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Case Report

Hartmann's Reversal Through Transanal Hand-Sewn Anastomosis With Rectal Mucosectomy for a Challenging Case: Case Report

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Introduction: Despite the advances in surgical techniques, Hartmann's reversal is often considered a difficult procedure, and the stoma cannot be restored in up to 40% of the cases. We report a patient with a challenging case of severe dense adhesions and a short rectal stump who recovered successfully after undergoing Hartmann's reversal through rectal mucosectomy and transanal hand-sewn anastomosis.

Case presentation: A 39-year-old man had multiple bowel injuries, including rectum, bladder, and ureter laceration, due to a stab wound. He underwent Hartmann's procedure with a short rectal stump. One year and 9 months later, Hartmann's reversal was performed. In the operative field, severe dense adhesions were observed in the pelvic cavity. Therefore, complications, including fistula, were likely to occur. Thus, we minimized the dissection around the rectal stump and avoided stapled anastomosis. Proctotomy was performed behind the rectal stump, and the proximal colon was inserted into the rectum. Rectal mucosectomy was performed for the rectum above the expected anastomosis site. Colorectal hand-sewn anastomosis was performed on the rectum, 3 cm from the anal verge. The patient recovered well after the surgery, and has remained healthy, without any discomfort, except for frequent defecation.

Conclusion: Rectal mucosectomy and transanal hand-sewn anastomosis were performed in a complex case of Hartmann's reversal, resulting in the patient's successful recovery without complications. This study recommends the preceding surgical technique for similar cases.

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Hartmann's procedure (HP) was introduced by Henry Albert Hartmann in 1921.[1] This surgical operation involves rectal closure and end colostomy after colon resection. The procedure is indicated when the anastomosis is dangerous due to colonic perforation or obstruction. Hartmann's reversal is considered after a certain period of time. In most cases, the time was 7 to 8 months after the operation where bowel conditions and general conditions were restored.[2] However, Hartmann's reversal has a high morbidity rate of 22.9% to 68.5% and a mortality rate of 0% to 4.7%.[3] In particular, dense adhesions due to a previous surgery or a short rectal stump increase the difficulty of the operation and frequency of complications.[1,2,4] When a fistula develops as a complication, the stoma needs to be reestablished, compromising the quality of life of patients.[5] Therefore, the reversal may be avoided or failed in up to 40%.[2] We report a patient with severe dense adhesions and a short rectal stump who successfully recovered after undergoing Hartmann's reversal through rectal mucosectomy and transanal hand-sewn anastomosis.

Case Report

A 39-year-old man presented to our hospital with a stab wound caused by attempted suicide. The patient was drowsy and confused on admission. His blood pressure was not measured. He had a pulse of 95/min, respiratory rate of 20/min, and SpO_2 of 100%. On physical examination, the wound exposed the small intestine outside the abdominal wall, and small bowel injuries were observed. His blood pressure was restored to 83/45 mmHg after fluid therapy. He has been depressed since 20 years of age. Laboratory tests revealed a hemoglobin level of 12.5 g/dL, white blood cell count of $14.36 \times 10^3/\mu L$, and platelet count of $250 \times 10^3/\mu L$.

The patient underwent an emergency exploratory laparotomy. In the operative field, 4 small bowel sites and the sigmoid colon were lacerated. The bladder was ruptured, and a left ureter laceration was noted. The rectum, vas deference, and seminal vesicles were severed. Massive and continuous bleeding was observed in the abdominal and pelvic cavity, particularly around the rectal wall.

Because the injured small bowel sites were far from each other, segmental resection of each bowel and anastomosis was performed. Then, the injured rectum and sigmoid colon were resected, and HP with end colostomy of the distal descending colon was performed. The length of the rectal stump was approximately 4 cm from the anal verge (AV). The bladder was repaired using a linear stapler, and ureteroneocystostomy was performed for left ureter laceration.

The patient recovered successfully and was discharged 25 days after surgery. The patient asked for the Hartmann's reversal to be postponed for personal reasons. It was performed 1 year and 9 months after the first operation. In the operative field, severe dense adhesions were observed in the pelvic cavity. A rectal stump was revealed after meticulous adhesiolysis, but the boundary between the rectal stump, the seminal vesicle, and the lower part of the bladder was ambiguous. The stapled anastomosis may have resulted in a fistula. Thus, proctotomy was performed behind the rectal stump, and the proximal colon was inserted into the rectum (Fig. 1). Next, the perineal approach was performed, and mucosectomy was performed for the rectum above the expected anastomosis site. Colorectal hand-sewn anastomosis was performed on the rectum 3 cm from the AV. Then, a temporary loop-ileostomy was performed. The patient was discharged from the hospital 7 days after surgery without specific findings. After 4 months, the patient underwent sigmoidoscopy and defecography to confirm the stability of the anastomosis. On sigmoidoscopy, the anastomosis was intact, and the scope was able to pass through without difficulty (Fig. 2A). Defecography was unremarkable (Fig. 2B). Five months after the Hartmann's reversal, the patient underwent ileostomy repair. He has remained healthy without discomfort, except for frequent defecation.

Discussion

Restoring intestinal continuity in patients undergoing the HP is essential for improving their quality of life.[2] Despite the advances in surgical technique, reversal is often considered a difficult procedure; the stoma cannot be restored up to 40% of the cases.[2] The rate of complications after Hartman's reversal is

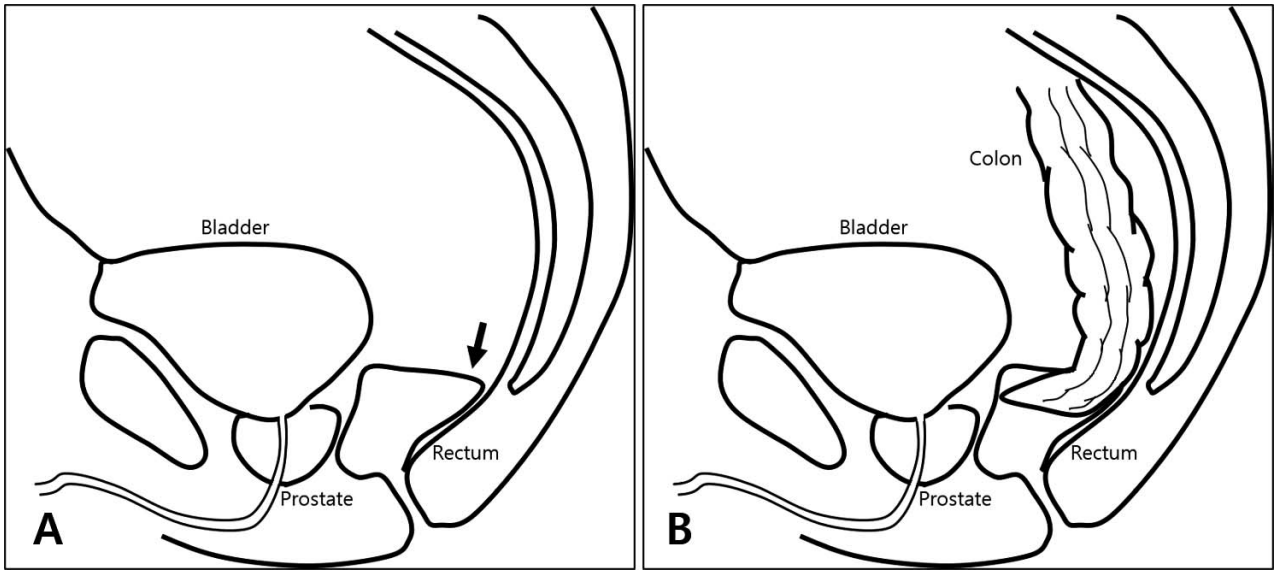

Fig. 1 (A) After dissection of the pelvic cavity, proctotomy is performed behind the rectum (arrow). (B) The colon is inserted into the rectum through the proctotomy site.

high at 22.9% to 68.5%, and the mortality rate is also high at 4.7%.[3] In many cases, the reversal was avoided, or the stoma had to be reconstructed after the reversal attempt, leading to a permanent stoma.[2,5]

Factors to the increased difficulty of the operation include a short rectal stump, rectal stump atrophy, and rigid dense pelvic adhesion.[1,4,5] In difficult cases such as the reported case, transanal hand-sewn anastomosis through the transanal approach was a viable alternative.[2] This surgical technique provides multiple advantages. First, the possibility of injury to other organs can be reduced by minimizing the dissection around the anterior and lateral deep pelvis without proctectomy. Second, avoiding a stapled anastomosis prevents fistula formation due to stapling of urinary or gynecological organs together. Third, because the suture for

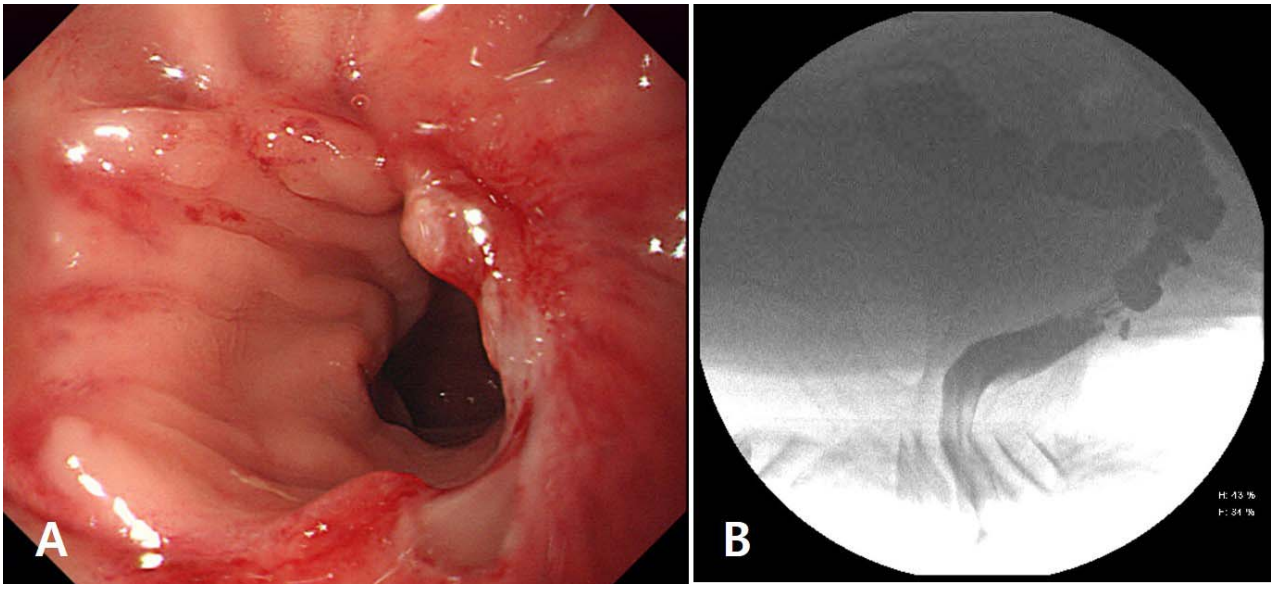

Fig. 2 Anastomosis site evaluation before ileostomy repair. (A) Sigmoidoscopy shows the anastomosis site is intact. (B) Defecography shows no remarkable abnormal finding.

anastomosis is made within the rectum, fistula formation to the external organs is minimized. This operation is similar to the Soave procedure, and the anastomosis method for familial adenomatosis polyposis and ulcerative colitis. There is sufficient evidence on its safety.[6]

There are several points to consider when performing this operation. Transanal hand-sewn anastomosis is performed after mucosectomy of the rectum above an expected anastomotic site without performing proctectomy. Therefore, if the rectal stump is long, it is difficult to perform mucosectomy on the upper rectum. When the rectal stump is long, dissecting around the stump (at least posterior dissection) in the abdominal cavity becomes feasible. In this situation, stapled anastomosis after dissection may be considered. Next, an adequate mucosectomy is required. Retention of the upper rectal mucosa results in persistent mucus secretion through the mucosa. This causes chronic inflammation and abscess. This surgical technique is ideal when there is dense and massive adhesion to the stump within 5 to 6 cm of the AV.

Other approaches have been proposed for Hartmann's reversal. Minimally invasive reversal of HP has been performed in several institutions. This surgical method reduced the hospital stay with a high conversion rate, and there was no significant difference in postoperative complications.[1] Performing this procedure is difficult in patients with severe adhesion, such as in the present case. A combination of transabdominal and transanal approaches has recently been proposed.[7] This technique involves full-thickness intra-abdominal and transanal dissection of the upper third of the stump. Unlike the surgical method used in this case, the combined technique involves proctectomy, which is performed by dissecting the rectal stump to some extent via a transanal approach and stapled anastomosis. The technique used in this case minimized rectal stump dissection, did not require proctectomy, and involved posterior proctotomy only. Thus, it is the safer option for complex cases.

In conclusion, rectal mucosectomy and transanal hand-sewn anastomosis were performed in a complex case of Hartmann's reversal, resulting in the patient's successful recovery without complications. This study proposes the preceding surgical technique as an alternative for similar cases.

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