

Management of rectovaginal fistulas secondary to use of stapling device for rectal cancer surgery

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Abstract

Aim: Scarce data are available for rectovaginal fistula (RVF) as a serious complication of low anterior resection with a double-stapled anastomosis for rectal cancer. In this study, we aimed to evaluate our surgical management of RVFs formed due to stapler use.

Material and Methods: Between 2010 and 2018, patients who developed rectovaginal fistula after the use of circular stapler during rectal surgery were included. Clinic characteristics, type of surgical treatment performed and details of surgery in patients were retrospectively evaluated.

Results: Ten patients for whom stapler device was used for rectal cancer surgery and diagnosed with RVF were included in our study. The mean age of the patients was 45.7 ± 11.8 and mean BMI value was 27 ± 2.4 . For 9 patients who had primary repair for RVFs, 7 patients experienced recurrence after their first operation. For this subgroup, muscle flap was performed in 3, vaginal mucosa advancement flap 2, sartius flap one, and another primary repair plus fibrin glue application one patient. After the second interventions, two patients were managed with muscle flap creation and primary repair plus fibrin glue was required for one patient, for their recurrence. For patient who had primary repair plus fibrin glue application for her second operation, sigmoid colostomy followed by abdominoperineal resection was required for persisting complaints.

Conclusion: The management of postoperative (RVF) after low anterior resection for rectal cancer is difficult and the results are often unsatisfactory. Endoanal mucosal flaps and muscle flaps are the treatment modalities we recommend, especially in patients with recurrence.

Keywords: Circular stapler; rectovaginal fistula; rectal cancer.

INTRODUCTION

Recto-vaginal fistulas (RVF) can be defined as an epithelial connection between the anterior wall of the rectum and the posterior wall of the vagina. They exhibit symptoms such as gas and feces coming from the vagina, vaginitis due to irritation of vaginal mucosa and vaginal purulent discharge. Obstetric causes, inflammatory bowel disease (IBD), carcinoma, radiation, diverticulitis, foreign body, infection, congenital anomalies and various postoperative complications for pelvic organs are important factors in the etiology (1-3).

RVFs are classified as simple and complex. The simple ones are located in the lower or middle and have dimensions less than 2.5 cm. Complex ones are located higher and over 2.5 cm in size. The use of stapler plays an important role in rectal surgery (1,4-6). However, this

method sometimes results in rectovaginal fistulas (RVF). The reported incidence of RVF was 0.9–2.9% after low anterior resection, while in another study, the incidence of RVF after anterior resection for rectal cancer was 0.9–9.9% (7,8).

Previous hysterectomy and double stapling techniques are known as risk factors for the development of RVF. In addition, anastomotic leakage often causes RVF when there is an intrapelvic abscess. Surgical treatments for RVF include local repair methods (transanal, vaginal, perineal), various tissue transposition methods and transabdominal repairs, but it is difficult to treat and has high risk of recurrence.

In this study, we aimed to review our surgical experience in 10 patients with RVF developing due to stapler use in rectal surgery, which is rare but has a difficult treatment.

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MATERIAL and METHODS

Patients developing rectovaginal fistula after circular stapler use during rectal surgery for rectal cancer and ulcerative colitis between 2010 and 2018 were included in the study.

A common database was created by examining patient files and hospital information system records. Using this database, patient information was evaluated retrospectively. Demographic characteristics, BMIs, comorbidities, radiotherapy histories, history of hysterectomy, need for stoma formation, the timing of fistula development after the operation.

Applied surgical treatment, the treatment success rates, details of repeat surgical treatment in patients who developed recurrence were examined. We detected rectovaginal fistula in the physical examination of vaginal discharge in patients.

Before the operation, patients were informed about the operation and written consent was obtained. The study was conducted according to the principles of the Declaration of Helsinki and the Good Clinical Practice guidelines.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 24 (IBM Corp., Armonk, N.Y., USA). Categorical measurements were summarized as numbers and percentages, and continuous measurements were summarized as mean and standard deviation (median and minimum-maximum where necessary).

RESULTS

Ten patients were included in our study, 9 of them were operated for rectal cancer and 1 for ulcerative colitis.

Stapler was used in all patients during their operations.

Two patients had postoperative radiotherapy, 7 patients had preoperative radiotherapy, 1 patient had not received radiotherapy.

The mean age of the patients was 45.7 ± 11.8 and mean BMI value was 27 ± 2.4 . Two patients had diabetes and 1 patient had chronic obstructive lung disease. None of the patients had a history of hysterectomy.

Diverting stoma was opened in 8 patients during the first operation, and it wasn't opened in 2 patients. Rectovaginal fistula developed after stoma closure in four patients. In four patients, the rectovaginal fistula developed before the stoma was closed. Rectovaginal fistulas developed postoperatively in 5 patients (50%) at 1 month, in 2 patients (20%) at 3 months, in 1 patient (10%) at 4 months, in 1 patient (10%) at 5 months, and in 1 patient (10%) at 6 months.

1 (10%) pull-through was performed in the surgical treatments applied to the patients. There was no recurrence during follow-up. Nine (90%) primary repairs

were performed. No recurrence occurred in 2 patients; the other patients had recurrence. There was stoma in 4 patients during rectovaginal operation and 2 of these patients had recurrence.

Of the 7 patients who developed recurrence after the first operations, 3 had muscle flap, 2 had vaginal mucosal advancement flap, 1 had sartius flap repair, and 1 had (10%) primary repair + fibrin glue. Recurrence occurred in 2 patients who had muscle flap after the second operations, and 1 patient who had primary repair and fibrin glue. In one of the patients who underwent muscle flap in their second operation, muscle flap was applied again and no recurrence occurred. The other was repaired with stapler (Fistula tract is cut with stapler by perineal approach), and no recurrence occurred. Sigmoid colostomy was performed on the patient who underwent primary repair and fibrin glue in their second operation. Abdominoperineal resection was performed after continued complaints. These are shown in Table 1.

No intraoperative and postoperative major complications were encountered. Wound infection developed in 3 patients after the first operations, 2 patients after the second operations, did not develop after the third operation and developed in 1 patient after the fourth operation. The most common reason for admission to hospital after discharge was wound infection.

DISCUSSION

Cohen et al. reported that anterior resection using the double-stapler technique had an acceptable clinical leakage rate, local recurrence rate, and survival rate. Inevitably, however, the staple has many risks, including misfire, incomplete resection ring and other technical difficulties with the placement of circular or linear staplers. Anastomotic leakage, stricture, bleeding and rectovaginal fistula (RVF) may occur during the early period (9).

The leading cause of RVF is involvement of the posterior wall of the vagina. Due to insufficient visualization of the deep pelvis operative area, the staple line holds the posterior wall of the vagina during circular staple firing. Sugarbaker, in his study describing potential errors in the double-stapler technique, stated that if the rectal stump and posterior vagina are not adequately separated and the staple gun is squeezed by the posterior vagina anvil far away from the anterior, it may be partially resected by the staple gun and circular blade (7,10).

In order to prevent this complication, the rectum should be separated from the posterior wall of the vagina and the staple gun. The vagina should be opened more posteriorly to keep it away from the circular anastomosis. Digital vaginal examination must be performed before the stapler is fired.

The risk factors for RVF formation were found to be low anastomosis (<5cm above the anal canal) in UICC stage IV cancer, preoperative chemotherapy, maximum tumor diameter (≥ 50 mm), intraoperative bleeding (200

Table 1. Clinical features and operations of patients operated for RVF

Case no	Age	BMI	Etiology	Radiotherapy	Radiotherapy timing	Diverting stoma	Time of development (month)	First operation	Recurrence	Second operation	Recurrence	Third operation	Recurrence	Fourth operation
1	45	27	Rectum Ca	Yes	Pre-operative	Yes	3	Primary repair	Yes	Muscle flap	Yes	Repair with stapler	No	
2	27	23	Repair with stapler	No		Yes	1	Primary repair	Yes	Mucosal flap	No			
3	48	29	Rectum Ca	Yes	Postoperative	No	1	Pull through	No					
4	35	30	Rectum Ca	Yes	Pre-operative	No	1	Primary repair	Yes	Primary repair+ fibrin glue	Yes	Sigmoid colostomy	Yes	Abdomino perineal resection
5	45	24	Rectum Ca	Yes	Pre-operative	Yes	1	Primary repair	No					
6	56	26	Rectum Ca	Yes	Pre-operative	Yes	4	Primary repair	Yes	Sartorius flap	No			
7	67	28	Rectum Ca	Yes	Postoperative	Yes	6	Primary repair	Yes	Mucosal flap	No			
8	43	28	Rectum Ca	Yes	Pre-operative	Yes	5	Primary repair	Yes	Muscle flap	No			
9	35	28	Rectum Ca	Yes	Pre-operative	Yes	3	Primary repair	Yes	Muscle flap	Yes	Muscle flap	No	
10	56	25	Rectum Ca	Yes	Pre-operative	Yes	1	Primary repair	No					

ml), and lateral lymph node dissection (8). One of the factors that increase the risk of RVF is neoadjuvant radiotherapy. Radiotherapy causes vascular injury, chronic inflammation and ischemia, leading to the development of RVF (11). In our series, the rate of recurrence after primary repair was higher in patients who underwent preoperative radiotherapy, compared to those who received postoperative radiotherapy, in accordance with the literature. In addition, having a hysterectomy is a risk factor for RVF (8).

Although there are approaches such as abdominal, rectal, vaginal, perineal, transsphincteric, transanal in the treatment of rectovaginal fistulas after low anterior resection, it is difficult to manage and does not have satisfactory results.

Rex and Khubchandani reported a high success rate for spontaneous closure of RVF in one study (71.4%). They suggested that close follow-up observation with low-calorie diets, antibiotics or intestinal rest may be sufficient in minimally symptomatic patients (12).

In the same study, 62.5% successful endoanal repair was reported. In our series, this rate was 60% in recurrent cases (12).

In their series, CASADESUS et al. reported a 75% success rate for primary repair in RVF (13). In other published series, success rates decrease to 40-85% after one or more unsuccessful repair attempts (14,15,16). In our series, the primary repair success rate was 22%. In our series, 3 patients required one-session intervention,

4 patients required two sessions, 2 patients required three sessions, and 1 patient required four sessions. The more the fistula is complicated, the higher the number of required operations.

Here, it is important that the surgeon who intervenes in RVF knows all the surgical options that should be applied. As shown in Table 1, although many of the operations described for RVF are known and performed, treatment is not always easy.

Since there are risks such as recurrence and incontinence after treatment, it is very important to determine the right strategy and to bring together well-blooded volumetric tissues without tension in a reconstructive procedure with appropriate dissection (1,7).

Opening of a stoma for diversion after an RVF operation contributes to wound healing by reducing the pressure gradient between the rectum and vagina (17,18).

CONCLUSION

In conclusion, management of rectovaginal fistula after stapler use consists of a series of complicated and patience-requiring operations. Although various methods are used in surgical treatment, primary repair has the lowest chance of success, endoanal mucosal flaps and muscle flaps are the treatment options we recommend, especially in patients with recurrence.

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