Avoiding stoma creation due to super-morbid obesity: a report of two surgical cases of colorectal cancer

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Case Report

Keywords: obesity, colorectal cancer, stoma, chemotherapy

Posted Date: August 11th, 2023

DOI: https://doi.org/10.21203/rs.3.rs-3233300/v1
Abstract

**Background:** A stoma is commonly created in patients with a high risk of anastomotic leakage. However, patients with obesity have a higher incidence of stoma-related complications, and the decision to create a stoma should be carefully considered. We report two cases of patients with colorectal cancer and super-morbid obesity wherein stoma creation was avoided.

**Case presentation:** Case 1 involved a 52-year-old male patient with a body mass index (BMI) of 41.8 kg/m$^2$ who underwent a robotic-assisted laparoscopic low anterior resection after neoadjuvant chemotherapy for lower rectal cancer. Although temporary diverting ileostomy was initially considered, stoma creation was skipped intraoperatively, considering the complication risk-benefit ratio. Case 2 involved a 42-year-old female patient with a BMI of 64 kg/m$^2$ who underwent open partial colon resection for descending colon cancer complicated by colonic perforation and abscess formation. The patient was considered to be at high risk of stoma-related complications due to high mobility of the abdominal wall; therefore, we decided not to create a stoma preoperatively.

**Conclusion:** Considering the high risk of stoma-associated complications, avoiding stoma creation and implementing preventive measures against potential complications are alternative options for patients with super-morbid obesity.

**Background**

Stoma creation is performed in patients with a high risk of anastomotic leakage, such as in surgical cases of bowel obstruction, intestinal perforation, or lower rectal resection (1). Previous studies have reported inconsistent findings regarding the incidence of complications associated with stoma creation, which varies from 10–70% (2–4). Stoma creation has aesthetic drawbacks that would adversely affect the quality of life of patients (5).

An appropriate length of the intestine must be maintained to penetrate the thick subcutaneous fat during stoma creation, particularly in patients with obesity; however, due to abundance of mesenteric fat, lifting out the intestine from the abdominal cavity while maintaining blood flow is technically challenging. Consequently, stoma-related complications are more frequent in patients with than in those without obesity, highlighting the need for carefully considering the indications for stoma creation (6, 7).

Here, we present two cases in which, despite being indicated, stoma creation was avoided because of the high risk of stoma-related complications due to super-morbid obesity.

**Case presentation**

Case 1: A 52-year-old male patient (height, 169.5 cm; weight, 120 kg; and body mass index (BMI), 41.8 kg/m$^2$) presented with positive fecal occult blood test results. Further examination revealed lower rectal cancer with lymph node metastases, cT3N2aM0, cStage IIIB (Union for International Cancer Control...
Since he had several comorbidities, such as type 2 diabetes and severe hypertension, and was considered to be a high-risk patient for postoperative complications due to severe obesity, we decided to administer preoperative chemotherapy (capecitabine plus oxaliplatin, four courses) and attempted to reduce his weight during that period; the patient lost 9.3% of body weight, which was reduced to 112 kg. Colonoscopy performed after chemotherapy revealed shrinkage of the primary tumor, and the endoscopic response was considered to be partial (Fig. 1b right). Robotic-assisted low anterior resection was selected as the surgical method. The tumor was located 6 cm from the anal verge, and temporary diverting ileostomy was initially planned, given the high risk of anastomotic leakage associated with severe obesity. Stoma site marking was performed (Fig. 1c). Intraoperative findings revealed intestinal malrotation and extensive intra-abdominal adhesions with abundant mesenteric fat. Additionally, preoperative computed tomography (CT) revealed 7-cm subcutaneous fat at the umbilical level (Fig. 1d). If temporary diverting ileostomy was to be created, it would have been difficult to ensure intestinal blood flow, potentially leading to stoma necrosis and an increased risk of postoperative stoma-related complications. Although the anastomosis site was 3 cm from the anal verge, the air leak test result was negative, and the risk of anastomotic leakage was not substantially high. Therefore, stoma creation was skipped, and a transanal drainage tube was placed. The postoperative fasting period was extended by 6 days to determine the absence of leakage. Considering the high risk of deep vein thrombosis, enoxaparin sodium was administered intravenously postoperatively. The postoperative course was uneventful, and the patient was discharged on the 27th postoperative day.

Case 2: A 44-year-old female patient (height, 155 cm; weight, 153 kg; and BMI, 64 kg/m²) presented with fever and poor appetite. Detailed examinations revealed descending colon cancer, cT4aN2aM1c (H2, PUL2, P3), cStage C (UICC 8th edition) with colonic penetration and abscess formation (Fig. 2a). In this patient, distant metastasis was present, curative resection was not possible, and early initiation of systemic chemotherapy was necessary. Surgery was planned to control the intra-abdominal inflammation and enable oral intake. Because she had obesity-related cardiopulmonary comorbidities, we decided not to perform intraoperative body repositioning. On the day before the surgery, we performed positional simulation in the operating room and confirmed its safety (Fig. 2b). Various surgical approaches, such as transverse colostomy or Hartmann's procedure, were initially considered. However, a large amount of subcutaneous fat with substantial mobility was observed from the epigastric to the femoral region. In case of stoma creation, compression of the stoma by massive fat would be evident, and the risk of stoma-related complications was considered to be very high. Therefore, one-stage colectomy and anastomosis were performed. An open approach was used to minimize the impact on cardiopulmonary function. The peritoneal disseminated nodules infiltrated the area surrounding the umbilicus; therefore, a transverse incision was made to excise them. Anastomosis was performed in non-inflamed and non-edematous areas, and skin closure was not performed (Fig. 2c left) for early initiation of negative pressure wound therapy (NPWT) postoperatively (Fig. 2c right). No severe complications occurred, and the patient was discharged on the 27th postoperative day.

**Discussion and conclusion**
We reported two cases of patients in whom stoma creation was avoided. In Case 1, based on the intraoperative assessment, the patient had abundant mesenteric fat, and the risk of anastomotic leakage was not substantially high. However, considering the potential risk of postoperative stoma-related complications, intraoperative stoma creation was avoided. In Case 2, the patient had abundant subcutaneous fat as well as mesenteric fat, with high abdominal wall mobility, suggesting a high risk of stoma-related complications, such as stoma retraction. Therefore, we decided not to create a preoperative stoma. In patients with obesity, no consensus has been reached on stoma creation; therefore, its indications should be carefully considered and based on preoperative and intraoperative findings, prediction of subsequent risks, and evaluation of the risk-benefit ratio.

In general, colorectal surgery in patients with obesity is associated with prolonged operative time, increased blood loss, and a higher incidence of surgical complications such as anastomotic leakage, wound infection, and lower extremity deep vein thrombosis than that in patients without obesity (8–11). To reduce the risk of complications, countermeasures such as insertion of a transanal drainage tube, use of NPWT, and antithrombotic therapy are adopted. Considering the availability of time, preoperative weight loss can mitigate the risk of complications. In Case 1, the weight of the patient was reduced by 9.3% during preoperative chemotherapy, and in Case 2, transanal drainage and NPWT were performed as countermeasures against postoperative complications. Both patients were discharged without major complications. In cases of severe obesity, preoperative simulation is important to ensure safe patient positioning and fixation during surgery. In both the cases in our study, careful preoperative simulation was performed in the operating room on the day before surgery, and no intraoperative complications in patient positioning and fixation occurred.

In patients with obesity, careful consideration is necessary when determining the indications for a stoma. One reason for this is the thickness of subcutaneous fat. Generally, the thicker the subcutaneous fat, the longer the intestinal length required to lift it out of the body. Therefore, patients with obesity require a longer intestinal tract than patients with standard body weight, and stoma creation often requires longer intestinal tracts than anastomosis, indicating the need for a wider range of mobilization (6). Intestinal lifting is typically achieved by passing the intestine through the rectus abdominis muscle to prevent peristomal hernias or stoma prolapse. However, in patients with obesity, visualization of the rectus abdominis muscle is difficult because of the thick abdominal wall. Thus, we must consider that patients with obesity have a higher risk of postoperative complications, including stoma-related complications, even if their bowel length is adequate. Furthermore, a large amount of subcutaneous fat is heavy, causing the abdominal wall to droop with gravity, and has very high mobility (6). The excessive tension in the lifted intestine may lead to stoma retraction. In addition, a large abdominal wall may render stoma visualization difficult, leading to challenging stoma management and an increased risk of management-related complications (6, 12). Another reason is the abundance of mesenteric fat. In patients with a standard body weight, visualizing blood vessels in the mesenteric fat and performing mesenteric procedures while ensuring blood flow to the intestine is not difficult. However, patients with obesity have massive mesenteric fat, and visualization of the vessels within the mesentery is often difficult, making the surgical procedure considerably more challenging. Mishandling of the blood vessels in the mesentery
can lead to ischemic intestinal necrosis, requiring additional surgery. Therefore, great care should be taken when handling the mesentery in patients with obesity. Even if sufficient intestinal length and blood flow are ensured during mesenteric preparation, lifting the intestine out of the body can be difficult due to the large amount of mesenteric fat. Even if it can be lifted, if the diameter of the intestine is too large for an incision in the abdominal wall, blood flow will be obstructed, leading to stomal necrosis. Moreover, careful handling should be performed when enlarging the laparotomy to lift the bowel, as this increases the risk of parastomal hernia or stoma prolapse (12–14). In the two cases reported in our study, we considered that stoma-related complications were inevitable because of the thick subcutaneous fat with high mobility and the abundance of mesenteric fat, leading to the decision to avoid stoma creation.

In conclusion, avoiding stoma and implementing countermeasures to prevent potential complications could be an alternative option, considering the risk-benefit ratio, in cases where stoma creation has a high risk.

**Abbreviations**

BMI  
Body mass index

UICC  
Union for International Cancer Control

CT  
Computed tomography

NPWT  
Negative pressure wound therapy

**Declarations**

Ethics approval and consent to participate: This study complied with the tenets of the Declaration of Helsinki. IRB approval was exempted because this was only a case report.

Consent for publication: Consent was obtained from the patient or the next of kin for publication of the case report and accompanying images. Written informed consent for publication of the clinical details was obtained from the patients.

Availability of data and materials: The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Competing interests: The authors declare that they have no competing interests.

Funding: No funding was received for this study.
Authors’ contributions: NF drafted the manuscript. TO helped with finalizing the manuscript, and HE gave the final approval of the article. All authors have read and approved the final manuscript.

Acknowledgements: Not applicable.

References


Figures

Figure 1

(a) In 3D-CT, the primary site of rectal cancer is indicated by a green tumor (circle), and lymph node metastases are indicated by a red node (arrow).

(b) Pre-chemotherapy colonoscopy shows a semi-peripheral type 2 lesion in the rectum (left), and post-chemotherapy colonoscopy shows shrinkage from pre-chemotherapy (right).

(c) Preoperative stoma site markings.

(d) Subcutaneous fat thickness at the umbilical level is 7 cm.
Figure 2

(a) CT image showing the primary descending colon cancer (left circle), a nodule suspected of peritoneal dissemination (left arrow) and liver metastases (right arrow). The thickness of the subcutaneous fat could not be measured because the thickness of the abdominal wall exceeded the CT imaging range.

(b) Preoperative simulation photograph. The abdominal wall was fixed with a side plate owing to the large amount of subcutaneous fat that caused it to sag.

(c) Epidermal closure was not performed (left) and NPWT was initiated (right).