Decision Making in Palliative Surgery

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BACKGROUND: Palliative surgery for advanced cancer patients involves complex decision making. Surgeons with a cancer-focused practice were surveyed to determine the extent to which palliative surgery was currently practiced, to identify ethical dilemmas and barriers they faced in performing palliative surgery, and to evaluate their treatment choices in four different clinical scenarios.

STUDY DESIGN: A 110-item survey was devised after extensive review of the palliative care and palliative surgery literature to evaluate current practices and attitudes regarding palliative surgery. Case vignettes were devised to evaluate clinical factors influencing surgeons' selection of treatment for symptomatic patients with advanced malignancy.

RESULTS: Survey response rate was 24% (419 of 1,740). Respondents reported 74% of their surgery caseload as cancer related, and 21% of these as palliative. On a scale of 1 (uncommon problem) to 7 (common problem), surgeons reported that the most common ethical dilemmas in palliative surgery were providing patients with honest information without destroying hope (5.6 ± 1.4) (mean ± standard deviation), and preserving patient choice (5.0 ± 1.7). Bound on error of the average frequency estimate for ethical dilemmas, based on response rate, was 0.08. On a scale of 1 (not a barrier) to 7 (a severe barrier), surgeons rated the most severe barriers to optimum use of palliative surgery as limitations of managed care (4.1 ± 2.0) and referral to surgery by other specialists (3.9 ± 1.8). Bound on error of the estimate for average severity of barriers, based on response rate, was 0.09. They rated the least severe barriers to palliative surgery as surgeon avoidance of dying patients (3.0 ± 1.8) and surgery department reluctance to perform palliative surgery (2.6 ± 1.6).

Analysis of surgeons' treatment selection in case vignettes indicated that patient age, aggressiveness of tumor biology, local extent of disease, and severity of patient symptoms were all variables of influence for treatment selection in patients with advanced malignancies.

CONCLUSIONS: Palliative surgery involves numerous ethical dilemmas, the most prominent being providing honest information to patients without destroying hope, and complex treatment decision making. We have identified variables of major influence to surgeons in the palliative treatment selection for patients with advanced, solid malignancies. Validation of these variables as meaningful will require future studies focusing on patient outcomes. (J Am Coll Surg 2002;195: 411–423. © 2002 by the American College of Surgeons)

Palliative care has received increased emphasis in the management of cancer patients. The Institute of Medicine and National Cancer Policy Board issued a report in June 2001 entitled *Improving Palliative Care for Cancer*,[1] including numerous recommendations for an expanded role of palliation in the comprehensive management of cancer patients. These recommendations include palliative care research as a requirement for comprehensive cancer center status, development and formal testing of practice guidelines for palliative care of cancer patients, and an expansion of efforts to educate physicians and other professionals involved in care of cancer patients.[1] Although other medical specialties have begun to assimilate palliative care into residency training and have even developed fellowship training in palliative care, surgeons have had very limited formal education or training in palliative care.[2] There is minimal attention to palliative

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care in standard surgical textbooks.[3,4] Furthermore, within the disciplines contributing to the specialty of palliative medicine, there is scant attention to the role of surgeons in the symptom management of advanced disease. The most recent edition of the *Oxford Textbook of Palliative Medicine* dedicates just 16 of 1,283 pages (1%) to the role of surgery in palliative care.[5]

Palliative care can encompass any treatment such as operation, radiation therapy, or chemotherapy whenever the major goal of treatment is enhancement of quality of life (QOL) rather than cure. The Institute of Medicine/National Cancer Policy Board report calls for focus on palliation of symptoms earlier in the trajectory of malignant disease, with increased attention to symptom management even while the main objective remains cancer cure for the individual patient. In that sense, palliative care need not be synonymous with end-of-life care. Rather, palliative care should be more encompassing and range from symptom management for patients undergoing curative treatment to major interventions largely directed at symptom relief where cure is unlikely, and also encompass end-of-life care, as more traditionally interpreted. Palliative surgery is best defined as surgery aimed at alleviation of patient symptoms and improvement of patient QOL, with minimal anticipated impact on overall patient survival.[6] Palliative surgery may indeed increase length of survival for some patients, but cure would be expected in only a small minority of patients.

Despite lack of formalized training, there is extensive evidence that surgeons have long participated in and have extensive interest in palliative care. A recent edition of *Surgical Oncology Clinics of North America* was completely devoted to the topic of the surgeon's role in palliative care.[7] Despite the relatively long history of palliative surgery, there has been little change in the methods of evaluation or reporting outcomes describing palliative benefits of surgical intervention. The majority of literature continues to report outcomes of palliative surgery by reporting only surgical morbidity and longterm survival rates.

Given that patients undergoing operations for palliative reasons would be anticipated to have limited life expectancy, reporting worse survival data for palliative operations compared with "curative" procedures does not promote the important service surgeons can provide in alleviating symptoms of advanced malignancies.[8–10] The scarcity of QOL data in the surgical oncology literature has recently been reviewed.[11,12] Miner and colleagues' review of the literature[11] noted that less than 10% of studies on palliative surgery were prospective in nature, and only 17% of studies reported outcomes related to patient QOL. Recent review articles have both emphasized that QOL measurement should become integral to assessing outcomes of cancer surgery and that appropriate selection of validated instruments in measuring QOL is essential.[13,14]

To better understand the current role of surgeons in palliative care, we chose to survey members of the Society of Surgical Oncology, a group of surgeons with an anticipated higher concentration of cancer patients in their surgical practice. This survey was designed to estimate the scope of palliative surgery as it is currently practiced in the United States, and to evaluate factors influencing treatment decision making for symptomatic patients with advanced malignancies. The survey was also intended to examine barriers to the optimal use of surgery as a therapeuic modality of palliative care and to examine ethical dilemmas currently encountered in the practice of palliative surgery.

METHODS

A 110-item survey was developed and mailed to all members of the Society of Surgical Oncology. The survey was based on key literature regarding palliative care, such as the Institute of Medicine report, and revised extensively by the researchers. A mailing was sent out in May 2000, followed by a second reminder mailing in July 2000. Demographic questions included details related to the specific Society of Surgical Oncology members and the patient population each member served. The remainder of the questionnaire was composed of nominal and scaled responses that focused on the definitions and goals of palliative surgery, as well as certain aspects of the members' palliative surgery practices. Survey respondents were presented with four different case scenarios. Each scenario presented two patients (denoted Patient A and Patient B later in this article) with an advanced, solid malignancy and a single clinical variable of difference between the two patients. Four key variables of influence in treatment decision making evaluated were: tumor biology, patient age, extent of local disease (and attendant potential surgical morbidity), and severity of patient symptoms. In each case scenario, respondents were asked to select from four treatment options that included nonsurgical therapy (eg, chemother-

apy, radiation therapy or both), a minor surgical procedure, a major surgical procedure, or other symptom management. Surgeons were also asked to identify clinical factors that influenced their decisions. Eight clinical factors that might influence treatment selection and an "other" category were provided.

Survey data were entered into an electronic data file and analyzed using the Statistical Package for the Social Sciences (SPSS, Chicago, IL), version 10.07. Descriptive statistics were computed for each survey item as appropriate. Four hypotheses were tested in examining surgeons' decision making for treatment of symptomatic patients. These hypotheses examined the influence of the four variables on the treatment selected for symptom palliation. Invasiveness of treatment selection was coded on a three-point ordinal rating scale: 1, nonsurgical palliation; 2, minor surgery; 3, major surgery, with the higher score assigned to more invasive treatment options. "Other" treatment options were omitted from the analysis.

Hypothesis 1: All other factors being equal, treatment choice will be significantly more invasive for low-grade tumor biology than for a high-grade tumor.

Hypothesis 2: All other factors being equal, treatment choice will be significantly more invasive for a younger patient than for an older patient.

Hypothesis 3: All other factors being equal, treatment choice will be significantly more invasive for minimally invasive local disease than for extensively invasive local disease.

Hypothesis 4: All other factors being equal, treatment choice will be significantly more invasive for a patient with severe symptoms than for a patient with mild symptoms.

Hypotheses 1 through 4 were tested using paired *t*-tests for responses within each of the four pairs of vignettes, in which the mean ratings for Patient A were compared with the mean ratings for Patient B.

Logistic regression analysis was then conducted to identify factors of influence in the selection of major surgery as the treatment of choice for each patient (A and B) in each vignette. Because each respondent selected a treatment recommendation and identified rationale (factors influencing their recommendation) for each vignette, eight separate logistic regression analyses were conducted. The factors evaluated included patient age, functional status of the patient, biologic aggressiveness of the tumor, morbidity of the procedure, unclear treatment objectives, potential for cure, potential for pain and symptom control, or potential for symptom avoidance. The eight factors were coded as 0 (not considered a factor) or 1 (considered a factor). A ninth factor, surgical specialty (surgical oncology coded as 1 and general surgery coded as 0) was included in the analysis of the first two pairs of clinical vignettes. The decision outcome for each logistic regression was coded dichotomously as 0 (not major surgery) or 1 (major surgery).

RESULTS

Demographics

The survey response rate was 24% (419 of 1,740) (Table 1). Ninety-eight percent of respondents were surgeons, with the remaining 2% practicing either medical or radiation oncology. Because the vast majority of respondents were surgeons, the terms *surgeon* and *respondent/member* are used interchangeably throughout the remainder of this article. The median age of respondents was 48.5 years, with a range of 33 to 92 years of age. Ninety-one percent of respondents were less than age 65. On average, respondents had completed medical school 23 years before (range 6 to 66 years), and had completed last formal training 15 years before (range 0 to 60 years). Respondents had, on average, spent 14.4 years in the field of oncology (range 0 to 52 years), and 79% had completed fellowship training in a surgical oncology subspecialty. In total, 60% of respondents described themselves as surgical oncologists, 20% described themselves as general surgeons, and 20% as other surgical specialists. The reported ethnicities for the patient populations served by the surgeons are also listed in Table 1.

Although a response of 24% is less than desired, it is not unusual for a lengthy mailed survey. We compared demographic data of our respondents to the general membership of the Society of Surgical Oncology to determine how representative this sample is of the membership. Based on 2001 membership data available from the Society of Surgical Oncology, the sample is consistent with society membership.

Palliative surgery experience and definitions

The 110-item survey resulted in a large amount of data that has been divided into two articles. The authors have previously reported data regarding surgeons' palliative care education and clinical experiences.[2] To briefly sum-

Table 1. Demographics (n = 419)

Demographic	Data
Respondent age (y)	
Mean	48.5
Range	33–92
Respondent gender (%)	
Male	86
Female	14
Surgeon ethnicity (%)	
Caucasian	88
Asian	3
African-American	2
Hispanic/Latino	2
Other	5
Patient population ethnicity (%)	
Caucasian	70.9
African-American	15.0
Hispanic/Latino	9.2
Asian or Pacific Islander	3.8
American Indian or Alaskan Native	0.4
Other	0.7
Place of surgical residency (%)	
United States	89
Non-United States	11
Position (%)	
Staff physician surgery	89
Fellow surgery	9
Staff physician medical oncology	2
Time since completed medical school (y)	
Mean	23
Range	6–66
Time since completed last formal training (y)	
Mean	15
Range	0–60
Number of years in oncology	
Mean	14.4
Range	0–52
Surgical specialty (%)	
General oncologic surgery	60
General surgery	20
Thoracic	4
ENT	2
Colorectal	2
Urology	3
Gynecology	2
Other	7
Did you complete a fellowship in oncology or are you currently an oncology fellow? (%)	
Yes	79
No	21
Setting of practice (%)*	
University	47
Private	38
Cancer center	36
Research	10
Managed care organization	6
VA system	6
Other	7

*Several respondents indicated more than one practice setting.

marize those findings, surgeons targeted in this survey reported 74% of their overall surgical caseload being cancer related and estimated 21% (range 0% to 80%) of their cancer operations as palliative in nature. Surgeons reported limitations in their previous education in palliative care. Ninety percent reported receiving 10 hours or less of palliative care content in medical school, 79% reported 10 hours or less in residency or fellowship, and 74% reported 10 hours or less of continuing education in palliative care since completing their training.

Forty three percent of surgeons surveyed believed palliative surgery was best defined based on preoperative intent; 27% preferred to define palliative surgery postoperatively, when pathologic disease status was better defined. An additional 30% preferred to define cancer surgery as palliative based on individual patient prognosis. Only 43% considered estimated patient survival time an important factor in defining palliative surgery, and just 22% considered estimated patient 5-year survival rates important. The vast majority (95%) agreed that tumor still evident after surgery in a patient with a poor prognosis constituted palliative surgery. Most surgeons considered surgical procedures warranted secondary to generalized illness related to cancer (80%) (management of malignant effusions, ascites, etc.) or surgery warranted to treat complications related to cancer treatment (76%) as palliative surgery. Patient symptom relief and pain relief were identified as the two most important goals in palliative surgery, with increased patient survival identified as the least important goal of palliative surgery. These data demonstrated that palliative surgery is a major component of cancer surgery and general surgery practice. QOL parameters, not patient survival, were identified as the most important goals of palliative surgery. The survey data related to ethical dilemmas, barriers, and decision making are presented here and focus on

Table 2. Ethical Dilemmas in Surgical Oncology (n = 419): How Frequently Ethical Dilemmas Occur In Surgical Oncology

Item	Mean*	SD
Providing honest information without destroying hope	5.56	1.45
Preserving patient choice	4.98	1.65
Use of advanced directives	4.69	1.70
Withholding/withdrawing life-sustaining treatments	4.53	1.62
Patient and family with differing goals	4.35	1.60
Discontinuing life supports	4.12	1.78
Uncertainty about the patient's prognosis	4.05	1.70
Fear of causing death by giving pain medications	2.64	1.64
Composite ethical dilemma score	4.36	0.94

*Scale: 1 (uncommon) to 7 (very common).

decision making in the surgical management of symptomatic patients with advanced malignancies.

Ethical dilemmas

Surgeons were asked to identify the frequency with which specific ethical dilemmas were encountered in their surgical practice. Eight dilemmas were presented and respondents were asked to rate these on a scale of 1 (uncommon) to 7 (very common). Results are presented in Table 2. The most common ethical dilemma reported was "providing honest information without destroying hope" (mean = 5.56). This was followed by "preserving patient choice" (4.98), "use of advanced directives" (4.69), and "withholding/withdrawing life-sustaining treatments" (4.53).

Differences in perceived frequency of ethical dilemmas, including a composite ethical dilemma score, between three surgical specialty categories (general, oncologic, and other) were tested using one-way analysis of variance (ANOVA) and were found not to be statistically significant. Likewise, no statistically significant differences were found in perceived frequency of ethical dilemmas by practice setting when respondents were assigned a primary practice setting (private practice, 38%; cancer center, 28%; university, 30%; and other, 4%). Primary practice setting was assigned so that all subjects who self-identified as being in private practice were so categorized, the remainder who self-identified as practicing in a cancer center were so categorized, and the remainder who self-identified with university practice were so classified, with all other respondents falling into the "other" category.

Barriers to palliative surgery

Respondents were asked to identify barriers to optimum use of palliative surgery that they encountered in their current surgical practice. Ten potential barriers were provided, and respondents were asked to rate the barrier on a scale of 1 (not a barrier) to 7 (severe barrier). Patient and family reluctance to undergo surgery was the most severe current barrier (4.10), followed closely by limitations of managed care (4.09), see Table 3. Other barriers

Table 3. Barriers to Use of Palliative Surgery (n = 419): How Severe a Barrier Items Are to the Optimal Practice of Palliative Surgery

Item	Mean*	SD
Patient/family reluctance to undergo surgery	4.10	1.54
Limits of managed care (short hospital stays/outpatient care)	4.09	1.98
Referral to surgery by other specialists	3.91	1.82
Other cost considerations	3.90	1.85
Cultural factors influencing end-of-life care	3.64	1.62
Unknown prognosis	3.57	1.84
Time expenditure needed for palliative care patients	3.23	1.82
Legal/regulatory restrictions	3.11	1.73
Avoidance of dying patients	3.00	1.79
Surgery department reluctance to perform palliative surgery	2.57	1.57
Composite barrier score	3.50	1.13

*Scale: 1 (not a barrier) to 7 (severe barrier).

Table 4. Patient Vignette 1. Variable: Tumor Biology (n = 354)

Best treatment options (choose one)	Patient A (%)	Patient B (%)
Nonsurgical palliative treatment (eg, chemo- or radiation therapy)	8.0	36.7
Major surgical procedure	80.1	19.1
Minor surgical procedure	6.0	17.6
Other symptom management	5.9	26.6
Mean invasiveness of treatment selection* (standard deviation)	2.70 (0.6)	1.58 (0.8)†
Factors that influenced decisions (select all)		
Age (y)	52.2	37.6
Functional status of patient	56.7	46.9
Aggressiveness of tumor	71.1	84.2
Morbidity of procedure	58.1	62.4
Unclear objectives	12.1	29.4
Potential for cure with surgery/other therapies	42.1	25.1
Potential for pain or symptom control	75.8	62.7
Potential for symptom avoidance	49.2	33.9
Other	4.5	5.1

*1, nonsurgical palliation; 2, minor surgery; 3, major surgery.
†$p < 0.001$.

identified included lack of referrals to surgery by other specialists, treatment cost considerations, and cultural factors. Barriers to the practice of palliative surgery rated less severe included unknown patient prognosis, surgeon's time expenditure needed for palliative care patients, and legal and regulatory restrictions. The least severe barriers cited were avoidance of dying patients and surgery department reluctance to perform palliative surgery.

There was a statistically significant difference between surgical specialty categories in perceived severity of one barrier to palliative surgery: legal/regulatory issues. General surgeons rated this barrier as significantly more severe (3.78) than did oncologic and other surgeons (2.99 and 2.88, respectively), using the Scheffe post hoc test ($p < 0.01$). There was also a statistically significant difference between practice settings in perceived severity of one barrier to palliative surgery: Limits of managed care. Private practitice surgeons rated this barrier as more severe (4.56) than did those self-identifying as university surgeons (3.66) ($p < 0.01$).

Factors influencing treatment selection

The first pair of patient vignettes examined the influence of tumor biology on treatment decision making (Table 4). Patient A is a 55-year-old man with a history of pseudomyxoma peritonei of the appendix and abdominal distention and discomfort and a large amount of disease in the abdominal cavity. Patient B is a 55-year-old man with a history of poorly differentiated adenocarcinoma of the appendix and abdominal distention and discomfort and a large amount of disease in the abdominal cavity. Surgical oncologists were significantly more likely to recommend major surgery for Patient A than were other surgeons (chi-square = 21.01, $p < 0.001$). Of the 354 respondents, including all respondents who made a treatment selection accompanied by a selection of rationale (influencing factors) and who were oncology or general surgeons whose data could be included in subsequent analysis, 80% selected a major surgical procedure for Patient A, with only 19% selecting the same for Patient B. Hypothesis 1 was supported, in that the mean invasiveness of treatment choice for the low-grade tumor (2.70) was significantly greater than that for the high-grade tumor (1.59), $p < 0.001$. These results suggest that tumor biologic behavior is a significant factor influencing surgeons' treatment decision making.

Table 5 displays the results of the logistic regression analysis identifying the factors predictive of choosing major surgery as the treatment of choice for each patient. The pair of patients in each vignette can be compared for significant factors that differentiate the survey respondent's decision to choose major surgery as the treatment of choice in each scenario. Table 5 indicates the percent of respondents selecting major surgery for each patient, and the chi-square value for the full model of eight or

Table 5. Factors Predictive of Major Surgery

	Low-grade tumor	High-grade tumor	85 years old	35 years old	Brachial plexus ext.	Subcutaneous ext.	Minimal symptoms	Severe symptoms
n (respondents)	354	354	354	354	393	393	349	349
Major surgery (%)	80	19	33	75	28	49	16	55
Chi-square	83.03*	104.62*	201.76*	109.42*	90.47*	17.27†	46.83*	11.53
Factors‡ (odds ratios)								
Surgical specialty	1.79	1.12	2.86†	1.48				
Age (y)	2.55†	4.15*	0.18*	4.85*	1.11	1.53	0.58	0.98
Functional status	0.76	3.20†	14.21*	3.24*	1.86	1.02	1.10	1.53
Tumor aggressiveness	0.75	0.15*	0.35§	0.17*	0.43§	0.76	0.87	0.76
Morbidity of procedure	0.42†	0.88	0.30§	0.53	0.38*	1.11	1.12	0.83
Unclear objectives	0.07*	0.17*	0.20†	0.46	0.22§	0.38†	0.20†	0.80
Potential for cure	2.09†	1.19	8.21*	4.95*	0.555	1.63	3.58*	1.57
Potential for symptom control	0.83	2.62†	1.57	1.45	4.57*	1.49	2.03†	1.88†
Potential for symptom prevention	1.82	1.45	1.58	0.86	1.57	0.84	2.95*	0.72

* $p < 0.001$.
† $p < 0.05$.
‡Patient age, functional status of the patient, biologic aggressiveness of tumor, morbidity of procedure, unclear treatment objectives, potential for cure, potential for pain/symptom control, or potential for symptom avoidance. The eight factors were coded as 0 (not considered a factor) or 1 (considered a factor). A ninth factor, surgical specialty (oncology coded as 1 and general surgery coded as 0) was included in the analysis of the first two pairs of vignettes. The decision outcome for each logistic regression was coded dichotomously as 0 (not major surgery) or 1 (major surgery). Surgical specialty (oncology, 1; general surgery, 0) was included as a possible predictor of treatment recommendation for the first two pairs of vignettes because of significant bivariate associations described in the text.
§ $p < 0.01$.
ext, extension.

nine predictors, and then lists odds ratios (OR) for each factor. For vignette pair 1, the factor influencing the choice of major surgery for patients with low-grade tumors was potential for cure (OR = 2.09). For patients with high-grade tumors, factors influencing the choice of major surgery were patient functional status (OR = 3.20), and potential for symptom control (OR = 2.62). Morbidity of the procedure decreased the likelihood of recommending major surgery in patients with a low-grade tumor (OR = 0.42). Tumor aggressiveness was a factor of influence in decreasing the likelihood of selecting major surgery for patients with a high-grade tumor. Patient age (which did not vary between the patients in this vignette) was a significant factor in selecting major surgery as the treatment of choice in both patients. Unclear treatment objectives significantly mitigated against the recommendation for major surgery in both patients, decreasing the odds of selecting major surgery (OR = 0.07 for low-grade tumor and OR = 0.17 in the high-grade tumor).

Table 6 presents the results of the second pair of vignettes evaluating the impact of patient age on surgical decision making in two patients, both highly symptomatic, with locally advanced pancreatic cancer. Patient A is 85 years old and Patient B is 35 years old. Patient A is an 85-year-old woman with an excellent performance status and no major comorbidities who presents with recent midback pain, jaundice, vomiting, and weight loss. Workup reveals a mass in the head of the pancreas with tumor adherent to the portal vein. Patient B is a 35-year-old woman with an excellent performance status and no major comorbidities who presents with recent midback pain, jaundice, vomiting, and weight loss. Workup reveals a mass in the head of the pancreas with tumor adherent to the portal vein. Surgical oncologists were significantly more likely to recommend major surgery for patient A than were other surgeons (chi-square = 11.28, $p < 0.01$). Of the 354 respondents, for those who made a treatment selection accompanied by a selection of rationale (influencing factors) and who were oncology or general surgeons who could be included in subsequent analysis, patient age was a significant factor in treatment selection. Only 33% of such respondents selected a major surgical procedure for the 85-year-old patient; 75% selected major surgery for the younger patient. The mean invasiveness of treatment selected for

Table 6. Patient Vignette 2. Variable: Patient Age (n = 354)

Treatment options	Patient A (%)	Patient B (%)
Nonsurgical palliative treatment (eg, chemo- or radiation therapy)	27.4	13.0
Major surgical procedure	33.3	74.9
Minor surgical procedure	20.5	6.9
Other symptom management	18.8	5.2
Mean invasiveness of treatment selection* (standard deviation)	1.94 (0.9)	2.65 (0.7)†
Factors that influenced decisions		
Age (y)	66.0	65.0
Functional status of patient	57.9	63.0
Aggressiveness of tumor	57.0	54.2
Morbidity of procedure	68.0	53.1
Unclear objectives	8.7	5.9
Potential for cure with surgery/other therapies	45.8	63.8
Potential for pain or symptom control	60.7	60.5
Potential for symptom avoidance	40.4	41.5
Other	2.8	4.0

*1, nonsurgical palliation; 2, minor surgery; 3, major surgery.
†$p < 0.001$.

the younger patient (2.65) was greater than that selected for the older patient (1.94), $p < 0.001$. Factors differentiating choice of major surgery were surgical specialty (OR = 2.86 for the surgical oncologist), age (OR = 4.85 for the younger patient and OR = 0.18 in the older patient), morbidity of the procedure (OR = 0.30 in the older patient), and unclear objectives (OR = 0.20 in the older patient). Both functional status (which did not vary between patients in the vignettes) and potential for cure were significant factors in selecting major surgery as the treatment of choice in both patients. Interestingly, functional status was 14 times more likely to be a factor in recommending major surgery for the 85-year-old patient and only 3 times more likely in the 35-year-old patient (see Table 5).

The third pair of patient vignettes presented the variable of local disease extent and surgical morbidity of resection as a factor of influence in treatment selection (Table 7). The two described patients are both women with stage IV breast cancer, both with axillary and lung metastases and a history of disease progression despite chemotherapy.

Patient A is a 55-year-old woman with breast cancer

Table 7. Patient Vignette 3. Variable: Local Disease Extent (n = 393)

Treatment options	Patient A (%)	Patient B (%)
Nonsurgical palliative treatment (eg, chemo- or radiation therapy)	58.8	19.1
Major surgical procedure	28.0	49.4
Minor surgical procedure	4.6	26.6
Other symptom management	8.6	4.9
Mean invasiveness of treatment selection* (standard deviation)	1.65 (0.9)	2.32 (0.8)†
Factors that influenced decisions		
Age (y)	21.4	23.7
Functional status of patient	30.9	35.1
Aggressiveness of tumor	65.1	48.9
Morbidity of procedure	59.3	44.3
Unclear objectives	15.6	94
Potential for cure with surgery/other therapies	19.6	21.1
Potential for pain or symptom control	66.3	80.4
Potential for symptom avoidance	26.9	45.0
Other	3.0	2.5

*1, nonsurgical palliation; 2, minor surgery; 3, major surgery.
†$p < 0.001$.

Table 8. Patient Vignette 4. Variable: Severity of Patient Symptoms (n = 349)

Treatment options	Patient A (%)	Patient B (%)
Nonsurgical palliative treatment (eg, chemo- or radiation therapy)	56.1	4.2
Major surgical procedure	15.8	55.0
Minor surgical procedure	6.5	36.1
Other symptom management	21.6	4.7
Mean invasiveness of treatment selection* (standard deviation)	1.39 (0.8)	2.53 (0.6)†
Factors that influenced decisions		
Age (y)	34.6	31.3
Functional status of patient	45.7	45.1
Aggressiveness of tumor	45.0	42.2
Morbidity of procedure	50.9	47.3
Unclear objectives	19.9	6.0
Potential for cure with surgery/other therapies	19.0	16.7
Potential for pain or symptom control	51.4	85.8
Potential for symptom avoidance	34.3	40.3
Other	3.4	2.7

*1, nonsurgical palliation; 2, minor surgery; 3, major surgery.
†$p < 0.001$.

metastatic to her right axilla that is fungating, foul smelling, and painful and has progressed on chemotherapy. Workup shows it to be invading her brachial plexus, and there are new 5-mm nodules bilaterally in her lungs. Patient B is a 55-year-old woman with breast cancer metastatic to her right axilla that is causing her pain and has progressed on chemotherapy. Workup demonstrates a mass only in the subcutaneous tissue, and there are new 5-mm nodules bilaterally in her lungs.

There was no significant association between treatment recommendation and surgical specialty category or practice setting. Of the 393 respondents who made a treatment selection accompanied by a selection of rationale (influencing factors) who could be included in subsequent analysis, 28% selected a major surgical procedure for patient A compared with 49% choosing a major surgical procedure for patient B. The most frequently cited factors were the potential for pain or symptom control, aggressiveness of tumor, and morbidity of the procedure. The mean invasiveness of treatment selected was significantly greater for the less extensive disease (2.32) compared with the more extensive disease exemplified by brachial plexus involvement (1.65), $p < 0.001$. Three factors differentiating the selection of major surgery for more extensive disease were tumor aggressiveness (OR = 0.43 in the brachial plexus patient), morbidity of the procedure (OR = 0.38 in the brachial plexus patient), and potential for symptom control (OR = 4.57 in the brachial plexus patient). For both patients, unclear objectives mitigated against major surgery (OR = 0.22 and 0.38, respectively) (see Table 5).

The final pair of vignettes presented evaluated the influence of patient symptom severity on treatment decision making (Table 8). Both patients were 72-year-old women with endometrial cancer and pelvic metastasis complicated by a rectal-vaginal fistula. Patient A has minimal vaginal drainage; Patient B suffers from significant fecal drainage through the vagina, which bothers her substantially. There was no significant association between treatment recommendation and surgical specialty category or practice setting. Given these two patient scenarios, of the 349 respondents who could be included in subsequent analysis, only 16% opted for a major procedure for Patient A; 55% of respondents opted for major surgery for Patient B. The overall mean invasiveness of the procedure selected for the more symptomatic patient (2.53) was significantly greater than for the less symptomatic patient (1.39), $p < 0.001$. The three factors differentiating the selection of major surgery for patients with minimal symptoms were unclear treatment objectives (OR = 0.20), potential for cure (OR = 3.58), and potential for symptom prevention (OR = 2.95). Potential for symptom control was an influencing factor for selecting major surgery for both patients, as shown in Table 5. Notice that the entire model for Patient B did not significantly predict treatment choice (chi-square = 11.53, $p > 0.05$).

DISCUSSION

The management of cancer patients involves numerous decision points for both caregivers and patients. Modalities of treatment for solid tumor malignancies are multiple (surgery, radiation, chemotherapy), each with potential toxicities and varying influence on both patient survival and patient symptoms. Selecting the appropriate course of treatment can be influenced by patient comorbidities, individual patient treatment preferences, and the experience and biases of the multiple physicians who can be involved in the patient's care. Treatment choices are also influenced by local and regional practice patterns and available local expertise. Further challenges emerge when patients either present or progress to advanced stages of malignant disease and the likelihood of achieving cure is incrementally diminished with advancing stage of disease. Given the overall complexity of cancer management, patients often rely on their physicians for guidance in treatment selection.

Ethical dilemmas

This survey sought to investigate some of the physician challenges faced in approaching the management of complex, often symptomatic patients with advanced malignancies. Although several of the ethical dilemmas respondents rated as "frequently encountered" deserve discussion, we will focus our discussion on just a few. Data from this survey indicate that forthright discussions with patients regarding cancer surgery can be challenging. The ethical dilemma surgeons rated as most often encountered was "providing patients with honest information without destroying hope." This is because of a diminishing likelihood of achieving longterm survival through surgical means juxtaposed to standard oncologic principle that the greatest likelihood of achieving longterm survival requires surgical resection for grossly discernible disease combined with appropriate adjuvant therapy. The delicate balance of providing patients with appropriate information with which to make an informed decision while maintaining hope in patients with advanced disease is a well-known dilemma to experienced surgeons managing cancer patients. For each surgeon/patient partnership, the discussion is likely to be different and reflect a combination of the surgeon's previous training, attitudes, and experience and the patient's therapeutic desires, social situation, education, and cultural background. Nowhere is this discussion more challenging for the surgeon than in the palliative care setting, when there is a shift in focus from eliminating cancer to eliminating cancer side effects.

Recent work has highlighted the changing nature of communication between physicians and cancer patients, a shifting paradigm from paternalism to shared decision making. In the late 1950s and early 1960s, studies revealed that more than 80% of surgeons preferred not to inform their patients of a cancer diagnosis.[15,16] Contemporary work by Christakis and Lamont[17] has suggested that physicians remain overly optimistic in their communication with cancer patients. In 23% of cases, a patient who specifically asked for a prognosis was not given one, and an additional 40% of the time, the doctor would give a patient a prognosis, but what was communicated was different from the doctor's private, best estimate of how long the patient had to live. The author in that study suggested that the three major reasons doctors had difficulty communicating reliable prognostic information was that they were unable to formulate prognoses accurately, unable to accept a likely terminal diagnosis in their patients, and they were concerned about a self-fulfilling prophesy, ie, that the bad news may accentuate the problem. Nuland[18] has suggested that communication between surgeons and patients with advanced malignancies may be compromised by surgeons' failure to acknowledge the limitations of surgery to alter disease outcomes.

Surgical decision making

Selection of patients for any operation has always involved a balance of disease morbidity, surgical morbidity, severity of patient symptoms, and the likelihood of surgery successfully alleviating these symptoms. In the setting of surgery for advanced malignancies, the issues can be even more complicated. Can an operation offer a meaningful chance of cure? How likely is an operation to successfully palliate the specific symptoms for which the surgery is intended, and are alternative options of palliation available? Will surgically derived symptom relief be outweighed by potential morbidity and even mortality of the operation? Further, will the benefits of specific symptom relief achieved through surgical intervention outweigh the magnitude of progressive symptoms of metastatic disease such as fatigue and cachexia, which are beyond the influence of a surgeon's knife? These are some of the factors of decision making likely considered by surgeons evaluating patients with advanced malignancies for potential therapeutic surgical interventions.

Various factors of influence in treatment selection in the setting of patients with advanced malignancy were evaluated in this survey. Particularly, we chose cases involving solid tumor malignancies, for which surgeons often play a pivotal role in both initial disease management and management of complications of advanced disease where local disease control is a major issue. In the first pair of vignettes, tumor biology was found to be a significant variable of influence in the treatment selected by surgeons. Major surgery was much more likely to be selected (79%) for a patient with a less aggressive tumor biology than in a patient with a poorly differentiated malignancy (19%). Presumably surgeons anticipate that symptoms of bowel distention and discomfort are either less likely to be alleviated in a patient with poorly differentiated adenocarcinoma than in a patient with pseudomyxoma, or perhaps that patient survival would be so limited, or potential surgical morbidity too great, as to negate the value of a brief respite from symptoms in the patient with the more aggressive biology.

In the second pair of vignettes, two patients with symptomatic (back pain, jaundice, vomiting) pancreatic head lesions are presented, and for both patients the tumor has features suggesting low likelihood of curative resection (tumor adherent to the portal vein). Despite both patients having excellent performance status and no listed comorbidities, surgeons chose very different surgical options for the two patients. Seventy-seven percent selected a major surgical procedure for the younger patient, and only 34% chose a major surgical procedure for the 85-year-old patient. Emotionally, one might select a more aggressive stance in the younger patient, but survival data supporting this position are lacking. On the contrary, data support equivalent outcomes for older patients with good functional status. When gross disease remains at the completion of an operation, age is not a factor in achieving longterm survival, and currently no data exist to support improved outcomes regarding symptom palliation based on age criteria. Similarly, there are little data that prove the duration or quality of palliation is any less in an older patient with surgically unresectable disease.

The final two pairs of vignettes both suggest that the extent of local disease (a surrogate for operative morbidity) and the severity of symptoms both influence treatment selection for patients with advanced disease. These two factors emphasize that carefully performed quality-of-life measurements will play a crucial role in determining the success of palliative surgery. The process of reporting symptom palliation is a difficult challenge, particularly in the context of advanced disease.[1,19] Any surgical success in alleviating patients' preoperative symptoms will need to be carefully balanced against potential development of new symptoms related to surgical complications or the recurrence of preoperative symptoms that may result from incomplete resection of disease and subsequent tumor regrowth. The potential for symptom control was found to be a major factor influencing the treatment selection of major surgery for each of the last two vignettes. This emphasizes that surgeons are acutely aware of the importance of symptom management in palliative surgery. Nevertheless, treatment selection was certainly not uniform among surgeons reviewing these scenarios and may reflect the lack of data regarding the success and durability of surgically attempted symptom relief. To date, there are very limited data reporting quality-of-life outcomes in patients undergoing operations with major intent of symptom alleviation rather than cure. Available reports[11,12] tend to have surgeon- rather than patient-reported outcomes.

There is currently a major health initiative on quality palliative care in the United States. This survey supports the need for surgeons to better understand this important aspect of health care and continue to contribute to the management of symptomatic disease with effective surgical interventions. The practice of palliative surgery is widely practiced in the discipline of surgical oncology. This survey has identified several variables that influence treatment selection for patients with advanced solid tumor malignancies. Validation of these variables as meaningful criteria to guide treatment decisions will require studies that focus on patient-reported quality-of-life outcomes.

Appendix

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Invited Commentary

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The article on palliative care by McCahill and colleagues is timely because we have entered a century in which the population of elderly patients will continue its exponential rise. Estimates are that by 2050 there will be between 20 and 30 million persons over the age of 80. It is our goal as physicians to maximize life span while maintaining quality of life, dignity, and overall satisfaction. Herein lies the similarity of care of the frail elderly and cancer patient—both have a terminal illness—and we need to decide whom we should invest medical resources and effectively treat to maximize life and whom we have little to offer except palliation for the duration of their illness.

McCahill and associates focused on cancer palliation, and questioned members of the Society of Surgical Oncology, and therefore received responses mostly from surgical oncologists in a university setting, although a number were surgeons in private practice. Very few were colorectal surgeons, which is problematic because of the high number of deaths from colorectal cancer in the US.

The authors confirm that surgeons adequately bal-