American Journal of Medical Case Reports, 2017, Vol. 5, No. 3, 50-52
Available online at http://pubs.sciepub.com/ajmcr/5/3/1

DOI:10.12691/ajmcr-5-3-1

Delayed Disruption of Anastomosis Caused by Severe Radiation Proctitis: A Case Report

Pyong Wha Choi*

Department of Surgery, Inje University College of Medicine, Ilsan Paik Hospital, 170, Juhwa-ro, Ilsanseo-gu, Goyang-si, Gyeonggi-do, 10380, Korea
*Corresponding author: choipeace1130@gmail.com

Abstract The role of radiotherapy in the treatment of rectal cancer has been well established. However, radiotherapy-associated complications are sometimes unavoidable. Chronic radiation proctitis is a representative complication, with the incidence ranging from 5% to 20%, which in turn, can cause other severe complications such as necrosis, perforation, fistula, and stricture. Although radiation influences anastomosis wound healing, delayed anastomotic disruption caused by severe radiation proctitis is extremely rare. Here, we present a case of delayed anastomotic disruption after postoperative radiotherapy. A 66-year-old woman presented with bloody diarrhea. She had undergone low anterior resection for rectal cancer 11 months ago, and had received 28 times radiotherapy for 6 weeks with a total radiation dose of 5040 cGy, postoperatively. Sigmoidoscopy showed circumferential necrosis and gangrenous change above the previous anastomosis site on the rectum, and pelvic magnetic resonance imaging revealed disruption of the previous anastomosis site. During the operation, the affected colonic segment, including the anastomosis site, was resected and coloanal pull-through anastomosis and ileostomy were performed. This case presents an unusually severe form of late radiation injury. Although radiotherapy is necessary for the treatment of advanced rectal cancer, predicting factors for radiation injury should be clarified for personalized treatment.

Keywords: *rectal cancer, radiotherapy, complication, radiation proctitis, anastomosis*

Cite This Article: Pyong Wha Choi, "Delayed Disruption of Anastomosis Caused by Severe Radiation Proctitis: A Case Report." *American Journal of Medical Case Reports*, vol. 5, no. 3 (2017): 50-52. doi: 10.12691/ajmcr-5-3-1.

1. Introduction

The role of radiotherapy in the treatment of rectal cancer, whether it is preoperative or postoperative, has been well established. However, complications of radiotherapy may be inevitable, which occur in 5-20% of the cases [1]. Radiation proctitis is a representative complication after radiation therapy, which in turn, can cause severe other complications such as necrosis, perforation, fistula, and stricture requiring surgery [2,3]. Although radiation has an effect on the anastomosis wound healing, delayed anastomotic disruption caused by radiation proctitis is extremely rare [4]. Here, we present a case of anastomotic disruption after postoperative radiotherapy, which was managed by resection and coloanal anastomosis.

2. Case Report

A 66-year-old woman presented with bloody diarrhea and abdominal discomfort. She had no medical history except from a well-controlled diabetes mellitus that was diagnosed 7 years ago, and a low anterior resection for rectal cancer (T3N2M0), performed about 11 months ago. Postoperatively, radiotherapy was administered 28 times for 6 weeks with total radiation dose of 5040 cGy, and she refused to receive adjuvant chemotherapy. Immediately after radiotherapy, even though she had mild perianal erythema and discomfort, she did not complain of symptoms associated with radiation proctitis. There was no remarkable finding of anastomosis site on follow up computed tomography, 6 months postoperatively. However, bloody diarrhea had started 1 month before this visit, and she complained of anorexia and nausea. Sigmoidoscopy was performed up to 10 cm from the anal verge due to the stricture. The mucosa showed circumferential hemorrhagic and necrotic appearance above the anastomosis site (5-10 cm from the anal verge), and biopsy showed ulcer with bizarre stromal cells that are consistent with radiation proctitis (Figure 1).

Although pelvic magnetic resonance image (MRI) showed no evidence of tumor recurrence, anastomotic disruption with fluid accumulation in the presacral space was noted (Figure 2).

During the operation, the affected colonic segment, including the anastomosis site, was resected, and coloanal pull-through anastomosis and ileostomy were performed (Figure 3).

Histologically, the resected segment showed submucosal fibrosis with diffuse telangiectasia, atypical endothelial cells, and mucosal ulceration with diffuse epithelial regenerative changes. The postoperative course was uneventful and the patient was discharged on the 9th

postoperative day. Two months later, ileostomy takedown was performed.

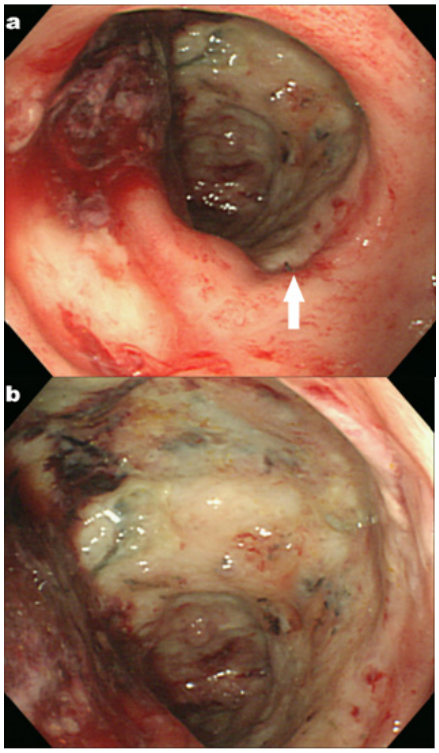

Figure 1. Colonoscopy shows circumferential necrosis and gangrenous change on the rectum. a) arrow indicates anastomosis site b) a close-up view

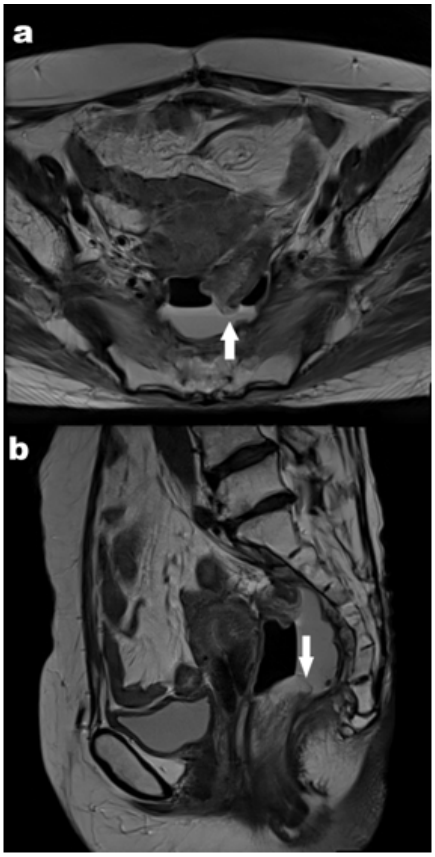

Figure 2. Pelvic MRI shows anastomosis site disruption with fluid collection. a) arrow indicates proximal side of previous anastomosis site (axial view) b) arrow indicates distal side of previous anastomosis site (sagittal view)

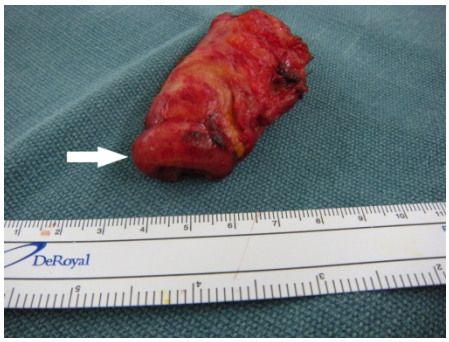

Figure 3. Gross finding of resected lesion of the anastomosis site (arrow indicates distal side of the previous anastomosis site)

3. Discussion

Surgical resection of rectal cancer is the most important treatment modality, while radiotherapy can be considered as an adjuvant treatment. Thus, even though in the past, radiotherapy was performed preoperatively or postoperatively depending on surgeon's preference or patient's condition, nowadays, preoperative concurrent chemoradiotherapy have been adopted as a standard treatment option. This is because it has some advantages over postoperative radiotherapy such as better prognosis, more sphincter saving, and less complication associated with radiation [5]. However, in the present case, surgery was performed prior to radiotherapy due to patient's preference and non-compliance for adjuvant chemotherapy.

Although technical improvement has been made for reducing radiation related complications, it is challenging to completely prevent the complications [6]. Radiation proctitis is one of the most common complications following radiotherapy, which develops in the acute or chronic form. Acute radiation proctitis is usually a self-limiting disease, occurring within 3 months after radiotherapy, while chronic radiation proctitis requires medical or surgical treatment, depending on the severity [7]. The incidence of chronic radiation proctitis ranges from 5% to 20% of the cases, and diabetes mellitus, hypertension, ageing, smoking, concurrent chemotherapy, and atherosclerosis have been suggested as risk factors for chronic radiation proctitis. Importantly, advanced cancer and total radiation dose over 5,000 cGy have been also shown to be risk factors [1,4,8,9]. In the present case, although the patient did not receive chemotherapy, old age, diabetes mellitus, and advanced cancer stage may contribute to the development of chronic radiation proctitis followed by necrosis and gangrenous change. This case reflects one of the severe complications after radiotherapy demonstrating that radiotherapy is an important risk factor for delayed anastomosis leakage in patients underwent low anterior resection for rectal cancer [4].

Histologically, during the radiotherapy, acute inflammation in the lamina propria, fibrosis of connective tissue and arteriolar endarteritis led to rectal tissue ischemia, which may be followed by bleeding, ulcer, stricture, fistula, necrosis, and gangrenous change of the rectum. Thus, the most common symptoms of radiation proctitis are anal bleeding and bowel change, which occur approximately 24 months after radiotherapy [7]. According to the Radiation Therapy Oncology Group, chronic radiation

injury and symptoms can be scored as: follows 0: No change, 1: Mild diarrhea, mild cramping, bowel movement 5 times/day, slight rectal discharge or bleeding, 2: Moderate diarrhea and colic, bowel movement > 5 times/day, excessive rectal mucus or intermittent bleeding, 3: Obstruction or bleeding requiring operation, 4: Necrosis, perforation, fistula, and 5: Death directly related to late radiation effects [2]. In this case study, the symptoms presented by the patient were bloody diarrhea and abdominal discomfort caused by necrosis of the rectum, which is consistent with score 4.

The treatment of radiation proctitis consists of medical, endoscopic, and surgical intervention. Anti-inflammatory agents, antioxidants, sucralfate, steroid enemas, and formalin therapy are used, among others, as medical treatment, while endoscopic intervention such as electrocautery, laser therapy, argon plasma coagulation, radiofrequency ablation, and cryotherapy are preferentially used in patients with anal bleeding [10]. However, severe radiation proctitis that is characterized by refractory bleeding, stricture resulting in obstruction, fistula, necrosis, and gangrenous change, requires surgical treatment. Surgical options vary from diverting ileostomy to formal resection, including affected segment with or without anastomosis, depending on the severity of the lesion and patient's general condition [4,7,10]. In general, when anastomosis disruption occurs, subsequent local or general fecal peritonitis ensues, requiring emergency operation, such as Hartmann's operation. In this case, even though anastomotic disruption was caused by gangrenous form of proctitis, the MRI scan showed that the fecal content of the rectum was confined within the pelvis without spreading into the peritoneal cavity due to postoperative adhesion. Since the patient had received low anterior resection, in which the anastomosis was made 5 cm from the anal verge, it is difficult to re-anastomose between colon and rectum after resection of the affected segment. In such situations, coloanal pull-through anastomosis has been suggested as a sphincter saving operation. Even though urgency or frequency may be one of the problems after coloanal pull-through anastomosis due to decreased reservoir volume, studies support this procedure because the most irradiated distal part of the rectum can be removed and non-irradiated colon can be directly anastomosed into the anal sphincter [11,12]. In the present case study, after removal of the affected segment, including proximal and distal part of previous anastomosis site, coloanal pull-through anastomosis was performed followed by diverting ileostomy.

Despite the better understanding of radiation injury mechanisms and advances in the ways of treatment, it is difficult to prevent this type of injury. Moreover, although some clinical risk factors for radiation proctitis have been suggested, as previously mentioned, sensitive biological markers of radiation injury have not been developed. Therefore, in order to provide optimal personalized treatment for each patient with rectal cancer, biological markers need to be determined in the future.

4. Conclusions

Although radiotherapy is necessary for treating advanced rectal cancer, personalized therapy according to the radiation toxicity is very important. Thus, studies for the identification of radiation toxicity and sensitivity predictors should be established in the future.

Acknowledgements

The author has no sources of funding to report.

References

[1] Leiper, K. and Morris, A.I., "Treatment of radiation proctitis," *Clinical Oncology*, 19 (9). 724-729. Nov.2007

[2] Turina, M., Mulhall, A.M., Mahid, S.S., Yashar, C. and Galandiuk, S., "Frequency and surgical management of chronic complications related to pelvic radiation," *Archives of Surgery*, 143 (1). 46-52. Jan.2008.

[3] Mathias, C.A.C., Pemberton, J.H., Wolff, B.G., Dozois, R.R., Nelson, H., Young-Fadok, T.M., Devine, R.M., Nivatvongs, S., Mathison, S., Larson, D. and Ilstrup, D., "Long-term functional results of radiation after coloanal anastomosis," *Acta Cirurgica Brasileira*, 14(4).

[4] Lim S.B., Yu C.S., Kim C.W., Yoon Y.S., Park I.J. and Kim J.C., "Late anastomotic leakage after low anterior resection in rectal cancer patients: clinical characteristics and predisposing factors," *Colorectal Dis*, 18(4). 135-40. Apr. 2016

[5] Sebag-Montefiore, D., Stephens, R.J., Steele, R., Monson, J., Grieve, R., Khanna, S., Quirke, P., Couture, J., de Metz, C., Myint, A.S., Bessell, E., Griffiths, G., Thompson, L.C. and Parmar, M., "Preoperative radiotherapy versus selective postoperative chemoradiotherapy in patients with rectal cancer (MRC CR07 and NCIC-CTG C016): a multicentre, randomised trial," *The Lancet*, 373 (9666). 811-820. Mar.2009.

[6] Abbasakoor, F., Vaizey, C.J. and Boulos, P.B., "Improving the morbidity of anorectal injury from pelvic radiotherapy," *Colorectal Disease*, 8 (1). 2-10. Jan. 2006.

[7] Wong, M.T., Lim, J.F., Ho, K.S., Ooi, B.S., Tang, C.L. and Eu, K.W., "Radiation proctitis: a decade's experience," *Singapore Medical Journal,* 51 (4). 315-319. Apr.2010.

[8] Yeoh, E., Horowitz, M., Russo, A., Muecke, T., Robb, T., Maddox, A. and Chatterton, B., "Effect of pelvic irradiation on gastrointestinal function: a prospective longitudinal study," *The American Journal of Medicine*, 95 (4). 397-406. Oct.1993.

[9] Shadad, A.K., Sullivan, F.J., Martin, J.D. and Egan, L.J., "Gastrointestinal radiation injury: symptoms, risk factors and mechanisms." *World J Gastroenterol,* 19 (2). 185-198. Jan.2013.

[10] Bansal, N., Soni, A., Kaur, P., Chauhan, A.K. and Kaushal, V., "Exploring the Management of Radiation Proctitis in Current Clinical Practice," *Journal of Clinical and Diagnostic Research: JCDR*, 10 (6). XE01-6. Jun.2016.

[11] Gazet, M.J.C., "Parks' coloanal pull-through anastomosis for severe, complicated radiation proctitis," *Diseases of the Colon & Rectum*, 28 (2). 110-114. Feb.1985.

[12] Lucarotti, M.E., Mountford, R.A. and Bartolo, D.C., "Surgical management of intestinal radiation injury," *Diseases of the Colon & Rectum,* 34 (10). 865-869. Oct.1991.