

**Migrated ERCP Stent Presenting with Sigmoid Perforation and Surgical Acute Abdomen:****A Case Report**Mohebbi M<sup>1</sup>, Soltani AE<sup>1</sup>, Tamimi A<sup>1</sup>, Harandi PS<sup>2</sup>, Moradmand M<sup>1\*</sup> and Ghorbani H<sup>3</sup><sup>1</sup>Department of General Surgery, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran<sup>2</sup>Departments of General Surgery, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran<sup>3</sup>School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran**\*Corresponding author:**

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**Keywords:**

Obstructive jaundice; Cholangiopancreatography

**Abbreviation:**

OJ: Obstructive Jaundice; ERCP: Endoscopic Retrograde Cholangiopancreatography; CBD: Common Bile Duct; EUS: Endoscopic Ultrasonography; DES: Drug-Eluting Stents; LAD: Left Anterior Descending [artery]; MRCP: Magnetic Resonance Cholangiopancreatography; ICU: Intensive Care Unit

**1. Abstract**

**1.1. Background:** Obstructive jaundice [OJ], often resulting from choledocholithiasis, impairs bile drainage and can lead to multi-system complications. Endoscopic Retrograde Cholangiopancreatography [ERCP] is a primary treatment modality for OJ, involving stenting for bile duct strictures or obstructions. While generally safe, ERCP can entail complications, including the infrequent but serious occurrence of stent migration.

**1.2. Case Presentation:** We report the case of an 87-year-old male with a history of ischemic heart disease, presenting with symptoms of OJ. He underwent ERCP for choledolithiasis and a stricture in the common bile duct [CBD], where a plastic biliary stent was placed. The initial post-procedure period was uneventful, but he was readmitted two months later with severe abdominal pain. Investigations revealed acute sigmoid colon perforation due to migrated biliary stent. The patient's condition necessitated emergency exploratory laparotomy, during which peritonitis was confirmed, and a colostomy was performed. Post-surgery, the patient was managed in the intensive care unit, followed by a successful colostomy reversal ten weeks later.

**1.3. Discussion:** This case illustrates a rare but severe complication of ERCP, highlighting the importance of considering stent migration in differential diagnoses for abdominal pain post-ERCP. The absence of traditional risk factors in this patient emphasizes the necessity for careful stent selection and rigorous follow-up,

regardless of apparent risk profiles.

**1.4. Conclusion:** ERCP, while beneficial, carries risks such as stent migration leading to severe complications like sigmoid colon perforation. Clinicians must maintain a high index of suspicion and promptly address any post-procedure symptoms. This case advocates for further research into developing comprehensive guidelines for stent type selection and post-procedure monitoring to minimize risks associated with ERCP.

**2. Background**

Obstructive jaundice [OJ] impairs bile drainage from the bloodstream to the intestines. This condition can arise from benign strictures or malignant pathologies. Gallstones in the common bile duct, a condition known as choledocholithiasis, are the most common cause of benign obstructive jaundice [1].

This condition leads to a range of pathophysiological outcomes. It affects the local biliary tree and causes systemic symptoms. Jaundice, as a result, increases the risk of complications such as liver dysfunction, kidney disease, and functional cardiovascular impairment. It also contributes to nutritional failure, hemorrhage, immunological compromise, infectious diseases, side effects of wound incision, and an increase in morbidity and mortality [2].

Healthcare professionals frequently use Endoscopic Retrograde Cholangiopancreatography [ERCP] to treat cholangitis, biliary stones, obstructive jaundice, and related disorders [3]. This procedure involves using a flexible tube with a camera [endoscope] to

examine the pancreatic and bile ducts. During ERCP, physicians often insert stent tubes for various reasons. These include addressing the narrowing or blockage at the ampulla of Vater, known as ampullary stenosis, treating bile duct injuries, and managing cases where gallstone removal is not feasible. They are also used in sphincter of Oddi dysfunction and certain pancreatic duct blockages [4].

Although ERCP with stent placement is a routinely employed and generally safe procedure, stent migration is a recognized complication, occurring in approximately 5-10% of cases. This risk is influenced by factors such as the type of stent used, the underlying cause of the biliary obstruction, and the duration of stent placement [6; 5]. Importantly, while most cases of stent migration are benign and result in the stent passing spontaneously without intervention, a small but significant proportion can lead to severe complications such as perforations in the gastrointestinal tract, including rare instances of sigmoid colon perforation [5; 8]. Biliary stents are frequently used for various malignant and benign issues, notably including stones and strictures of the common bile duct, as well as acute cholangitis. Stent migration occurs in 3-21% of cases, depending on the stent type, follow-up duration, and stricture cause [5]. A retrospective cohort study found that benign biliary strictures more frequently experienced stent migration compared to malignant cases. Proximal strictures, long stents, and post-cholecystectomy strictures were associated with distal migration, while distal strictures, short stents, and non-post-cholecystectomy strictures tended towards proximal migration [6].

### 3. Case Presentation

**3.1. Initial Presentation:** An 87-year-old male patient was admitted to Taleghani Hospital presenting with right upper quadrant abdominal pain, nausea, vomiting, pruritus, and generalized jaundice lasting six days. His medical history included ischemic heart disease, drug-eluting stents [DES] insertion in the left anterior descending [LAD] artery, and medications including Aspirin, Clopidogrel, and Losartan.

**3.2. Chest X-Ray Findings:** The initial imaging, a chest X-ray, revealed subdiaphragmatic free air, indicating a possible perforation (Figure 1).



**Figure 1:** Chest X ray; Subdiaphragmatic free air (white arrow) is visible

**3.3. Diagnosis and Initial Treatment:** Endoscopic ultrasonography [EUS] revealed a filling defect in the distal portion of the common bile duct [CBD] and local thickening of the CBD wall. An ERCP procedure was performed, during which choledolithiasis and a stricture in the distal CBD were identified. Stone extraction and brush cytology were carried out, ruling out malignancy. A straight biliary plastic stent, 12 cm in length and 10 Fr in diameter, was placed due to the residual stricture. The patient experienced resolution of jaundice and symptom improvement, and was discharged without complications three days later. Follow-up MRCP and dynamic liver MRI showed no signs of malignancy.

**3.4. Re-Admission and Further Diagnosis:** Two months later, the patient was readmitted with acute onset severe abdominal pain originating from the left lower quadrant. Upright and supine abdominal X-rays were conducted, showing signs suggestive of peritonitis and a foreign body in the left lower quadrant, respectively (Figures 2 and 3). The physical examination and laboratory data further supported a diagnosis of sigmoid colon perforation due to stent migration.



**Figure 2:** Upright Abdominal X Ray; Subdiaphragmatic free air, along with increased opacity in central and lower portions of the abdomen (white arrow) can be suggestive of free fluid in the abdomen and thereby peritonitis due to patient’s symptoms and examination findings. Intestinal loops (green arrow) indicate local ileus in the hypogastric region. In addition, there were accumulation of the small intestine loops in the upper abdomen and enhanced opacity in the lower abdomen, suggestive of a pathology in the hypogastric region.



**Figure 3:** Supine Abdominal X Ray; A foreign body in the left lower quadrant (blue arrow) is obvious.

**3.5. Treatment and Surgical Intervention:** A central venous catheter was inserted, and the patient received hydration and intravenous antibiotic therapy with vancomycin and meropenem. During the exploratory laparotomy, peritonitis and a perforated sigmoid colon with the stent tip protruding were observed (Figure 4). The abdomen was thoroughly cleaned, and no other complications were found. Given the patient’s age and condition, a colostomy was performed instead of anastomosis.



**Figure 4:** Stent Tube Perforating the Sigmoid Colon (white arrow).

**3.6. Recovery and Follow-Up:** Post-operatively, the patient was managed in the ICU and underwent a cardiology consultation. He began a diet of thin liquids, transitioning to regular food as tolerated, with normal colostomy function. He was discharged six days later with oral antibiotics. At a one-week follow-up, his sutures were removed, and the colostomy was functioning well. He maintained good nutrition and gained weight over the next two months.

**3.7. Colostomy Reversal:** Ten weeks post-surgery, a successful colostomy reversal was performed. The patient resumed a normal diet and bowel function, with no complications during follow-up visits.

#### 4. Discussion

The increasing use of Endoscopic Retrograde Cholangiopancreatography [ERCP] for diagnosing and treating biliary and pancreatic diseases is notable [9]. ERCP, particularly effective for managing bile duct stricture or obstruction, often employs stenting as a key intervention [10]. However, despite its clinical utility, ERCP is associated with a significant rate of complications. Pancreatitis, the most common among these, presents a potentially fatal risk. Preventive measures such as pancreatic duct stenting and the use of NSAIDs have been proposed to mitigate this risk. Other complications following ERCP include cholangitis, perforation, and bleeding, with infection risks particularly heightened when extensive drainage of the obstructed biliary tract is required [11, 12]. A systematic review by Andriulli et al., involving 16,855 patients, highlighted these risks, noting complication and mortality rates at 6.85% and 0.33%, respectively. These complications ranged from pancreatitis in 3.47% of patients to infections, bleeding, and perforations, the latter occurring in 0.60% of cases [14]. Our case underscores the importance of considering less frequent but severe complications such as stent migration, which is reported in about 5-10% of patients [6]. Factors influencing this include the type of stent, underlying pathology, and duration of stent placement.

Stent migration, though often benign and self-resolving, can lead to severe outcomes, including perforations in the gastrointestinal tract. In our case, the use of a straight, long plastic stent, typically associated with a higher risk of migration, led to sigmoid colon perforation despite the absence of common structural risk factors like sigmoid diverticula [5, 6, 20]. This highlights a critical clinical consideration: the need for careful stent selection and rigorous follow-up, especially in patients without clear risk factors. Peritonitis, which can be primary or secondary, was a significant concern in our patient. Secondary peritonitis, resulting from direct contamination, was evident in our case, underscoring the need for prompt and accurate diagnosis following ERCP-related complications [21]. Rybinski et al.'s study, compiling cases of colon perforation due to biliary stents, revealed that most such cases resulted in sigmoid colon perforations and required surgical intervention [5]. This aligns with our case; wherein surgical management was imperative due to the nature of the complication.

Additionally, the literature reports other instances of significant and rare complications, such as cecal perforation induced by migrated biliary stent, which further illustrate the potential severity of these events [23]. This emphasizes the need for a high index of suspicion and prompt investigation of abdominal pain or other symptoms post-ERCP, even in cases without typical risk factors. Our findings emphasize a critical aspect of post-ERCP care: vigilance for symptoms indicative of complications, especially in patients with newly inserted biliary stents. While our patient did not present typical structural risk factors, the development of severe symptoms warranted immediate investigation, leading to the identification of stent migration and subsequent perforation. This underscores the need for a high index of suspicion for stent migration in similar clinical scenarios.

## 5. Limitations

This case report, focusing on a single patient's ERCP complication, has limitations including its lack of generalizability due to the single-case nature, absence of long-term follow-up data, and limited comparative analysis with other similar cases. The report could benefit from a broader discussion on alternative diagnostic methods and a more detailed exploration of the clinical decision-making process. Additionally, a more extensive presentation of imaging and laboratory data would enhance the depth of the findings. These limitations highlight the need for further research to enrich the understanding of ERCP-related complications.

## 6. Conclusion and Recommendations

This case of biliary stent migration resulting in sigmoid perforation highlights an important clinical lesson. Peritonitis, often a differential diagnosis for abdominal pain following ERCP, requires immediate attention. Imaging studies, such as X-rays or CT scans, are vital for early detection of complications like stent migration.

Clinicians should be aware of this possibility even in patients lacking traditional risk factors. Future research might focus on developing guidelines for stent type selection and post-procedure monitoring to minimize the risk of such complications.

## 7. Declarations

**Ethics Approval and Consent to Participate:** The ethics committee of Shahid Beheshti University of Medical Sciences approved this study. All ethical principles were followed, and the report is consistent with the journal's guidelines.

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