Advanced Rectal Cancer

What Is the Best Palliation?

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The best treatment of advanced rectal cancer remains uncertain. The aim of this study was to determine the outcome after palliative procedures in patients with advanced rectal cancer. One hundred and three patients treated over a seven-year period were identified, including 30 with local invasion, 18 with local metastases, and 55 with distant metastases. Patients were grouped into two groups: those who underwent palliative resection (68) and those who were treated without rectal resection (55). The nonresected group included patients who underwent diverting colostomies (28) and those who received multimodality therapy without surgery (7). The average age of all patients was 63.1 years. Patients in the nonresected group had more distant disease (68 percent) than the resected group (46 percent). Significant pelvic pain was a more common problem in the nonresected group (15 percent) than in the resected group (4 percent). Similarly, pelvic sepsis was more common in the nonresected group (14 percent) than in the resected group (9 percent). Postoperative mortality was 4.3 percent after palliative resection and 3.8 percent after diverting colostomy. Survival of the resected group at one year was 65 percent and at two years 20 percent. Survival of the nonresected group at one year was 20 percent and at two years 0 percent. Survival in the resected group was significantly ($P <$ .01) better than the nonresected group but probably can be attributed to the more extensive disease generally present in the patients who did not undergo resection. These results suggest that patients with advanced rectal cancers should undergo palliative resection whenever possible because resection decreases pelvic complications and may improve quality of life. [Key words: Rectal neoplasms; Colorectal carcinoma; Cancer; Rectum; Colostomy; Abdominoperineal resection; Sphincter preservation]

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APPROXIMATELY 35,000 new cases of rectal cancer are diagnosed each year in the United States.[1] The natural history of untreated rectal cancer was well documented in the 19th century. William Allingham, a surgeon at St. Mark's Hospital in London, wrote that "Cancer is...a fatal disease, and when the rectum is the part affected it usually runs it course in about two years."[2] The most distressing symptom that untreated rectal cancer produces is violent straining. Allingham stated that, "The cancerous growth...provokes reflex action, and irresistable bearing down results."[2] Because of the dismal prospects facing a patient with rectal cancer, curative resection has been advocated throughout this century as the best treatment for this disease. Daland, Welch, and Nathanson wrote, in 1936, "...there is hardly a more miserable man alive than one with an advanced rectal cancer."[3] And as a result "desperate chances should be taken to attempt a cure by radical surgery rather than let the patient go on to the advanced stages."[3] This continues to be the standard approach to potentially curable rectal cancer. The best palliation for patients with advanced rectal cancers, however, is more difficult to discern.

The purpose of palliative treatment is to relieve symptoms, to prevent obstruction, and to improve the patient's remaining quality of life. Measures used for palliation of rectal cancer include palliative resection, with or without

adjuvant therapy, diversion of fecal stream by the production of an intestinal stoma or, in certain cases, multimodality therapy without surgery. Resection of rectal cancer is deemed palliative when gross tumor is left behind in the patient because of local invasion of contiguous tissue, local metastases, or distant metastases.

Palliative resection of rectal cancer is a formidable procedure to perform on patients with a limited life expectancy. Other studies have indicated that palliative resection does not improve survival for patients with advanced rectal cancer.[4-6] Does resection of the rectum benefit these patients by decreasing local complications of the disease and thereby improve quality of life?

The purpose of this study was to review the results of treating patients with advanced rectal cancer at three teaching hospitals. Specifically, the morbidity and mortality after palliative resections, diversion procedures, and nonoperative management were studied. Survival and complications of persistent disease after these types of therapy were determined. Whenever possible, the reason that the type of therapy was selected was identified. The results of this study support the role of palliative resection in the treatment of most patients with advanced rectal cancer.

Materials and Methods

The hospital files and pathologies records of all patients classified as having cancer of the rectum between 1980 and 1986 were reviewed at the West Haven Veterans Administration Medical Center, Bridgeport Hospital, and Yale-New Haven Hospital. From this group, patients with advanced rectal cancer were identified. Advanced rectal cancer was defined as (1) local invasion of the tumor outside the confines of the rectum not amenable to *en bloc* resection, (2) local metastases to either the peritoneum, mesentery, small bowel, or pelvis, or (3) distant metastases to either the liver, lung, or brain. Patients in whom all gross tumor was removed at operation were considered to have undergone a potentially curative resection and were excluded from this study.

The records of patients with advanced rectal cancer were reviewed for age, sex, presenting symptoms, duration of symptoms before diagnosis, treatment, complications of disease and treatment, survival, and cause of death. Pathologic diagnosis was reviewed by a senior surgical pathologist at each hospital. A computerized data base was used to tabulate results. Analysis of crude survival was done using the Kaplan-Meier method.[7] Survival of groups was compared using the Mann-Whitney U Test.

Results

Between 1980 and 1986, 710 patients were managed for cancer of the rectum at Yale-New Haven Hospital, West Haven Veterans Administration Medical Center, and Bridgeport Hospital. Advanced rectal cancer was found in 134 (18.9 percent) of these patients. Follow-up information was not available in 31 (18.5 percent) of these patients. Complete follow-up was available for 103 (79.5 percent) of the patients with advanced rectal cancer, 18 of whom remained alive. These patients form the basis of this report.

There were 72 men (71 percent) and 31 (29 percent) women. The average age of all 103 patients at presentation was 63.1 ± 11.6 years (range, 27 to 86 years). Four patients were asymptomatic at the time of presentation. Bleeding was the most common presenting symptom (45 percent) followed by change in bowel habits (31 percent), rectal or pelvic pain (12 percent), obstruction (2 percent), and sepsis (4 percent). The guiaic test for occult blood in the stools was positive in all 103 patients. All but two patients (98 percent) had the diagnosis of rectal cancer established by endoscopic examination of the rectum. The average duration of symptoms before the diagnosis of rectal cancer was 5.1 ± 4.4 months.

Location and Extent of Disease: The location of the rectal cancers is listed in Table 1. The rectal cancer was located in the upper rectum in 45 patients (44 percent), in the middle rectum in 22 (21 percent), and in the distal rectum in 36 (35 percent). Histologically all but two tumors were adenocarcinomas; the remainder were a rectal carcinoid and a cloacogenic tumor of the anorectal junction. Of the 103 patients, 30 patients (29.6 percent) had local spread of the tumor which was not amenable to *en bloc* resection, 18 patients (17.8 percent) had local metastases to either the small bowel, mesentery, or pelvis, and 55 patients (53.6 percent) had distant metastases to either the liver (91 percent), lung (5 percent), or brain (4 percent).

TABLE 1. *Characteristics of 103 Patients Who were Treated for Advanced Rectal Cancer**

Feature	Resected (percent)	Nonresected (percent)	Total Group (percent)
Average age ± STD	61.3 ± 11.1	66.9 ± 11.7	63.1 ± 11.6
Sex			
Male	65	80	70
Female	35	20	30
Location of tumor			
Upper third	44	43	44
Middle third	16	31	21
Lower third	40	26	35
Extent of disease			
Local invasion	32	23	30
Local metastases	22	9	17
Distant metastases	46	68	53

*Patients are divided into two groups; 68 patients who underwent palliative resection (resected) and 35 patients that were treated without rectal resection (nonresected).

TABLE 2. *Reasons That 35 Patients with Advanced Rectal Cancer did not Undergo Palliative Resections*

Reason	Number	Percent
Diffuse abdominal disease	12	34
Diffuse pelvic disease	9	26
Not specified	6	17
Preoperative morbidity	4	11
Intraoperative complications	2	6
Family wishes	2	6
TOTAL	35	100

Type of Treatment: Almost all patients underwent abdominal operations during the evaluation and treatment of their disease (95 percent). Palliative resection of the rectal cancer could be accomplished in 68 of the 103 patients (66 percent). Characteristics of these patients were detailed in Table 1. Among these patients, 33 patients underwent low anterior resection with primary anastomosis, 13 underwent low anterior resection with end colostomy, and 22 underwent abdominoperineal resection. Preoperative radiotherapy was given to three patients who underwent palliative resection. Postoperatively, adjuvant therapy was employed in 45 of the 68 patients.

The rectum was not resected in a total of 35 patients (34 percent). Characteristics of these patients are listed in Table 1. Diffuse abdominal disease or diffuse pelvic disease were the two most common reasons that patients did not undergo palliative resections (Table 2). These patients were treated by a variety of methods. Twenty patients underwent diverting colostomy only. Seven patients received either radiotherapy and/or chemotherapy as their sole modality of treatment. An additional 21 of these 35 patients received some combination of radiotherapy and chemotherapy.

Morbidity: Eighteen patients among those who were treated with palliative resection sustained complications (26 percent). These complications are listed in Table 3.

TABLE 3. *Complications Suffered by 103 Patients Treated for Advanced Rectal Cancers**

Complication	Resected	Nonresected	Total
Pelvic pain	3 (4%)	5 (14%)	8 (8%)
Pelvic sepsis	6 (9%)	5 (14%)	11 (11%)
Bleeding	1 (1%)	- (0%)	1 (1%)
Obstruction	3 (4%)	1 (3%)	4 (4%)
Genitourinary	2 (3%)	1 (3%)	3 (3%)
Anastomotic leak	1 (1%)	- (0%)	1 (1%)
Ischemic stoma	2 (3%)	- (0%)	2 (2%)
TOTAL	18/68 (26%)	12/35 (34%)	30/103 (29%)

*Patients are divided into two groups; 68 patients who underwent palliative resections (resected) and 35 patients who were treated without rectal resection (nonresected).

TABLE 4. *Cause of Death for 103 Patients Treated for Advanced Rectal Cancer**

Cause of Death	Resected	Nonresected	Total Group
Cancer	31 (46%)	26 (75%)	57 (55%)
Cardiovascular	4 (6%)	- (0%)	4 (4%)
Pulmonary	1 (1%)	1 (3%)	2 (2%)
Sepsis	7 (10%)	3 (8%)	10 (9%)
Pulmonary embolism	- (0%)	1 (3%)	5 (5%)
Perioperative	4 (6%)	1 (3%)	5 (5%)
Urosepsis	1 (1%)	- (0%)	1 (1%)
Not known	4 (6%)	- (0%)	4 (4%)
Alive	16 (24%)	3 (8%)	19 (18%)
TOTAL	68 (100%)	35 (100%)	103 (100%)

*Patients are divided into two groups; 68 patients who underwent palliative resections (resected) and 35 patients who were treated without rectal resection (nonresected).

Three patients required reoperation for obstruction. Two of these patients had recurrent disease after a low anterior resection, while one patient obstructed after fulguration. All three patients underwent diverting transverse loop colostomies. Two patients required laparotomy for intra-abdominal abscess, one from an anastomotic leak after a stapled low anterior resection. One patient had to be re-explored for pelvic bleeding. Two patients were discharged on intermittent catheterization. Two patients developed ischemic stomas that resolved without treatment. There were 12 complications among those patients who were not treated by palliative resection (Table 3). One patient developed obstruction and received multimodality therapy without surgery.

Pelvic Sepsis: In the palliative resection group, six patients developed pelvic abscesses; four patients required percutaneous drainage, one patient died from an undrained pelvic abscess, and one was re-explored because of a leak following colorectal anastomosis. Among the patients who were not treated by palliative resection, pelvic sepsis was more common (Table 3). One patient developed urosepsis from an obstructed left ureter. Four patients developed pelvic sepsis from presumed tumor erosion, one of whom underwent successful percutaneous drainage.

Pelvic Pain: Patients were classified as having pelvic pain if they required regular daily oral or intravenous narcotics for pelvic pain, or they underwent either anterolateral chordotomy or placement of an epidural catheter for intrathecal narcotics for control of pelvic pain. Among those resected, three patients (4 percent) developed continuous postoperative pelvic pain, while among those not resected, five patients (15 percent) developed pelvic pain after treatment.

Mortality: The causes of death among all patients are listed in Table 4. Five patients died within the first 30 days of treatment (perioperative). Overwhelming tumor

TABLE 5. *Mean Crude Survival from Time of Diagnosis of 103 Patients with Advanced Rectal Cancer**

Location	N	1 Year (percent)	2 Year (percent)	Mean (months)	Median (months)
Upper third	45	47	18	14.2	9
Middle third	22	32	5	11.0	8
Lower third	36	58	14	14.6	14
TOTAL	103	47	14	13.6	11.6

*Patients are divided into three groups based on location of the tumor in the rectum. There was no significant difference between survival of the three groups.

burden was the cause of death in 75 percent of the nonresected group and 46 percent of the resected group.

Survival: Mean survival for 103 patients with advanced rectal cancer at the time of last follow-up was 13.6 months (Tables 5 to 7). Median survival for all 103 patients was 11.6 months. Crude one-year survival for all patients was 47 percent and two-year survival 14 percent (Table 8). There were no five-year survivors. Table 5 lists one year, two year, mean, and median survival for these patients, based on the location of the tumor in the rectum. There was no significant difference between the survival of patients with lesions in the proximal, middle, or distal rectum. Table 6 lists the survival of these patients based on the extent of disease. Patients with distant metastases survived significantly shorter periods of time than patients with local invasion ($P = .03$) or patients with local metastases ($P = .05$). There was no significant difference between survival of patients with local invasion as compared with patients with local metastases. Crude survival from the time of diagnosis of the 68 patients who underwent palliative resection and the 35 patients who were not treated by resection is shown in Fig. 1 and listed in Table 7. Survival of patients who underwent resection was significantly longer ($P < .01$) than patients who were treated without rectal resection. Also, mean crude survival from the onset of symptoms as well as from the time of diagnosis for these two groups of patients is listed in Table 7. Patients who underwent palliative resection had a 65 percent one-year survival and a 20 percent two-year survival (Table 7). Patients who were not treated by resection had only an 18 percent one-year survival and none lived for two years. Patients who were treated by palliative resection survived more than twice as long from the onset of symptoms than patients who were treated without rectal resections.

Discussion

The authors have retrospectively studied the morbidity, mortality, and survival of 103 patients who were treated for advanced rectal cancer in three teaching hospitals. Specifically, the results of therapy of patients treated by palliative resection were compared with results achieved in patients who did not undergo rectal resection. Patients who underwent palliative resection developed fewer pelvic complications of rectal cancer. After palliative resection only 4 percent of patients developed signifi-

TABLE 6. *Average Crude Survival from Time of Diagnosis of 103 Patients with Advanced Rectal Cancer**

Extent of Disease	N	1 Year (percent)	2 Year (percent)	Mean (months)	Median (months)
Local invasion	30	60	23	16.3	15
Local metastases	18	67	11	14.9	14
Distant metastases	55	32	10	11.8	8
TOTAL	103	47	14	13.6	11.6

*Patients are divided into three groups based on extent of disease. Survival of patients was significantly less for patients with distant metastases as compared to patients with local invasion ($P = .03$) or local metastases ($P = .05$).

TABLE 7. *Crude Survival of 103 Patients Treated for Advanced Rectal Cancer**

Extent of Disease	N	1 Year (percent)	2 Year (percent)	Mean (months)	Median (months)
Resected	68	65	20	17.2	16
Nonresected	35	20	-	6.8	5
TOTAL	103	47	14	13.6	11.6

*Patients are divided into two groups; 68 patients who underwent palliative rectal resection (resected) and 35 patients who were treated without resection (nonresected). Survival of the resected group was significantly greater than the nonresected group ($P < .01$).

TABLE 8. *Mean Crude Survival of 103 Patients with Advanced Rectal Cancer**

Treatment	N	Survival from the Onset of Symptoms	Survival from the Time of Diagnosis
Resected	68	32.1	17.2
Nonresected	35	11.2	6.8
TOTAL	103	18.6	13.6

*Survival is measured from the onset of symptoms and from the time of diagnosis. Patients are divided into two groups based on type of treatment; those who underwent palliative resections (resected) and those in whom the tumor was not resected (nonresected).

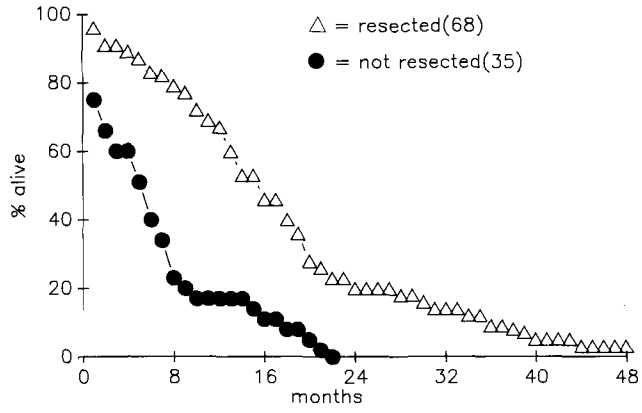

FIG. 1. Crude survival of 103 patients who were treated for advanced rectal cancer. Survival of 68 patients who underwent palliative resection was significantly better ($P < .01$) than that of 35 patients who were treated by resection of the primary cancer.

cant pelvic pain; this occurred in 14 percent of the nonresected group. Pelvic sepsis occurred somewhat more commonly in the nonresected group but the difference was small. Other complications such as intestinal obstruction, ureteral obstruction, and hemorrhage occurred infrequently. Death was more commonly associated with tumor burden in the nonresected patients (75 percent) than in the patients who had undergone resection. Perioperative mortality after palliative resection was 6 percent. Overall, quality of life seemed better when palliative resection could be accomplished because of better control of pelvic disease.

Survival was different for patients after palliative resection as compared with those who were treated without resection. One-year crude survival from the time of diagnosis was nearly four times greater following palliative resection. Furthermore, two-year survival of the palliative resection group was 20 percent (Fig. 1) but was 0 percent for the nonresected patients. This dichotomy held true even when survival was measured from the onset of symptoms; using this interval, patients after palliative resection survived more than twice as long as nonresected patients (Table 8). This difference in survival is most likely due to the extent of disease at the time of diagnosis. More patients (68 percent) in the nonresected group had already developed distant metastases at the time of initial diagnosis than in the palliative resection group (46 percent). Similarly, the most common reasons that patients did not undergo palliative resection were because of diffuse local disease or diffuse distant disease (Table 2). In general, patients who did not undergo palliative resection had more advanced disease.

Surgical resection of advanced colorectal cancers must be accomplished with a low mortality if it is to be used for palliative therapy. In 1949, Midlin and Walker reported an 8.5 percent operative mortality following palliative resections.[4] More recently, reports of operative mortality for palliative resections have ranged from 0.8 percent to 11.7 percent.[5,6,8,9] In this study, operative mortality for palliative resections was 4.3 percent. These results indicate that resection of advanced rectal cancer can be accomplished safely in the vast majority of patients.

The impact of palliative resection on survival of patients with advanced rectal cancer is more difficult to judge. In 1943, Lahey indicated that, after resection, patients live twice as long.[10] In contrast, Modlin and Walker found that there was no difference in survival from the onset of symptoms for patients who underwent palliative resections, diverting colostomies, or received no treatment.[4] Stearns and Binkley found that survival was improved in patients with liver metastases but not in patients with peritoneal or pulmonary metastases.[11] In the authors' study, as well as other recent studies,[5,6,8,9] survival was substantially greater for patients who underwent palliative resection as compared with patients who received other forms of treatment. Unfortunately, none of these reports are randomized studies. Consequently, the improved survival may be entirely due to preselection of patients with less advanced disease for palliative resection. The present review of treatment choice in individual patients supports this conclusion (Table 2). It is possible, however, that patients who undergo palliative resections gain some benefit in terms of survival because of a lower rate of septic complications (Table 4).

The major purpose of palliative treatment is to relieve symptoms and to improve quality of life. During the early 1900s, palliative surgery for colorectal cancer consisted of colostomy and short-circuiting operations.[4] In 1943, Lahey stated that, after palliative resections, patients "are more comfortable while they live and die an infinitely less distressing death."[10] In the present study, severe pelvic pain developed in only 4 percent of patients after palliative resection. Other groups have reported similar results of palliative resection in controlling local perineal symptoms.[8,12,13] These results support the use of palliative resection in the treatment of advanced rectal cancer.

Some surgeons, although willing to perform a palliative resection, are unwilling to perform a primary anastomosis because of the fear of anastomotic leaks, obstruction, frequent bowel movements, or anal incontinence. In this study, 33 patients underwent palliative resections and primary anastomoses for advanced rectal cancers. One patient (3 percent) required reoperation because of an anastomotic leak. Two patients (6 percent) sustained colonic obstructions because of recurrent disease. Moran and colleagues reported similar results; after 66 palliative low anterior resections, only one patient developed colonic obstruction because of recurrent disease.[9] All patients in the present series and in the series of Moran and colleagues were continent after low anterior resection and primary anastomosis.

Although not addressed in the present study, other studies have indicated that morbidity is substantially less after low anterior resection than after abdominal perineal resection.[11,14-17] These studies suggest that low anterior resection with primary anastomosis, when possible, represents the best form of palliation for patients with advanced rectal cancer.

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