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Uncontrollable Intra-Abdominal Bleeding Necessitating Low Anterior Resection of the Rectum After Stapled Hemorrhoidopexy: Report of a Case

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Abstract
Stapled hemorrhoidopexy (SH) has become a widely accepted surgical procedure for hemorrhoids; however, one of the most serious complications of this technique is severe bleeding. We report a case of extensive hemoperitoneum after SH for third-degree hemorrhoids. On postoperative day (POD) 1, the patient complained of severe abdominal pain and clinical signs of peritonitis soon became evident. Computed tomography (CT) showed blood in the abdomen. We performed an emergency exploratory laparotomy, which revealed extensive hemoperitoneum, and a devitalized, edematous rectum with a tense hematoma, approximately 1 cm above the staple line and extending up to the level of the peritoneal reflection. We also found a small seromuscular laceration in the anterior aspect of the rectum just above the peritoneal reflection. This small laceration was bleeding actively. Thus, we performed a low anterior resection and the patient was discharged from hospital 10 days later. We report this case to raise awareness of the possibility of life-threatening intra-abdominal complications without evidence of typical rectal bleeding.

Key words Hemorrhoid · Stapled mucosectomy · Complication · Bleeding

Introduction

In recent years, stapled hemorrhoidopexy (SH) has become a widely accepted procedure for third-degree hemorrhoids.[1,2] It is generally thought to have low complication rates; however, recent data show that the complication rate of SH is probably higher than that of conventional hemorrhoidectomy.[3] One of the most serious complications after SH is rectal bleeding, which occurs at an estimated incidence of 7.5%[3] and requires a second operation in 1.3% of cases.[4] So far, only a few cases of intra-abdominal or retroperitoneal hemorrhage or sepsis have been reported. These complications may be severe, and a fatal outcome has been reported.[5] To increase awareness of this rare, yet devastating abdominal complication, we report a case of severe intra-abdominal bleeding after SH.

Case Report

A 44-year-old man underwent elective SH for third-degree hemorrhoids. Surgery was performed using the 33-mm Proximate HCS (PPH 01 Stapling gun, Ethicon Endo-surgery, Somerville, NJ, USA) and care was taken while inserting the purse-string suture to include only mucosa and submucosa. After firing the gun, the staple line was intact without evidence of anastomotic leakage, 2–3 cm above the dentate line. There was no hemorrhage from the rectum and only one additional stitch was necessary in the staple line. As is often the case with this procedure, histological examination of the doughnut showed some smooth-muscle fibers.

On postoperative day (POD) 1, the patient complained of abdominal and pelvic fullness and pain. Physical examination revealed a dry mouth, diffuse abdominal tenderness with rebound pain, and diminished bowel sounds. During a rectal digital examination, we felt the staple line low in the rectum, without evidence of rectal bleeding. The patient was hypotensive, hypoxemic, and tachycardic, and his hemoglobin was low, at 6.2 g/dl. He was given immediate supportive management. Hemodynamic stabilization and resuscitation required intravenous fluids and packed red blood cells (pRBCs), despite which his general condition failed to improve.

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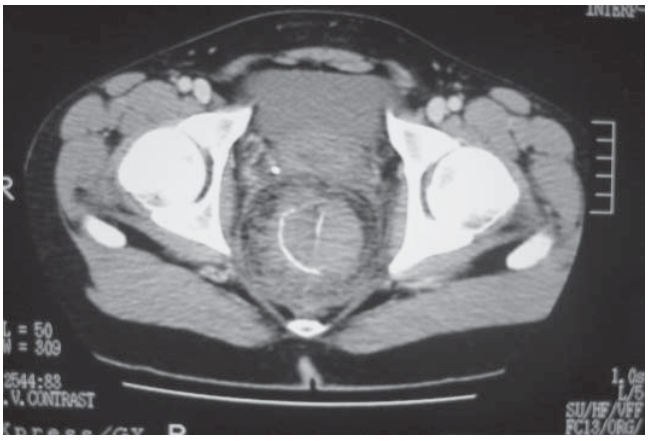

Fig. 1. Postoperative computed tomography scan of the pelvis, showing the hematoma formation above the staple line

Fig. 2. Postoperative computed tomography scan of the abdomen showed extensive hemoperitoneum

Emergency rectoscopy showed a normal anal canal and regularly stapled mucosa without evidence of active bleeding, but computed tomography (CT) of the abdomen revealed extensive hemoperitoneum (Figs. 1 and 2).

The patient underwent emergency exploratory laparotomy 24 h after the SH, which revealed extensive hemoperitoneum. Moreover, the rectum appeared devitalized and very edematous with hemorrhagic infiltration. It contained a huge, tense hematoma, approximately 1 cm above the staple line, extending up to the level of the peritoneal reflection, and a small seromuscular laceration was seen in the anterior aspect, just above the peritoneal reflection. This small laceration was bleeding actively. After a meticulous search with dissection of the rectal wall, we determined that the point of bleeding was approximately 1 cm above the staple line, but we could not identify the exact source. Based on these perioperative findings, hemostasis was not feasible. Furthermore, because leaving the devitalized rectum in situ would have been too risky for the patient, we decided to perform low anterior resection. Thus, we transected the rectum at the rectosigmoid junction and mobilized it down to the pelvic floor, revealing a hematoma of the pararectal tissues. The staple line was inspected again and found to be intact. After peritoneal lavage, the pelvis and presacral space were drained and the low anterior resection was completed. The patient was transferred to the intensive care unit, after which he recovered uneventfully and was discharged on POD 11.

Discussion

Stapled hemorrhoidopexy is a widely accepted surgical technique for third-degree hemorrhoids because it is associated with a shorter hospital stay and less discomfort than conventional hemorrhoidectomy. However, the rate of early minor complications associated with SH is still of some concern. In large studies, the overall complication rate was roughly 15.0%–17.5%.[6,7] The most common early complication is rectal bleeding, reported in 4.2%–7.5% of patients.[3,6] The cause of minor rectal bleeding is mainly hemorrhage from the stapled ring, which requires early reintervention in up to 5% of patients.[8] It is generally easier to treat other complications, such as urinary retention and postoperative pain, which occur in approximately 2% and 4.5% of patients, respectively.[4,7] Major complications, although unusual, are potentially life-threatening. Maw et al.[5] reported retroperitoneal sepsis after SH, and Kirsch et al.[4] described the results of an anonymous survey of 224 departments of surgery performing SH in Germany. Among 4635 stapled hemorrhoidopexies, there were three cases of rectal perforation, one case of complete rectal obstruction, one case of a large retrorectal hematoma, and one case of fatal Fournier's gangrene.[5,9,10] Recently, Aumann et al.[11] reported a case of severe intra-abdominal bleeding after SH, mainly initiated by the intra-abdominal positioning of a staple caused by an enterocele. Our case provides further evidence that intra-abdominal bleeding might occur after hemorrhoid surgery using the PPH device.

The depth and height of the purse-string suture appears critical to ensure that an adequate "doughnut" is removed and the staple line lies at an appropriate height.[12] The incorporation of smooth muscle in the ring of tissue removed may be of little consequence for most patients,[13] but it carries the potential for catastrophic complications if there is a leak from the staple line. Bleeding is one of the most common immediate complications, probably caused by the staples not achieving proper hemostasis or too much folded mucosa in the

staple line. Taking larger bites of the mucosa into the purse-string increases the space against which the staples are fired, causing inefficient hemostasis.

It is possible that ring dehiscence after SH may cause intra-abdominal bleeding. Another possible cause is the stapled ring being placed too high in the anal canal in an intra-abdominal position. It is well known that SH may cause a full-thickness excision of the rectal wall[14] and when the purse-string suture is placed too high or too much tissue is drawn into the stapler housing, the muscularis propria may be incorporated in the staple line. The incorporation of rectal wall muscle in the excised tissue is not uncommon after hemorrhoidopexy. Muscularis propria was found in the excised tissue in 4 of 11 patients who underwent SH in a series reported by Rowsell et al.,[15] and in 4 of 5 patients with long-term complications after SH in a series reported by Cheetham et al.[16] When the stapler is placed too high in the rectum, the ventral rectal wall can be excised in full thickness.

A meticulous search did not reveal an inadvertent perforation of the rectum, localized failure of the staple line, or intra-abdominal position in our patient. Furthermore, no overt technical problems were encountered during the operation. Although care was taken to incorporate only mucosa in the purse-string, histological examination of mucosal doughnut did reveal some smooth-muscle fibers. The above-mentioned complication is not uncommon with this procedure and is likely to be related to the design of the PPH 01 stapling gun. This stapling gun is made specifically to allow the purse-string to be pulled down along the shaft, and the anvil can accommodate much larger quantities of tissue than the standard circular stapling gun. Both of these features may allow the incorporation of some of the muscle wall, despite a well-placed mucosal purse-string. Care must be taken to avoid incorporating too much proximal prolapsing rectal mucosa into the jaws of the closing gun. A suggested prophylactic technique is the submucosal injection of saline at the proposed site of the purse-string suture,[17] which would reduce the risk of incorporation of rectal muscularis propria into the stapler housing. Histologic studies of doughnuts confirm that circular smooth muscle is found in 25%–100% of specimens without adverse sequela.[13]

We could not determine the exact mechanism of intra-abdominal hemorrhage without evidence of rectal bleeding in our patient. However, we hypothesize that closure of the gun before final stapling may have crushed the rectal wall, resulting in rupture of a muscularis propria arterial branch, which was incorporated into the purse-string, but not into the staple line. This active bleeding in the muscularis propria space resulted in the formation of a tense rectal wall hematoma, which ruptured intraperitoneally, through the small laceration in the anterior aspect. Thus, while care must be taken to include only mucosa and submucosa during insertion of the purse-string, excessive traction must be avoided because this hypothetical mechanism of injury may result in acute bleeding in the rectal wall and hematoma formation. In parallel, we emphasize vigilance to prevent life-threatening intra-abdominal complications without evidence of typical rectal bleeding.

In conclusion, we reported a rare case of severe intra-abdominal bleeding after SH with an intact staple-line, where no overt technical deficiencies were encountered intraoperatively. Stapled hemorrhoidopexy is a promising treatment strategy for patients with hemorrhoids; however, while it is effective and has many advantages, life-threatening complications do occur. These risks must be addressed when advising patients and selecting the appropriate procedure. We suggest that SH be performed only by experienced colorectal surgeons who are familiar with this technique and aware of its possible complications.

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