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Mina Alkomos

Jolie Ibrahim

Karan Desai

Beshoy Effat Elkomos

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See next page for additional authors

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Duodenal Perforation From Dislodged Prophylactic Pancreatic Stent Following ERCP for Hilar Cholangiocarcinoma: A Rare Adverse Event

Mina Alkomos^{a,*}, Jolie Ibrahim^b, Karan Desai^a, Beshoy E. Elkomos^c,
Walid Baddoura^a, Youssef Botros^a

^a Gastroenterology Department, Saint Joseph's University Medical Center, Paterson, NJ, USA

^b Internal Medicine Department, Ain Shams University, Cairo, Egypt

^c General and Colorectal Surgery Department, Royal United Hospital, Bath, UK

Abstract

We report a rare complication of prophylactic pancreatic duct stenting during ERCP for suspected hilar cholangiocarcinoma. A 47-year-old woman presented with two weeks of painless jaundice, total bilirubin 18 mg/dL, and cholestatic enzymes. Imaging revealed intrahepatic biliary dilation without CBD dilation. ERCP with cholangioscopy identified a right hepatic duct stricture; biopsies were obtained. A 10 mm × 4 cm covered metal stent was placed in the CBD, a 7 Fr × 12 cm plastic stent in the right hepatic duct, and a 4 Fr × 5 cm pancreatic stent was prophylactically inserted after inadvertent duct cannulation.

Two days later, she developed acute abdominal pain. CT revealed stent migration with duodenal perforation. Repeat ERCP removed the dislodged stent, closed the defect endoscopically, and replaced the metal biliary stent with plastic. Biopsies confirmed perihilar cholangiocarcinoma.

This case emphasizes that although prophylactic stenting reduces the risk of post-ERCP pancreatitis, migration and perforation can occur, underscoring the importance of vigilance and early recognition of post-procedural complications.

Keywords: Perforation, Pancreatic stent, ERCP, Hilar cholangiocarcinoma

1. Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) remains central in the diagnosis and palliation of cholangiocarcinoma. In patients at high risk of post-ERCP pancreatitis (PEP)—especially after inadvertent pancreatic duct cannulation—placement of prophylactic pancreatic stents is widely recommended by ASGE, ESGE, and JGES guidelines.^{1,2} Prophylactic stents reduce PEP incidence from 15 to 20% to <5% in high-risk populations.³

Despite its benefits, pancreatic and biliary stenting carries known risks, including migration, occlusion, and fracture. Stent migration occurs in approximately 5–10% of cases, though most are clinically silent. Clinically significant complications such as bowel perforation are rare but potentially life-threatening.

A large cohort study reported migration in 8.4% of patients undergoing biliary stenting, highlighting that this is not an uncommon mechanical event, though severe complications remain rare.^{4–7}

Duodenal perforation due to migrated pancreatic stents is exceedingly rare, with only isolated case reports described. We present a unique case of intraperitoneal duodenal perforation following prophylactic pancreatic duct stent placement in the setting of suspected hilar cholangiocarcinoma, highlighting both a rare complication and its successful endoscopic management.

2. Case description

A 47-year-old woman presented with two weeks of painless jaundice. Labs revealed total bilirubin of

Received 3 September 2025; revised 6 April 2026; accepted 27 April 2026.
Available online 17 July 2026

* Corresponding author at: Saint Joseph University Medical Center, 703 Main Street, Paterson, NJ, 07503, USA.

E-mail address: Minafansawalkomos@gmail.com (M. Alkomos), Joliegeorge15@yahoo.com (J. Ibrahim), Karandesai09@gmail.com (K. Desai), Beshoy.Elkomos@nhs.net (B.E. Elkomos), baddourw@sjhmc.org (W. Baddoura), gibotros1@gmail.com (Y. Botros).

<https://doi.org/10.55729/2000-9666.1610>

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18 mg/dL and elevated alkaline phosphatase and GGT. CT showed intrahepatic ductal dilation without CBD enlargement. ERCP with SpyGlass cholangioscopy identified a dominant right hepatic duct stricture; targeted biopsies were obtained. A covered metal biliary stent (10 mm × 4 cm) and a right hepatic plastic stent (7 Fr × 12 cm) were placed. Due to inadvertent dorsal pancreatic duct cannulation, a prophylactic 4 Fr × 5 cm plastic stent was placed. Two days post-ERCP, the patient developed abdominal pain. CT demonstrated free air and migration of the pancreatic stent into the peritoneum (Fig. 1).



Fig. 1. Coronal section of CT abdomen that shows plastic stent perforation into the peritoneum (Blue arrow).

Repeat ERCP confirmed duodenal perforation from the stent tip. The stent was removed, and the defect was closed endoscopically (Fig. 2). The metal CBD stent was replaced with a plastic stent to facilitate closer follow-up. Biopsies confirmed moderately differentiated perihilar cholangiocarcinoma. The patient recovered and proceeded with further oncologic care (see Fig. 2).

3. Discussion

3.1. Role of prophylactic pancreatic stents

Prophylactic pancreatic stents remain the most effective intervention for reducing PEP risk.^{1,3} Both plastic 3–5 Fr short stents (3–7 cm) and single-pigtail designs are favored to facilitate spontaneous migration within days.⁷ However, even appropriately selected stents can migrate unpredictably.

3.2. Mechanisms of migration and perforation

Stent migration occurs in up to 5–10% of cases.⁴ Risk factors include:

- **Stent characteristics:** larger caliber, straight design, or excessive length.^{4,5}
- **Anatomical factors:** duct angulation, sphincterotomy, or high duodenal motility.⁶
- **Procedure-related:** prolonged manipulation, difficult cannulation, or concurrent biliary stenting.

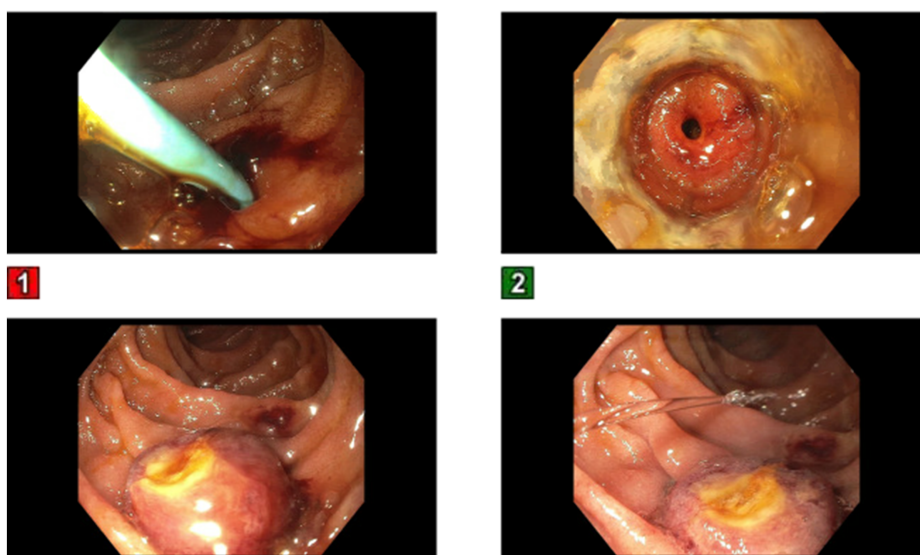


Fig. 2. ERCP views demonstrate stent-induced duodenal perforation and subsequent endoscopic closure using an over-the-scope clip (OTSC). The top left panel shows the migrated stent perforating the duodenal wall. The top-right panel shows the perforation site prior to closure. The bottom panels (left and right) show the perforation site after successful endoscopic closure.

Perforation typically results from the distal stent tip eroding through the duodenal wall. While most migrations are benign, intraperitoneal perforations can lead to peritonitis and sepsis if unrecognized.^{8,9}

3.3. Clinical presentation and management

Patients often present with delayed abdominal pain, peritonitis, or free air on imaging within days of ERCP.⁸ In our case, the patient developed pain 48 h after stent placement, consistent with other reports.

Management depends on perforation size, location, and patient stability:

- **Endoscopic therapies:** Through-the-scope (TTS) clips, over-the-scope clips (OTSC), covered metal stents, or endoscopic suturing are first-line for contained defects.^{9,10}
- **Surgical intervention:** Reserved for large, uncontained perforations or failed endoscopic closure. Our patient was successfully managed with endoscopic removal and OTSC closure, avoiding laparotomy.

3.4. Lessons and preventive considerations

- **Careful stent selection:** Small-caliber (3–4 Fr), short (<5 cm), and single-pigtail designs minimize migration.⁸
- **Timing of removal:** ESGE recommends confirming passage or removing prophylactic stents within 5–10 days.²
- **Post-ERCP vigilance:** Any delayed abdominal pain warrants imaging to exclude migration, perforation, or pancreatitis.

This case adds several unique elements to the existing literature. First, the complication occurred after placement of a small-caliber (4 Fr) prophylactic pancreatic stent, which is typically considered low risk and is designed to migrate spontaneously without adverse consequences. Second, the perforation occurred during concurrent complex biliary intervention for suspected hilar cholangiocarcinoma, a scenario not commonly described in prior reports. Compared with previously published cases (Table 1),^{11–14} which often involve larger biliary stents or delayed migration, this case demonstrates that even short, small-caliber pancreatic stents can result in early intraperitoneal perforation.

4. Conclusion

Prophylactic pancreatic duct stents remain essential in PEP prevention, yet clinicians must recognize the small but real risk of stent migration

Table 1. Comparison of reported cases of gastrointestinal perforation due to stent migration. The present case is unique in that it involves early intraperitoneal perforation from a small-caliber prophylactic pancreatic stent and successful endoscopic management.

Study	Indication	Stent type	Location of perforation	Timing	Management	Unique Feature
Bharathi et al, 2008. ¹¹	Malignant biliary obstruction	Biliary stent	Duodenum	Delayed	Surgery	Late migration
Gromski et al, 2020. ¹²	Biliary stricture management	Biliary stent	Duodenum	Variable	Endoscopic	Migration-related
Pachhai et al, 2022. ¹³	Cholangitis	Biliary stent	Duodenum	Early	Surgery	Severe peritonitis
Asghari et al, 2025. ¹⁴	Acute biliary pancreatitis	Biliary stent	Duodenum	Variable	Endoscopic	Migration-related
Present Case	Cholangiocarcinoma	4 Fr pancreatic stent	Duodenum (intraperitoneal)	48 h	Endoscopic (OTSC)	Small-caliber prophylactic stent; cholangiocarcinoma setting

and duodenal perforation. Early recognition, imaging, and prompt endoscopic intervention are critical to avoid morbidity. Our case highlights that even appropriately placed, small-caliber stents can migrate intraperitoneally, emphasizing the need for vigilant monitoring.

Informed consent

Informed patient consent was obtained for publication of the case details.

Prior presentations

The study was presented as a poster at the 2025 ACG meeting.

Authors contributions

Mina Alkomos: Case description and writing. Jolie Ibrahim: Manuscript revision, image adjustment. Karan Desai: Manuscript revision. Beshoy Effat Elkomos: Image review, conclusion/discussion writing. Walid Baddoura: Proofreading the article and writing the abstract. Youssef Botros: Literature review and proofread the article, along with the introduction.

Conflict of interest

No actual or potential financial or competing conflict of interest with any of the authors.

References

1. ASGE Standards of Practice Committee, Chandrasekhara V, Khashab MA, Muthusamy VR, et al. Adverse events associated with ERCP. *Gastrointest Endosc*. 2017;85(1):32–47.
2. Dumonceau JM, Andriulli A, Elmunzer BJ, et al. Prophylaxis of post-ERCP pancreatitis: ESGE guideline. *Endoscopy*. 2014; 46(9):799–815.
3. Elmunzer BJ, Scheiman JM, Lehman GA, et al. A randomized trial of rectal indomethacin to prevent post-ERCP pancreatitis. *N Engl J Med*. 2012;366:1414–1422.
4. Kawaguchi Y, Lin JC, Kawashima Y, et al. Risk factors for migration, fracture, and dislocation of pancreatic stents. *Gastroenterol Res Pract*. 2015;2015:365457.
5. Emara MH, Ahmed MH, Mohammed AS, Radwan MI, Mahros AM. Biliary stent migration: why, how, and what? *Eur J Gastroenterol Hepatol*. 2021;33:967–973. PMID: 33560688. <https://doi.org/10.1097/MEG.0000000000002078>.
6. Mangiavillano B, Pagano N, Baron TH. Outcome of stenting in biliary and pancreatic benign and malignant diseases. *World J Gastroenterol*. 2015;21(30):9038–9054.
7. Dumonceau JM, Devière J, Le Moine O, et al. Endoscopic pancreatic drainage in chronic pancreatitis: long-term results. *Endoscopy*. 2004;36(9):781–789.
8. Freeman ML. Use of prophylactic pancreatic stents for prevention of PEP. *Gastroenterol Hepatol (N Y)*. 2015;11(6): 420–422.
9. Mutignani M, Tringali A, Shah SG, et al. Endoscopic treatment of GI perforations using over-the-scope clips: a multicenter retrospective study. *Gastrointest Endosc*. 2010;72(6): 1269–1276.
10. Jadallah K, Alzubi B, Sweidan A, Almanasra AR. Intraperitoneal duodenal perforation secondary to early migration of biliary stent: closure with TTS clip. *BMJ Case Rep*. 2019;12(9): e230324.
11. Bharathi RS, Rao PP, Ghosh K. Intraperitoneal duodenal perforation from stent migration. *Int J Surg*. 2008;6:478–480. Epub 2006 Aug 10. PMID: 19059151. <https://doi.org/10.1016/j.ijsu.2006.06.012>.
12. Gromski MA, Bick BL, Vega D, et al. Duodenal perforation due to biliary stent migration. *Endosc Int Open*. 2020;8(11): E1530–E1536.
13. Pachhai P, Khadka R, Maharjan N, Sharma D, Pradhan S, Bhandari RS. Duodenal perforation due to a migrated biliary stent. *Int J Surg Case Rep*. 2022;97:107354. Epub 2022 Jul 2. PMID: 35870218; PMCID: PMC9403011. <https://doi.org/10.1016/j.ijscr.2022.107354>.
14. Asghari Y, Firuzpour F. Sigmoid perforation due to biliary stent migration. *Int J Surg Case Rep*. 2025;128:110921. Epub 2025 Jan 21. PMID: 39904271; PMCID: PMC11847084. <https://doi.org/10.1016/j.ijscr.2025.110921>.