

## CASE REPORT

Nagoya J. Med. Sci. 81. 529–534, 2019  
doi:10.18999/nagjms.81.3.529

# Ileal conduit necrosis after total pelvic exenteration for recurrence of gastrointestinal stromal tumor

Koji Komori<sup>1</sup>, Nozumi Okuno<sup>2</sup>, Takashi Kinoshita<sup>1</sup>, Taihei Oshiro<sup>1</sup>, Akira Ouchi<sup>1</sup>, Seiji Ito<sup>1</sup>, Tetsuya Abe<sup>1</sup>, Yoshiki Senda<sup>1</sup>, Kazunari Misawa<sup>1</sup>, Yuichi Ito<sup>1</sup>, Norihisa Uemura<sup>1</sup>, Seiji Natsume<sup>1</sup>, Eigi Higaki<sup>1</sup>, Masataka Okuno<sup>1</sup>, Takahiro Hosoi<sup>1</sup>, Byonggu An<sup>1</sup>, Daisuke Hayashi<sup>1</sup>, Tairin Uchino<sup>1</sup>, Aina Kunitomo<sup>1</sup>, Satoshi Oki<sup>1</sup>, Jin Takano<sup>1</sup>, Yasuhito Suenaga<sup>1</sup>, Shingo Maeda<sup>1</sup>, Hideyuki Dei<sup>1</sup>, Yoshihisa Numata<sup>1</sup>, and Yasuhiro Shimizu<sup>1</sup>

<sup>1</sup>Department of Gastroenterological Surgery, Aichi Cancer Center Hospital, Nagoya, Japan

<sup>2</sup>Department of Gastroenterology, Aichi Cancer Center Hospital, Nagoya, Japan

## ABSTRACT

We report a case of ileal conduit necrosis after total pelvic exenteration for recurrence of gastrointestinal stromal tumor. A 47-year-old man was diagnosed with recurrence of gastrointestinal stromal tumor adjacent to the prostate after abdominoperineal resection 10 years prior. With imatinib administration for 18 months, the local recurrence decreased in size but did not separate from the prostate. We performed urinary diversion with conventional total pelvic exenteration. Ileal conduit necrosis was suspected the following day and emergency surgery was performed. The serosa of the ileal conduit showed segmental necrosis extending about 10 cm from the orifice. The ureterointestinal anastomotic site was opposite the orifice and was not necrotic. We resected the necrotic ileum and reconstructed an ileal conduit. The patient was discharged without any symptoms 46 days after surgery for further adjustment to use of a urostomy.

Keywords: ileal conduit necrosis, total pelvic exenteration

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## INTRODUCTION

As urinary diversion with an ileal conduit is frequently performed for urologic conditions such as bladder cancer, management of complications is usually performed by the urologist. However, gastroenterological surgeons may also need to create an ileal conduit in total pelvic exenteration (TPE) for advanced rectal cancer with invasion of a neighboring organ such as the bladder or prostate. Depending on the hospital, either the urologist or the gastroenterological surgeon will create the ileal conduit in TPE for rectal cancer. Accordingly, the gastroenterological surgeon must also be familiar with the complications associated with an ileal conduit.

We report a case of ileal conduit necrosis after TPE for recurrence of gastrointestinal stromal

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Received: October 1, 2018; accepted: November 26, 2018

Corresponding Author: Koji Komori, MD

Department of Gastroenterological Surgery, Aichi Cancer Center Hospital, 1-1, Kanokoden, Chikusa, Nagoya, Aichi 464-8681, Japan

Tel: +81-52-762-6111, Fax: +81-52-763-5233, E-mail: [kkomori@aichi-cc.jp](mailto:kkomori@aichi-cc.jp)

tumor.

## CASE REPORT

A 47-year-old man was admitted to another hospital with rectal gastrointestinal stromal tumor and had undergone abdominoperineal resection in November 2006. However, about 10 years later, he developed local recurrence in the pelvis. The patient was subsequently referred to our hospital (Aichi Cancer Center Hospital, Nagoya, Japan).

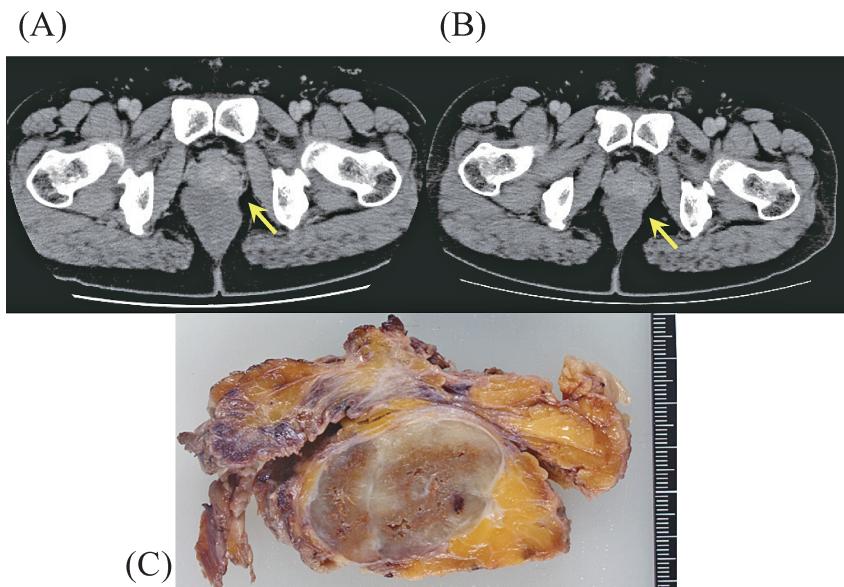
The local recurrence was adjacent to the prostate and was not well-circumscribed. It was suspected that the local recurrence had invaded the prostate. Chemotherapy with imatinib (400 mg/day) was administered in the hope that the local recurrence would diminish and separate from the prostate.<sup>1</sup> With imatinib administration for 18 months, the local recurrence decreased in size but did not separate from the prostate. It was assumed that additional administration of imatinib would be ineffective; therefore, we performed urinary diversion with conventional TPE in March 2018 (Fig. 1).

The patient was moderately obese, with a body mass index of 26.31, and had a thick abdominal wall with visceral obesity (Fig. 2). Thus, we created an ileal conduit about 30 cm long, although in most cases an ileal conduit measures about 20 cm for ensuring the length of an ileal conduit from abdominal wall skin. Left and right ureterointestinal anastomoses were performed at about 3 cm and 5 cm, respectively, from the blind end of the ileum, with bilateral ureteral stents. After confirming adequate blood flow in the ileum, the outlet was created.

By the following day, the ileal conduit had become dark and black, and blood drained from the bilateral ureteral stents. Ileal conduit necrosis was suspected. Emergency endoscopic examination revealed ischemic segmental mucosa in the ileal conduit, extending about 10 cm from the outlet (Fig. 3). Emergency surgery was performed through the previous midline incision. The serosa of the ileal conduit showed segmental necrosis extending about 10 cm from the outlet (Fig. 4), thus the length of the ileal conduit ended up in 20 cm. The ureterointestinal anastomotic site was opposite the orifice and was not necrotic and not destroyed.

The area of necrosis included the ileal conduit placed in the thick abdominal wall. We resected the necrotic ileum and reconstructed the ileal conduit. The patient was discharged without any symptoms 46 days after surgery for further adjustment to use of a urostomy.

## Necrosis of ileal conduit

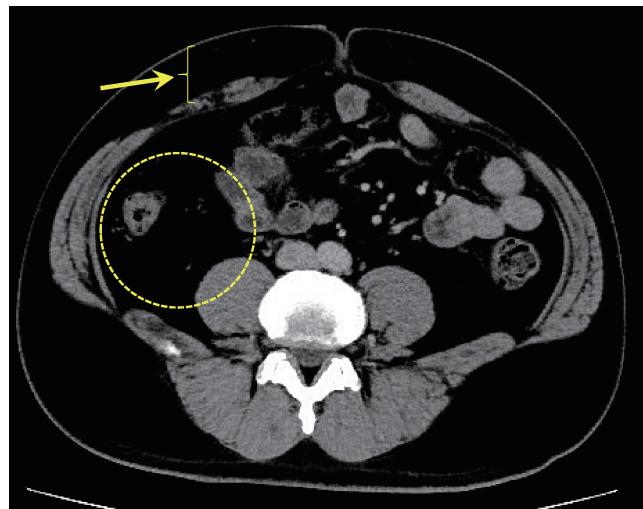


**Fig. 1** Preoperative imaging and resected specimens

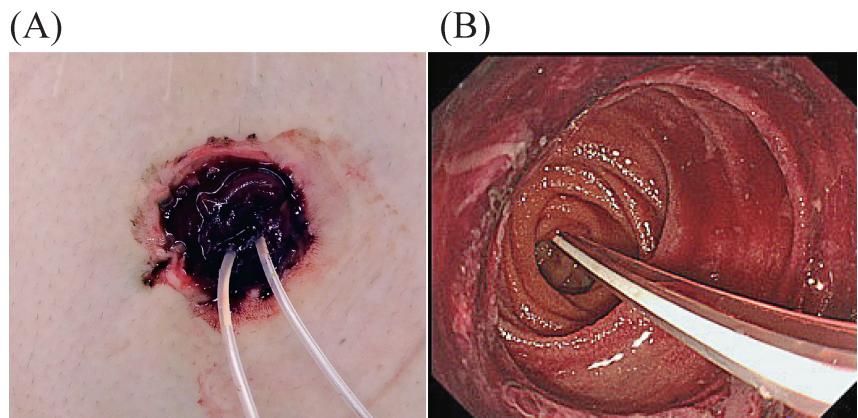
**Fig. 1A:** Abdominal computed tomography shows that local recurrence was adjacent to the prostate and not well-circumscribed before administration of imatinib (yellow arrow).

**Fig. 1B:** Abdominal computed tomography shows that the local recurrence became smaller but did not separate from the prostate after administration of imatinib (yellow arrow).

**Fig. 1C:** The resected specimens (local recrudescent gastrointestinal stromal tumor) are shown.



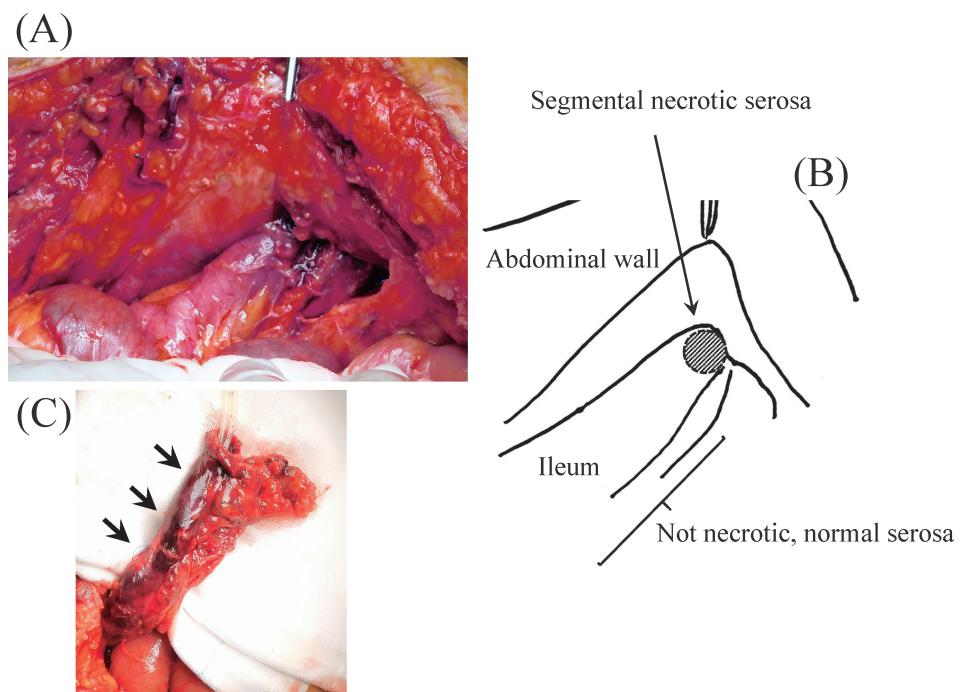
**Fig. 2** Abdominal computed tomography shows the thick abdominal wall (yellow arrow) with visceral obesity (circled yellow dots)



**Fig. 3** The findings of ileal conduit after TPE

**Fig. 3A:** The ileal conduit appeared dark and black.

**Fig. 3B:** Emergent endoscopic examination revealed ischemic segmental mucosa in the ileal conduit.



**Fig. 4** Intraoperative findings

The area of ileal conduit necrosis involved the thick abdominal wall (A) and ischemia was apparent (B). The serosa of the ileal conduit showed segmental necrosis extending about 10 cm from the outlet (black arrows, C).

## DISCUSSION

The complications of an ileal conduit are usually encountered by urologists, but gastroenterological surgeons who perform TPE may encounter the same complications. The complications of ileal conduit were not rare and have some risks. Abe et al reported that the frequency of complication was 20% in a total of 493 ileal conduit cases.<sup>2</sup>

The most common complication is urinary tract infection.<sup>3</sup> In cases of severity more than grade 3 according to the Common Terminology Criteria for Adverse Events classification,<sup>4</sup> ileal conduit complications were divided into two categories, i.e., early and late phases. Typically, the former includes peri-anastomotic urine leakage and ileal conduit necrosis and the latter includes ureterointestinal anastomotic strictures.<sup>5</sup> These strictures occur in an estimated 20% of cases,<sup>3</sup> but reports of ileal conduit necrosis are uncommon, because necrosis itself is uncommon. Karsenty et al reported that the rate of ischemic complications was 12%,<sup>6</sup> all requiring reoperation.

We experienced 5 cases of more than grade 3 complications according to the Common Terminology Criteria for Adverse Events classification involving the ileal conduit among 60 TPE cases at the Department of Gastroenterological Surgery, Aichi Cancer Center Hospital, Nagoya, Japan, between January 2007 and August 2018 (Table 1). Only 1 case of ileal conduit necrosis (1.7%) was identified and reported here.

Lee C. T et al reported that increased BMI was a perioperative risk associated with increased complication rate.<sup>7</sup> It was assumed that impaired blood flow to the ileal conduit orifice was due to the long ileal conduit (30cm), the thick fat in the mesentery, and abdominal wall. Thus, in creating an ileal conduit in obese patients, the size of urostomy must be considered, as follows.

First, the size of the outlet on the skin incision is usually about 2.5 cm in diameter, but a larger size was needed in our case. Second, subcutaneous fat is usually deprived in a cylindrical case to compress the ileal conduit. Third, adequate blood flow to the ileal conduit outlet must be confirmed after the operation.

Recently, it was reported that the indocyanine green (ICG) test was effective in confirming adequate blood flow of colorectal. Wada T et al reported that ICG fluorescence imaging was useful for assessing anastomotic perfusion in colorectal surgery, which could result in more precise operative decisions.<sup>8</sup>

In conclusion, in patients with visceral obesity, it is critical to confirm adequate blood flow to the ileal conduit outlet in TPE.

**Table 1** Clinicopathologic factors and Operative morbidity and mortality correlated with ileal conduit (n=60)

Age	median (range)	61 (34~78)
Sex	male	51 (85.0%)
	female	9 (15.0%)
BMI	median (range)	22.3 (16.7~28.1)
Time (minutes)	median (range)	586 (305~1102)
Blood loss (ml)	median (range)	3109(330~15400)
Complication with ileal conduit (more than Grade 3)	Total	5 (8.3%)
	ureterointestinal anastomotic stricture	0 (0.0%)
	Ureterointestinal anastomotic urine leakage	4 (6.7%)
	necrosis of ileal conduit	1 (1.7%)
Hospital mortality		0 (0.0%)

## DISCLOSURE STATEMENT

All authors certify that they have no personal financial or institutional interest in the subject matter, materials, or drugs in this article.

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