fellowship training. Of those completing a fellowship, 40% were in surgical oncology. The majority of surgeons (67%) reported they performed fewer than 6 BC surgeries per month. The distribution of years in practice was equal among ≤10, 11–20 and >20 years reflecting a diverse range of experience.

Preoperative assessment

We found that almost 90% (86–93%) of surgeons "frequently" or "always" report having a core biopsy before proceeding to operate on palpable (P) and non-palpable cancers (NP) (Table 2). Higher volume surgeons (≥6 cases/month) ($p < 0.001$) and those working at an academic centre ($p < 0.001$) were more likely to report having a confirmed preoperative diagnoses with core biopsy for both P and

Table 1
Characteristics of the study cohort (general surgeons who treat breast cancer $n = 302$).

Characteristic	Number of cases	Percentage
Breast cancer surgeons	302	51.0
Nature of practice		
Community	242	80.0
Academic	60	20.0
Volume of practice		
Low (0–2 cases/month)	98	32.6
Medium (3–5 cases/month)	105	34.9
High (≥6 cases/month)	98	32.6
Years in practice		
≤10 years	112	37.1
11–20 years	99	32.8
>20 years	91	30.1
Fellowship training		
Surgical oncology	40	13.2
Other type of fellowship	58	19.2
None	204	67.5