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ORIGINAL ARTICLE

Low or Ultralow Anterior Resection of Rectal Cancer Without Diverting Stoma: Experience with 28 Patients

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Abstract A diverting temporary stoma is frequently used to decrease the chance of anastomosis leakage in the middle and lower rectum cancer surgeries, but its role in preventing the leakage is still doubtful. This study has been designed to evaluate any possible anastomosis complications after a rectum resection and a low or ultralow anastomosis when no diverting stoma is applied in patients with rectal cancer. Twenty-eight patients suffering from rectal cancer were treated by a low anterior resection between the years 2005 and 2008 in Imam Reza University Hospital, Mashhad, Iran. Out of the 28 patients, 6 patients had already undergone a course of neoadjuvant radiotherapy. Anastomosis was performed manually in 23 patients, using a stapler in 5 of them. None of the patients had a diverting stoma. Then, the outcome was evaluated. Fecal incontinence occurred in one of the patients (6.7 %) who had already undergone a course of radiotherapy preoperatively and had a stapler used for anastomosis. No leakage was detected in any of them. The very low incidence of complications in this study, such as those not preventable by a diverting stoma, suggest a very low chance of leakage in low or ultralow anastomosis in patients with rectal cancer and in those who were treated with neoadjuvant radiotherapy.

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Introduction

With regard to the improvements in surgical techniques and surgeon's knowledge, there has been an increase in the tendency of sphincter sparing operations in low- and mid-rectal cancers.

Diverting stomas for low and ultralow rectal anastomosis are being constructed routinely in some colorectal centers [1–8] based on crediting the fact that creating route diverting stomas, and thereby making a space from the anastomosis, lowers the anastomotic leakage incidence; whereas, some other centers have shown the reverse [9–13]. Furthermore, the stoma itself would increase the morbidity in construction time, life period, and closure time, which also in its place needs reoperation and hospitalization, and so has its own morbidity and mortality [14–16]. In some instances, the stoma cannot be closed in the patient's entire lifetime [17–19]. Some articles have mentioned no decrease of fistula, but less leakage complications, and so the necessity of operation [20].

This study aimed to pursue the anastomotic complications in patients with low or ultralow rectal resection while not using a diverting stoma due to low- and mid-rectal carcinoma.

Patients and Methods

The study was conducted after the ethics committee approval (Mashhad University of Medical Sciences, Iran) from March 2005 to September 2008. The participants included 28 patients with mid- and distal rectal cancers who were

Table 1 The patient's characteristics

	Without neoadjuvant chemoradiation	With neoadjuvant chemoradiation	Total
Mean age (years)	57 (range 40–74)	62.66 (range 48–81)	59.8 (range 40–81)
Male/female ratio	14/8	3/3	17/11
Hand sewn anastomosis	18	5	23
Stapler anastomosis	4	1	5
Total	22	6	28

operated on in Imam Reza University Hospital. All the patients signed an informed consent and had a confirmed pathological report of adenocarcinoma.

The colon was mechanically and chemically prepared using polyethylene glycol, saline enema, neomycin, and erythromycin. All the patients were operated through a median incision; thereafter, a thorough exploration was performed to search for any possible abdominal metastasis. Our approach was dissecting the colon with total mesorectal excision, a safe proximal and distal margin, and then low or ultralow anastomosis—without colonic pouch or coloplasty—using hand suturing or linear/circular staplers (low or ultralow anterior resection). Neither a diverting stoma was constructed nor a drain was placed routinely in any of the patients. All of them were prescribed a broad-spectrum intravenous antibiotics pre and 3 days postoperationally. Postoperatively, none of the patients went through a contrast enema study to evaluate the anastomosis integrity. Detecting postoperational complications (e.g., anastomosis site leakage or abscess formation) and clinical signs and symptoms such as fever, persistent or sever anal pain, anal pus discharge, and leukocytosis were reconsidered during admission time and through 1 month postoperationally. The patient was then followed up every 3 months for 2 years and every 6 months until the 5-year mark. The cases have been followed up using physical examination, chest X-ray, carcinoembryonic antigen level, and colonoscopy. Abdominal ultrasonography and/or abdominopelvic computed tomography scan were performed, if needed. After data collection, statistical analysis was performed using SPSS (version 16), by means of chi-square and *t* test±2 SE for determination of confidence interval of 95 %.

Results

Table 1 shows the characteristics of the 28 patients who participated in the study. Of the 28 patients, anastomosis was accomplished by hand suturing in 23 patients and by stapling in 5 patients. Six patients (21.4 %) had already undergone neoadjuvant chemoradiation, of which in five cases anastomosis was made using hand suturing and stapler suturing was done in the remaining one patient. The mean age was 59±1.8 years (range 40–81). The overall male to female ratio was 17:11.

The mean follow-up time was 37 months (range 11–53). No anastomotic leakage was observed. None of the participants experienced fascial dehiscence, abdominal or pelvic abscess, fistula, or significant anastomotic site stricture. No mortality related to operative technique was recorded during the follow-up period.

One of the patients who had gone through the radiotherapy prior to the operation and his anastomosis was performed by stapler faced temporary fecal incontinence, but the difference

Table 2 Comparison of complications in different groups of patients

			Anastomotic leakage		Temporary fecal incontinence		Total
			Negative	Positive	Negative	Positive	
With NAC	Operative technique	Hand sewn	0 (0 %)	0 (0 %)	5 (100 %)	0 (0 %)	5 (83.3 %)
		Stapler	0 (0 %)	0 (0 %)	0 (0 %)	1 (100 %)	1 (16.7 %)
	Total		0 (0 %)	0 (0 %)	5 (100 %)	1 (100 %)	6 (100 %)
Without NAC	Operative technique	Hand sewn	0 (0 %)	0 (0 %)	18 (81.8 %)	0 (0 %)	18 (81.8 %)
		Stapler	0 (0 %)	0 (0 %)	4 (18.2 %)	0 (0 %)	4 (18.2 %)
	Total		0 (0 %)	0 (0 %)	22 (100 %)	0 (0 %)	22 (100 %)

NAC neoadjuvant chemoradiation

between this group and those who did not receive neoadjuvant chemoradiation was not statistically significant (Table 2).

Discussion

Nowadays, rectal tumor resection with a 1–2 cm of safe distal margin and total mesorectal excision followed by low or ultralow anastomosis with a sphincter sparing approach is a globally accepted treatment. Even though by developed technologies and using staplers, this kind of anastomosis is more feasible, but hand suturing is still acceptable and based on some articles it is even safer than the staplers [21]. Very low anastomosis, preoperative radiation, presence of intraoperative adverse events, stapled anastomosis, T3–T4 tumor or positive lymph nodes, and male sex were independent risk factors for symptomatic anastomotic leakage in the multivariate analysis [12, 13, 22].

Although anastomotic leakage has been reported to be between 3.3 and 28 % in some articles [5–7, 13, 22–27], we did not observe even one such case.

As some surgeons believe that "the lesser anastomotic site fecal contamination, the lesser chance of anastomotic site leakage", using diverting ileostomy or colostomy would be a constant part of their low or ultralow anterior resection [1–8]; although several recent studies have not confirmed this idea, and only persisted on less complication of the possible leakage such as the pelvic sepsis [11, 19] or and less operational needs for further possible leakages [23, 28, 29].

A diverting stoma may have the following complications: fluid-electrolytes disorders, skin irritation, stoma-site hernia, and prolapse [21]. Economically, as these patients need stoma care and later on hospitalization and another operation for stoma closure, a routine diverting stoma creation will increase the treatment cost for sure [10, 24, 25]. At the time of making and consequently taking down the diverting stoma there are 5.2–23.3 % and 9.5–18.3 % chances of complications, respectively [21]; the overall morbidity and mortality rates for this procedure are 33.8 % and 6.4 %, respectively [30]. Although 6.3–19.2 % of temporary stomas have never been closed and remained forever [17–19, 21], some studies showed that the quality of life would be bad with stoma and generally improved after ileostomy closure [31]. So a temporary stoma should be created in selected patients with highest risk anastomotic leakage [23, 26, 31].

Some studies believe that routine contrast enema evaluation of low pelvic anastomoses did not provide any additional details which would change the patient management [32], thereby in our study none of the patients went through a contrast enema to evaluate the integrity of the anastomosis.

In the present study, the only reported complication was fecal incontinence in one patient, which could not be prevented or treated with a diverting stoma. Thus, although it is believed that a diverting stoma facilitates the treatment of complications resulting from anastomotic leakage in rectal surgeries with low and ultralow anastomosis and also decreases the need for laparotomy in such patients, proper selection of patient, development of a reliable anastomosis technique, proper and complete preoperative mechanical and chemical bowel preparation, and performing anastomosis at the shortest distance from the anal verge in patients undergoing total mesorectal excision would help clearly reduce anastomotic leakage. However, it seems reasonable to perform a diverting stoma according to the patient's conditions and the surgeon's preference in selected patients with a high probability of anastomotic leakage. Another important point is that none of the patients who underwent preoperative radiotherapy experienced anastomotic leakage. This also suggests that an unreliable anastomosis technique and patient's bad general conditions are the main risk factors for anastomotic leakage, which is in contrast with the views of some researchers who have considered preoperative radiation therapy as a risk factor for the leakage [12].

This study demonstrates a low rate of anastomotic complications in rectal operations with low or ultralow anastomosis. Thereby, we concluded that a routine diverting stoma to prevent that complication is not necessary, though stoma creation is prudent for those with higher risk of anastomotic leakage such as immunocompromised patients.

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Conflict of Interest All authors have no conflicts of interest.

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