

This article is licensed under the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC) (<http://www.karger.com/Services/OpenAccessLicense>). Usage and distribution for commercial purposes requires written permission.

## Single Case

# Abdominoperineal Resection for Unexpected Distal Intramural Spreading of Rectal Cancer

Shinya Munakata<sup>a</sup> Yuta Murai<sup>a</sup> Akihiro Koizumi<sup>a</sup> Hisaki Kato<sup>a</sup>  
Riku Yamamoto<sup>a</sup> Syuhei Ueda<sup>a</sup> Satoshi Tokuda<sup>a</sup> Syunsuke Sakuraba<sup>a</sup>  
Tomoyuki Kushida<sup>a</sup> Hajime Orita<sup>a</sup> Mutsumi Sakurada<sup>a</sup>  
Hiroshi Maekawa<sup>a</sup> Koichi Sato<sup>a</sup> Ryo Wada<sup>b</sup>

<sup>a</sup>Department of Surgery, Juntendo Shizuoka Hospital, Juntendo University School of Medicine, Shizuoka, Japan; <sup>b</sup>Department of Pathology, Juntendo Shizuoka Hospital, Juntendo University School of Medicine, Shizuoka, Japan

## Keywords

Rectal cancer · Distal intramural spread · Abdominoperineal resection

## Abstract

**Introduction:** In rectal cancer, distal intramural spread may sometimes occur, but a maximum extent of distal spread of >6 cm is very rare. **Case Presentation:** A 65-year-old Japanese male with an advanced rectal cancer tumor with para-aortic lymph node metastasis was admitted. We performed a low anterior resection with lymphadenectomy, but the intraoperative frozen-section analysis of margins revealed malignant cell positivity; we, therefore, performed an abdominoperineal resection. Pathological findings showed that the maximum extent of distal spread was 6 cm. After 12 courses of FOLFOX4 as adjuvant chemotherapy, abdominal computed tomography revealed whole lymph node metastases, including Virchow's node. Though FOLFIRI + panitumumab was started, he was not eligible for additional chemotherapy after 10 cycles. **Conclusion:** An intraoperative frozen pathology examination was helpful for the additional resection, when unexpected distal spreading had occurred in rectal cancer. The evidence of a distal negative margin should not be underestimated.

© 2018 The Author(s)  
Published by S. Karger AG, Basel

## Introduction

The existence of microscopic tumor implants in the intestinal wall, distal to the inferior edge of a macroscopic tumor (either continuous or discontinuous with the tumor), is called distal intramural spread (DIS) [1]. In their study of 381 cases, Shimada et al. [2] reported that distal spread was detected in 14.7%, DIS only in 6.6%, mesorectal distal spread only in 4.5%, and both intramural and mesorectal distal spread in 3.7%. The most common category of DIS was direct invasion, and the most common category of mesorectal distal spread was extranodal cancer tissue [2]. Using a definition of “long distal spread” of  $\geq 2$  cm in rectal cancer [3], only 2.1% of their patients had long distal spread [2]. The maximum extent of distal spread was 24–50 mm as extranodal cancer tissue, deposit, and nodal involvement [2, 4, 5]. Here, we report a rare case of a 6-cm maximum extent of DIS diagnosed pathologically.

## Case Presentation

A 65-year-old Japanese man was admitted to our hospital for the treatment of a rectal tumor incidentally found by colonoscopy during a routine medical checkup. No apparent abnormalities were found on physical examination at admission, and the patient had no prior history of malignancy. A colonoscopy demonstrated a type 3, 7-cm-diameter rectal cancer located 10 cm proximal to the anal verge plus 2-cm DIS that had occurred due to lymphatic permeation (Fig. 1a). The colonoscopic biopsy from the tumor revealed a moderately differentiated adenocarcinoma. The dilatation was further assessed with a barium enema examination, which demonstrated an apple core sign at the rectum that was causing a mild obstruction (Fig. 1b). The upper gastrointestinal endoscopic findings were unremarkable.

Computed tomography (CT) of the patient’s chest and abdomen demonstrated no evidence of metastasis in distant organs; however, swelling of the lymph nodes around the rectum and of the para-aortic lymph node was observed (Fig. 1c). The level of carcinoembryonic antigen was 3 ng/mL, and that of cancer antigen 19-9 was 6 ng/mL. Other laboratory results were normal.

To determine whether sphincter-preserving surgery could be possible, we planned to perform a low anterior resection with lymphadenectomy, including the para-aortic lymph node with a 5-cm margin including the 2-cm DIS. However, an intraoperative frozen-section analysis of margins revealed positivity for malignant cells, and we therefore performed an abdominoperineal resection (APR). The operation time was 7 h and 12 min, and the blood loss was 660 mg.

A gross examination of the resected specimen showed a Borrmann type 3 lesion (ulcerofungating type) (5 × 4 cm) in the rectum (Fig. 2a). The final pathological stage was T4a N2b M1b (para-aortic lymph node) (stage 4B according to the Union for International Cancer Control). The patient had no postoperative complications and was discharged on postoperative day 16.

Adjuvant chemotherapy with FOLFOX (5-fluorouracil, leucovorin, oxaliplatin) was administered to the patient for 6 months on an outpatient basis. At the end of this treatment, the patient underwent a restaging CT scan, which showed progressive disease with Virchow’s lymph node metastasis. We initiated treatment with FOLFIRI (5-fluorouracil, leucovorin, irinotecan) + panitumumab. The patient was not eligible for additional chemotherapy after 10 cycles. However, he is now well 24 months after his surgery.

## Discussion

There are many reports of DIS in the rectum, but a maximum extent of distal spread >6 cm is very rare. Williams et al. [6] reported that among 50 patients with rectal cancer, the size of the DIS was <1 cm in 78.4%, >2 cm in 6%, and >3 cm in only 1.6%. Shimada et al. [2] observed similar values. Moreover, distal spread easily develops in patients with stage III or IV disease compared to those with stage I or II disease [2, 7]. Though ultrasonography has been recommended for the detection of DIS [8], we could not examine the ultrasonography findings in the present patient. Regarding the preoperative diagnosis of DIS, it is generally difficult to detect a DIS lesion before surgery. In our patient's case, there was apparently a DIS lesion in epithelial change as shown by endoscopy. However, the length of the DIS as diagnosed by endoscopy was quite different from what we expected.

Shimada et al. [2] noted a long distal spread of rectal cancer in the mesorectum detected with whole-mount sections. The DIS in our patient's case was 6 cm.

Obtaining a negative distal resection margin remains an important goal in rectal cancer resection. A distal margin of  $\geq 2$  cm is recommended during sphincter-preserving surgery for rectal carcinoma [9]. In agreement with this recommendation, we performed a low anterior resection for our patient, but an APR had to be performed for a negative distal resection. We were compelled to perform the APR based on the frozen-section findings, which suggested remaining cancer cells. Frozen sectioning is a reliable method for determining an intraoperative free distal margin. Shirouzu et al. [7] showed that patients with noncurative and distal spread of rectal cancer have an extremely low survival rate and a high risk of distant metastasis rather than local recurrence. Considering our patient's case, it is clear that in cases of advanced rectal cancer we should not underestimate the distal margin and investigate the intraoperative frozen sections.

Regarding para-aortic lymph node dissection (PALND), the reported incidence of isolated PALND ranges from 1.3 to 1.7% [10]. PALND was shown to confer a survival advantage in comparison with conventional palliative chemotherapy and with chemoradiation therapy [10]. Because our patient also had a distant lymph node metastasis, we performed the primary resection and PALND. We thus speculate that our management helped this patient be well for over 24 months.

In conclusion, we have reported a case of rectal cancer with distal spreading >6 cm. The evidence of a distal negative margin should not be underestimated.

## Statement of Ethics

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

## Disclosure Statement

The authors declare no conflicts of interest.

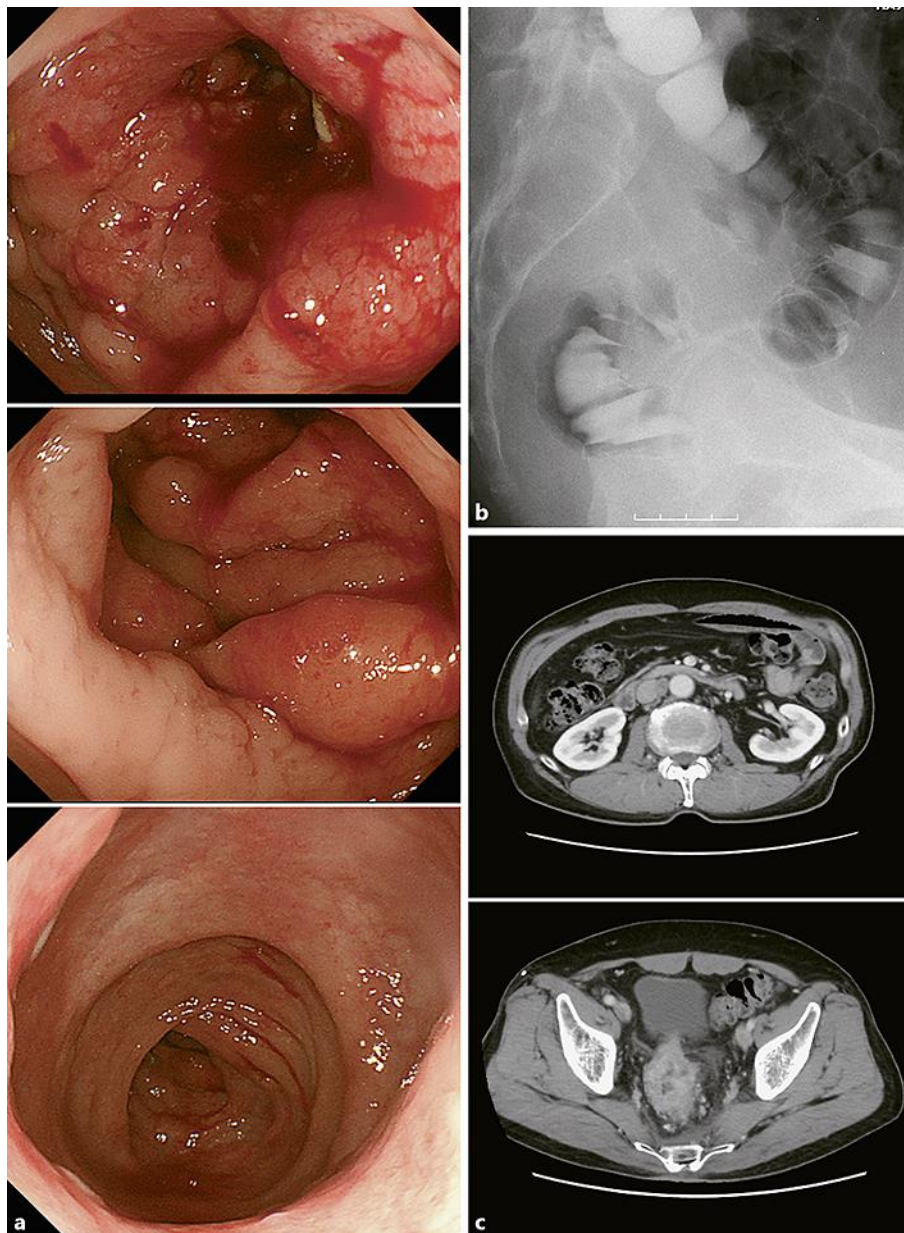
## Author Contributions

Data acquisition: S.M., Y.M., A.K., H.K., R.Y., S.U., S.T., S.S., T.K., H.O., M.S., H.M. Drafting of the manuscript: S.M. Critical revision of the manuscript: K.S.

## References

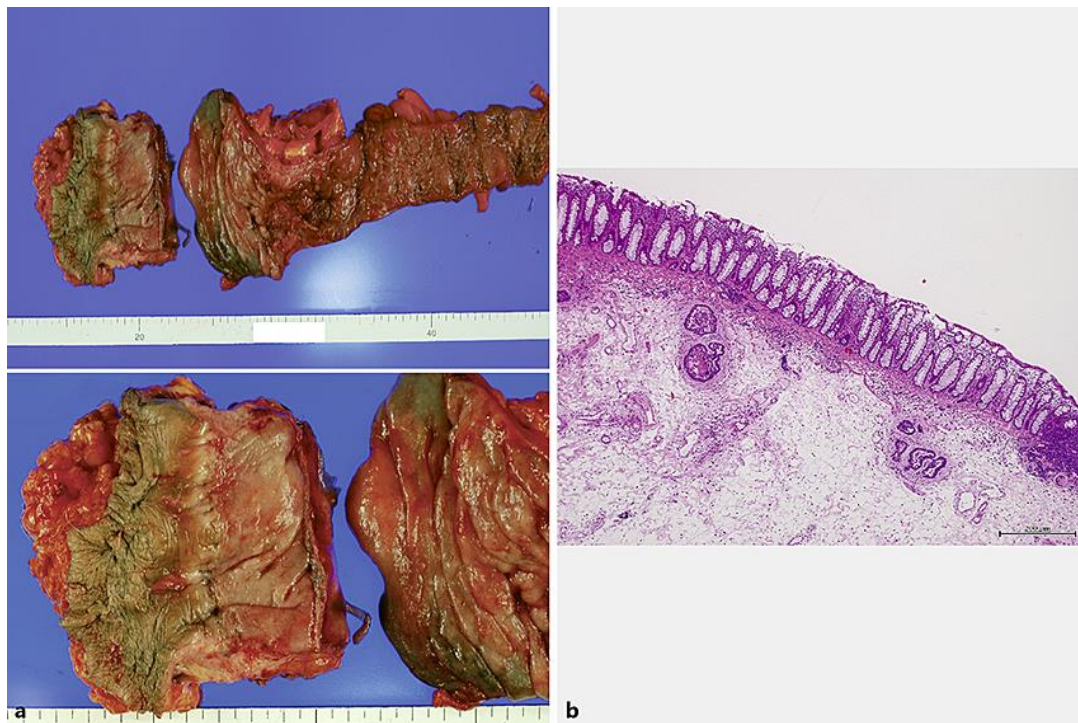
- 1 Ignacio Raffa C, Schmitz L, Fandiño S, Sánchez PJ, Bumashny E. Distal intramural spread of adenocarcinoma of the rectum after neoadjuvant therapy. *Acta Gastroenterol Latinoam*. 2014;44(4):299–304.
- 2 Shimada Y, Takii Y, Maruyama S, Ohta T. Intramural and mesorectal distal spread detected by whole-mount sections in the determination of optimal distal resection margin in patients undergoing surgery for rectosigmoid or rectal cancer without preoperative therapy. *Dis Colon Rectum*. 2011 Dec;54(12):1510–20.
- 3 Watanabe T, Itabashi M, Shimada Y, Tanaka S, Ito Y, Ajioka Y, et al.; Japanese Society for Cancer of the Colon and Rectum. Japanese Society for Cancer of the Colon and Rectum (JSCCR) Guidelines 2014 for treatment of colorectal cancer. *Int J Clin Oncol*. 2015 Apr;20(2):207–39.
- 4 Reynolds JV, Joyce WP, Dolan J, Sheahan K, Hyland JM. Pathological evidence in support of total mesorectal excision in the management of rectal cancer. *Br J Surg*. 1996 Aug;83(8):1112–5.
- 5 Ono C, Yoshinaga K, Enomoto M, Sugihara K. Discontinuous rectal cancer spread in the mesorectum and the optimal distal clearance margin in situ. *Dis Colon Rectum*. 2002 Jun;45(6):744–9; discussion 742–3.
- 6 Williams NS, Dixon MF, Johnston D. Reappraisal of the 5 centimetre rule of distal excision for carcinoma of the rectum: a study of distal intramural spread and of patients' survival. *Br J Surg*. 1983 Mar;70(3):150–4.
- 7 Shirouzu K, Isomoto H, Kakegawa T. Distal spread of rectal cancer and optimal distal margin of resection for sphincter-preserving surgery. *Cancer*. 1995 Aug;76(3):388–92.
- 8 Yanagi H, Kusunoki M, Shoji Y, Yamamura T, Utsunomiya J. Preoperative detection of distal intramural spread of lower rectal carcinoma using transrectal ultrasonography. *Dis Colon Rectum*. 1996 Nov;39(11):1210–4.
- 9 Park IJ, Kim JC. Adequate length of the distal resection margin in rectal cancer: from the oncological point of view. *J Gastrointest Surg*. 2010 Aug;14(8):1331–7.
- 10 Wong JS, Tan GH, Teo MC. Management of para-aortic lymph node metastasis in colorectal patients: A systemic review. *Surg Oncol*. 2016 Dec;25(4):411–8.

Shinya Munakata has first authorship. Koichi Sato has senior authorship.



**Fig. 1.** **a** The endoscopy demonstrated a rectal cancer and distal spreading with mucosal edema. **b** A barium enema examination which demonstrated an apple core sign at the rectum that was causing a mild obstruction. **c** The computed tomography showed advanced rectal cancer and para-aortic lymph node metastasis.





**Fig. 2.** **a** The macroscopic view of the surgically resected specimen shows a 5 × 4 cm cancer at the rectum. **b** Microscopic examination of the resected specimen. Morphology on routine staining (HE, ×40) at the end of the margin showed that the tumor cells were spreading over 6 cm from the edge of the main tumor.