Genitourinary tract preservation versus pelvic exenteration for advanced colorectal tumors

Nicolas Muruve, MD

Department of Surgery, Division of Urology, Ellis Fischel Cancer Center, University of Missouri, Columbia, Missouri, USA

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Introduction: *Total pelvic exenteration (TPE) is the standard of care for locally advanced colorectal cancer. This is a morbid procedure often leaving the patient with two ostomy sites and an extended recovery. Bladder preservation with complete tumor resection is often possible in these cases and we set out to determine if limited resection of the GU tract was as effective in tumor control as TPE.*

Materials and methods: *This is a retrospective review of all patients over a 7-year period with colorectal tumors invading the urinary system. These patients were divided into two groups based upon the surgical procedure they received: TPE or GU tract sparing surgery. Tumor stage, adjuvant cancer therapy, and complications were reviewed. Recurrence and survival rates were calculated.*

Results: *There were 19 patients with colorectal tumors invading the GU tract. Eight patients were treated with TPE and 11 patients received GU tract sparing procedures. Tumor stage and extent of disease were similar for both groups as were adjuvant/neoadjuvant therapy received. The average follow up from surgery for TPE and GU tract sparing procedures was 40 months (range 9 - 96) and 53 months (range 21.5 - 94), respectively. The limited resection and TPE groups experienced similar complication rates: 7/11 (63.6%) and 6/8 (75%) respectively. The 5-year survival rate was 37.5% and 61.4% for TPE and limited GU resections, respectively (p=0.07).*

Conclusion: *The cancer recurrence and complication rates were similar in both groups offering no clear advantage to TPE. GU sparing surgery in the face of locally invasive colorectal tumors is a viable option allowing for treatment of the disease and reducing the morbidity of total pelvic exenteration.*

Key Words: colorectal neoplasms, urogenital neoplasms, urinary diversion

Remembrance

It is not difficult for me to describe the impact that Ernie Ramsey has had on my life and career. It would be an understatement to say that Ernie Ramsey had influential role in my development as an urologist. My career in renal transplantation and in oncology can both be traced back to my residency with him at the University of Manitoba. My exposure to these areas had been limited prior to this and, the more I worked with Ernie, the more I realized this would be my field. I am proud to present my data on bladder preservation for advanced colorectal tumors because a lot of the techniques I used in this series I learned from Ernie. He taught me the concepts of cancer surgery plus the techniques of reconstruction. His style of medicine demonstrated to me that it is an evolving field and we need to constantly explore new approaches to common problems. All of these virtues, including his style of teaching, I have incorporated into my practice and extend to the residents now under my guidance. I am grateful for the time I spent with him and also for his continued influence on my career.

Nicolas Muruve

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Address correspondence to Nicolas Muruve MD, University of Missouri – School of Medicine, Room M562, 1 Hospital Drive, Columbia, Missouri, 65203 USA

Introduction

Management of locally extensive (T4) or recurrent colorectal tumors requires aggressive treatment if reasonable response rates are to be achieved.[1-3] The genitourinary tract can be involved in up to 26% of T4 colorectal tumors[2] and 64% of recurrent tumors will recur in the pelvis.[3] If the neoplasm is invading the bladder or ureters, complete organ resection is often recommended.[4] Pelvic exenteration exposes the patient to significant morbidity and can prolong recovery.[5,6] Complete resection of the disease with partial removal and reconstruction of involved genitourinary structures not only decreases the impact of the procedure on the patient, but can also help improve a patient's self image. Normal urinary elimination is maintained removing the need for an ostomy and improving quality of life.

As genitourinary reconstruction becomes more common in everyday practice, it is reasonable to extend these techniques to preserve GU function in the management of advanced or recurrent colorectal cancer. What needs to be established however is that a less radical approach does not compromise disease control. It would need to offer similar if not better results than the current standard therapy. In this study we set out to determine if complete surgical resection of T4 or recurrent colorectal adenocarcinoma combined with GU preservation offered similar cancer control rates than total pelvic exenteration.

Materials and methods

We reviewed all patients with T4 or recurrent colorectal tumors invading the GU system between 1993 and 2000 at Ellis Fischel Cancer Center. Patients were divided into two groups based on the type of treatment they received; total pelvic exenteration or tumor resection with GU reconstruction. Patient demographics, tumor stage at the time of primary diagnosis, primary or recurrent disease, and adjuvant therapies given were obtained from our hospital tumor registry. The fifth edition of the American Joint Committee on Cancer TMN staging system was used to stage all patients.

Patients were assessed radiographically, endoscopically and intraoperatively for location of tumor to ensure that clear tumor margins could be achieved during the resection. All patients in the GU preservation group were counseled and consented for the possibility of a total exenteration if reconstruction could not be performed. Types of reconstruction performed were obtained from the operative notes. All patients who underwent TPE had an ileal conduit for diversion. Postoperative complications were noted.

Actuarial survival was calculated using Kaplan-Meier estimates. Wilcoxon and log rank tests were used to test for significance where appropriate. Statistical analyses were performed using SPSS software.

Results

A total of 19 patients were treated with colorectal tumors invading the urinary tract during the review period. Patient demographics and initial tumor stages by group are presented in Table 1. One patient in each group received surgical therapy only. One patient in the TPE group received postoperative radiation only. Otherwise, all patients received neoadjuvant chemotherapy (5-FU and leucovorin) and radiation (45-63 Gy, median 54 Gy) with surgery. Procedures performed in the GU sparing group included: three partial cystectomies and primary closure of the bladder, two partial cystectomies with ileal augmentation, two partial cystectomies and distal

TABLE 1. **Patient demographics**

	Total Pelvic Exenteration	**GU Sparing Resection**
n	**8**	**11**
Average age (range)	**69.6 (53-80)**	**67.8 (48-81)**
male/female	**8/0**	**6/5**
Initial clinical stage: (%)		
T2	1 (12.5)	0
T3	3 (37.5)	3 (22.8)
T4	4 (50)	8 (72.7)
N1	1 (12.5)	3 (22.8)
N2	0	1 (9.1)
M1	1 (12.5)	1 (9.1)
Presented with recurrence (%)	5 (62.5)	5 (45.5)

TABLE 2. **Post-surgical complications**

Complication	TPE (n=8)	GU Sparing (n=11)
Infection (%)	4 (50)	5 (45.5)
Incontinence (%)	0	4 (36.4)
Fistula (%)	3 (37.5)	1 (9.1)

ureteral resections (one unilateral, one bilateral) with ileal augmentation and reimplantation into the augment, three distal ureterectomies and reimplantation (two with psoas hitch), and one prostatectomy and proximal urethrectomy with bladder closure and Mitrofanoff continent diversion.

Complication rates were high in both groups, which is not unusual considering the advanced level of disease and adjuvant treatment given Table 2. Most infections were uncomplicated wound infections and responded to antibiotic therapy. However three patients in the GU sparing group experienced UTI's postoperatively secondary to urinary retention and required intermittent self catheterization to resolve. Incontinence resolved in two patients with anticholinergic therapy and another with intermittent self-catheterization. The fourth patient with leakage required bladder neck suspension several months after her cancer treatment. Fistulas were managed conservatively with drainage and, in two cases, with hyperbaric oxygen therapy.

Mean survival time for both TPE and GU sparing groups were 39.3 and 52.8 months respectively. Actuarial 5 year survival was 61.4% for the GU sparing group and 37.5% for the TPE group (p=0.07 Wilcoxon, p=0.12 log rank). Five of eleven in the GU sparing group remain alive (56-81 months after treatment) three are disease free, two are alive with recurrent disease. There were no survivors in the TPE group (range 9 – 96 months).

Discussion

Management of T4 or recurrent colorectal adenocarcinoma has evolved over the last decade. In the early 1990's these patients would often be treated with pelvic exenteration or wide local excision and achieve only modest results.[7] Currently, the standard treatment consists of multi-modality treatment with both radiation and chemotherapy followed by surgery.[8] In those patients who respond, shrinkage of tumor size allows for easier resection and also consideration for organ sparing therapy. Numerous techniques exist for urinary tract preservation and are readily available to the urologist. When performing organ sparing surgery, it must be stressed that the principles of cancer surgery be adhered to ensuring complete resection of the neoplasm without patient compromise.

Partial resection of GU structures is supported by evidence that suggests invasion of local structures can often be fibrous in nature and that tumor involvement may be low. Weinstein et al found in a recent review of partial cystectomy for non-urologic malignancies invading the bladder that only 21.5% of their final specimens found actual tumor invasion.[9] Most specimens had only a dense fibrotic reaction to adjacent organs. It should be cautioned however that despite the low incidence of tumor invasion, separating these structures should be avoided, as there still exists a risk for malignant cells to be present in the adhesions.[10]

Our series demonstrates that resection of T4 or recurrent colorectal tumors can be performed without compromise to the patient and while also preserving function of the urinary tract. Although not statistically significant, there was a trend towards improved survival in our GU sparing group supporting the above statement that urinary tract preservation can be done without compromising cancer control. Complication rates were similar in both groups. Genitourinary reconstruction in a radiated field does present with a risk of poor wound healing but wound breakdown or fistula rates were equal in both groups. This suggests that preserving the radiated tissues does not increase complication risk to those patients. Incontinence is a problem that would not be seen with pelvic exenteration, however in all cases the problem was easily managed.

An objective measure of quality of life was not available during the review. A quality of life questionnaire would have been ideal to assess patient satisfaction after these procedures, but was not possible. One would assume however that normal urinary elimination would be a desirable aspect of one's cancer treatment and highly sought after by most patients. We feel that GU preservation in the treatment of T4 or recurrent colorectal tumors involving the bladder is safe and does not compromise a patient's cancer care. Total pelvic exenteration offers no advantage over bladder preservation in selected cases and should be reserved for those where reconstruction is not possible. □

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