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CASE REPORT | COLON

Large Bowel Obstruction following Endoscopic Spray Cryotherapy for Palliation of Rectal Cancer Bleeding

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ABSTRACT

We report a unique case of a 79-year-old woman with metastatic rectal cancer who developed bowel obstruction following endoscopic cryotherapy with liquid nitrogen for palliation of bleeding in the rectum. She developed abdominal distention and pain following the procedure. Computed tomography of the abdomen revealed a paraumbilical hernia containing a segment of transverse colon resulting in partial bowel obstruction. It appears that the recurrent freeze-thaw cycles with poor decompression of the colon despite active venting suction during cryotherapy may have resulted in bowel distention and collapse, causing conformational changes resulting in partial bowel obstruction due to a paraumbilical hernia.

INTRODUCTION

Endoscopic spray cryotherapy or cryoablation uses liquid nitrogen to ablate tumor tissue and has been found to be safe and effective for the treatment of Barrett's esophagus and high-grade dysplasia, as well as for palliative use in esophageal adenocarcinoma.[1,2] Although the majority of the existing literature on endoscopic cryotherapy discusses esophageal cancer, some evidence also exists for its use as a palliative treatment option in patients with advanced and inoperable rectal cancer.[3-5] Endoscopic cryotherapy is minimally invasive and appears to be well-tolerated; however, the possibility of serious adverse events following this procedure should always be considered.[4,6]

CASE REPORT

A 79-year-old woman initially presented to our hospital in July 2015 with intermittent bright red blood per rectum. Prior colonoscopy performed in April 2015 showed a circumferential non-obstructing lesion extending from the anal verge approximately 8 cm into the rectum, which upon biopsy was proven to be invasive adenocarcinoma of the rectum. A computed tomography (CT) scan of the chest, abdomen, and pelvis revealed multiple metastatic lesions in the lung and liver. The patient was started on oral capecitabine and intravenous oxaliplatin. She had poor tolerance to chemotherapy and thus was switched to single-agent oral capecitabine in August 2016. Follow-up CT scan of the chest, abdomen, and pelvis showed an increase in both liver and lung metastases. Further treatment options were discussed with the patient at this time; she declined palliative chemotherapy and elected to proceed with supportive care.

Two months later, the patient again presented to our gastroenterology clinic with increasing rectal pain, constipation, and rectal bleeding. Laboratory tests revealed severe anemia with hemoglobin 7.6 gm/dL, which had significantly dropped from 10.4 gm/dL about 2 weeks prior. The patient received a transfusion of two units of packed red blood cells. Colonoscopy revealed a large circumferential tumor in the rectum, which was causing moderate

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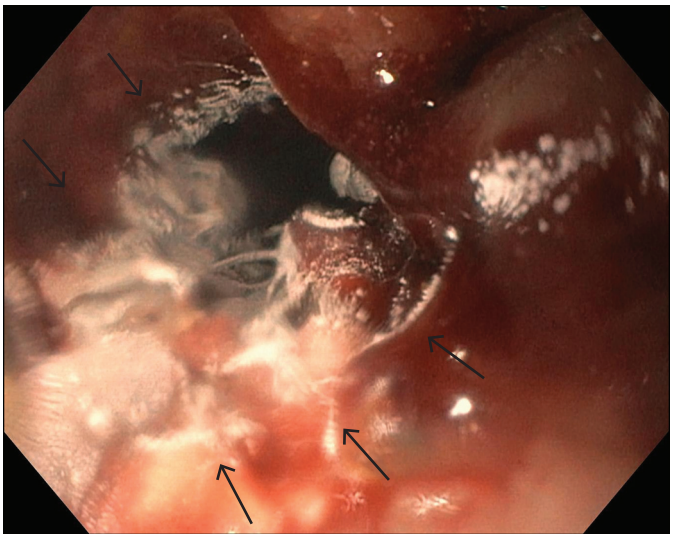

Figure 1. Endoscopic spray cryotherapy for rectal adenocarcinoma.

obstruction along with active oozing of blood. Argon plasma coagulation to cauterize active bleeding was not successful. The patient was advised to try palliative radiation, which she declined.

Colonoscopy was repeated after 2 weeks due to ongoing rectal bleeding, and liquid nitrogen endoscopic spray cryotherapy was performed at two separate tumor sites for three cycles of 15 seconds each (Figure 1). Before performing spray cryotherapy, a large-bore venting suction catheter was placed in the large bowel with the tip in the mid-transverse colon. This catheter was connected to continuous suction to prevent over-distention of colon during liquid nitrogen injection under high pressure.

The patient developed moderate abdominal distention and discomfort after the procedure, and she was admitted to our hospital for observation. Clinical examination revealed an obese woman with distended abdomen and mild discomfort. No guarding or rebound tenderness was noticed. Bowel sounds were present. Abdominal x-ray showed prominent gas-filled cecum and ascending and proximal transverse colon (Figure 2). There was no free air. The bowel distention and discomfort did not resolve in the next 24 hours, so CT scan of the abdomen was performed, which revealed a paraumbilical hernia containing a segment of the transverse colon resulting in partial bowel obstruction (Figure 3). The patient underwent repeat colonoscopy without bowel preparation. This revealed transverse colon in the hernia sac, which was successfully reduced by maneuvering through the colon. She later underwent laparoscopic hernia repair with uneventful recovery. The patient was followed at our institution for 1 month, at which point the rectal bleeding had resolved and her hemoglobin was found to be stable at approximately 9.5 gm/dL with no need for transfusion.

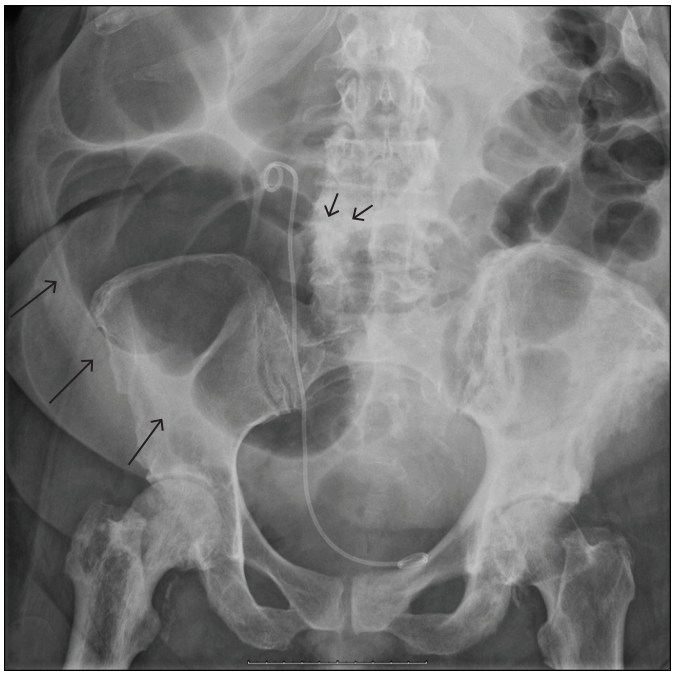

Figure 2. Abdominal x-ray after endoscopic spray cryotherapy showing the distended ascending colon and part of the transverse colon, but a non-distended left colon.

DISCUSSION

Approximately half of patients with rectal cancer may be candidates for palliative therapy at some point during their disease process because of locally advanced or metastatic disease or high operative risk.[4,7] Treatment strategies as an

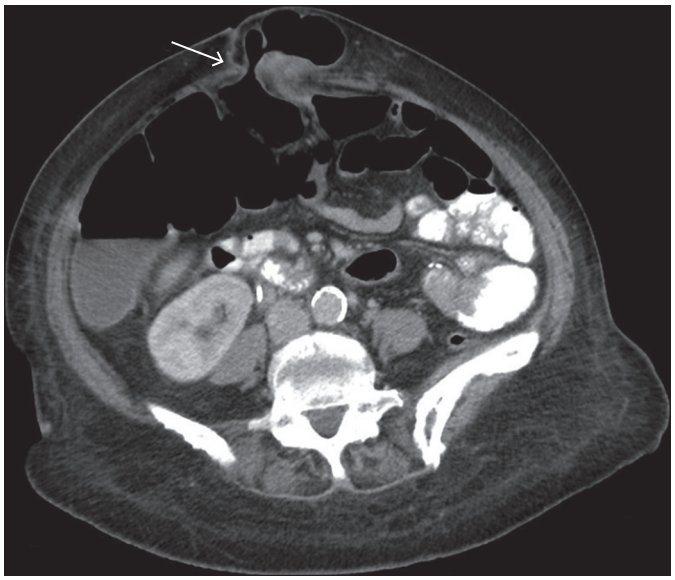

Figure 3. Abdominal CT scan showing the transverse colon displaced into the hernia sac, causing partial bowel obstruction and proximal bowel dilatation.

alternative for palliative surgery for advanced stage rectal cancer include laser ablation, argon plasma coagulation, electrocoagulation, photodynamic therapy, pelvic radiotherapy, chemotherapy, endoscopic stenting, and cryotherapy.[7-11] Treatment selection should consider the patient's symptoms, age, comorbid conditions, extent of disease, and patient preference.

Endoscopic cryotherapy has been used to control tumor bleeding in the gastrointestinal tract. This technique involves directing freezing nitrogen gas on the lesion during direct visualization, causing immediate and delayed cellular death.[6,12] Each mucosal site is generally treated for 20–30 seconds for 2–3 cycles with at least 45 seconds between freezes to allow complete tissue thawing. Endoscopic spray cryotherapy is frequently used to stop bleeding from vascular lesions such as gastric antral vascular ectasia and arteriovenous malformations.[13,14] Endoscopic cryotherapy has also been used as a palliative treatment option in patients with advanced and inoperable rectal cancer. The largest reported case series contained 106 patients with inoperable rectal cancer who underwent palliative cryosurgery for the relief of local symptoms such as rectal bleeding, mucous discharge, and obstruction.[4] Complete relief of local symptoms was reported in 62% of patients, moderate palliation in 16%, and no palliation in the remaining 22%. The most pronounced pallative effect was observed in patients with small (<4 cm) intraluminal tumors. Adverse events such as fistula and fibrotic reaction were reported in 10 patients. Due to the relatively lower palliation rate and potential for adverse effects, endoscopic cryotherapy has been considered inferior to other palliative techniques.

Our patient had morbid obesity with a pendulous abdomen, which made it difficult to clinically evaluate for the presence of paraumbilical hernia prior to and after the cryotherapy procedure. During the freeze cycle of endoscopic spray cryotherapy, high-flow nitrogen was injected onto the tumor, which caused bowel distention. A suction tube was placed in the transverse or descending colon for active venting, which suctioned out the air and caused the bowel to collapse. During endoscopic cryotherapy there could be anywhere between 3–12 freeze-thaw cycles. We believe that during recurrent freeze-thaw cycles, the underlying paraumbilical hernia coupled with repeated bowel distention caused conformational changes resulting in partial bowel obstruction.

It is important to note that the etiology of bowel obstruction in this case is multifactorial. Endoscopic cryotherapy by itself is highly unlikely to result in such a complication. We therefore believe that it is important to thoroughly examine the patient for the presence of paraumbilical hernia prior to endoscopic spray cryotherapy. With partial colonic obstruction, it can potentially act as a ball-valve with air being trapped in the right colon, potentially risking perforation. At our center, we have a dedicated nurse to constantly examine the patient's abdomen during cryotherapy for distention or firmness. If there this occurs, we recommend performing full colonoscopy to suction air out and assess for barotrauma.

DISCLOSURES

Author contributions: All authors wrote and revised the manuscript. R. Prakash and D. Gupta searched the literature. R. Prakash is the article guarantor.

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