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Trends in Palliative Surgical Care

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Keywords

• Palliative surgery • Decision making • Palliative care • Metastasis

Key points

- Surgical palliative care addresses goals of care for a patient with a surgical problem including preservation of quality of life, reduction of suffering, and even prolongation of survival.
- In the setting of advances in systemic treatment, the indications for surgical intervention are rapidly shifting and now encompass considerations beyond hopeful preemption or end-of-the-line treatment.
- Expansion of palliative surgery now encompasses ''adjuvant surgery'' and a surgeon's role in determining the appropriateness of nonoperative management.
- Decision making in surgical palliative care involves data, but must also incorporate the presentation of treatment options in the context of a patient's preferences and treatment goals.

INTRODUCTION

A 1990 report from the World Health Organization offers one of the first and most widely referenced definitions of palliative care: ''Palliative care is the active total care of patients whose disease is not responsive to curative treatment. Control of pain, of other symptoms, and of psychological, social and spiritual problems is paramount. The goal of palliative care is achievement of the best possible quality of life for patients and their families. Many aspects of palliative care are also applicable earlier in the course of the illness, in conjunction with anticancer treatment'' [1].

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The subspecialty of hospice and palliative medicine was not recognized with a certificate by the American Board of Medical Specialties until 2006 [2,3], but there has been a steady momentum of rapid growth and increasing recognition of palliative care benefits for patients and their families, as well as to hospitals and health care systems [4–9]. Palliative care specific to the surgical setting has benefitted from the recent growth of the field more broadly. Surgeons' academic interest in palliative care continues to evolve but use of more formalized palliative care services in surgery continues to lag behind that of medical specialties, and specific roles for palliative interventions are often less clear.

This article summarizes recent trends in palliative surgical care. We briefly provide an overview of the history of palliative care in the surgical setting and then review some of the most recent research findings in palliative surgical procedures for common diseases. To close, we look into the future of this discipline by considering the changing nature of how advanced surgical disease is managed.

EVOLUTION OF PALLIATIVE SURGICAL CARE

Surgical intervention is predominantly undertaken as a curative endeavor. Fix the broken arm. Remove the ureteral stone. Cut out the cancer. In the not-so-distant past, surgical palliative care primarily consisted of operative interventions designed to treat symptoms and/or preempt sequelae of the natural history of advanced and possibly incurable disease.

There are several overarching paradigms to consider in the palliative care of the surgical patient (Table 1) [2]. First, there is the generalized notion of palliative care, broadly encompassing an interdisciplinary team that addresses physical, psychological, spiritual, and practical burdens of illness. Surgical palliative care, or what might classically be thought of as palliative care for the surgical patient, addresses goals of care for a patient with a surgical problem including preservation of quality of life, reduction of suffering, and even prolongation of survival (eg, obstructing metastatic colon cancer relieved with diverting colostomy and treated with systemic chemotherapy). In turn, palliative surgery, although often a part of surgical palliative care, is a specific surgical intervention designed to treat the patient but not necessarily to cure the disease. There is clearly overlap of these concepts and strategies. It is also important to understand the opportunity to incorporate both concepts as part of a patient's overall care plan, including efforts aimed at treatment and cure.

There has been directed leadership from the American College of Surgeons (ACS) to advance research and education in surgical palliative care. In 1998 the ACS produced the Statement on Principles Guiding Care at the End of Life [10], and from there created the Surgical Palliative Care Workgroup, which first met in 2000 [11,12]. The ACS has promoted educational offerings in palliative care, with forums at national surgical meetings and the development of didactic curricula [13,14]. However, despite this increased attention, researchers recently found that there has been no meaningful improvement in surgeons' education in palliative care over the past decade, as measured by a regional survey of surgeons, medical oncologists, intensivists, and palliative

Table 1
Palliative care definitions

Palliative care	Medical care provided by an interdisciplinary team, including the professions of medicine, nursing, social work, chaplaincy, counseling, nursing assistant, and other health care professions, focused on the relief of suffering and support for the best possible quality of life for patients facing serious life-threatening illness and their families. It aims to identify and address the physical, psychological, spiritual, and practical burdens of illness.
Palliative medicine	Palliative medicine is the study and management of patients with active, progressive, and far-advanced disease, for which the prognosis is limited and the focus of care is the quality of life.
Surgical palliative care	Surgical palliative care is the treatment of suffering and the promotion of quality of life for patients who are seriously or terminally ill under surgical care [1].
Palliative surgery	A surgical procedure used with the primary intention of improving quality of life or relieving symptoms caused by advanced disease. Its effectiveness is judged by the presence and durability of patient-acknowledged symptom resolution.
Hospice	Hospice is variably used to describe (1) a philosophy of care; (2) a place of care; or (3) an insurance benefit, such as the Medicare Hospice Benefit. Hospice describes supportive care for patients and their families during the patients' final phase of life-limiting illness. The traditional goal of hospice care is to enable patients to be comfortable and free of pain, so that they live each day as contentedly as possible.

From Dunn GP. Surgical palliative care: recent trends and developments. Anesthesiol Clin 2012;30(1):13–28; with permission.

care physicians [15]. Deficiencies in palliative care training were associated with more aggressive treatment recommendations in advanced cancer case scenarios. Other research corroborates these findings, including one study that identified that few fellows in surgical oncology and hepatobiliary surgery programs report exposure to palliative care education during their training, although the impact on practice patterns was not evaluated [16].

Given the evidence demonstrating persistently low levels of exposure to palliative care education and training for surgeons, it follows that use of palliative care services for surgical patients may lag behind that for medical patients. A study published in 2018 by Olmsted and colleagues [17] evaluated the frequency of interventions in the last year of life for nearly 200,000 patients within the Veteran's Health Administration. The retrospective study found that surgical patients were significantly less likely than medical patients to receive palliative or hospice services in the last year of life and that more than 20% of patients had at least one surgical procedure in the last year of life.

Indeed, surgeons themselves identify barriers to offering palliative care for their patients, including inadequate education and training in palliative care and difficulty communicating around these difficult topics. Difficulty with prognostication and uncertainty were also reported as barriers to offering palliative care to their patients [18]. This reluctance to fully embrace palliative care may

be in part because of its historic association with hospice care, which promotes an antiquated construct that palliative care is synonymous with end-of-life care or hopelessness. Although palliation is a goal unto itself, it should also be used as a means of complementing disease-targeted therapy and not viewed as either an aggressive or nihilistic approach per se.

Research reports in palliative surgical care have arguably been of variable quality, largely because they represent retrospective reviews, often of small cohorts of patients. Because these are often patients with advanced disease states, reported end points do not always convey meaningful outcomes and the retrospective nature of these studies is fraught with patient selection bias and they do not reflect the complex decision-making processes inherent in decisions to undergo (or defer) a palliative procedure. In 2016, Lilley and colleagues [19] published a systematic review of interventions aimed at improving quality and delivery of palliative care for surgical patients. The report found that palliative care interventions for surgical patients are beneficial, improving communication and reducing overall health care resources. However, the authors stated they were unable to perform a meta-analysis or draw many meaningful conclusions in light of dissimilar study methods across the studies they identified. In short, their review demonstrated that research into the paradigm of palliative care for the surgical patient is limited.

It is also worth noting that palliative care has largely been a service available to those in well-resourced settings. This has led to disparities in access to interdisciplinary palliative care services [20,21]. However, even in the absence of a palliative care team, all surgeons must be ready to incorporate palliative care principles into their scope of practice.

THERAPEUTIC TRENDS

Disease-specific guidelines in surgical palliative care remain scarce. Many have associated surgical intervention in patients with advanced conditions with significant morbidity and mortality [22,23]. Careful patient selection was the cornerstone of improved results, and there were, at best, modest gains in the ability to effectively prevent or treat symptoms related to incurable or advanced disease. On the other end of the spectrum, many took the nihilistic perspective that surgical palliation could have no benefit.

In the setting of advances in systemic treatment of some disease types, however, the indications for surgical intervention are rapidly shifting and now encompass considerations beyond hopeful preemption or end-of-the-line treatment. With this evolution is the expansion of the broader field of "palliative surgery" to include "adjuvant surgery" and a surgeon's role in determining the appropriateness of nonoperative management.

SURGICAL ONCOLOGY

Surgical oncologists have been the traditional prototype of surgeons who deal with palliative issues. Palliative surgery considerations were classically used to treat symptoms associated with advanced cancers at the end of life. Palliative

surgery served to alleviate obstructive symptoms, as is the case with proximal colonic diversion in the setting of obstruction or placement of pleural drainage catheters to manage symptomatic malignant effusions. Indications broadened with preemptive procedures when unresectable cancers were encountered. For instance, surgical palliation in the setting of unresectable pancreatic cancer has long been a part of clinical practice and used to preempt downstream sequelae of tumor growth and subsequent gastric outlet obstruction and obstruction of the biliary tract [24]. Even in this classic example, the open gastrojejunostomy with biliary-enteric bypass option has evolved to include minimally invasive approaches, such as laparoscopic gastrojejunostomy (with or without jejunostomy) and consideration of an endoscopically placed biliary stent, noting the trade-offs between operative morbidity and durable palliation with patient performance status and overall life expectancy.

With the discovery of more effective systemic treatment regimens, surgical interventions that were previously purely palliative in intent began to form the foundation of multimodality, cancer-focused treatment. For example, there is well-accepted evidence over the past several years supporting improved survival (and survival that continues to improve) following palliative resection of asymptomatic primary tumors in stage IV colon cancer [25–27]. A meta-analysis published in 2018 found that overall and cancer-specific survival improved following tumor resection after years of evolving practice patterns [26]. "Successful" two-staged resections for stage IV colorectal cancer in the early 2000s have evolved, along with increasingly effective systemic options into more nuanced curative-intent management strategies for those with metastatic disease.

Similar findings were recently published in metastatic cervical cancer, demonstrating another solid organ tumor with improved survival associated with definitive local therapy in the setting of advanced disease [28]. All of these are retrospective studies, but their findings support resection of the primary tumor even in the setting of metastatic disease, largely a testament to the increasing effectiveness of systemic treatments.

In contrast, the results of the Carmena study [29], a randomized-controlled trial, were published in 2018 and challenged the role of primary surgical management in metastatic renal-cell carcinoma (RCC). The standard of care for the past two decades in metastatic RCC has been cytoreductive nephrectomy, and this was in fact one of the seminal examples of such a cytoreductive strategy followed by interleukin-2-immunomodulation. Yet in the past decade, more highly effective targeted therapies have emerged in the treatment of RCC. In this trial, patients with synchronous metastatic RCC were randomized to receive sunitinib (a receptor protein-tyrosine kinase inhibitor) or to undergo nephrectomy followed by sunitinib. Survival was not worse with sunitinib alone compared with sunitinib after surgery (18.4 vs 13.9 months, respectively, in a noninferiority trial). In the so-called Surgery Time (SURTIME) trial [30], investigators sought to investigate the approach of deferred cytoreductive nephrectomy, comparing sunitinib followed by nephrectomy (and subsequent

sunitinib) with nephrectomy followed by use of sunitinib. The findings of the study were underpowered, but suggested noninferiority of deferred nephrectomy. Both studies challenge the long-held belief that primary nephrectomy plays an essential role in the management of metastatic RCC and herald a changing paradigm. New, highly effective targeted molecular therapy and immunotherapy regimens for a host of metastatic tumors are now accompanied by evolving indications for surgical intervention in the setting of advanced cancer; considerations for "palliative" resection of metastatic disease has morphed to that of "adjuvant surgery."

EMERGENCY SURGERY AND MALIGNANT BOWEL OBSTRUCTION

Comprehensive palliative care is often considered in patients with chronic terminal illnesses, and there is an increasing role for the same services in acute illnesses. Indeed, just as there is often an urgent or emergent need for surgical intervention in the acute setting, there is an increasing appreciation for the role of palliative care concomitant to these emergent evaluations. Moreover, acute changes in chronic conditions can challenge previously established goals of care and quality-of-life concerns.

Compared with elective surgical care, emergency surgery, particularly in older populations and those with chronic illness, is associated with greater morbidity and mortality for patients, and increased cost to hospitals and health systems [31–34]. Reports vary, but in patients with disseminated malignancy undergoing emergency surgery, 30-day morbidity and mortality rates have been found to be 50% and 27.9%, respectively [22]. A recent study specifically evaluated the outcomes of emergency major abdominal surgery in adults older than 65 years of age. The authors characterized study subjects by illness burden before undergoing emergency major abdominal surgery and found, unsurprisingly, that higher preoperative illness burden was associated with a higher risk of poor outcomes, such as in-hospital death and death within the first year after surgery [35]. These findings confirm inherent patient selection bias and, importantly, challenge us to more carefully consider all treatment alternatives. Surgical decision making for older adults is often complex, and only so much more so in the setting of an acute illness.

Better risk assessment and prognostication are ways to better inform decision-making processes. A 2017 study found reduced postoperative mortality for patients who underwent preoperative frailty screening [36]. Note that this study was conducted in the preoperative setting for patients undergoing elective, rather than emergency, surgery. Postoperative mortality decreased for all patients in the study, but most considerably for frail patients. Another study by the same group studied the impact of frailty screening on palliative care in the preoperative setting, demonstrating that preoperative palliative care consultation was associated with decreased postoperative mortality [37]. Although not explicitly able to be captured in either study, it may be inferred that in some instances operative decision making changed as a result of the

frailty assessment and/or the palliative care consultation, including the decision not to operate.

Indeed, not operating is an important and emerging concept in surgical palliative care. Researchers have shown that even in patients who achieve initial symptom relief following palliative surgical intervention, more than half will have recurrent or new symptoms within months [23]. Several studies have been recently published raising questions about the role of operative intervention in a common surgical problem encountered in patients with advanced cancer: malignant bowel obstruction (MBO). MBO is most frequently associated with colorectal and ovarian cancers, but can also be seen in the setting of many malignancies ranging from melanoma to gastric cancer [38]. Obstruction can be secondary to new discrete masses or more diffuse processes, such as carcinomatosis. The presence or absence of these features often guides management strategies, but diagnosis of the latter can be elusive in the preoperative setting. The guiding principle of treatment, regardless of the cause, is symptom relief. However, the widely variable outcomes after operative intervention have made palliative surgery in these settings often frustrating and increasingly controversial.

An updated MBO systematic review [39,40] found that the operative intervention itself varied widely and reported outcomes were not routinely stratified by operation. In addition, patients experienced clinical resolution between 26.7% to more than 68% of the time, whereas return to oral intake ranged from 30% to 100%. The durability of symptom relief is incompletely reported and just one of many important end points for these patients. Quality of life is infrequently measured in an explicit fashion and the authors are often unable to draw reliable conclusions about the merits of operative intervention for MBO. A clinical trial comparing surgical and nonsurgical management strategies for MBO is underway (ClinicalTrials.gov identifier NCT02270450) [41]. Primary outcome measures include number of days alive and outside hospital; secondary end points include a focus on gastrointestinal function, such as ability to eat, days with nasogastric tube, days of intravenous hydration, and days of solid food. There is also specific measurement of quality of life outcomes.

BURNS AND SURGICAL CRITICAL CARE

Traditionally, the academic and clinical focus of palliative care has been on patients with malignant disease. There is also increasing integration of palliative care in surgical intensive care units (ICUs), where patients across the spectrum of surgical disease require interdisciplinary care to address their complex and varied needs.

For example, care for burn patients has been credited as one of the first areas of surgical palliative care [2,11]. Burn care involves intensive pain management while managing complex physiology and severe injuries. Because of historically low survival rates, burn care became a discipline well suited for integration of palliative care services [42]. However, a recent nationwide study published in 2018 evaluated the use of palliative care services in burn care and found that

palliative care services may be underused in this population. The study found that elderly, comorbid, and more extensively burned patients were more likely to receive palliative care consultation. Encouragingly, there was also a linear increase in palliative care use over the course of the 10 years studied. Yet even at its peak, less than 6% of burn patients received formal palliative care consultation as part of their multimodality management [43].

In addition to the care of burn patients, critical care more broadly is a discipline ripe with opportunity for the engagement of palliative care. The extent of need is so great that some centers have even included an automatic palliative care consultation for all patients on admission to the ICU. Providers in surgical ICUs benefit from working with dedicated palliative care teams to assist in the care of critically ill patients [44]. The ACS Trauma Quality Improvement Program *Palliative Care Best Practice Guidelines*, published in 2017, supports the essential role for interdisciplinary palliative care in surgical ICUs while recommending that trauma care providers themselves should have a basic knowledge and skillset in palliative care. The *Guidelines* also reinforce the important theme that palliative care for trauma patients must proceed alongside, rather than instead of, life-saving care [14].

OVERARCHING WORK IN SURGICAL PALLIATIVE CARE

Given degrees of uncertainty, a research and action agenda becomes increasingly clear and there are ongoing efforts to help surgeons and their patients in their clinical decision making with regard to palliative intervention. Physicians crave prognostic certainty in quantifying outcomes, especially if risks of the procedure and the underlying condition may outweigh benefits hoped to be gained with an intervention. The use of the frailty index is helpful in guiding patient discussions, as are other risk calculators. Many prediction tools are being developed to better assess probability of specific outcomes given a set of measurable variables. Resultant estimates are incorporated into discussions about prognosis and likelihood of favorable outcomes or adverse events. A nomogram recently developed by researchers at the University of California at Davis Medical Center uses ACS National Surgical Quality Improvement Program data to estimate risk of 30-day morbidity and mortality following surgical intervention in patients with disseminated malignancy [22]. Efforts like these are designed to help providers better understand the risks of palliative interventions, so that they may be better informed when guiding patients in decision making.

Important work in the process of shared decision making is ongoing. Although risk assessment may take expected or anticipated best or worst-case outcomes into account and help present complex data in a more simplified manner, important information support for decision-making processes is still evolving. Decision making involves data, but must also incorporate the presentation of treatment options in the context of a patient's preferences, and treatment goals. Truly shared decision making requires dialogue in addition to information so that patient preferences are elicited and gains are matched

with trade-offs that are assumed in exchange for the desired outcome. Education around the balance between medical recommendations and patient autonomy must inform surgeons' use of data and prognostic tools [45]. Efforts to develop conversation frameworks are a starting point for more patient-centered decisions and improved care in difficult acute and/or end-of-life settings, and there is an evolving concept that merely providing patients with evidence and inviting them to choose a treatment option is inadequate for true patient empowerment.

The relative weighting of "more is more" and "less is more" becomes less important. Conversation as "instrument of care" leverages evidence and an opportunity to uncover the best decision given a patient's circumstances and values [46], possibly avoiding futile surgical procedures or, conversely, possibly understanding trade-offs for a best case scenario and hoped-for outcome (Fig. 1). Work by the Schwarze group [45,46] has led to the development of a novel communication tool called "Best Case/Worst Case" to promote goal-concordant care following discussions about risk-risk acute surgical issues.

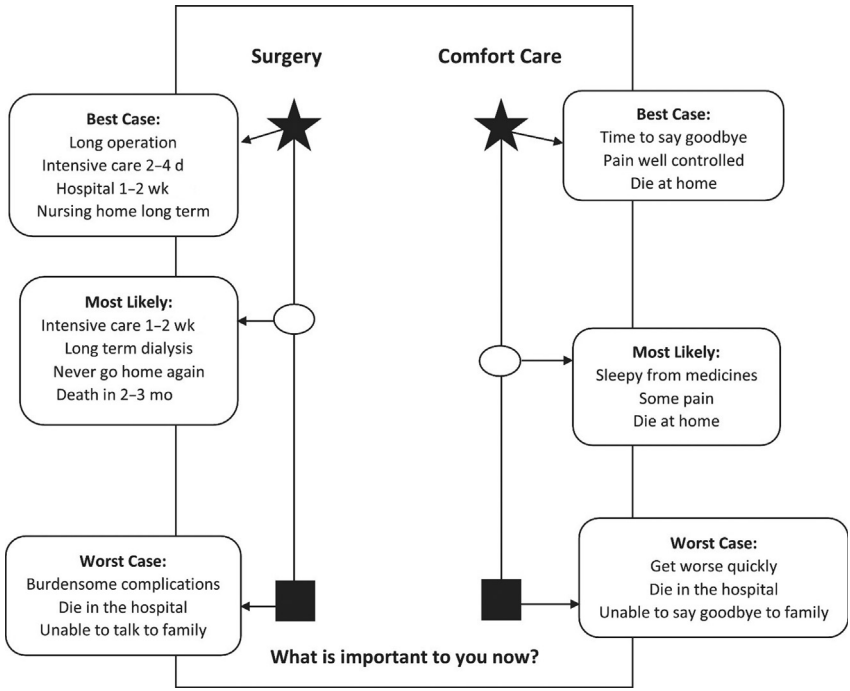

Fig. 1. Representative graphic aid example of "Best Case/Worst Case" communication tool. (*From* Taylor LJ, Adkins S, Hoel AW, et al. Using implementation science to adapt a training program to assist surgeons with high-stakes communication. J Surg Educ 2019;76:166; with permission.)

There remain appropriate scenarios for palliative surgery, and the importance of considering each case individually remains paramount. However, equally important to knowing when to operate is knowing when not to, and efforts continue to help guide surgeons and their patients through these complex decisions.

EVOLUTION OF PALLIATION AND FUTURE DIRECTIONS

Among the central challenges of palliative care, and certainly of palliative surgery, is that what is considered curable or treatable disease is a constantly moving target. Arguably, in light of the definitions of palliative care provided throughout this article and elsewhere, improved survival should be viewed as an important secondary benefit, rather than a primary aim, of palliative care. Patients with incurable diseases are living much longer than before because of advances in multimodal treatments including, among others:

- Surgery
- Chemotherapy
- Radiation
- Immunotherapy

However, among the more recently lauded benefits of palliative care is improved survival [9]. There is a dyad of optimal care for patients with incurable diseases; one suggests that operative intervention is beneficial, and the other suggests that operative intervention is, perhaps, unnecessary. A recent white paper defining research priorities for surgical palliative care included: measuring outcomes that matter to patients, communication and decision making, and a focus on how to deliver palliative care to surgical patients [47].

What is clear from these recent trends is that uncertainty is unavoidable. Better treatments and better predictive models are important advances, but engaging in patient discussions for shared decision-making trumps incremental improvements in surgical outcomes. Strategies for managing uncertainty and discussing uncertainty with patients can and should be taught so that decisions are made using data and patient preferences collectively, prioritizing patients' goals of care.

SUMMARY

Surgical palliative care, including considerations for palliative surgery, must be approached with the intention to relieve suffering and pursue therapeutic benefit where possible and desired. There are ongoing opportunities to provide palliative care to many who stand to benefit from it. Truly integrated and interprofessional palliative care services benefit the patient and their families; timely and comprehensive care improve quality and quantity of life. Although the medical and surgical nuances of palliation continue to evolve with practice-changing discoveries and continued innovations at the bench and in the operating room, "precision medicine" for surgical palliative care may come in the form of enhanced communication skills around decision making in the palliative setting.

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