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Single Case

Incarcerated Small Bowel Herniation in a Stoma Mimicking Sigmoid End Colostomy Prolapse

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Keywords
Stoma prolapse · Parastomal hernia · Incarcerated intestine · Manual reduction

Abstract
Introduction: A stoma prolapse is easy to diagnose by visual examination, and it rarely incarcerates. Therefore, manual reduction is usually performed as soon as the diagnosis is made. In this report, we describe a case of stoma prolapse that could not be reduced manually and ruptured because an incarcerated parastomal hernia occurred in the stoma, mimicking stoma prolapse. ***Case Presentation:*** A 66-year-old woman underwent total hysterectomy, bilateral salpingo-oophorectomy, pelvic and para-aortic lymphadenectomy, omentectomy, resection of dissemination, and low anterior resection with formation of a sigmoid end colostomy for endometrial cancer with infiltration of the rectum. Fourteen months after the initial operation, she presented with stoma prolapse and multiple episodes of vomiting. The prolapsed stoma was 20 cm in length, appeared swollen and edematous, and was somewhat firm. Although it looked viable, some of the mucosa was darkish red, indicating congestion. Therefore, the diagnosis was sigmoid end colostomy prolapse with an ischemic component. An attempt at manual reduction resulted in rupture, so an emergency laparotomy was performed. Intraoperatively, we found that the ileum was incarcerated in the aperture created where the colostomy had been formed. When the incarcerated ileum was released, the stoma prolapse could be reduced easily. The end colostomy was refashioned in the left upper quadrant of the abdomen. ***Conclusion:*** An incarcerated parastomal hernia can mimic stoma prolapse. If the findings differ from those of typical stoma prolapse, imaging should be performed to confirm whether another clinical entity is involved in the stoma prolapse.

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Introduction

Stoma prolapse is a full-thickness protrusion of the bowel through a stoma [1], and parastomal hernia is defined as an incisional hernia associated with an abdominal wall stoma [2]. Both of these are common late complications after stoma formation [3]. The reported incidence of stoma prolapse and parastomal hernia varies according to the type of stoma and follow-up period [2, 4, 5]. Stoma prolapse is reported to be less frequent in end colostomy than in loop colostomy [1, 4]. During long-term follow-up, the cumulative risk of stoma prolapse at 13 years was 11.8% in end colostomies [5]. Parastomal hernia is more frequent in patients with end colostomy than in those with loop colostomy [2, 4, 6]; in patients with end colostomy, the cumulative risk of parastomal hernia at 10 years was 36.7% [5]. Moreover, regarding the route of stoma creation in end colostomy, a systematic review and meta-analysis found that the extraperitoneal route had lower rates of parastomal hernia and stoma prolapse compared with the transperitoneal route [7].

Edema and congestion in a prolapsed stoma can sometimes worsen over time, disrupting blood flow, but an incarcerated stoma prolapse is unusual [1]. Stoma prolapse seldom requires emergency surgery because the prolapsed intestine can be easily reduced by manual reduction [1], but if it recurs frequently and the patient cannot manage the stoma on their own, elective surgery can be considered. There are various surgical options, ranging from local procedures to refashioning a stoma at a different location. Some local procedures have been reported, and recently, a method has been described that uses a linear stapler to excise the prolapsed intestine [8, 9].

Most parastomal hernias can also be managed conservatively, with or without using a stoma support device [2]. Emergency surgery is required in cases of intestinal obstruction or strangulation, and elective surgery should be considered when there is significant difficulty in managing the stoma [2, 10]. There are three main surgical options for repairing parastomal hernias: local primary repair, relocation of the stoma, and mesh repair [2, 11]. Among these, mesh repair is reported to be superior because of its lower recurrence rate.

Stoma prolapse is usually easy to diagnose visually and reduce manually and only rarely incarcerates [1]. Therefore, manual reduction is usually performed as soon as the diagnosis is made. In this report, we describe a case in which incarcerated small bowel parastomal herniation into the stoma mimicked sigmoid end colostomy prolapse in a woman who required emergency surgery after manual reduction was unsuccessful.

Case Presentation

A 66-year-old woman underwent total hysterectomy, bilateral salpingo-oophorectomy, pelvic and para-aortic lymphadenectomy, omentectomy, resection of dissemination, and low anterior resection with formation of a sigmoid end colostomy for endometrial cancer with infiltration of the rectum. The transperitoneal route was used to create the colostomy in the left lower quadrant of the abdomen at a site decided by a doctor and wound ostomy nurse. She had received six cycles of paclitaxel and carboplatin as adjuvant chemotherapy after surgery and had been under follow-up. A stoma prolapse had occurred 4 months after the initial operation, but there were no other symptoms, and it had resolved spontaneously.

Fourteen months after the initial surgery, she presented to the hospital's emergency department complaining of a prolapsed colostomy and several episodes of vomiting. Examination of the abdomen revealed a prolapsed stoma that was 20 cm in length (Fig. 1a), swollen with edematous change, and somewhat firm. Although the stoma prolapse appeared viable, some of the mucosa was darkish red, indicating congestion. There was no evidence of

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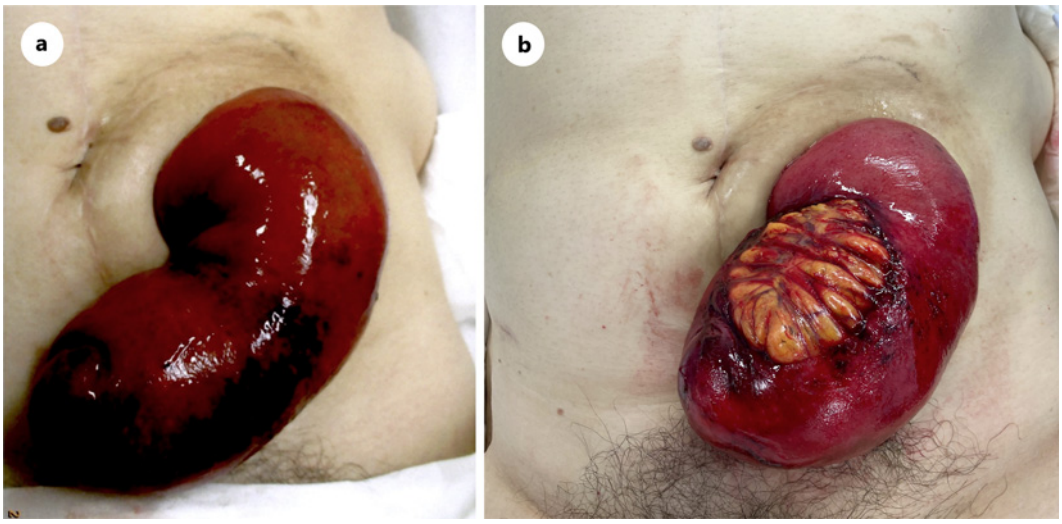

Fig. 1. Clinical photograph of the prolapsed stoma. **a** When the patient arrived at our hospital, the prolapsed sigmoid end colostomy was 20 cm in length, swollen with edematous change, and somewhat firm. **b** Before surgery, the prolapsed stoma had a rupture of about 5 cm in length with exposure of mesenteric fat at the fissure.

abdominal pain or dilatation. A diagnosis of prolapsed sigmoid end colostomy with an ischemic area was made. Initially, manual reduction was attempted by gradually applying pressure to the protruding portion of the prolapsed stoma toward the luminal side with the patient in the supine position. This was unsuccessful. We then applied a 50% glucose solution to the mucosa of the stoma prolapse to reduce the edema but without noticeable effect. When we reattempted manual reduction, the prolapsed stoma developed a rupture about 5 cm in length (Fig. 1b). Therefore, an emergency laparotomy was performed.

After making a midline incision, we found that the small intestine was incarcerated in the aperture made by the formation of the colostomy (Fig. 2). Enlargement of the aperture and releasing the incarcerated small intestine within the stoma prolapse into the intra-abdominal cavity revealed reversible ischemic change in about 40 cm of the ileum, which did not need resection. When the incarcerated ileum was released, the prolapsed stoma was easily reduced. We resected the prolapsed stoma, including the damaged length of the colon, and refashioned a sigmoid end colostomy in the left upper quadrant of the abdomen. Macroscopic examination of the resected specimen revealed light and dark brown areas of ischemia and an area where the colonic stoma had perforated into the sigmoid mesentery, measuring 9 cm long and 3.5 cm wide (Fig. 3).

The patient was discharged 10 days after surgery with no postoperative complications. There were no stoma-related complications in the 6 months after the surgery.

Discussion

This case has two important clinical teaching points. First, when a parastomal hernia occurs, and the hernia contents are in the stoma, blood flow to the prolapsed stoma can become insufficient, which likely appears similar to typical stoma prolapse. Second, imaging should be performed before manual reduction when stoma prolapse has an atypical presentation.

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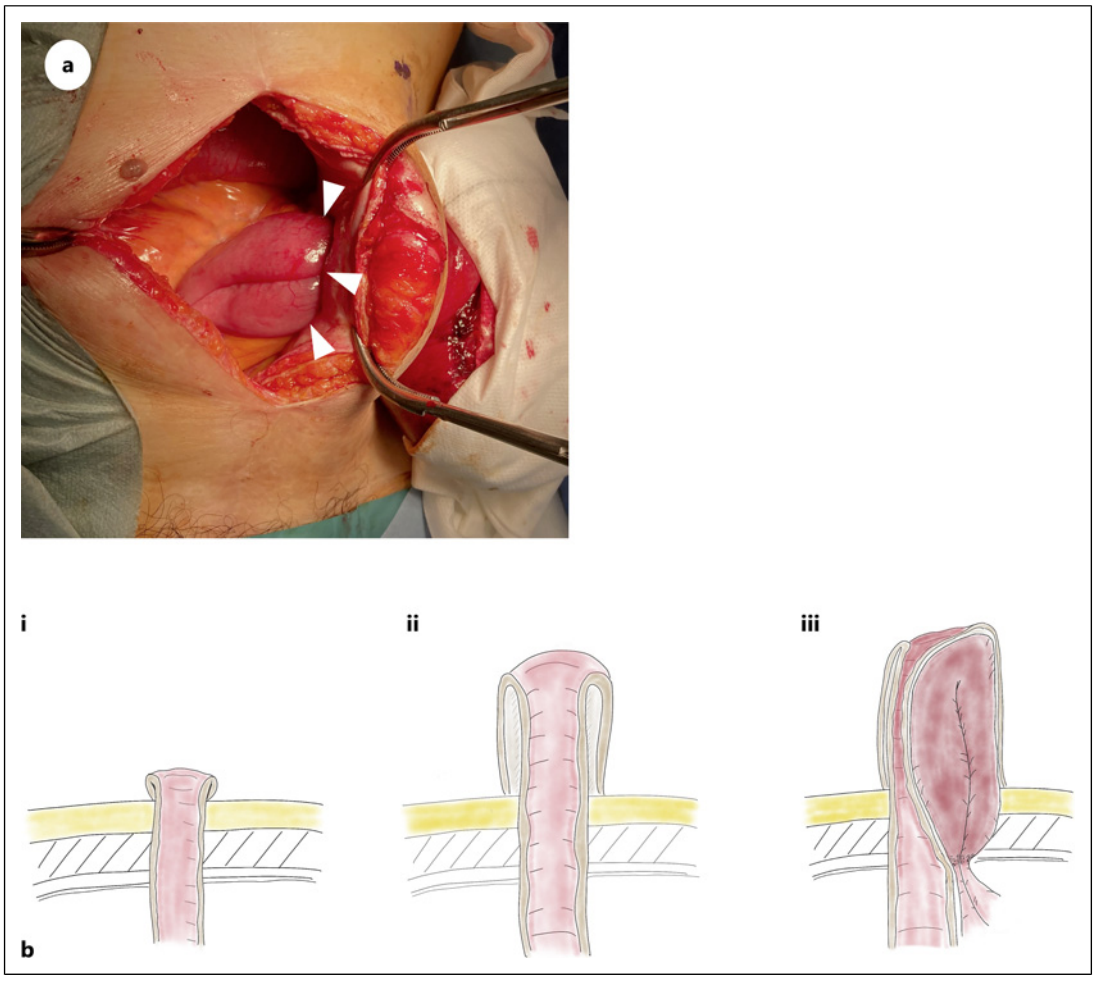

Fig. 2. Intraoperative findings. **a** The small intestine incarcerated in the aperture made when the colostomy was formed (arrowheads). **b** Schema. (i) Normal end colostomy. (ii) Stoma prolapse in end colostomy. (iii) Intrastomal hernia in this case. The incarcerated small bowel herniated into the stoma mimicking stoma prolapse.

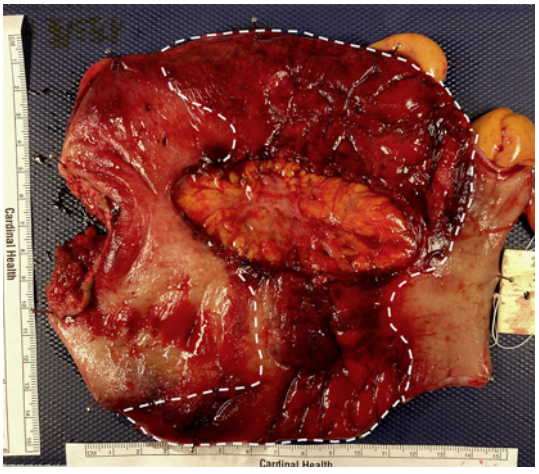

Fig. 3. Macroscopic findings in the resected stoma. Light and dark brown areas of ischemia (dashed line) and an area where the colonic stoma had perforated into the sigmoid mesentery, measuring 9 cm long and 3.5 cm wide.

In relation to the first teaching point, in 2012 the European Hernia Society (EHS) proposed a new standard classification for parastomal hernia based on the parastomal hernia defect size and the presence of a concomitant incisional hernia [12]. Before that, Devlin classified parastomal hernias into four subtypes based on anatomical types of herniation [10]. However, these classifications were considered to have low clinical value in subgroups of patients, showing no relationship with treatment options or prognosis [12]. In the classifications, when the hernia contents are alongside the stoma and lie between the emergent and everted layers of the stoma, it is classified as an "intrastomal hernia" [10]. In our case, in which the patient had a sigmoid end colostomy constructed via the transperitoneal route, an incarcerated parastomal hernia, classified as intrastomal hernia, initially occurred, after which the small intestine, which deviated from the abdominal cavity, compressed the wall of the stoma. Subsequently, an unusually large stoma prolapse developed with altered blood flow because of increasing pressure inside the stoma. In view of the tone of the stomal mucosa, congestion and mainly impaired venous flow caused the altered blood flow.

We conducted a literature search using PubMed for the terms "stoma prolapse," "hernia," "small bowel incarceration," and "small bowel strangulation" to identify similar cases in the literature. It is very rare for an incarcerated small intestine to enter into a prolapsed end colonic stoma, and only four such cases have been reported previously [13–16]. The previous 4 cases rarely mention parastomal hernia, but according to the reported clinical findings, they can be considered intrastomal hernia. The stoma prolapse was large in all cases. Three of the four patients complained of severe abdominal pain; the remaining patient had an intellectual disability and may have had symptoms but been unable to report them. Unlike in the previous reports, our patient did not complain of abdominal pain, although vomiting was confirmed. Kai reported that a similar case succeeded in manual reduction following computed tomography (CT) and correct diagnosis but needed an emergency operation due to bleeding [15]. In all cases, including ours, the physical appearance was that of a stoma prolapse, but the main symptoms came from the incarcerated parastomal hernia. Therefore, it is essential to know that an incarcerated small intestine herniated into a stoma can mimic stoma prolapse.

The second teaching point is that imaging should be performed before attempting manual reduction when stoma prolapse has an atypical presentation. Stoma prolapse does not usually incarcerate and can be easily diagnosed based on visual inspection. Therefore, imaging is not always necessary. Furthermore, manual reduction is relatively easy to perform and is usually performed as soon as a stoma prolapse is identified. Although the more edematous the stoma prolapse becomes, the more difficult it is to reduce by manual reduction, previous reports have described using osmotic agents to improve edema for manual reduction. These methods involved sprinkling sugar on the mucosa of the prolapsed stoma [17] or applying a 50% glucose solution, known as the "slug method" [18]. We used the slug method in this case, but it had no effect on the edema in the prolapsed intestine. At that time, we should have performed CT but did not do so. This was because stoma prolapse had already been diagnosed by visual inspection, and we did not consider the possibility of an incarcerated parastomal hernia mimicking stoma prolapse. We attempted to reduce the prolapsed stoma by manual reduction, which resulted in perforation of the colonic stoma. Had we recognized that the stoma prolapse in this patient was atypical in terms of both symptoms and lack of improvement in the edematous colonic stoma, and had we performed CT imaging before manual reduction, we could have made a correct diagnosis of stoma prolapse with an incarcerated parastomal hernia and could have attempted manual reduction more carefully. A previous case reported that small bowel incarceration was able to be treated by manual reduction after CT imaging [15]. Our case shows potential pitfalls when stoma prolapse is diagnosed by visual inspection alone and treated by manual reduction. If the stoma prolapse has an atypical presentation,

such as vomiting which suggests intestinal obstruction, and edema does not improve with use of osmotic agents, imaging should be performed before attempting manual reduction.

In conclusion, incarcerated small bowel herniation in a stoma can mimic stoma prolapse and can cause insufficient blood flow to the prolapsed stoma. Stoma prolapse is easy to diagnose by visual inspection, so it is possible to overlook the signs and symptoms of a parastomal hernia, which is not visible to the naked eye. Most stoma prolapses can be easily reduced by manual reduction. However, when encountering patients with stoma prolapse, it is important to take note of the condition of the stoma and the clinical manifestations. If necessary, an imaging examination should be ordered to confirm whether another clinical entity is present in addition to the stoma prolapse. The authors completed the CARE Checklist for this case report, attached as online supplementary material (for all online suppl. material, see https://doi.org/10.1159/000535988).

Statement of Ethics

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. Ethics approval was not required in accordance with national guidelines in Japan.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

K.A. and D.Y. performed the operation. K.A., D.Y., C.K., and M.O. contributed to patient management. K.A. drafted the manuscript. D.Y., C.K., M.O., and K.S. helped to prepare the manuscript. All authors read and approved the final version of the manuscript.

Data Availability Statement

All data generated during this study are included in this article. Further inquiries can be directed to the corresponding author.

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