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Case Report

GASTRECTOMY R1/R2

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ABSTRACT

Background: Effective palliation rather than cure is often the most appropriate goal in the management of patients with advanced gastric cancer. The literature to date is limited by the imprecise use of the term palliative and subsequent variable designation of patients into evaluable groups.
Study design: Between 2000 and 2007, 303 patients underwent an operation for gastric adenocarcinoma. Patients who received a noncurative (R1/R2) resection were identified. A procedure was defined as palliative if it was performed explicitly to palliate symptoms or improve quality of life.
Results: One hundred and ninety five of them (65%) received a noncurative gastric resection. The operation was palliative in 47% (92/195) and nonpalliative in 53% (103/195). Palliative noncurative operations aimed at preservation of tumour-engaged organ's function, enhanced quality of patient's life till death, but not prolonged his life. No curative or palliative operations aimed at cytoreductive effect by removing the organ engaged with primary tumour and improve the results of postoperative complex treatment and prolong the patient's life.
Conclusions: There are important differences among patients undergoing noncurative operations for gastric cancer. Studies designed to measure palliative interventions would benefit from precise designations of palliative intent in patients receiving noncurative operations.

Key Words: gastrectomy, palliative, gastric cancer

INTRODUCTION

Considerable variation in defining palliative care has complicated the understanding of the role of surgery in managing patients with advanced malignancies (1) Surgeons commonly use the word *palliative* to describe a procedure performed in the presence of unresectable disease, a patient with limited survival, or as acknowledgment that a successful curative operation is not possible (2). Such imprecise and incorrect characterizations of palliation have contributed to varied interpretations of surgical indications and outcomes. Palliative care has been defined by the World Health Organization as "the total active care of patients whose disease is not responsive to curative treatment. Control of pain, or other symptoms, and of psychologic, social, and spiritual problems is paramount. The goal of palliative care is the achievement of the best quality of life for patients and their families (3). Others have further classified surgical palliation to include the evaluation of extent of disease (to include surgical biopsy), control of local disease, control of discharge or haemorrhage, control of pain, reconstruction and rehabilitation, and treatment of procedure-related complications (4). Although these broad definitions provide a global understanding of the scope of palliative care, they fail to clarify the subject of surgical palliation. For example, inclusion of patients undergoing a surgical biopsy with those undergoing a palliative resection produces such dissimilar groups that the evaluation of important factors such as surgical morbidity and mortality is severely limited. Even in patients with known metastatic disease, it is difficult to make valid comparisons between contrasting clinical scenarios such as elective

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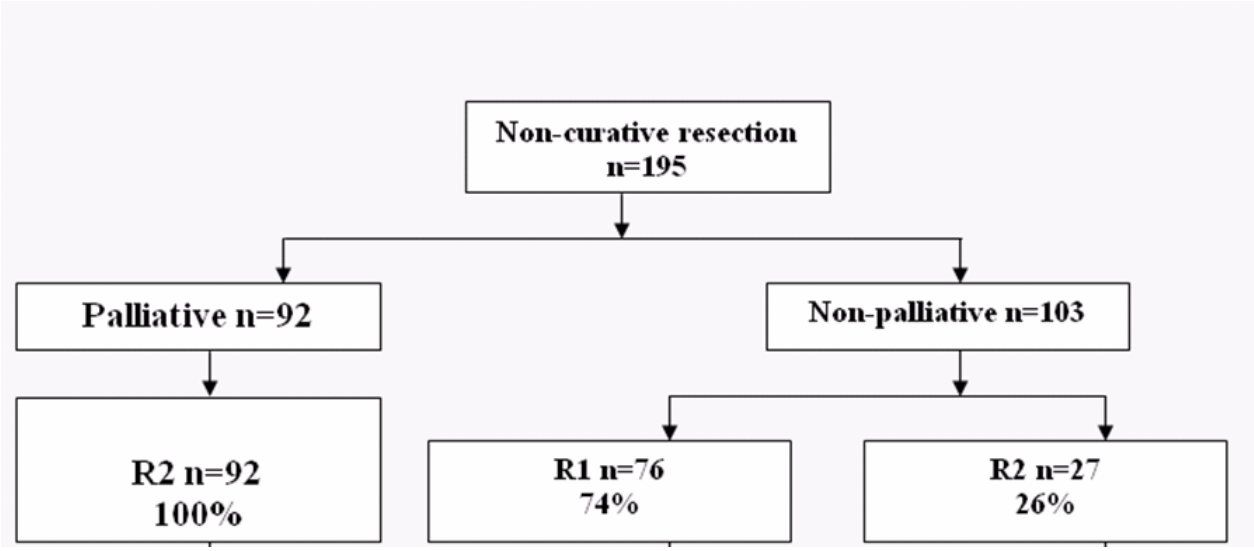
flap coverage of a complex wound versus an emergency laparotomy for gastrointestinal bleeding. Because ideal palliative care requires an approach defined in terms of a patient's individual needs and values, identical procedures may play dramatically different roles for each patient (5). Surgical palliation of malignancy is defined best as a procedure used with the primary intention of improving quality of life or relieving symptoms caused by an advanced malignancy (1, 2, 5). Palliation is not the opposite of cure. Each term has its own distinct indications and goals and should be evaluated independently. Important considerations relate to the medical condition and performance status of the patient, the extent and prognosis of the cancer, the potential for a curative procedure, knowledge of the natural history of the primary and secondary symptoms, potential durability of the intervention, and the expectancy and quality of life of the patient (6). By stressing quality of life and symptom control as key elements of palliative care, this definition not only maintains a primary focus on an individualized approach for palliative surgery but also is consistent with the recommendations of the World Health Organization definition, the landmark *Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment Trial*, (7) and the *American College of Surgeons Statement on Principles Guiding Care at the End of Life* (8). A survey of *The Society of Surgical Oncology* members demonstrated a need for clarity in defining palliative surgery. These surgeons strongly acknowledged the importance of quality of life and symptom control in evaluating the effectiveness of palliative surgery (9).

Because of the low cure rate and the advanced stage presented by many patients, palliative strategies are an essential component of gastric cancer management. Surgical palliation of advanced gastric cancer may include resection or bypass, alone or in combination with endoscopic or percutaneous interventions. Such interventions have been proposed not only to improve symptom control, but also to eliminate potential complications (bleeding, obstruction, pain, perforation, debilitating ascites) caused by the primary tumour (10, 11). The effective and appropriate use of gastric resection as a palliative intervention in gastric cancer remains controversial. The aim of this study is to examine the role of surgical intent in patients undergoing a noncurative resection for gastric cancer to allow appropriate comparisons between properly defined groups. Analysis of this particular group of patients could serve as a useful framework to designate groups of patients requiring noncurative procedures for other advanced malignancies as well.

METHODS

All patients admitted to the surgical services of Department of General and Operative Surgery, St Marina University Hospital with a diagnosis of gastric adenocarcinoma between 2000 and 2007 were entered into the department of surgery's prospective database. Those patients who underwent a gastric resection were included in this study. The extent of resection depended on the location of the primary tumour and was defined as R0 if there was complete resection of all disease, R1 if there was residual microscopic disease at the resection margins, and R2 if there was an incomplete resection with gross residual disease. Although a standard D2 lymphadenectomy usually was performed in patients in whom the primary surgeon felt a complete resection could be achieved, the extent of lymphadenectomy was at the discretion of the attending surgeon in those patients in whom a complete resection was not possible. Unplanned operations required within 24 hours of admission were considered to be emergent. Patients undergoing an R1 or R2 resection were considered the noncurative resection group for this analysis. Demographic, operative, pathologic, and staging data were recorded from the database and listed descriptively. Noncurative gastric resections were classified as either palliative or nonpalliative. An operation was considered palliative only when the record explicitly stated that it was performed to relieve specific symptoms, control pain, or improve quality of life. Although subjects classified as nonpalliative often had symptoms worthy of treatment, operations appeared to be performed with curative intent (prolong survival time, prevent tumour recurrence, "cure" the cancer). See **Table 1**.

Table 1. *Surgical intent of non-curative gastric operations and R status*



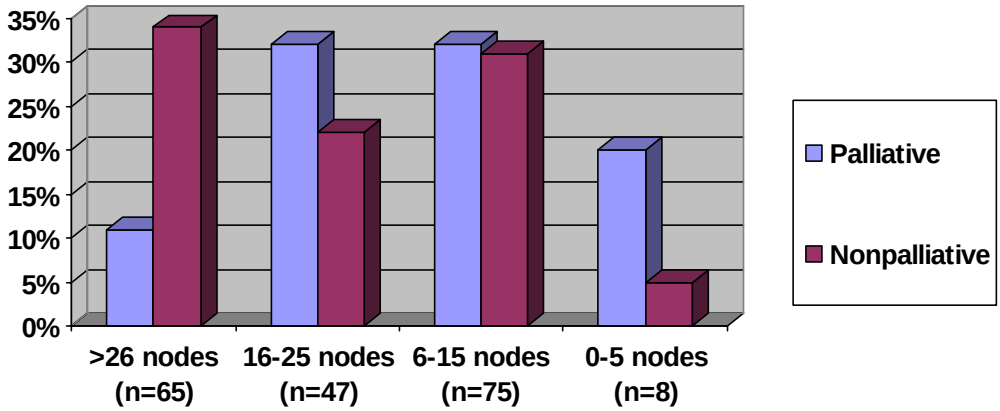
RESULTS

Between 2000 and 2007, 303 patients had a operation for gastric adenocarcinoma at the Department of General and Operative Surgery, University Hospital "St Marina". During this period, 35% (107 of 303) of the patients had an R0 resection, 25% (76 of 303) an R1 resection, and 40% (120 of 303) an R2 resection. Sixty-five percent (195 of 303) of all resections were noncurative (R1/R2). There was no difference in age, gender, T stage, or Lauren classification between palliative and nonpalliative patients. Palliative patients had a higher rate of M1 disease and presented more frequently with primary lesions in the antrum and pylorus. Nonpalliative patients had lower American Joint Commission on Cancer stages, were less commonly node positive, and presented with gastro-oesophageal junction tumours more often. Forty-seven percent (92 of 195) of the patients had an operation deliberately performed with palliative indications. In all of these cases, the patient record explicitly stated that the procedure was proposed to address specific symptoms or improve quality of life. At presentation, patients reported bleeding in 20% (18 of 92), gastrointestinal obstruction in 43% (39 of 92), pain in 29% (27 of 92), unexplained weight loss in 4% (4 of 92), and other in 4% (4 of 92). Only 2% (2 of 92) of the resections were performed emergently. The decision to proceed with a palliative procedure was documented before surgery in 22% (20 of 92). In the remaining 78% (72 of 92) of patients, the specific designation of palliative was identified from elements in the operative report. It was the authors' impression that intraoperative findings in these subjects suggested that removal of all gross disease was impossible, causing the surgeon to select a palliative approach. No explicit palliative indications were identified in 53% (103 of 195) of the subjects who had a nonpalliative, noncurative (R1 or R2) operation. At presentation, patients reported bleeding in 8% (9 of 103), gastrointestinal obstructive symptoms in 50% (52 of 103), pain in 32% (33 of 103), unexplained weight loss in 3% (3 of 103), and other in 2% (2 of 103). Five percent (5 of 103) of patients had no reported symptoms at presentations. Most of these patients (74% [76 of 103]) had an R1 resection. The remaining 26% (27 of 103) of the patients received a therapeutic R2 resection. This highly selected group comprised patients, many on protocol, who received a gastric resection after a good response to induction chemotherapy and a minimal volume of residual disease documented. At the time of operation, an intraperitoneal catheter was generally placed for instillation of chemotherapy postoperatively. Only 1 (1% [1 of 103]) of the nonpalliative operations was performed emergently.

Table 2 shows the extent of lymphadenectomy. Patients undergoing palliative operations had significantly fewer lymph nodes taken at resection compared with those who underwent a nonpalliative operation (mean 15 versus 19). In the postoperative period, a complication was identified in 54% (105 of 195) of patients. The perioperative mortality rate was 6% (12 of 195). High-grade complications were less

common in palliative (22% [20 of 92]) than in nonpalliative patients (29% [30 of 103]). Total complications — palliative (49% [45 of 92]) versus nonpalliative (61% [63 of 103]) — and perioperative mortality — palliative (7% [6 of 92]) versus nonpalliative (4% [4 of 103]) — occurred at similar rates. There was no difference in the mean length of hospitalisation after noncurative gastric resections (palliative [median 15.4 days] versus nonpalliative [median 14.9 days]).

Table 2. *Extent of lymphadenectomy*



DISCUSSION

Despite improved clinical outcomes associated with earlier diagnosis, more accurate staging, and decreased surgical morbidity and mortality, the overall prognosis of gastric cancer remains poor because many patients are incurable at presentation. A complete R0 resection remains the most powerful indicator of survival (15, 16). For those patients who present with stage IV disease, cure measured by 5-year survival is exceedingly rare and is not a realistic treatment goal. (17-21) Although long-term disease-free survival is not expected after noncurative operations, symptom control remains a principal concern in the total care of the patient with gastric cancer, making appropriate palliative strategies an essential component of patient management (22-29). A work from Memorial Sloan-Kettering Cancer Centre by Lawrence and McNeer (30) demonstrated that palliative gastric resections effectively relieve symptoms in patients with incurable gastric cancer. Although this report stressed the importance of defining palliative gastric operations in terms of symptom severity, these wise recommendations from 1958 have not been incorporated into subsequent analyses. Because of concerns that the associated high rates of perioperative morbidity and mortality were not justified in patients with such brief periods of anticipated survival, the authors suggested that a total gastrectomy was rarely worthwhile as a palliative procedure in patients with incurable gastric cancer. This conclusion was supported by Remine in 1979, (31) who also suggested that total gastrectomy was not a satisfactory palliative operation. Later series associated improved symptom relief with gastrectomy compared with gastroenterostomy, without increasing complication rates (32, 33, 46). Others have based their support for palliative gastric resections primarily on improved survival data and have proposed that it should be performed whenever technically possible (34,35) Because of decreasing perioperative complications, some authors now suggest that total palliative gastrectomy and oesophagogastrectomy is justified in selected patients (33,36,37,46).

Table 3. *Clinical and Pathologic Factors Associated with Overall Survival*

Variable	***n (patients)***
All patients	195
Palliative intent	92
Visceral metastasis	31
R resection status (R1)	76
More then 2 sites of metastases	30
Age > 65	82
Residual peritoneal disease	58
Residual nodal disease	56

The effective and appropriate application of palliative surgical interventions in patients with gastric cancer remains controversial. Recommendations from the literature are contradictory and often based on the

retrospective evaluation of suboptimal data (30-40, 46). A highly variable and imprecise understanding of the goals and indications of palliative surgery, poorly defined patient groups, and a reliance on inappropriate end points contribute to this confusion. The designation of patients as "palliative" is commonly based on the extent of disease (ranging from gross disease at operation to postoperative margin status) rather than a sound definition encompassing factors associated with good palliative therapy. Even though the value of a palliative procedure should be judged by its ability to control symptoms, reports often fail to use validated quality of life or pain assessment instruments and rarely consider the durability of potential palliative benefits (5). These factors limit useful interpretation of earlier studies on palliative procedures for gastric cancer. A sound and reproducible definition of palliative surgery was used in this study to evaluate patients who had a noncurative resection for gastric cancer. Observations from this report suggest that there are important differences among patients undergoing noncurative operations for gastric cancer. Significant differences between primary tumour sites, staging, degrees of nodal and metastatic disease, and the types of procedures performed support the differentiation between palliative and nonpalliative designations. Although successful utilization of the explicit chart review performed in this work allows for inclusion of patients who were similarly selected for a procedure to manage symptoms or improve quality of life, it potentially excludes palliative patients missing the required terminology. This would tend to obscure differences between groups. Although a prospectively assigned designation of patients as "palliative" would have been preferred, this retrospective methodology probably represents the best available method and has been used successfully in the past to identify palliative operations in patients with other advanced malignancies (13). The overall median survival of patients undergoing a noncurative gastric resection was 10.6 months. Median survival was decreased in patients who had a palliative operation (8.3 months) and is similar to other reported series by Baba (41) (8.3 months) and Meijer (32) (9.5 months). Observations on univariate analysis from this study are consistent with other reports by showing diminished overall survival associated with increased tumour load (nodal, peritoneal, visceral) and after an R2 versus R1 resection (42, 43, 46). Such survival distinctions were not maintained on multivariate analysis. Only identification of palliative indications and patient age was independently associated with decreased survival in this article. Although several studies have demonstrated that microscopic resection line disease is independently associated with poor outcomes in all patients undergoing a gastric resection, these findings suggest that the importance of this factor is lost when considering noncurative operations as a distinct group. After a noncurative gastric resection, survival is best characterized by features suggesting palliative intent. Conclusions about the effectiveness of palliative operations in the gastric cancer literature are often based, incorrectly, on incremental survival differences. Caution must be used when evaluating survival data in patients after a palliative intervention. Palliative care ideally selects treatment that will maximize quality of life and minimize complications. Consideration of anticipated survival helps to define a period during which the requirements of effective symptom control must be met and may be useful when considering the risk-benefit ratio for an individual patient (13, 44). Although increased survival may be a secondary goal of a palliative procedure, it is inappropriate to select a palliative procedure solely based on improved duration of survival (5). Based on patients grouped by extent of disease rather than palliative intent, The Dutch Gastric Cancer Group recently suggested that differences in overall survival after "palliative" gastric resections may be beneficial in patients with tumour load restricted to one metastatic site (40).

By applying a sound definition of surgical palliation, this study demonstrates important differences between patients undergoing noncurative operations for gastric cancer. Such discrepancies may explain some of the current inconsistency in the gastric cancer literature. In the future, designation of patients by palliative intent will provide improved analysis by allowing for suitable questions to be asked of similar groups (46). Utilization of such a system will facilitate the creation of relevant prospective trials to properly evaluate the role of surgery in patients with advanced malignancies.

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