

Single Case

Successful Closure of Chronic Colonic Double Perforation Caused by a Plastic Biliary Stent with Over-the-Scope Clip

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Keywords

Chronic colonic perforation · Biliary stent dislocation · Endoscopic closure · Over-the-scope clip

Abstract

Introduction: Biliary stenting is commonly used for managing bile duct conditions, with stent migration occurring in up to 21% of cases. Colonic perforation from stent migration is rare, typically managed surgically or with conventional endoscopic clips. The use of over-the-scope clips (OTSCs) for such perforations is less documented. **Case Presentation:** An 89-year-old multimorbid woman presented with abdominal pain and new-onset constipation. Imaging revealed a migrated biliary stent causing sigmoid colon perforation. One year earlier, the stent had been placed for choledocholithiasis. Endoscopic removal of the stent and OTSC closure of the perforations were successfully performed, with no complications on follow-up. **Conclusion:** This case demonstrates the successful use of OTSCs for closing a chronic colonic perforation caused by a migrated biliary stent. OTSCs may be a viable, less invasive alternative to surgery in similar cases.

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Introduction

Biliary stenting is a common procedure to treat a variety of conditions such as common bile duct stones, acute cholangitis, and strictures of the common bile duct. Stent migration occurs in 3%–21% [1] of patients, the rate being highly dependent on the etiology of the stricture, stent type used, and length of follow-up. Although stent migration is not uncommon, serious complications

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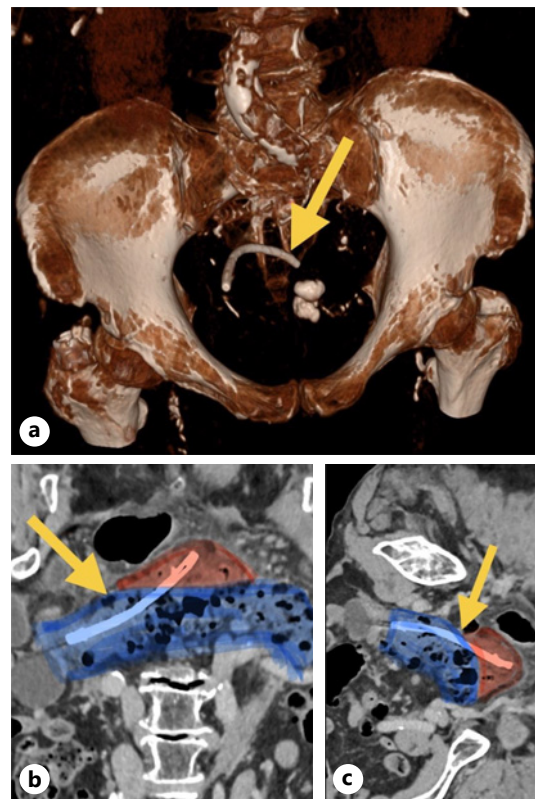


Fig. 1. CT (reconstructions) showing stent location in the sigmoid colon in the pelvis (**a**), sigmoid lumen (blue) and stent location outside the lumen with mesenteric fat stranding (red) (**b**, **c**).

are rare [2]. Colonic perforation has been reported in 41 cases [3–5]. Most of the cases occurred in the rectosigmoid colon and were associated with impaction in thin-walled diverticula or other structural variations such as postoperative bowel adhesions [6]. In these cases, endoscopic and/or surgical intervention may be required. In the majority of cases, surgical treatment was required, while endoscopic closure after retrieval is described using through-the-scope clips (TTSs).

Case Presentation

A 89-year-old woman was transferred to our hospital with chronic abdominal pain in the right lower quadrant, new-onset constipation, and worsening of the pain throughout the past 4 days. The patient was known for atrial fibrillation under prophylactical anticoagulation, recent hip fracture needing surgical treatment, hypertension, chronic anemia, and a transient ischemic attack in the past. We saw a hemodynamically stable, afebrile patient with abdominal tenderness in the lower right quadrant and associated localized resistance. Laboratory results showed no leukocytosis, but C-reactive protein elevation (108.4 mg/L, reference <10 mg/L). Abdominal computed tomography (CT) was performed and showed a dislocated plastic biliary stent localized in the sigmoid colon with colonic perforation on both ends of the stent including a perifocal fluid collection and inflammatory changes of the surrounding tissue. No free air or fistula formation could be detected (shown in Fig. 1). Antibiotic therapy with piperacillin-tazobactam was started.

Past medical history revealed primarily uncomplicated endoscopic retrograde cholangiography with endoscopic papillotomy, biliary stone extraction, and placing of a plastic biliary stent (Tannenbaum biliary stent) due to choledocholithiasis 1 year ago. Cholecystectomy was performed during her admission. She was discharged home after the hospitalization, and 8 weeks

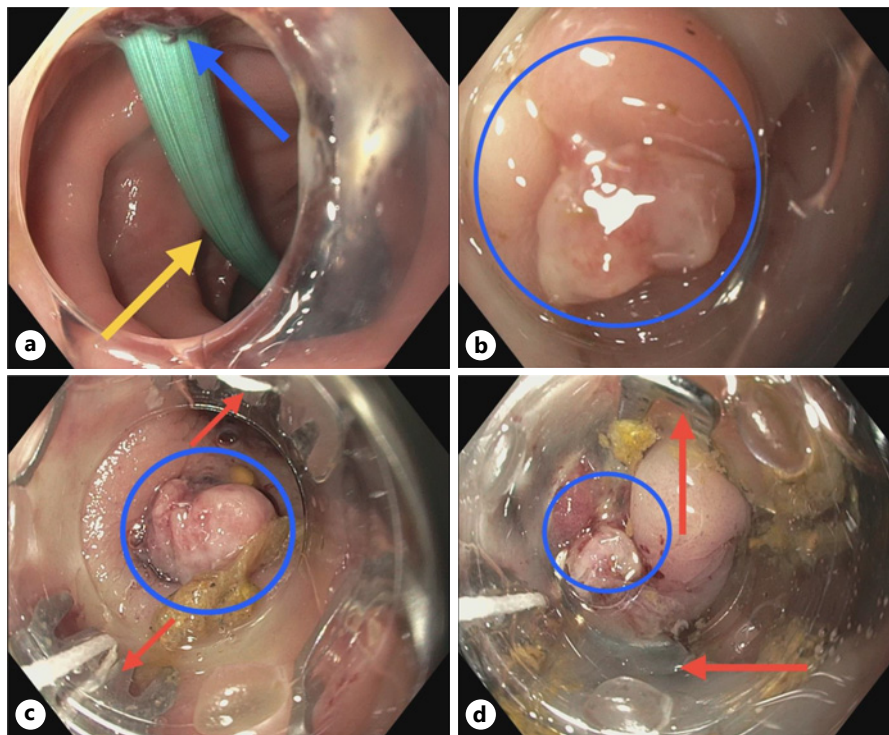


Fig. 2. Flexible sigmoidoscopy showing perforation site (blue arrow) of the stent (yellow arrow) (a), perforation site (blue circle) after stent removal (b), placing of the OTSC (red arrows) at perforation (blue circle) (c), and closed perforation (blue circle) with OTSC in situ (red arrows) (d).

later, an imaging with CT scan to control the position of the stent was performed. This already showed dislocation of the stent to the sigmoid colon. No further measures were taken at this time.

An interdisciplinary discussion decided for an attempt at endoscopic treatment for this multimorbid 89-year-old patient at risk for major surgical complications due to her general condition. During colonoscopy, the stent was found to be lodged in the sigmoid colon, penetrating the colonic wall with both ends (shown in Fig. 2). The stent was dislodged from both perforation sites using a forceps. The sites of perforation were first marked with ink and then both closed using over-the-scope clips (OTSCs). Antibiotic therapy was continued for 1 week. There were no signs of complications or therapy failure, and the patient was asymptomatic on follow-up at several outpatient visits with her general practitioner with no signs of systemic inflammation in laboratory works and 1 year later at our clinic. We refrained from follow-up imaging due to the good progress and absence of symptoms.

Discussion

Rescue therapy for late gastrointestinal (GI) perforations has traditionally required surgical interventions. Surgical interventions are more invasive and potentially more prone to long-term adverse events compared to endoscopic therapy. In 2007, the successful and safe use of OTSCs was first described [7]. OTSCs have been increasingly used in the treatment of acute GI perforations, including colonic perforations, due to their effectiveness in achieving immediate closure, often eliminating the need for more invasive surgical interventions [8, 9]. Main advantages of OTS-clipping compared to conventional TTS-clipping of GI perforation are the more efficient closure due to grasping of all the bowel wall layers leading to a more stable closure [10] and the feasibility

Table 1. Reported colonic perforations due to dislocated biliary stents and endoscopic therapy

Author, year	Indication for ERCP	Stent	Location	Manifestation	Treatment	Outcome
Diller [3] (2003)	Benign stricture	Straight	Sigmoid colon	Asymptomatic	Endoscopic removal and sigmoidectomy	Perforation after endoscopic removal
Anderson [3] (2007)	CBD stone	Straight	Sigmoid colon	Pain/abscess	Endoscopic removal	Uneventful
Jafferbhoy [3] (2011)	Postoperative bile leakage	Straight	Sigmoid colon	Pain w/o peritonitis	Endoscopic removal and clip closure	Uneventful
Alcaide [3] (2012)	CBD stone/stricture	Straight	Sigmoid colon	Pain/peritonitis	Endoscopic removal and clip closure	Abscess (day 5, treated with antibiotics)
Jones [3] (2013)	Benign stricture	Straight	Cecum	Pain w/o peritonitis	Endoscopic removal	Uneventful
Virgilio [3] (2015)	CBD stone	N/A	Sigmoid colon	Pain/covered perforation	Endoscopic removal	N/A
Chou [3] (2017)	CBD stone	N/A	Sigmoid colon	Asymptomatic	Endoscopic removal and clip closure	Uneventful
Cano-Hoz [3] (2018)	CBD stone/stricture	Straight	Sigmoid colon	Fever/hydronephrosis	Endoscopic removal and clip closure	Uneventful
Ramani [3] (2019)	CBD stone	Straight	Sigmoid colon	Pain/impaction in sacral foramen	Endoscopic removal	Uneventful
Hnaris et al. [13] (2019)	CBD stone/Mirizzi syndrome	N/A	Ascending colon	Pain w/o peritonitis	Endoscopic removal and clip, endoloop closure	Uneventful
Yamaguchi et al. [15] (2022)	CBD stone	Straight	Sigmoid colon	Pain w/o peritonitis	Endoscopic removal and OTSC closure	Uneventful
Rybinsky [3] (2023)	Ascending cholangitis	Straight	Ascending colon	Asymptomatic	Endoscopic removal and clip closure	Uneventful
Kwong et al. [14] (2023)	CBD stone	Straight	Sigmoid colon	Asymptomatic	Endoscopic removal and OTSC closure	N/A

CBD, common bile duct; ERCP, endoscopic retrograde cholangiopancreatography; OTSC, over-the-scope clip; N/A, not available.

in defects larger than 10 mm with only one clip resulting in time saving [11]. The use of OTSCs to treat iatrogenic colonic perforation during a colonoscopy if immediately detected is widely accepted, which is shown by the European Society of Gastrointestinal Endoscopy's (ESGE's) recommendations in their position statement (updated version 2020) [12] on management of colonic perforations. The available literature focuses mostly on endoscopic treatment in cases with acute iatrogenic colon perforation during colonoscopy with or without therapeutic interventions. In our case, the perforation was also iatrogenic but due to a migrated biliary stent in the past with present signs of chronic inflammation and localized peritonitis. A recent systemic review [5] showed most cases of perforation due to biliary stents occurred in the small bowel (64.4%) compared with the colon (34.8%). Stents were mostly plastic (87.1%). Reported cases with colonic perforation by a migrated biliary stent in the colon were either managed surgically or using TTS clips [3], in one case combined with endoloop [13]. To our knowledge, only two cases of a colonic perforation by a migrated biliary stent, in which an endoscopic closure with the use of an OTSC was performed, have been reported [14, 15]. A summary of reported cases of late colonic perforation by migrated stent with endoscopic treatment is found in Table 1. Our case is further remarkable because of lack of signs of treatment failure in follow-up despite the suspected chronic perforation and initial clinical signs of peritonitis. We explained this due to a possible fistula formation and thus minimizing further peritoneal inflammation. OTSC closure of GI fistulas is a commonly accepted and efficient procedure [16]. We showed a successful closure in the setting of a longer standing colonic perforation caused by a migrated Tannenbaum biliary stent with OTSCs, which is an established minimally invasive approach for perforation closure in the context of an iatrogenic complication. The novelty lies in the fact that we successfully applied this method to a chronic perforation with systemic signs of inflammation. As our review of literature shows, further experience is necessary to provide good evidence in managing these clinical situations with an OTSC. The CARE Checklist has been completed by the authors for this case report, attached as online supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000545561>).

Statement of Ethics

Ethical approval is not required for this study in accordance with local or national guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

M.L.: drafting of the manuscript; H.H.: endoscopy supervision and drafting of the manuscript; B.B.: patient care on the ward; T.H.: providing reconstructed images of the CT scan; M.Z.: endoscopy, drafting of the manuscript, and is the article guarantor.

Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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