Original article

Defunctioning stoma in high-risk rectal anastomosis

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Abstract. *Background:* Ileostomy in rectal surgery is not always indicated for protecting the anastomosis. *Methods:* We examined patients who underwent low rectal resection surgery for carcinoma between June 2005 and December 2007. We categorized the patient's characteristics according to the American Society of Anesthesiologists (ASA). We estimated hospital stay, and postoperative Dukes stage. *Results:* 68 patients, 47 males and 21 females (mean age 67.8 years, range 40-85 years) treated with low rectal resection for carcinoma. An ileostomy was performed in 29 out of 68 patients (42.6%). Six postoperative ileostomy cases led to the appearance of peritonitis from anastomotic fistula. Among the patients with ileostomy 19 pts. (65.5%) belonged to ASA II and 10 pts.(34.5%) to ASA III; among those patients without ileostomy, 32 (82.05%) ASA II and 7 (17.95%) ASA III (p=n.s.). Of patients who underwent the first protective surgical procedure, 4 belonged to ASA II (66.6%) and 2 to ASA III (33.3%). The mean hospital stay for the non ileostomy group was 7.64±0.7 days, while it was 7.36±0.49 (p=n.s.) for the ileostomy group.The mean stay of postoperative ileostomy for leakage was 10.83±1.16 days. *Conclusions:* Ileostomy cannot completely prevent the onset of leakage, but may reduce overall hospitalization time. (www.actabiomedica.it)

Key words: Ileostomy, rectal cancer, total mesorectal excision, rectal anastomosis, leakage

Introduction

Surgery for neoplasia of the mid- and lower rectum represents a great risk for leakage due to the intricate vascularization of this anatomical region. However, further the resection is pushed towards the lower rectum, higher is the risk of anastomotic complications. In these cases, neoadjuvant radiochemo-therapy is frequently employed, although the associated comorbidity (atherosclerotic pathology, nutritional deficit, etc.) and the technical difficulties of rectal surgery itself add to the risk. Some authors advise executing a defined surgical ileostomy in order to "protect" the patient from the strains of rectal anastomosis, while others advise basing the ileostomy on individual risk factors. Here, we retrospectively examined cases of low rectal resection conducted by our Surgical Unit between January 2005 and December 2007 in order to assess patient risk factors, timing of packaging products, and of its closure and whether the choice of surgery was related to patient morbidity.

Materials and methods

We examined patients who underwent low rectal resection surgery for carcinoma between June 2005 and December 2007. Surgery was performed in the Unit of General Surgery and Organ Transplantation at the Department of Surgical Sciences, University of Parma using an anastomotic technique according to Knight Griffen.

We categorized the patients characteristics according to the American Society of Anesthesiologists

(ASA) classification system. The mean hospital stay was related to the type of surgery (rectal resection with or without ileostomy) and whether the stoma led to leakage during the postoperative period. We estimated postoperative stage by evaluating the number of lymph nodes removed, grading, and disease stage based on the Dukes classification system.

All patients were followed by our stoma service for the premature and late complications related to the management of the stoma.

All patients were treated by two senior surgeons and one resident.

Morbility analysis was correlated with stoma closure.

The data were analyzed through Student's *t*-tests and chi-square tests, with values of $p<0.05$ considered as statistically significant.

Results

We analyzed 68 patients (47 males and 21 females) with a mean age of 67.8 years (range 40-85 years) that were treated with low rectal resection for carcinoma.

A defunctional ileostomy was performed in 29 out of 68 patients (42.6%), with protective, one-loop ileostomy in 25 of these 29 patients (86.1%), along with one cecostomy.

In 26 cases, ileostomy was performed in association with neoadjuvant radiochemotherapy. In 3 cases, the intraoperative pneumatic test, that was carried out during the surgical procedure was not satisfactory and/or the rings of the anastomosis were incomplete.

Six ileostomy cases led to the appearance of peritonitis from anastomotic fistula during the postoperative period.

Table 1. ASA classification and stomy

	Ileostomy patients	Without ileostomy	
ASA II	19	32	
ASA III	10	7	
	29	39	p=n.s.*

n.s.= not significant

Table 2. Hospital stay and surgical procedure

	Ileostomy patients	Without ileostomy	Postoperative ileostomy	
Hospital stay	7.36±0.49	7.64±0.7	--	p=n.s.
Hospital stay	7.36±0.49	--	10.83±1.16	p<0.001

Using the ASA classification system, we categorized the patients into three groups. Among those patients with ileostomy as part of the procedure, 19 (65.5%) fell into ASA class II and 10 (34.5%) into ASA III. Among those patients without ileostomy, 32 (82.05%) were in the ASA II class and 7 (17.95%) were in the ASA III (p=n.s.) (Table 1). Among the patients who underwent the first protective surgical procedure, 4 belonged to ASA II (66.6%) and 2 to ASA III (33.3%).

The mean hospital stay for the group in which ileostomy was unnecessary was 7.64±0.7 days, while it was 7.36±0.49 days (p=n.s.) for the ileostomy group.

The mean stay of the group in which the stomia was performed for the occurrence of leakage was 10.83±1.16 days; these data compared with the group of the patients in which the stoma had been carried out contextually to the resection, revealed a $p<0.001$ (Table 2).

The number of lymph nodes removed from patients treated either with or without ileostomy was 17.3±10.07 and 19.88±10.89, respectively (p=n.s.).

The histological examination using the Dukes classification system showed the following distribution of cases in the 39 patients operated without an ileostomy: 9 cases classifiable as B1, 13 cases as B2, 3 cases as C1 and 14 cases as C2. Out of the four ileostomy patients, one fell under the B1 classification, 6 under B2, 8 under C1 and 11 under C2.

Among the 29 ileostomy patients, three presented with peristomal bleeding and six had peristomal dermatitis within 7 days after surgery.

Thirty days post-surgery, we reported two cases of peristomal hernia and one case of subocclusion requiring further hospitalization. Out of the 35 ileostomy patients (6 cases postoperative), 31 patients had been rechanneling with a mean waiting time of 176±13.3 days, all after bowel enema. Four patients opted out of further surgical intervention.

Discussion

Colorectal anastomosis is a high-risk surgery due to technical factors related to patient comorbidity and risk of leakage.

Several authors have highlighted high-risk factors related to low rectal resection in obese patients including difficult anatomical dissection, the presence of irregular anastomotic rings, anastomosis performed under tension and, patient age (particularly when greater than 70 years). High-risk conditions for total mesorectal excision (TME) include colon-anal anastomosis concomitant with radiotherapy; resection performed under urgent conditions; surgery in immunocompromised patients or on iatrogenic lesion of the distal rectum, small intestine or vagina; vascular risk during the maneuvers of dissection; and cases where blood loss of more than 2000 mL from either the presacrali veins or spleen is present (1-3). Additional risk factors take into account the anatomy of the patient, which plays a fundamental role in technical difficulties of rectal dissection. Males have an anatomically closer pelvis, creating more technical difficulties in low resection of the rectum (4). When analyzing the ASA data, we found that ileostomy patients belonged to a higher ASA class than that of the untreated patient group.

Some authors have attempted to perform a straight anatomical repere of the resection line, a distance from the anus to define a risk factor of leakage. Pakkastie (5) identifies an anastomotic risk when the level of the suture is 7 cm from the anal rhyme. Kananja (6) places this limit at 6 cm from the anal rhyme while Rullier (4) uses 5 cm.

Leakage is clinically verified through the evaluation of the drain used to protect the line of suture, through digital exploration (rare) or through radiologic or endoscopic examinations.

Anastomotic leakage determines the state of peritonitis caused by enteral fluid leakage from the suture, the consequent pelvic abscess, and the onset of rectovaginal fistula (3).

The risks described above highlight the need for an intraoperative indicator in order to perform protective ileostomy. In the literature, several authors describe their experiences on indications for performing an ileostomy. Machado describes the experience of two surgical units operating within the same area (7): one group routinely performed ileostomy surgery to protect against high-risk anastomosis (performed on 96% of patients), while the other unit rarely treated patients with this surgery (only 5% of treated patients). No difference in terms of re-intervening surgery, postoperative mortality or pelvic infections were present. Analyzing these two patient series, we showed that a group that routinely performs an ileostomy does not mobilize the splenic flexure (performed in 23% of cases), while a group that does not perform surgical ileostomy mobilizes the splenic flexure (96% of cases).

The level of rectal resection is at 4 cm in the first group and 3 cm in the second group. These data show the need to execute an anastomosis that is not in tension. This result is obtained by mobilizing the splenic flexure. Ileostomy offers an undiscussed advantage of protecting the lower rectum, which decreases symptomatic leakage (3). Koperna showed in 2003 that, although leakage may arise in ileostomy patients, the number of intervening surgeries is proportionally lower (8). Ileostomy helps to limit the consequences of anastomotic leakage after TME in patients treated with radiochemiotherapy (9). When we performed ileostomy to protect from anastomosis, it was an ileostomy such as in our series (86.1% of cases). We also take into account the management of the same ileostomy and the need for its next closure. We stress the importance of informing and educating both the patient and his/her family on a correct postoperative management during the first months of recovery, until the stoma is fully closed.

A second, less invasive surgical procedure is often required, in which 11% of patients develop complications such as dehydration, electrolyte imbalance, perilesional dermatitis, peristomal bleeding, and intestinal obstruction (1, 10-12). The surgical course of action during the first ileostomy should take into consideration that the majority of ileostomy incisions do not fully close (13-15). Other authors show that the first stoma performed does not close in 19% of patients and that 97% of the patients undergo surgery within a year of the first procedure to close the stoma.

If the stoma does not close during the first year, it has a higher probability of remaining permanently open. In terms of health expenditure, we calculate that

the purpose for which the surgeon decides to perform an ileostomy is to avoid reintervention surgeries for complications associated with frequent leakage and comorbidity. The average cost for a patient with colorectal fistula disruption is three times higher than that of a patient without complications. Koperna identified the 2003 costs for rectal resection surgery as € 8400 without complications, € 13,895 for a low anterior resection with ileostomy, and € 42,250 for an ileostomy reintervention surgery after anastomotic leakage (8).

We report a higher rate of laparoscopic resection in the past few years. In 2006, Breuknik reported no statistically significant difference between LTME (laparoscopic total mesorectal excision) and OTME (open total mesorectal excision) and no difference between leakage disruption rates (16). Postoperative bleeding from operations carried out through laparoscopic techniques is reduced compared to those performed through open techniques. The average operation time remains longer in patients with laparoscopic resection, although there is no histological difference between the proximal and distal anastomotic margins or number of lymph nodes removed. As in all laparoscopic procedures, however, recovery is more rapid in terms of regular food intake, pain control and hospital stay.

Conclusions

After reviewing the literature, we conclude that ileostomy should be performed on TME patients after radiochemiotherapy, in obese or male patients, and in patients with intraoperative complications connected with difficulties in dissection. A good ileostomy may require an additional surgical intervention and cannot completely prevent the onset of leakage, but may reduce overall hospitalization time.

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