

Iatrogenic Rectal Perforation During Operative Colonoscopy: Closure With Endoluminal Clips

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ABSTRACT

The risk of perforation during diagnostic or operative colonoscopy can be as high as 2%. Despite conservative treatment being acceptable, the closure of the perforation is usually mandatory, and surgery (either open or laparoscopic) is commonly advocated as rescue therapy. Currently, with the availability of the Endoclip, endoscopists are able to manage iatrogenic perforations avoiding surgery. Clip placement, if necessary, will not delay surgery and might help the surgeon find the site of perforation. However, data in the literature are scant, especially for the closure of large colonic defects. Endoscopic repair using Endoclip devices for a large high rectal perforation following polypectomy is described herein.

Key Words: Iatrogenic perforation, Colonoscopy, Clips.

INTRODUCTION

The risk of perforation after colonoscopic procedures ranges from 0.1% to 2%.¹⁻³ Commonly surgery, either open or laparoscopic, has been advocated as rescue therapy. Despite conservative treatment being acceptable for select patients, to limit perivisceral contamination thus avoiding sepsis and its sequelae, the closure of the perforation is usually mandatory. When surgery is chosen, usually it is carried out as soon as possible. As a matter of fact, if a conservative approach fails, surgery is more extensive and followed by high mortality and morbidity.³

Recently, successful endoluminal closure with clips (either experimental or clinical) has been reported as feasible and effective for esophageal, gastric, or duodenal perforations and for fistulas and leaks.⁴⁻¹⁰ On the other hand, the treatment of lower GI perforations by endoscopic clipping is still controversial.¹⁰ Literature data are scant, and only a handful of authors advocate this as a first-choice approach. We describe a case of high rectal perforation during operative colonoscopy that was immediately closed with endoluminal clips.

CASE REPORT

A 60-year-old Caucasian female who had a 2-cm sessile polyp with severe dysplasia 10cm from the anal verge underwent planned inpatient operative colonoscopy. During polypectomy, a 3-cm long rectal perforation occurred and was immediately recognized. It was located just above the second valve of Houston, along the transverse axis (**Figure 1**). The defect was situated on the right anterolateral wall, and the colonoscope never traversed the perforation. It was promptly closed using a rotating clip-fixing device (**Figure 2**).

The perforation was immediately confirmed with an abdominal x-ray that showed pneumoretroperitoneum. Several hours later, the patient experienced modest lower quadrant pain, bilateral lumbar pain, and chest pain with modest dyspnea. A chest, abdominal, and pelvic CT scan was obtained showing pneumoretroperitoneum, pneumomediastinum, and subcutaneous emphysema with modest intraabdominal subhepatic free air (**Figure 3**).

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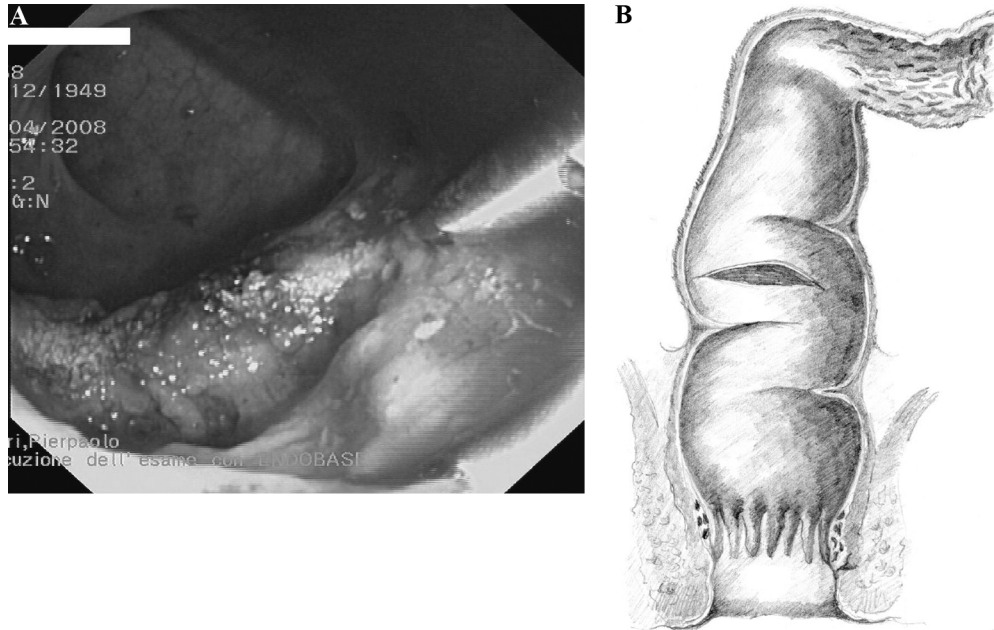


Figure 1. Rectal perforation (3-cm long along the transverse axis just above the second valve of Houston).

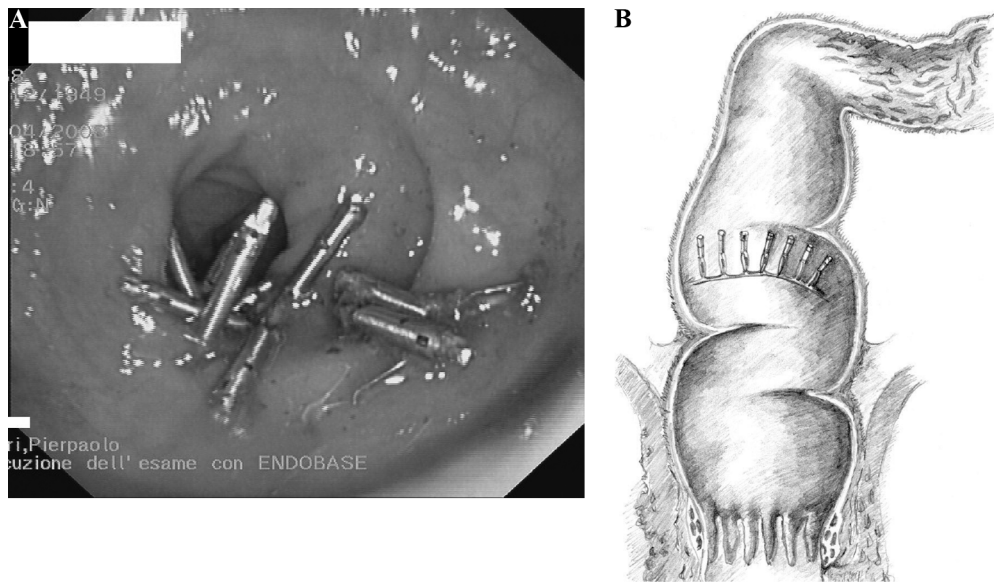


Figure 2. Clip placement (9 clips were used but 2 were misplaced).

The patient was kept nil by mouth with fluids and peripheral parenteral nutrition, started on IV fluids, PPI and IV large spectrum antibiotics. During the night, she experienced fever ($>38^{\circ}\text{C}$), with minimal signs of lower quadrant peritonism in the absence of any sign of shock. Starting on postoperative day 1 (POD1), she had minimal neutrophilic leukocytosis (WBC 13000 number/ mm^3), which returned to normal on POD3. C-reactive protein

(CRP) peaked on POD2 (270 mg/L) returning to baseline at POD6.⁴ Abdominal pain and fever disappeared respectively on POD4 and POD5. Chest and abdominal x-rays were repeated on POD3 and POD7. The latter showed an improvement in free-air reduction (chest, abdomen, and subcutaneous) compared with the previous status. The patient returned to an oral diet on POD7 and was discharged on POD10.

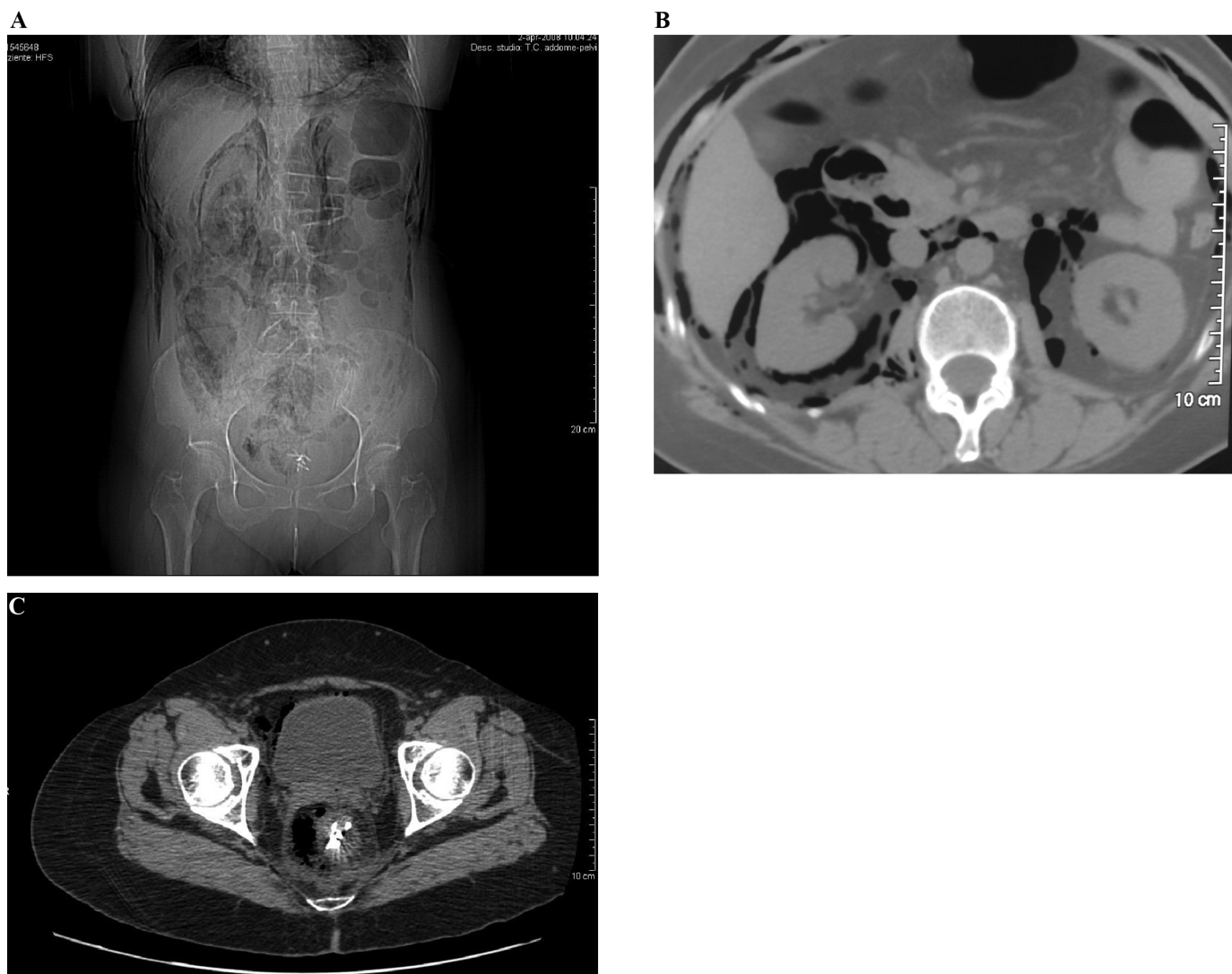


Figure 3. (A) Scout CT scan showing significant retroperitoneal air (around the right kidney, both flanks, and left retroperitoneum); (B) CT scan cross-section showing right anterior peri-vesical air and right prerectal air with right retroperitoneal air. Projecting endoscopic clips are also evident; (C) abdominal CT scan cross-section showing subhepatic intraperitoneal free air.

DISCUSSION

Despite conservative treatment of lower GI iatrogenic perforation being possible for stable patients in good health and excellent bowel preparation, the most common approach is surgical.^{3,10} A conservative approach, consisting of careful clinical observation, IV antibiotics, nasogastric tube decompression, and frequent laboratory studies, is often chosen when retroperitoneal perforation occurs and when a properly prepped colon minimizes the amount of gross spillage. However, clinical symptoms can be absent or scant thus delaying diagnosis, eventually followed by more challenging surgery. When surgery is

immediately chosen, laparoscopic repair of iatrogenic colonic perforation is safe and effective leading to rapid recovery.¹¹ Laparoscopy may also provide an exact diagnosis and aid in deciding the need for prompt operative management. Recently, Kilic and Kavic¹² proposed an active role for laparoscopy in complex colonoscopies. Laparoscopic-assisted “difficult” polypectomy may allow prompt recognition of the perforation thus direct suture or resection of the injured segment. However despite this, this approach might not be routinely applied.

Moreover, both patients and physicians, whenever possible, prefer to avoid emergency surgery.

Raju et al⁴ have experimentally shown that endoscopic closure of small, iatrogenic colon perforations with clips results in mucosal and submucosal apposition and healing, preventing fecal soiling. Although an experimental endoclipping closure is technically feasible and effective for defects as large as 5 cm, further investigations are needed to evaluate the robustness of endoscopic closure of colon perforation and the nature of wound healing over time with just mucosal and submucosal apposition compared with surgery when a full-thickness suture is performed.⁴

In a recent review of patients referred to the National Cancer Centers in Japan, Taku et al¹⁰ observed a 70% success rate for endoclipping closure suggesting this approach be used for small defects (<10 mm) with good bowel preparation. On the other hand, some reports have questioned the efficacy of endoclipping for lower GI perforations,¹⁰ and colonic perforation after endoclipping placement for delayed postendoscopic resection bleeding has also been described.¹³

Our patient had pneumoretroperitoneum, pneumomediastinum, and subcutaneous emphysema as well as minimal pneumoperitoneum secondary to the air insufflation during operative colonoscopy through a 3-cm anterolateral rectal defect. Despite the large defect and presence of intraabdominal air, we decided on conservative treatment based on the clinical condition of the patient, the excellent bowel preparation, and the good endoluminal closure achieved.

We believe that endoluminal clip placement in this case greatly reduced the chances of fecal contamination and the need for surgery. Subsequent bowel rest, large spectrum IV antibiotics, and peripheral parenteral nutrition enhanced the recovery.

In accord with other authors,^{14,15,16} we have shown that endoluminal clipping closure of iatrogenic perforation after operative colonoscopy is feasible and effective. Clip placement will not delay surgery if necessary and might help the surgeon in finding the site of perforation.¹ We believe that endoscopic clip placement should be attempted after iatrogenic perforation, and the decision to perform surgery should be based mainly on subsequent clinical findings.

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