

Conservative treatment of rectovesical fistula after leakage following laparoscopic radical resection of rectal cancer

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Shunli Yan¹ , Huimin Sun², Zhaohui Li¹,
Shuaifeng Liu¹ and Baowei Han¹

Abstract

Rectovesical fistula (RVF) is a multifactorial complication that can be caused by different types of laparoscopic surgery, malignant tumor invasion, and chronic inflammation. However, RVF as a postoperative complication of laparoscopic radical rectal cancer is rare and serious. Here, we describe the case of a patient with RVF secondary to pelvic infection that was induced by anastomotic leakage. The patient was managed with conservative treatment, which included double-cavity cannula irrigation-drainage, indwelling balloon urethral catheter, treating the urinary tract infection, partial parenteral nutrition, and enteral nutrition. The patient was discharged after his symptoms had improved. In this case report, we provide a feasible scheme for patients with RVF that is induced by postoperative anastomotic fistula. Inflammatory, infectious, and thrombotic factors are presumable factors that are involved in RVF pathogenesis. These findings provide new directions for the study of RVF induced by anastomotic leakage after rectal cancer surgery. Conservative treatment may be an option in patients who want to avoid an ostomy.

Keywords

Rectovesical fistula, anastomotic leakage, rectal carcinoma, conservative treatment, rectal cancer surgery, ostomy, inflammation, infectious factors, thrombotic factors, rectovesical fistula pathogenesis

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¹Department of Gastrointestinal Surgery, Luoyang Central Hospital Affiliated to Zhengzhou University, Luoyang, Henan, China

²Operation Department, Luoyang Central Hospital Affiliated to Zhengzhou University, Luoyang, Henan, China

Corresponding author:

Shunli Yan, Department of Gastrointestinal Surgery, Luoyang Central Hospital Affiliated to Zhengzhou University, 288 Zhongzhou Middle Road, Luoyang, Henan 471000, China.
Email: 15139906487@163.com



Introduction

In addition to congenital factors, most rectovesical fistulas (RVFs) are caused by pelvic surgery and radiation damage, inflammation and trauma, or direct tumor invasion.¹ Severe urinary tract infection, pneumaturia, fecaluria, and urine per rectum are the most common symptoms of patients with RVF and they can seriously affect quality of life. Because there is no uniform treatment for RVF, the related treatment methods vary. Many experts have tried a variety of surgical methods to manage RVF with good results, such as sphincter reservation by rectal approach, transperineal repair, transanal endoscopic microsurgery (TEM),² and a novel over-the-scope clip device Padlock[®] system that is used in patients with non-visible colovesical fistula.³ In this report, we observed that a rare case of RVF secondary to pelvic infection that was induced by anastomotic leakage after laparoscopic radical resection of rectal cancer. We managed this patient using conservative treatment, such as the double-cavity cannula irrigation-drainage, indwelling balloon urethral catheter, and no diverting ostomy, and satisfactory results were achieved.

Case report

A 61-year-old man was diagnosed with rectal cancer. The patient provided consent for publication of this case. Pelvic magnetic resonance imaging was performed, which revealed a rectal tumor, irregular rectal wall thickening, and serosal invasion that was about 7.7 cm from the anal verge. In the mesorectum, multiple lymph nodes were seen. The imaging diagnosis was middle-high rectal cancer (T₃N₂M_x CRM-). After preoperative examination, laparoscopic radical resection of rectal cancer was performed for this patient (postoperative day 0, POD0). On postoperative day 7 (POD7), the patient presented with general

discomfort that was accompanied by a low-grade fever, but no digestive juices were seen in the drainage tube. On day 10 after surgery, purulent and fecal fluid were seen in the pelvic drainage tube. The patient developed a fever that was as high as 39°C. Rectal irritation was also present, and defecation times began to increase to as many as 10 times per day. However, he had no associated urinary symptoms or signs. Hematological and biochemical testing showed a white blood cell count of 13,220/ μ L and a C-reactive protein level of 45.02 mg/L. Color Doppler ultrasonography examination suggested a small, localized pelvic effusion. Therefore, we believed that the drainage was unobstructed. All the signs indicated that the patient had postoperative anastomotic leakage. We selected and instituted conservative treatment for the patient based on his systemic condition, which included double casing flushing and drainage, partial parenteral and enteral nutrition, and antibiotics. We used 1500 mL of normal saline every day to wash and drain the pelvic cavity using a double cannula. We provided partial intravenous nutrition to the patient and oral ENSURE as the main enteral nutrition treatment for the patient, which was an ideal choice. Cefazoxime sodium was used in the patient as anti-infection therapy. Over time, the patient's overall condition tended to improve.

On day 39 after surgery, the patient complained of dysuria, pneumaturia, and pyuria, and we began to suspect that the patient had an RVF. However, this time, there was no fever. Hematological and biochemical test results showed a white blood cell count of 10,160/ μ L and a C-reactive protein level of 19.05 mg/L. Routine urine examination showed the following results: white blood cell count, 280+/ μ L; red blood cell count, 11+/ μ L; bacteria count, 235+/ μ L; and occult blood, ++. Pelvic computed tomography (CT) was performed after filling the bladder with contrast agent,

which showed that the contrast agent had penetrated into the rectum (Figure 1a) and gas was visible in the bladder (Figure 1b). This patient developed a fistula from the colorectal anastomosis into the bladder. The treatment was still non-surgical and conservative treatment. This time, we used levofloxacin orally to treat the urinary tract infection. An indwelling catheter was only used to drain urine to relieve urinary retention caused by urinary tract stimulation. Double-sleeve irrigation and total enteral nutrition (ENSURE) were continued until the patient's symptoms were significantly reduced. When the patient's urinary symptoms and rectal irritation were completely relieved, we removed the double-sleeve. On postoperative day 45 (POD45), the patient was discharged with a catheter.

Two weeks after discharge (POD59), the patient was re-examined using a pelvic CT in the outpatient department, and the pelvic CT results showed that the contrast agent had not penetrated into the rectum (Figure 1c and d). The bladder catheter was subsequently removed. No RVF-related symptoms have been found in this patient since outpatient follow-up.

Discussion

RVF is a rare but serious complication following radical resection of rectal cancer. RVFs have multiple causes, such as congenital anorectal malformation,^{4,5} pelvic surgery such as bladder and prostate surgery,⁶ gynecologic and colorectal surgery,⁷ radiotherapy in the treatment of recurrent malignant pelvic tumors,⁸ and neglected foreign bodies.⁹ One study of 109 patients with colovesical and rectovesical fistulas¹⁰ showed that in 73 patients, the fistula was caused by inflammation. As minimally invasive laparoscopic techniques and chemotherapy radiation treatments advance, the number of patients who undergo radiation treatment has been greatly

increased. Therefore, the incidence of complications after radiotherapy and minimally invasive surgery has also increased.

In this case, the patient first experienced major surgical trauma, and then experienced severe surgical complications, including rectal anastomotic fistula and severe pelvic infection, which ultimately resulted in RVF. In an acute infection, mucosa congestion and edema occur and various proinflammatory cytokines are released, which could improve blood viscosity, increase the prothrombotic state, and activate the coagulation system, which eventually leads to local thrombosis.¹¹ Local microthrombus formation may lead to microvascular injuries and mucosal ischemia, which are susceptible to fistula formation. In addition, this process was accelerated by erosion by local pus and digestive fluid. This also explained why a patient with RVF nearly 1 month before had a rectal anastomotic fistula.

Although most RVFs require surgical repair,¹² we witnessed a natural healing process in this patient. Similar to any other patient with RVF, this patient experienced all the expected symptoms such as pneumaturia, fecaluria, urine per rectum, and urinary tract infection symptoms. Cystography confirmed the diagnosis of RVF (Figure 1a and b). We managed this patient's case with conservative treatment, which included the double-cavity cannula irrigation-drainage, indwelling balloon urethral catheter, treating urinary tract infection and total parenteral nutrition. The patient was discharged after his symptoms improved. One month later, cystography revealed that there was no contrast medium leakage into the rectum. Similar conservative treatment of rectovaginal fistula has been reported by Moreno-Selva et al.,¹³ but most RVFs after rectal cancer surgery have not been managed by expectant treatment. Surgical diversion of the urinary and the gastrointestinal tracts are common treatment measures. With the

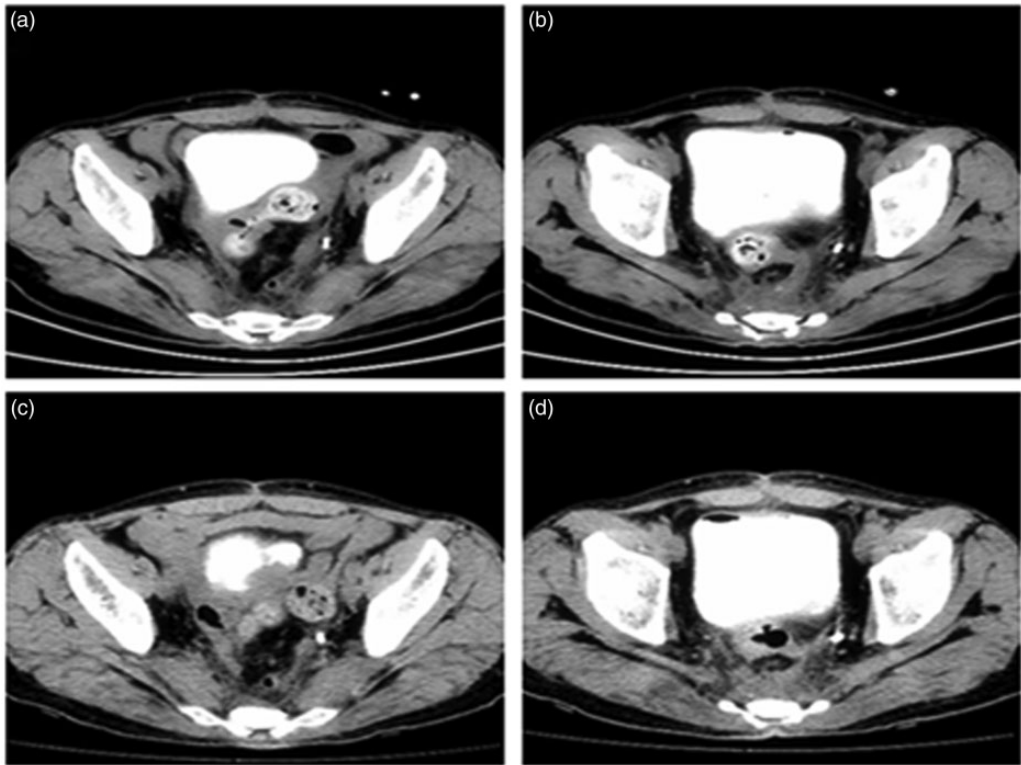


Figure 1. (a and b) Before conservative treatment, the contrast agent had penetrated into the rectum (a) and gas was visible in the bladder (b). (c and d) After conservative treatment, the contrast agent had not penetrated into the rectum.

development of robotic surgery technology, Yeung et al.¹⁴ provided a parametric scheme for repairing RVF using robots. Recently, Velayos et al.³ reported a case of RVF that was treated with a novel over-the-scope clip device Padlock[®] system combined with urology. Kanehira et al.² performed repair surgery for ten patients with RVF by transanal endoscopic microsurgery, among whom seven patients were cured and three procedures failed. Although the relevant surgical methods have achieved satisfactory results, surgical experts have not stopped investigating RVF, but there is no recognized unified treatment. We believe that the treatment method that is suitable for patients is the best choice, and our protocol involves individualized treatment.

Conclusions

In this patient with an RVF secondary to pelvic infection that is induced by anastomotic fistula after laparoscopic radical resection of rectal cancer, our successful experience with patient management provides a feasible scheme for reference. Because complications related to surgical-induced RVFs have the lowest incidence rate and lack the required relevant treatment experience, most colorectal surgeons are careful. Inflammatory infectious factors were associated with an increased the risk of microthrombosis, which may also be the cause of this RVF. These findings provide new directions for the study of RVF that is induced by an anastomotic fistula after

rectal cancer surgery. Conservative treatment such as double-sleeve irrigation and drainage or urinary bladder drainage may be an option in patients who want to avoid an ostomy.

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Declaration of conflicting interest

The authors declare that there is no conflict of interest.


Ethics and consent

The patient knows the content of this report and agreed with publishing it. Relevant informed consent has been signed. This paper was approved by the local ethics committee, which is called the Medical Ethics Committee of Luoyang Central Hospital (approval number, 2019-05-29).

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ORCID iD

Shunli Yan  <https://orcid.org/0000-0002-5820-2962>

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