




Surgeon Perspectives on the Management of Aborted Cancer Surgery: Results of a Society of Surgical Oncology Member Survey

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ABSTRACT

Background. While surgery is generally necessary for most solid-organ cancers, curative-intent resection is occasionally aborted due to unanticipated unresectability or occult metastases. Following aborted cancer surgery (ACS), patients have unique and complex care needs and yet little is known about the optimal approach to their management.

Objective. The aim of this study was to define the practice patterns and perspectives of an international cohort of cancer surgeons on the management of ACS.

Methods. A validated survey assessing surgeon perspectives on patient care needs and management following ACS was developed. The survey was distributed electronically to members of the Society of Surgical Oncology (SSO).

Results. Among 190 participating surgeons, mean age was 49 ± 11 years, 69% were male, 61% worked at an academic institution, and most had a clinical practice focused on liver/pancreas (30%), breast (23%), or melanoma/sarcoma cancers (20%). Participants estimated that ACS occurred in $7 \pm 6\%$ of their cancer operations, most often due to occult metastases (67%) or local unresectability (30%). Most surgeons felt (very) comfortable addressing their patients' surgical

needs (92%) and cancer treatment-related questions (90%), but fewer expressed comfort addressing psychosocial needs (83%) or symptom-control needs (69%). While they perceived discussing next available therapies as the patients' most important priority after ACS, surgeons reported avoiding postoperative complications as their most important priority ($p < 0.001$). While 61% and 27% reported utilizing palliative care and psychosocial oncology, respectively, in these situations, 46% noted care coordination as a barrier to addressing patient care needs.

Conclusions. Results from this SSO member survey suggest that ACS is relatively common and associated with unique patient care needs. Surgeons may feel less comfortable assessing psychosocial and symptom-control needs, highlighting the need for novel patient-centered approaches.

Keywords Surgical oncology · Palliative care · Supportive care · Patient-centered outcomes · Occult metastases · Bad news

While cancer care is becoming increasingly multidisciplinary in nature, surgical resection remains the primary curative-intent treatment modality for most patients with solid-organ cancers. Typically, the decision to proceed with surgery is made after a comprehensive evaluation of a patient's physical status, their individual cancer characteristics, and the degree of anatomic involvement of their tumor. Such careful patient selection not only decreases the risk of perioperative complications but it also improves the

likelihood that surgery will provide oncologic benefit. Nevertheless, even with meticulous preoperative evaluation that includes contemporary high-quality imaging and biochemical testing, curative-intent resection is sometimes unexpectedly aborted. While rates of aborted cancer surgery (ACS) vary significantly based on patient, provider, and cancer characteristics, the reported incidence for gastrointestinal, gynecologic, and urologic malignancies ranges between 4% and 25%.¹⁻⁷ The vast majority of aborted operations occur due to unanticipated unresectability or occult metastatic disease.^{8,9}

Following ACS, not only must patients undergo the same postoperative recovery and risk of complications as patients whose cancer surgery is successful but these individuals may also experience symptoms from the cancer left in situ while dealing with a sudden change in their prognosis.^{10,11} Indeed, multiple studies have demonstrated that long-term outcomes after an aborted cancer operation are generally poor, with decreased survival and a low likelihood of successful reoperation.^{1,4,6-8,12,13} With a terminal change in health and a surgery from which to recover, patients are at an increased risk for anxiety, depression, and emotional distress.¹⁴⁻¹⁶ Indeed, recent qualitative research has noted that physical and emotional symptoms, as well as disruptions to normal life routines, were prevalent following an ACS and that patients utilized a wide range of coping mechanisms and support systems to respond.¹⁰

Although patients have unique care needs following ACS, little is known about surgeon perspectives and practice preferences regarding ACS. Such information may highlight opportunities to improve patient-centered interventions following ACS or inform the need for specialized providers aimed at supporting patient care needs. Therefore, the purpose of the current study was to measure practice patterns and perspectives of an international cohort of cancer surgeons on their management of ACS.

METHODS

Survey Design

This study utilized a survey tool that was previously developed and validated using a standardized process, aimed at measuring cancer surgeons' knowledge and perspectives on patient care needs following ACS, as well as their general practice patterns.¹⁷ The survey content was rigorously designed and validated with evidence synthesis,^{9,18} patient interviews,¹⁰ and preliminary surgeon surveys ($n=50$)⁹ at The Ohio State University Wexner Medical Center. Items were iteratively developed and reviewed by an expert advisory board comprised of members with expertise in surgical oncology, medical oncology, psychosocial oncology, palliative care medicine, and survey methodology. The survey

was then pilot tested with a group of surgical oncologists ($n=10$) before finalizing it for distribution. The final survey asked respondents about basic demographics and surgical training, primary practice setting, practice geography, primary disease focus, and their perspectives on the rates and reasons for ACS. A separate portion of the survey focused on surgeon perspectives of patient care needs following ACS, while the final section focused on surgeon's general management of patients after ACS, along with barriers to addressing patient care needs.

Study Cohort

As only de-identified data were used, the study was deemed exempt by our Institutional Review Board. The final survey was distributed electronically to members of the Society of Surgical Oncology (SSO). The SSO includes over 2000 members from over 70 countries, and its research committee reviews all potential surveys for possible distribution to its membership twice per year. SSO members were invited by email in May 2022, with a reminder email sent 1 month later. The survey remained open until July 2022. The survey was conducted using Qualtrics, and all responses were stored on RedCAP. Informed consent by all participants was confirmed by their voluntary participation; no compensation was provided.

Data Analysis

Survey responses were coded and analyzed using SPSS version 28 (IBM Corporation, Armonk, NY, USA). Descriptive statistics including frequencies, proportions/percentages, means/medians with standard deviations and ranges, as appropriate, were used to summarize the data. Only quantitative results were analyzed for this study.

RESULTS

Among the 2659 SSO members who were invited to participate, 190 survey responses by surgeons were completed and were included in the final analysis (response rate 7.1%). The mean age of respondents was 49 ± 11 years, 69% were male, and 71% self-reported as White. The majority of surgeons worked in an academic (62%) or hybrid-type (26%) practice, and 52% were at a National Cancer Institute-designated hospital. The average number of years in surgical practice was 15, and nearly 80% of surgeons had pursued fellowship training with Complex General Surgical Oncology or the Americas Hepato-Pancreato-Biliary Association. Participants estimated that cancer surgery comprised approximately 86% of their practice and that the most common primary disease focus of participants included liver/

pancreas (30%), breast (23%), and melanoma/sarcoma (20%) (Table 1).

Respondents estimated that, on average, $7 \pm 6\%$ of their curative-intent cancer resections had to be aborted, most often due to occult metastatic disease (67%) or local unresectability (30%), and less frequently due to intraoperative surgical complications (3%). About half of respondents (52%) reported 'very often' or 'always' counseling patients preoperatively about the possibility of an aborted resection, while 27% either 'rarely' or 'never' discussed this possibility during preoperative counseling (Table 2). After an ACS, surgeons most often reported that they updated the patient either later that day (41%) or the following day (35%) on the results of surgery. The focus of their initial conversations with patients most often focused on supporting emotional care needs (82%), discussing next steps in cancer care (75%), and facilitating recovery from surgery (71%). Other hospital and ambulatory services that participants reported utilizing after ACS included Medical Oncology (82%), Palliative Care (61%), and Psychosocial Oncology (27%).

Regarding surgeon perspectives on patient experiences following ACS, the most commonly reported experiences included symptoms from their cancer (41%), uncertainty/anxiety about next steps (35%), severe symptoms or prolonged recovery after surgery (13%), complications from surgery (6%), or emotional distress from receiving bad news (5%). Interestingly, whereas surgeons perceived that their patients' primary priority after an ACS was discussing next-available cancer therapies, their most common priority was ensuring that their patients recovered from surgery without complications ($p < 0.001$) (Fig. 1). Additionally, while most surgeons reported feeling comfortable or very comfortable addressing their patients' surgical needs (92%) or cancer treatment-related needs (90%) following ACS, they were less likely to report being (very) comfortable addressing patient overall preferences (83%), psychosocial needs (83%), or symptom-control needs (69%; $p < 0.05$) (Fig. 2). Perceived barriers to addressing patient care needs included lack of good treatment options (60%) and care coordination (41%), although lack of physician comfort/awareness was also noted (19%) (Table 2). Overall, 50% felt that additional research on patient care needs following ACS was either very or extremely important.

DISCUSSION

Despite careful preoperative patient selection, surgeons are sometimes faced with the difficult and unexpected decision of having to abort a planned cancer resection and leave a cancer in situ. Indeed, despite improvements in cross-sectional imaging and other diagnostic tools, ACS remains a relatively common occurrence, especially among certain high-risk cancers.^{1-4,6,7} The long-term consequences of

TABLE 1 Demographics and professional characteristics of participating surgeons

Demographics and professional characteristics	All participants [N=190]
Age, years (mean \pm SD)	49 \pm 11
Sex	
Male	131 (70)
Female	55 (30)
Race	
White	135 (71)
Black	3 (2)
Hispanic	15 (8)
Asian	21 (11)
Other	15 (8)
Primary practice setting	
Academic	116 (62)
Community/private	21 (11)
Hybrid	49 (26)
Veterans	2 (1)
NCI vs. CoC Accreditation	
NCI	35 (23)
CoC	74 (48)
Both	45 (29)
Current practice geography	
West	24 (13)
Midwest	48 (25)
South	48 (25)
Northeast	41 (22)
International	29 (15)
Years in practice (mean \pm SD)	15 \pm 12
Fellowship training	
SSO/CGSO	142 (75)
Breast	17 (9)
Other	23 (12)
AHPBA	4 (2)
None	4 (2)
Primary disease focus	
Liver/pancreas	56 (30)
Breast	44 (23)
Melanoma/sarcoma	37 (20)
Colorectal	16 (8)
Peritoneal surface malignancies	13 (7)
Upper GI	11 (6)
Other	13 (7)
Percentage of practice that is cancer focused (mean \pm SD)	86 \pm 19

Data are expressed as *n* (%) unless otherwise specified

SD standard deviation, *NCI* National Cancer Institute, *CoC* Commission on Cancer, *SSO* Society of Surgical Oncology, *CGSO* Complex General Surgical Oncology, *AHPBA* The Americas Hepato-Pancreato-Biliary Association, *GI* gastrointestinal

TABLE 2 Participating surgeons reported perioperative management of patients experiencing aborted cancer surgery

Aborted cancer surgery and patient care	All participants[n = 190]
Percentage of cancer operations aborted (mean ± SD)	7 ± 6
Preoperative counseling of patients about the likelihood of ACS	
Always	48 (26)
Very often	48 (26)
Sometimes	40 (22)
Rarely	33 (18)
Never	17 (9)
Perceived most common patient experience after ACS	
Symptoms from cancer	46 (41)
Uncertainty/anxiety about next steps	39 (35)
Severe symptoms/prolonged recovery	15 (13)
Complications from surgery	7 (6)
Emotional distress from receiving bad news	6 (5)
Focus of initial conversations with patients after ACS	
Supporting emotional care needs	142 (82)
Discussing next steps in cancer care	130 (75)
Facilitating recovery from surgery	127 (71)
Enhancing symptom control	69 (40)
Establishing goals of care and code status	47 (27)
Potential barriers to addressing patient care needs	
Lack of good treatment options	104 (60)
Coordinating with other providers	71 (41)
Insufficient hospital/personnel resources	55 (32)
Lack of physician comfort/awareness	34 (19)
Services utilized after ACS	
Medical oncology	142 (82)
Palliative care	105 (61)
Psychosocial oncology	46 (27)
Acute/chronic pain	44 (24)
Chaplain	39 (22)
Patient experience team	18 (11)
Formal training in delivering bad news	
Yes	99 (57)
No, but I would like to	43 (25)
No, and not interested	30 (17)
Unsure	3 (2)
Formal training in palliative care	
Yes	57 (33)
No, but I would like to	65 (37)
No, and not interested	48 (27)
Unsure	5 (3)

ACS aborted cancer surgery, *SD* standard deviation

this event are grave for most cancer types as the inability to resect a tumor generally precludes the potential for cure. However, the immediate repercussions are also significant, having physical, psychosocial, and emotional consequences for the patient.^{14–16} Despite the prevalence of ACS, there have been little data in the literature exploring its impact on

patients and their specific care needs following its occurrence.^{10,18} The results of this international survey of cancer surgeons' practice patterns and perspectives on patient care needs following ACS are critical to inform the design of future patient-centered interventions aimed at improving patient outcomes.

FIG. 1 Physician perspectives on patient priorities versus personal priorities after aborted cancer surgery

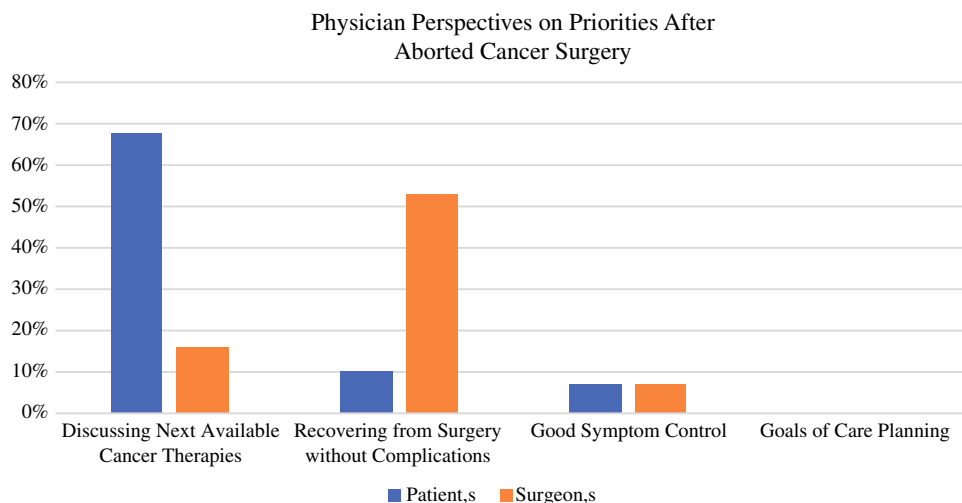
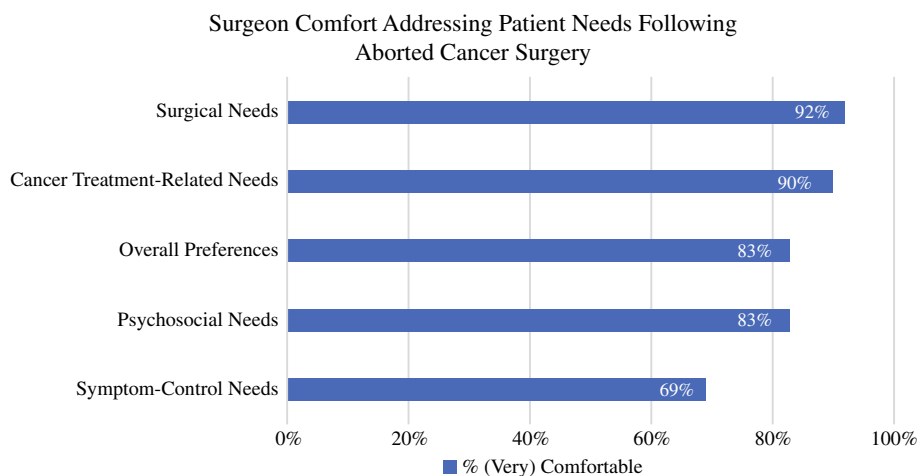


FIG. 2 Surgeon comfort addressing patient needs following aborted cancer surgery



Participants in our international survey agreed that ACS is unfortunately a relatively common and important problem, estimating that, on average, 7% (but ranging as high as 40%) of their planned cancer operations were aborted, primarily due to occult metastatic disease or local unresectability. These findings are in line with reports from prior studies.^{1-4,6-8} For example, in a study of patients with periampullary cancer by Azari et al., 17% of planned pancreatoduodenectomies were aborted.¹² Likewise, Pisters et al. reported that 18% of surgeries for pancreatic head cancers were aborted on staging laparoscopy due to the discovery of occult metastatic disease.² Despite the known frequency with which ACS occurs, a minority of surgeons in our study reported regularly counseling their patients preoperatively about the possibility that surgery could be aborted. These data suggest that, at least for high-risk cancer types, there may be opportunities for establishing improved preoperative expectations and in developing future approaches to coordinate and plan care for cancer patients. One area that was not addressed but would also be interesting for future

research is the effect of ACS on surgeons, including its impact on well-being and coping strategies. Understanding both surgeon and patient response to ACS may be valuable to improve outcomes for patients, as well as informing self-care for providers.

An important finding of our study was the discordance between surgeon priorities following ACS and the perceived priorities of patients. While the main focus of surgeons was that their patients recover successfully from surgery without further complications, respondents believed that their patients' primary preference was to discuss next steps in their cancer treatment. Further research on patient preferences after ACS will therefore be helpful to inform the content and timing of provider interventions. The discordance in surgeon reports of priorities highlights the importance of assessing patient-specific needs and individualizing post-operative care.

Another important finding of the current study was the disparity in surgeon comfort addressing patients' needs after ACS. While most participants felt comfortable addressing

surgical or cancer treatment-related needs, the comfort level decreased with addressing psychosocial or symptom control needs. Multiple studies have found physical and emotional symptoms to be significant in cancer patients.^{19–25} These issues may be exacerbated among patients simultaneously recovering from ACS. Surgeons may feel less comfortable addressing psychosocial or symptom-control needs, let alone prognosis or end-of-life care, which were not tested in this survey. Previous research has highlighted the challenges in assessing and treating psychosocial health concerns among patients with cancer,^{24–26} and discussions about prognosis and goals of care are often incomplete or avoided.^{27,28,30–34} While cancer type plays a role in the degree of psychosocial symptoms, patients who undergo ACS are at an increased risk for worsening of these symptoms.¹⁶ Since failure to address these psychosocial and existential needs may jeopardize the outcomes of cancer therapies and patient quality of life,^{16,26–29} additional research is needed to measure whether patients' care needs are adequately addressed by their existing cancer providers.

Taken together, these findings suggest an opportunity for involving providers with experience in assessing and addressing patient care needs following ACS. Despite the known importance of addressing the psychosocial needs of cancer patients,^{35–39} only about half of surgeons surveyed had formal training in delivering bad news, fewer in specialized palliative care, and only a minority were interested in receiving additional formal training. Palliative care, with its focus on patient preferences, prioritizing symptom management, addressing psychosocial needs, and assisting with decision making, may improve patient-centered care following ACS. Although often reserved for patients with advanced disease, previous research has suggested that late referrals to palliative care are suboptimal for addressing patient needs.^{40–42} Indeed, a large body of evidence has highlighted the value of introducing palliative care early in the course of advanced cancer to improve quality of life, symptom burden, mood, and future use of healthcare services among cancer patients.³⁵ A key method by which early palliative care influences patient outcomes is by educating patients on symptom management and advanced care planning.^{43,44} An ongoing clinical trial at the authors' institution is investigating the early incorporation of palliative care following ACS. Alternatively, given the existing workforce shortage of palliative care providers, developing educational programs that provide surgical oncologists with training in delivering bad news, managing symptoms, and screening for those who would most benefit from palliative care consultation should be considered.

Despite the novelty of this research, some limitations should be acknowledged. First, although we utilized the SSO, the largest international society of surgical oncologists, the diversity of specialties represented may have biased

the findings by including surgeons (e.g., those focused on breast cancer care) who encounter ACS less commonly and omitting some (e.g., gynecologic oncologists) who may encounter ACS more often. On the other hand, given that participating surgeons had predominantly cancer-focused practices, the findings of the current study may be even more pronounced among general surgeons in the community who perform elective cancer surgery less frequently. Second, the overall sample size was relatively small, although the response rate was consistent with previous studies published using the SSO membership.^{45,46} As with most survey-based research, participants who chose to respond may differ from surgical oncologists who did not participate. Despite these limitations, the strengths of this study are the use of a standardized approach to validate a survey on an important understudied topic, and the diversity in demographic and professional characteristics of the studied cohort of surgeons.

CONCLUSION

Results from this SSO member survey suggest that ACS is relatively common and is associated with unique patient care needs. As surgeons' priorities may differ from patient priorities, and as they may feel less comfortable assessing psychosocial and symptom-control needs, novel patient-centered, multidisciplinary approaches should be evaluated. Future research to understand and address patient care needs will be necessary to improve the quality of life of patients with advanced cancer who experience ACS.

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