

SURGEONS AS GATEKEEPERS

Access to presurgical multidisciplinary assessment in cancer care

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Abstract

Rationale: Surgery remains the primary treatment for many solid tumours. Over the past few decades, however, neoadjuvant therapies have increasingly been shown to enhance outcomes. Multidisciplinary assessment prior to surgery in the form of tumour conferences improves adherence to evidence-based guidelines and improves outcomes. The British Columbia Cancer Agency (BCCA) and the Vancouver General Hospital, BC's largest teaching hospital, conducted a retrospective study to examine 2 questions: To what extent are surgical oncology patients referred for multidisciplinary assessment? If done, does this assessment occur before or after surgery? *Methods:* All surgical cases flagged as oncology cases at the Vancouver General and University of British Columbia (UBC) hospitals for a 3-month period were linked to the BC Cancer Registry and the BC Cancer Information System. The percentage of cases referred to the BCCA was calculated. The data were stratified by surgical specialty and then by whether the patient was seen at the BCCA before or after surgery. An analysis was also done of referral rates by surgical specialties with well-defined provincial programs vs those without such programs. *Results:* Overall, 64.9% of cases were referred to the formal cancer system, i.e. the BCCA, in connection to their surgical episode. Of these, 66.4% were seen in advance of their surgery and 33.6% were seen afterwards. A further 11.3% of patients were seen at the BCCA but the time of their visit could not reasonably have been associated with the episode of care involving the relevant surgery. A statistically significant difference was found in favour of specialties with well-defined provincial programs compared to other surgical specialties. *Conclusion:* Defined provincial programs are associated with higher referral to the formal cancer treatment system.

RATIONALE

The improvements in outcomes that have occurred in pediatric cancers are among the most significant in cancer care. In the late 1970s and 1980s, a substantial literature attributed much of this improvement in outcomes to the use of multidisciplinary assessment in treatment planning.¹ While surgery remains the primary treatment for many solid tumours in adults, over the past few decades neoadjuvant therapies — mainly radiation and systemic chemotherapies — have increasingly improved outcomes. Presurgical multidisciplinary assessment in the form of tumour conferences has been shown to improve utilization of neoadjuvant therapies through improved adherence to evidence-based guidelines.² However, access to multidisciplinary assessment in adult cancer care has focused on supportive care^{3,4} and, in particular, palliative care.⁵ Little work has been done to quantify access to multidisciplinary assessment for treatment planning conducted prior to surgery.

Surgery in British Columbia (BC) is delivered mainly through the BC Health Authorities, not through the BCCA, the provincial cancer agency (although the BCCA Vancouver Centre provides a small outpatient surgical service, outreach consultation and followup clinics in other parts of the province). The situation in the rest of Canada is similar. Surgeons therefore act as gatekeepers to the cancer system and serve as initiators of multidisciplinary assessment and planning for most people with solid tumour cancers.

While evidence shows that early multidisciplinary assessment substantially changes recommended treatment plans, a 1994 study found that access to multidisciplinary care was a concern: nearly 50% of cancer patients in Ontario were not referred to the cancer centre.⁶ Since then efforts have been made in Ontario to find other ways to increase participation in multidisciplinary treatment planning conferences, such as via telehealth.⁷ A US study published in 2001 indicated that 43% of patients with breast cancer would have

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had a different treatment plan recommended if they had had multidisciplinary assessment before surgery.⁸

The BCCA and the Vancouver General Hospital (VGH) conducted an observational study to explore access to multidisciplinary assessment for surgical oncology patients. The VGH is BC's largest tertiary academic health care facility; 14.7% of its surgical cases are oncology cases. The Vancouver Centre of the BCCA is adjacent to the VGH and, while it also offers outpatient surgical care for oncology cases, it mainly provides radiotherapy and systemic therapy (including chemotherapy, hormonal

therapy and biologic therapies) as well as supportive care. Weekly case conferences are held for each of the tumour sites.

The UBC-BCCA Research Ethics Board approved this study. Referral to the BCCA and attendance at a "new patient visit" was considered to indicate multidisciplinary care.

METHODS

The VGH operating room booking system "flags" suspected cancer cases. An extract of all procedures containing the oncology flag during a 3-month period in the Fall of 2003 was taken. The date of the surgery and the surgical specialty of the primary surgeon were also extracted.

There were 1124 such cases during this time period. Of these, 239 (21.3%) lacked a Personal Health Number (PHN). The PHN is required for BC residents to receive provincial health insurance coverage. It also allows patients' health information to be made available to all BC health-care providers and provides demographic data to the Ministry of Health, health authorities, hospitals and clinics. Patients without PHNs were excluded from the study, as the data could not be linked to the BCCA's Cancer Agency Information System (CAIS), which is used to record treatment details of patients referred to the BCCA.

The flagged cases ($n = 885$) with PHNs from the VGH operating room booking system were then linked to the CAIS. Of these 885 patients, 638 were registered at the BC Cancer Registry, a listing of all cancer cases diagnosed in BC. Initially, 281 of the 885 linkable cases were not registered at the Registry. Given that there is some delay in updating the Registry, a second linkage was done nearly 2 years past the date of surgery, reducing this number to 247 cases. While it is possible that the Registry had failed to receive the pathology report and thus did not register the case, ongoing quality control would suggest that it is more likely that these 247 patients were found to not have cancer at the time of the relevant surgery.

For the 638 registered cancer cases, the date of referral to the BCCA and date of initial assessment was extracted. The percentage of cases referred to the BCCA was calculated and stratified first by surgical specialty and then by whether the patient was seen prior to or after surgery. A further

analysis was done of the difference in referral rates between surgical specialties that have provincial oncology programs (as described below) compared to those that do not.

RESULTS

Of the 638 cancer cases registered in the BC Cancer Registry and CAIS, 414 (64.9%) were referred to the BCCA within a time interval indicating linkage to the surgery; 53 (8.3%) were seen at the BCCA but the time of the visit (either prior to surgery or after surgery) could not reasonably have been associated with the episode of care involving the surgery; and the remaining 171 (26.8%) were registered only — i.e. no referral to the BCCA was ever made. Of the 414 cases referred to the BCCA in a timely manner, 275 (66.4%) were seen in advance of their surgery and 139 (33.6%) were seen after their surgery.

Cases were defined by surgical specialty. Based on the provincial incidence of treatment by surgeons, the highest-volume surgically-treated cancer types are breast, prostate, colorectal, bladder and lung. These 5 cancer types tend to fall within the purview of 3 specialties: urology, general surgery and thoracic surgery. **Table 1** (page 34) shows that there is significant variation by surgical specialty, from a high of 100% in orthopedics to a low of 49.7% in urology.

A further comparison was made of those services with well-defined provincial programs (as described below), notably gynecologic, thoracic and orthopedic oncology, with all other surgical services. As shown in **Table 2** (page 35), the incidence of referrals to the BCCA by the services with provincial programs was higher, although the difference was not statistically significant. Patients in the provincial programs were more likely to have an assessment at the cancer agency prior to their surgery, and by a statistically significant margin ($p = 0.01$). Other differences were not significant.

High-volume cancers

Urologists, who treat prostate, bladder and renal cancers, performed the highest volume of cancer surgeries, and fewer than half of these patients were referred to the BCCA. Of the patients referred, however, most were seen prior to their surgical procedure.

General surgeons, who treat mainly breast, colon, rectal and other gastrointestinal cancers and melanoma, performed the second-highest volume of cancer surgeries. The majority of these patients were referred to the BCCA, but nearly half were referred after their surgery. The urgency of the case was not identified in the data set and so it is not possible to determine if there is an association between the timing of the referral and urgency. Further, we could not differentiate between the 2 highest-volume cancers treated by general surgeons — breast and colorectal cancers — with respect to the timing of referrals.

Provincial oncology programs

A provincial oncology program was defined as a recognized BCCA program that includes surgical clinics within the ambulatory clinic. Funding support is provided to the surgical group for the provision of this service. A surgical

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oncology consultation service alone, even if dedicated to oncology, is not sufficient to be considered a provincial oncology program.

Gynecologic oncology

The BCCA's Division of Gynaecologic Oncology is centred at the Vancouver site and provides outreach clinics to the other BCCA cancer centres. Also, one gynecologic oncologist associated with the program is located at the Victoria centre. This gynecology program has a long-established multidisciplinary new patient clinic, where patients are assessed by gynecologic, medical and radiation oncologists. Nearly 90% of patients referred to this program are seen

prior to their surgery. However, more than a quarter of the flagged oncology cases treated at VGH were not referred at all, although, as discussed below, this may not reflect lack of multidisciplinary planning.

Musculoskeletal sarcomas

Orthopedic Oncology is part of the Musculoskeletal Tumour and Sarcoma Group of the BCCA. The orthopedic surgeons are Vancouver-based. These cancers are relatively rare: 1789 cases were diagnosed between January 1, 1987 and December 31, 1996. About 37.9% of all sarcoma incidence is due to soft tissue sarcoma (678 cases during the 10 years), 14.2% to bone sarcoma (254 cases), and the

TABLE 1. Surgical patients recorded in the BC Cancer Registry and visits to the BCCA

surgical specialty	number recorded in Registry ¹	associated visit to BCCA			unassociated visit to BCCA ²	no visit to BCCA ³
		all	pre-operatively	post-operatively	number (%)	number (%)
		number (%)	number (%)	number (%)		
high-volume cancers						
urologic	151	75 (49.7%)	34 (45.3%)	12 (16.0%)	29 (38.7%)	76 (50.3%)
general surgical*	110	89 (80.9%)	40 (44.9%)	44 (49.4%)	5 (5.6%)	21 (19.1%)
provincial cancer programs						
gynecologic oncology	90	65 (72.2%)	53 (81.5%)	5 (7.7%)	7 (10.8%)	25 (27.8%)
thoracic oncology	76	60 (78.9%)	27 (45.0%)	30 (50.0%)	3 (5.0%)	16 (21.1%)
orthopedic oncology	23	23 (100.0%)	23 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
other cancers						
otolaryngology	63	52 (82.5%)	34 (65.4%)	14 (26.9%)	4 (7.7%)	11 (17.5%)
neurology	49	39 (79.6%)	20 (51.3%)	17 (43.6%)	2 (5.1%)	10 (20.4%)
plastic surgery	29	27 (93.1%)	17 (63.0%)	8 (29.6%)	2 (7.4%)	2 (6.9%)
vascular surgery	19	15 (78.9%)	11 (73.3%)	3 (20.0%)	1 (6.7%)	4 (21.1%)
others including spinal, other ortho, oral, ophthalmology, maxillofacial cancers	28	22 (78.6%)	16 (72.7%)	6 (27.3%)	0 (0.0%)	6 (21.4%)

¹ includes breast, colorectal and other gastrointestinal cancers, and melanoma

² visit not likely associated with current procedure

³ i.e. recorded in BC Cancer Registry only

remaining 47.9% are found in other tissues. Sarcomas can be spread by surgical manipulation, necessitating unique surgical skills. Therefore, unlike most solid tumours, biopsy is only done when all investigations are completed and after consultation with an orthopedic oncologist. All cases (100%) referred to this program are sent on to the BCCA, receive multidisciplinary assessment prior to surgery, and are booked and planned cases.

Thoracic cancers

The Provincial Thoracic Surgery Program is organized slightly differently than the others, in that surgical clinics are not held in the BCCA clinic but in 1 of 4 centres of excellence in thoracic surgery in BC. A special provincial payment plan supports the work of this program. While nearly 80% of the patients treated at the VGH are referred to the BCCA, the majority for non-small cell lung cancer, most are seen after their surgery.

Lower-volume cancers

Otolaryngology, Neurosurgery and Plastics are small subspecialty groups with long-standing ties to the BCCA, including provision of surgical consultations. A large majority of these patients are referred to the BCCA.

DISCUSSION

Gynecology

All gynecology patients seen at VGH for surgery have their pathology reviewed at BCCA, and the case is discussed at a multidisciplinary disposition clinic. Only those who require chemotherapy or radiation are then referred in person, so the reported referral figures may be artificially low with respect to determining whether multidisciplinary planning has occurred. As well, an estimated 20% of ovarian tumours are initially flagged as oncology cases but are identified postoperatively as benign (ovarian tumours are not biopsied preoperatively).

Urology

Urology is notable for 2 reasons. First, only half the patients are referred to the cancer agency at all. While surgery plays a significant role as definitive treatment for prostate cancer — the largest-volume cancer treated by urologists — radiotherapy is also a curative treatment option, and this requires referral to the BCCA. There is little difference in terms of tumour control between these treatment options, however, there are quality-of-life considerations. Patients not referred to the agency may be missing the opportunity to discuss alternative treatments, and supportive services are only available to referred patients. Ways to increase the referral of urological surgical oncology patients are under discussion.

Second, the largest proportion of visits not associated with the current surgical procedure occurred in urology. Because urologists care for bladder cancer patients, and more than half of all bladder cancers have more than one surgery over the course of their cancer treatment, this may simply reflect an elongated surgical treatment pattern with multiple surgeries.

Other programs

Since the time of this study, a small general surgical oncology program focusing on breast cancer has been started at the BCCA. This program supports the development of an academic program in surgical oncology. It has 2 main goals: to serve as a teaching facility demonstrating that outcomes are enhanced through multidisciplinary practice because of improved access to adjuvant and/or neoadjuvant therapies as appropriate; and to foster research in breast cancer. In addition to evaluating different surgical techniques, the research aspect promotes tissue banking to enhance basic science research.

The BC Surgical Oncology Network (SON) also endeavors to improve the integration of quality surgical oncology services into the formal cancer care system, through the

TABLE 2. Differences in incidence of visits to BCCA of surgical patients seen in provincial oncology programs vs those seen by other surgeons

referral source	total	visit to BCCA				no visit to BCCA ³
		all visits	pre-operatively	post-operatively	unassociated	
provincial program surgeons (%)	189	148 (78.3%)	103 (69.6%)	35 (23.6%)	10 (6.8%)	41 (21.7%)
other surgeons (%)	449	319 (71.1%)	172 (53.9%)	104 (32.6%)	43 (13.5%)	130 (29.0%)
difference		7.3%	15.7%	-9.0%	-6.7%	-7.3%
95% confidence interval		-2.50% to 14.1%	3.7% to 26.6%	-6.3% to 29.1%	-25.9% to 12.1%	-21.0% to 9.4%
p-value		p = 0.09	p = 0.01	p = 0.29	p = 0.48	p = 0.34

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Surgical Tumour Groups.⁹ For example, the efforts of the colorectal group recently introduced changes in the treatment of rectal cancers in the province.¹⁰


Study limitations and research needed

This study was limited to an academic tertiary facility and may not be generalizable to the assessment and treatment process in other facilities. More research is required to explore the feasibility of presurgical assessment and treatment planning for all cancers that may require surgical treatment. While studies have demonstrated that better outcomes result from multidisciplinary assessment, the impact on outcomes was outside of the scope of this preliminary study.

With respect to cases referred after surgery, while it is preferable to have multidisciplinary assessment prior to any treatment, some surgery is provided on an urgent basis, precluding the opportunity for preoperative assessment. Further research will be needed to determine whether the urgency of the case is related to the timing of the referral.

CONCLUSION

All radiotherapy in the province is provided through the BCCA, and all systemic therapy (chemotherapy and hormonal therapy) is funded through it. Access to either of these treatment modalities requires a referral. Despite close ties between the surgeons at BC's largest teaching hospital and the BCCA, there is considerable variation with respect to the probability that an oncology patient will be referred to the agency prior to surgery. While not all patients

require systemic treatment or radiotherapy, the lack of referral not only precludes multidisciplinary assessment but also reduces access to other supportive services provided to cancer patients through the agency. Clearly defined provincial programs are associated with higher referral to the formal cancer treatment system. It appears that integrating surgeons into the cancer clinic improves presurgical multidisciplinary assessment. Presently in British Columbia, only certain low-volume cancers have such defined programs. 

Disclosure

The authors report no potential conflicts of interest pertaining to this article.

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