

Original Research

Outcomes of pelvic exenteration for recurrent and primary locally advanced rectal cancer



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ARTICLE INFO

Keywords:
Rectal cancer
Recurrence
Pelvic exenteration
Colorectal surgery

ABSTRACT

Background: Pelvic exenteration is the only radical treatment for locally advanced (ARC) or recurrent (RRC) rectal cancers. The long-term results of the procedure are variably reported in the literature, with recent series suggesting similar survival between ARC and RRC. The study aimed to analyze and compare the long-term survival and perioperative outcomes of patients undergoing pelvic exenteration for ARC and RRC in a tertiary center.

Materials and methods: This was a retrospective analysis of prospectively collected data. Comparison of variables was performed using Chi-square, Fisher's exact or Wilcoxon rank sum test as appropriate. The Kaplan Meier method was used to analyze the disease-free survival (DFS) and the log-rank test to compare the two groups.

Results: Since 2002, 46 patients underwent pelvic exenteration for ARC (28, 60.9%) and RRC (18, 39.1%). The groups had comparable characteristics, perioperative results, including postoperative complications, and rate of adjuvant chemotherapy. A R0 resection was obtained in 71.4% and 55.6% (p 0.41) and a T4 stage was diagnosed in 75% and 94.4% (p 0.22) of ARC and RRC patients, respectively. After a median follow-up time of 32.5 and 56.6 months (p 0.01), the 5-year DFS was significantly lower in the RRC group (23.6 vs 46.2%, p 0.006), even after exclusion of R1 cases (30 vs 54.5%, p 0.044).

Conclusion: The long-term disease free survival of patients undergoing pelvic exenteration is significantly worse when the procedure is performed for RRC, regardless of the tumor involvement of the resection margins.

1. Introduction

Great progressions in the management of rectal cancer have been obtained in the last decades. While the application of population-based screening has led to a decreased incidence of colorectal cancer in elderly patients [1], the local and distant recurrence rates after surgery have declined dramatically thanks to the adherence to standardized surgical techniques and the use of neoadjuvant chemoradiation [2,3].

Nevertheless, a great percentage of patients is still diagnosed with a locally advanced rectal cancer [4–7]. The neoadjuvant therapy might help downstaging advanced tumors and allow a total mesorectal excision with clear margins; nevertheless, the risk of persistence of cancer invading adjacent organ at surgery remains high [8]. In some of those cases, a more aggressive surgical approach must be considered in order to achieve negative resection margins [9]. Similarly, a multiorgan resection may be offered to patients affected by a local recurrence of rectal cancer in order to improve survival [10].

Moreover, the severe morbidity and mortality associated with extended resections must be considered and discussed during the strategy

planning [11,12], as well as the possibility of positive resection margins after surgery, which could frustrate the efforts of the surgeons [13].

There is conflicting evidence about different outcomes after pelvic exenteration for locally advanced primary rectal cancer (ARC) or locally recurrent rectal cancer (RRC). Recent reports, in fact, found similar survival between the two groups of patients, with the radicality of surgery playing the most important role for long-term survival [14]. On the other hand, other Authors reported worse outcomes in patients undergoing surgery for recurrent cancers [15].

However, there is a paucity of studies in the literature comparing the oncologic outcomes of pelvic exenteration for ARC or RRC, with obvious differences among centers regarding the patients' characteristics and the surgical approach to the cancer.

The aim of the study is therefore to compare the perioperative and long-term outcomes after pelvic exenteration for ARC or RRC in a tertiary center.

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2. Methods

Patients undergoing pelvic exenteration for primary or recurrent rectal cancer were identified from a prospectively maintained Ethical Committee approved database and included in the study. Exclusion criteria were tumors other than colorectal (ie ovarian, sarcomas, benign), distant metastases, palliative procedures and a postoperative follow-up shorter than 12 months.

All patients underwent a diagnostic pathway which included physical evaluation, full colonoscopy with biopsy, high resolution CT scan of the thorax, abdomen and pelvis, magnetic resonance image of the pelvis and whole body positron emission tomography. All cases were discussed in a multidisciplinary meeting involving the surgeons, the oncologists and dedicated radiologists.

A R0 resection was considered the principal purpose of surgery. In any doubt regarding the number of pelvic compartments to resect, the surgical plan was made on the radiological staging that was reported prior to chemoradiation.

The indication to neoadjuvant therapy was discussed with the radiotherapist and oncologist and was based on patient's comorbidity, location and extension of the tumor and, in case of RRC, on the previous application of radiotherapy on primitive cancer. A decision to proceed with immediate surgery was taken if a great likelihood of a radical resection was expected and if the preoperative tests did not show any evidence of node involvement.

Postoperative complications were grouped according to the Clavien-Dindo classification [16]. Variables were presented as median (range) or number (%). Comparison of categorical variables was analyzed with Chi-square or Fisher's exact test as appropriate, and Wilcoxon rank sum test was used for quantitative and ordinal variables. The analysis of the long-term recurrence rate was performed using the Kaplan-Meier method and the log rank test was used to compare the curves. A P value < 0.05 was considered significant. Statistical analyses were performed using JMP version 11 (SAS Institute, Cary, NC, USA).

3. Results

Between 2002 and January 2016, 62 patients underwent a pelvic exenteration. After application of the exclusion criteria, 46 cases (24 males) were included in the study. Twenty-eight (60.1%) and 18 (39.9%) patients underwent an exenteration for ARC and RRC, respectively.

The patients' characteristics and perioperative variables are shown in Table 1. The two groups were comparable for demographic variables, ASA score, histology types and rate of neoadjuvant chemoradiation. The number of resected pelvic compartments was also similar between groups, with the majority of patients undergoing the removal of 2 compartments, and only one patient in the RRC group having all 4 compartments excised. A similar rate of sacrectomy was performed (17.9% vs 22.2%), while a flap reconstruction was necessary in 32.1% of ARC and 11.1% of RRC patients, respectively.

A R0 resection was obtained in 71.4% of ARC patients and 55.6% of RRC patients (p 0.41). A comparable rate of T4 cancers and N+ tumors was seen in the two groups.

A similar rate of 30-day morbidity was shown in the two groups (32.1% and 33.3%). The majority of complications were managed conservatively (Clavien-Dindo grade I and II), while in 7.2% of ARC and 5.5% of RRC cases an intervention under general anesthesia was required.

After a follow-up time that was significantly shorter among the RRC patients (32.5 vs 56.6 months, p 0.01), the 5 year disease-free survival rate was 46.1% in ARC and 23.6% in RRC cases (p 0.006, Fig. 1).

The pattern of cancer recurrence is shown in Table 2.

After exclusion from the analysis of the R1 and R2 patients, the comparison of 5 year disease-free survival between ARC (54.5%) and RRC (30%) confirmed a significantly worse outcome in the group of

Table 1

Comparison of perioperative variables between patients with locally advanced rectal cancer (ARC) and locally recurrent rectal cancer (RRC) undergoing pelvic exenteration. Variables are presented as median (range) or number (%). ASA: American Society of Anesthesiologists.

Variable	ARC (28)	RRC (18)	p
Male gender	12 (42.9%)	12 (66.7%)	0.12
Age	59 (29–86)	55 (31–76)	0.71
Squamous cell carcinoma	6 (21.4%)	2 (11.1%)	0.41
ASA score 3	17 (60.7%)	12 (66.7%)	0.90
Neoadjuvant therapy	20 (71.4%)	10 (55.5%)	0.25
Intraoperative blood loss (mL)	600 (300–4000)	750 (265–2700)	0.74
Number of resected compartments			0.43
2	22 (78.6%)	13 (72.2%)	
3	6 (21.4%)	4 (22.2%)	
4	0	1 (5.6%)	
Sacrectomy	5 (17.9%)	4 (22.2%)	0.74
Flap reconstruction	9 (32.1%)	2 (11.1%)	0.14
Duration of surgery (min)	310 (180–612)	305 (175–745)	0.73
Radicality of resection			0.41
R0	20 (71.4%)	10 (55.6%)	
R1	7 (25%)	6 (33.3%)	
R2	1 (3.6%)	2 (11.1%)	
T stage			0.22
0, 1, 2	4 (14.3%)	1 (5.6%)	
3	3 (10.7%)	0	
4	21 (75%)	17 (94.4%)	
N stage			0.75
X	1 (3.6%)	2 (11.1%)	
0	11 (39.3%)	8 (44.5%)	
1	5 (17.8%)	2 (11.1%)	
2	11 (39.3%)	6 (33.3%)	
Postoperative complications	9 (32.2%)	6 (33.2%)	0.92
Clavien-Dindo grades			0.64
I	3 (10.7%)	2 (11.1%)	
II	4 (14.3%)	2 (11.1%)	
IIIa	1 (3.6%)	0	
IIIb	1 (3.6%)	1 (5.5%)	
IV	0	0	
V	0	1 (5.5%)	
Length of hospital stay (days)	13 (8–77)	13 (10–49)	0.53
Adjuvant therapy	20 (71.4%)	12 (66.7%)	0.72

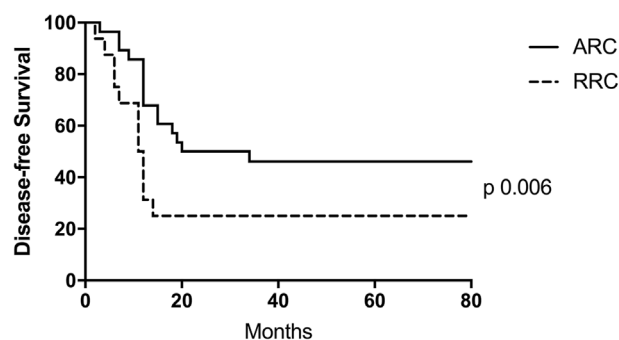


Fig. 1. Comparison of disease-free survival between patients with locally advanced rectal cancer (ARC) and locally recurrent rectal cancer (RRC) undergoing pelvic exenteration.

Table 2

Comparison of pattern of recurrence between locally advanced rectal cancer (ARC) and locally recurrent rectal cancer (RRC) undergoing pelvic exenteration. Variables are presented as number (%).

Recurrence location	ARC (28)	RRC (18)	p
No recurrence	13 (46.4%)	5 (27.8%)	0.57
Local	5 (17.9%)	4 (22.2%)	
Distant	8 (28.6%)	6 (33.3%)	
Local and distant	2 (7.1%)	3 (16.7%)	

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