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Case Report

Hartmann's rectal stump revisited preoperative evaluation prior to reversal

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ABSTRACT

Hartmann's procedure is the gold standard surgical intervention in a variety of emergencies. Hartmann's Reversal is a complex procedure and has high rates of intra-operative and post-operative complications. There are no clear guidelines or recommendations for pre-operative evaluation of the remnant colorectal pouch prior to restoration of intestinal continuity. We present two patients who underwent Hartmann reversal. In both cases, during pre-operative endoscopic evaluation of the Hartmann colorectal pouch, a stricture was incorrectly thought to be the pouch's blind end and the anastomosis was formed proximal to that stricture. In case 1, a partial obstruction developed that was successfully treated with endoscopic balloon dilatation. In case 2, a complete obstruction occurred, requiring emergent re-operation with formation of a bypass around the stricture. Surgeons and gastroenterologists should be aware of this diagnostic pitfall, and consider pre-operative evaluation that includes both endoscopic and radiologic evaluation in patients being considered for reversal.

Keywords: Barium enema, Hartmann's reversal, Endoscopy, Rectal stricture

INTRODUCTION

Prior to the Hartmann procedure, the common surgical intervention for colonic obstruction was abdominoperineal resection, a much more radical procedure described by Dr. Miles in the beginning of the 20th century.[1] The Hartmann's procedure was first introduced by Dr. Henry Hartmann, a French surgeon, in 1921.[2] He described two patients with colonic obstruction due to a malignant tumor who were treated by resection of the obstructed colon, producing an end colostomy and leaving a rectal pouch.[3]

Hartmann's procedure was shown to increase survival rates significantly for obstructed patients. During the 20th Century, the Hartmann procedure gained popularity among surgeons to treat colonic obstruction and perforated large bowel, a complication commonly associated with diverticular disease. Today, this procedure is still the first choice in these surgical emergencies.

Hartmann reversal is associated with significant post-operative morbidity and is considered by many surgeons to be among the more complex colorectal procedures.[4,5] Despite the technique's utility, it is somewhat surprising that no pre-operative practice guidelines exist for evaluation of the distal colorectal pouch.

Surgeons attempting Hartmann reversal must make their own judgments whether or not to evaluate the distal rectal pouch and which evaluation techniques to use.

Author were present two cases in which pre-operative endoscopic evaluation prior to Hartmann reversal demonstrated a false negative finding of a stricture in the colorectal pouch that led to post-operative obstruction. In addition, a brief review of the literature on pre-operative evaluation of the Hartmann's colorectal pouch is conducted.

CASE REPORTS

Case 1

A 20 years old male with a past medical history of Crohn's disease since childhood underwent a primary ileocolic resection with an end ileostomy. Within 24 hours he was brought back to the operating room for a subtotal colectomy with an end ileostomy and a long Hartmann's pouch stapled off at the level of the sigmoid to treat septic shock secondary to clostridium difficile colitis. Post-operatively, the patient had a long hospital course, but ultimately recovered without a need for additional surgical interventions.

Fifteen years after that hospitalization, the patient desired to undergo restoration of bowel continuity. Because of the patient's complex history and the long interval since formation of the Hartmann pouch, a CT scan with intravenous contrast was performed that showed evidence of a possible stricture of the Hartmann pouch. Flexible sigmoidoscopy was performed demonstrating no obvious stricture and a blind end-like anatomy approximately 20cm from the anal verge with a pinhole opening (Figure 1).

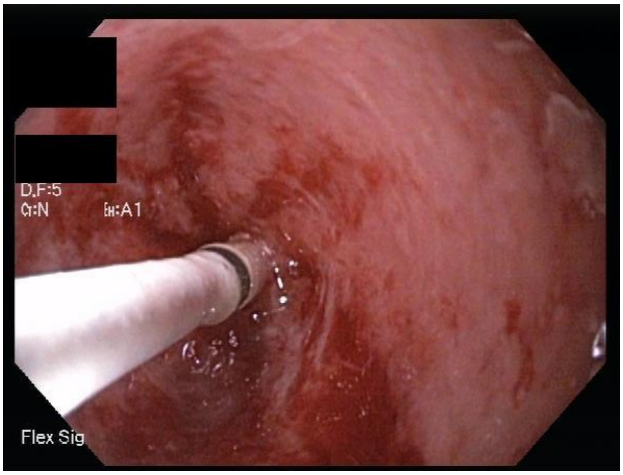

Figure 1: On the pre-Hartmann reversal by flexible sigmoidoscopy in case 1, at about 20cm from the anal verge a pinhole opening was noted. An injection catheter was employed in this image and all contrast returned. This was thought to be the true blind end of the Hartmann stump.

A catheter was used to inject contrast under fluoroscopic guidance into the suspected opening. There was no contrast seen penetrating the area or progressing proximally. Therefore, this was thought to be the true end of the Hartmann pouch. A month later the patient underwent an open Hartmann's reversal with a functional end to end anastomosis between end ileum and sigmoid. Post-operatively, the patient was clinically obstructed and had intermittent fevers and emesis.

A CT scan with oral contrast demonstrated a partial obstruction with mild distension proximal to the region of the anastomosis and some contrast visible in the sigmoid. On post-operative day 6, flexible sigmoidoscopy was repeated again demonstrating a pinhole opening, and on post-operative day 7, fluoroscopy-guided contrast injection revealed a 2cm long stricture distal to the anastomosis. The stricture was dilated to a diameter of 12mm using an endoscopic balloon with prompt release of bowel contents (Figures 2 and 3).

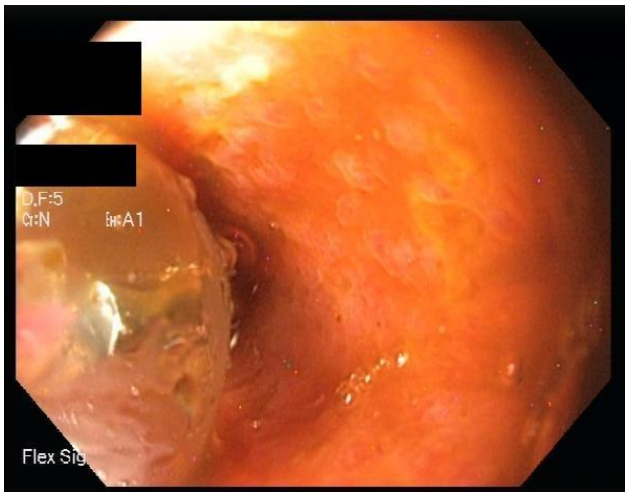

Figure 2: Balloon Dilatation of Stricture After Hartmann Reversal. After Hartmann reversal in case 1, the patient became obstructed by a stricture, distal to the anastomosis, in the same region as the pinhole noted on pre-operative endoscopic evaluation. A wire was EMPLOYED, and the process of balloon dilatation is shown.

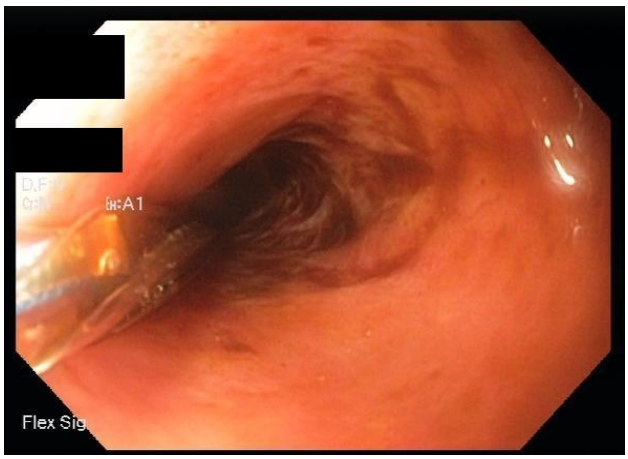

Figure 3: After balloon dilatation in case 1 (Figure 2), the stricture became patent.

The ileo-colonic anastomosis 10cm proximal to the stricture appeared widely patent. Subsequently, the patient developed an enterocutaneous fistula at the site of the anastomosis and was brought back to the operating room where an end ileostomy was performed. The patient was discharged and remains diverted.

Case 2

A 60 years old female with necrotizing pancreatitis complicated by severe ischemic colitis underwent exploratory laparotomy and extended right hemicolectomy leaving a long Hartmann pouch and an end ileostomy. The patient presented a year and a half later for restoration of bowel continuity. Pre-operative evaluation included a sigmoidoscopy that revealed diversion colitis throughout the Hartmann segment and a stricture 25cm from the anal verge that was traversed. Approximately 10cm proximal to the stricture a blind end was encountered and taken to be the end of the Hartmann pouch.

A week after this pre-operative colonoscopy, the patient underwent extensive lysis of adhesions, takedown of the ileostomy, and formation of an ileo-descending colon anastomosis. Post-operatively, the patient developed obstructive symptoms including abdominal distension and nausea. A CT with rectal contrast showed an obstruction in the region of the ileo-descending colon anastomosis (Figure 4).

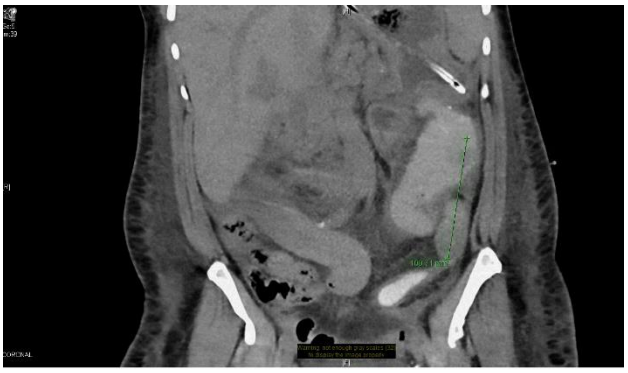

Figure 4: CT scan with rectal contrast of case 2, taken on post-Hartmann reversal day 8, demonstrating stricture causing high grade obstruction distal to the ileo-descending staple line.

The patient underwent repeat sigmoidoscopy revealing persistent diversion colitis. The stricture previously noted at 25cm from the anal verge was identified and dilated again. At 35cm, previously thought to be the end of the Hartmann pouch, a pinhole opening was noted. Fluoroscopy-guided contrast injection revealed this to be a second stricture (Figure 5). Endoscopic balloon dilation was attempted but was unsuccessful. This area was tattooed for future identification. The patient was taken back to the operating room and underwent exploratory laparotomy and a bypass around the stricture by forming a side-to-side anastomosis between the ileum to the sigmoid colon distal to the first anastomosis. A protecting loop ileostomy was formed. The patient was discharged and several month later, after confirmation that anastomosis were intact, successful reversal of the ileostomy was performed.

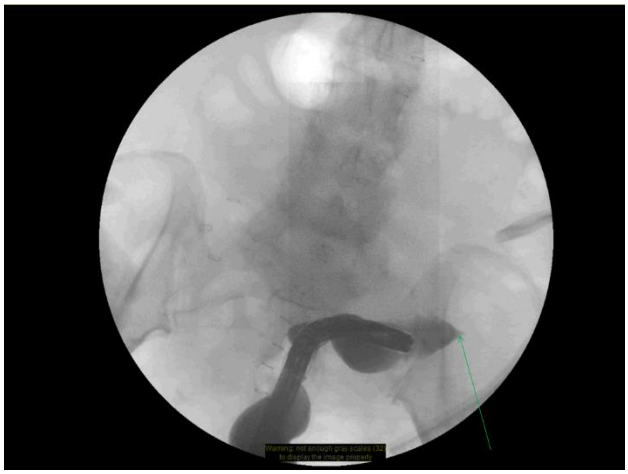

Figure 5: After balloon dilatation of more distal stricture, fluoroscopy-guided endoscopy identified a second, more proximal stricture.

DISCUSSION

The Hartmann procedure has been performed for nearly a century in various emergencies, including colonic perforations and colonic obstructions, often from diverticulitis and malignant tumors. Though some studies have advocated for routine evaluation of the Hartmann's pouch to rule out malignant neoplasms, no guidelines or clear recommendations exist about pre-operative evaluation of the bowel prior to Hartmann reversal.[6-9] Unlike the practice guidelines that call for evaluation prior to reversing temporary ileostomies above a high-risk anastomosis, such as an ileo-pouch anal anastomosis (J-pouch) or after a low anterior resection, pre-operative evaluation before Hartmann reversal is surgeon dependent in both practice and method.[10]

To the best of our knowledge, there are only two articles in the literature detailing the pre-operative evaluation of the distal rectal pouch.[11,12] Cherukuri et al reviewed 84 patients who underwent contrast enhanced radiography, mostly with barium studies and some with water soluble contrast, detecting a 19% rate of abnormalities in the Hartmann's pouch.[11] The authors found an even higher rate of abnormalities (36%) in a subset of patients who had suspected complications of the Hartmann pouch. These abnormalities included recurrent neoplasia, colitis, leaks, and one patient with a stricture. Based on these findings, the authors recommended a water-soluble contrast study prior to restoration of bowel continuity to reduce possible post-operative complications. Ballian et al. retrospectively reviewed over 200 patients who underwent Hartmann's reversal, of which two thirds

underwent pre-operative evaluation of the Hartmann's pouch either by imaging study or endoscopy.[12]

The authors found abnormalities in 7% of patients who underwent evaluation. Two patients (1.5%) had strictures found on pre-operative evaluation that delayed their reversal and endoscopic balloon dilatation was employed in one patient. Because of the low rate of abnormal findings, the authors concluded that Hartmann's reversal without pre-operative evaluation of the Hartmann's pouch was acceptable in patients without preoperative symptoms.

Based on this limited evidence, surgeons must decide on whether sigmoidoscopy, barium enema or CT barium enema, both, or no evaluation should be performed before reversing a Hartmann. If sigmoidoscopy is employed, the endoscopist must take great care to definitively identify the end of the Hartmann pouch using surgical landmarks such as staples or suture lines. If a stricture is noted, endoscopic balloon dilatation may be considered because this procedure has high success rates with low morbidity and may reduce post-operative complications.[13] If imaging is used, clear images of the entire Hartmann segment should be obtained, if possible. Both techniques have limitations; the blind end can sometimes be difficult to anatomically distinguish from a stricture by endoscopy, and a barium enema or CT barium enema will not detect a stricture causing complete obstruction.

In this report, author were present two cases where strictures in the Hartmann's pouch were endoscopically misdiagnosed as the blind end of the pouch and led to complications following Hartmann's reversal. In both cases the failure to correctly identify a stricture pre-operatively in the Hartmann pouch led to acute obstruction ultimately requiring surgical re-exploration and re-diversion.

In both cases, restoration of bowel continuity by Hartmann reversal was performed after a longer interval from the original Hartmann's procedure than has been typically reported in the literature.[14,15] It is possible that the long interval between the initial Hartmann and the reversal contributed to the formation of the strictures and the post-reversal complications.

CONCLUSION

The study believe that pre-operative evaluation of the Hartmann segment may increase the success rates of Hartmann reversal. Physicians should consider imaging studies possibly in conjunction with endoscopy to evaluate the rectal pouch prior to restoration of bowel continuity.

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