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A Fatal Complication: Intestinal Perforation Secondary to Migration of a Biliary Stent

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Summary

Background:

Stent insertion is widely performed to restore biliary drainage in hepatic, biliary, and pancreatic obstructive conditions. Intestinal perforation due to the migration of these stents is an extremely rare late-term complication that is associated with a high rate of mortality. The current report aimed at presenting the radiological findings of a case of extraluminal biliary stent migration into the pelvic region that caused intestinal perforation.

Case Report:

We report a case of an 85-year-old male with a history of previous stent insertion who presented with a sudden – onset severe abdominal pain. An abdominal multidetector computed tomography (MDCT) revealed a tubular foreign body density, compatible with intestinal perforation due to migration of the biliary stent.

Conclusions:

Biliary stent insertion becomes a more common procedure. This serious complication must always be remembered in patients presenting with abdominal pain after stent insertion.

MeSH Keywords:

Biliary Tract • Intestinal Perforation • Multidetector Computed Tomography • Stents

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Background

Endoscopic biliary stent insertion is a well-established treatment for hepatic, biliary or pancreatic disorders. Complications of this technique include cholangitis, cholecystitis, duodenal perforation, bleeding, stent occlusion, fracture of a stent and stent migration [1]. In all patients, a close follow-up after biliary stent placement is mandatory [2]. This case highlights a very rare but life-threatening complication of biliary stent migration. Perforation must always be remembered in patients presenting with abdominal pain after stent placement. Migration of a stent can be identified on plain abdominal X-ray and MDCT is an important diagnostic method in delineating the exact location and extraluminal extension of the stent.

Case Report

An 85-year-old male patient was admitted to our hospital with complaints of a sudden- onset severe abdominal pain, with a pre-diagnosis of acute pancreatitis on abdominal ultrasonography (US) and MDCT. The US examination

was not optimal due to the patient's noncooperation and the presence of intense gas artifacts. However, no free fluid was observed within the abdomen. An intravenous contrast agent could not be administered during MDCT scans due to elevated serum creatinine. An abdominal MDCT scan without the administration of a contrast agent showed pneumobilia, free fluid in all peritoneal compartments, and free air consistent with intestinal perforation (Figure 1). A tubular foreign body density with predominantly horizontal placement was observed in the pelvic region adjacent to the distal ileal loops in the suprapubic area surrounded by free air and free fluid (Figures 2, 3). A thorough review of the patient's medical history revealed that the patient underwent stent insertion approximately six months earlier due to a hepatobiliary disease, for which further details could not be obtained. The findings were considered to be consistent with intestinal perforation due to migration of the biliary stent. According to the information received later, the patient was discharged from hospital upon his request after refusing an operation and he died on the road after having left hospital.

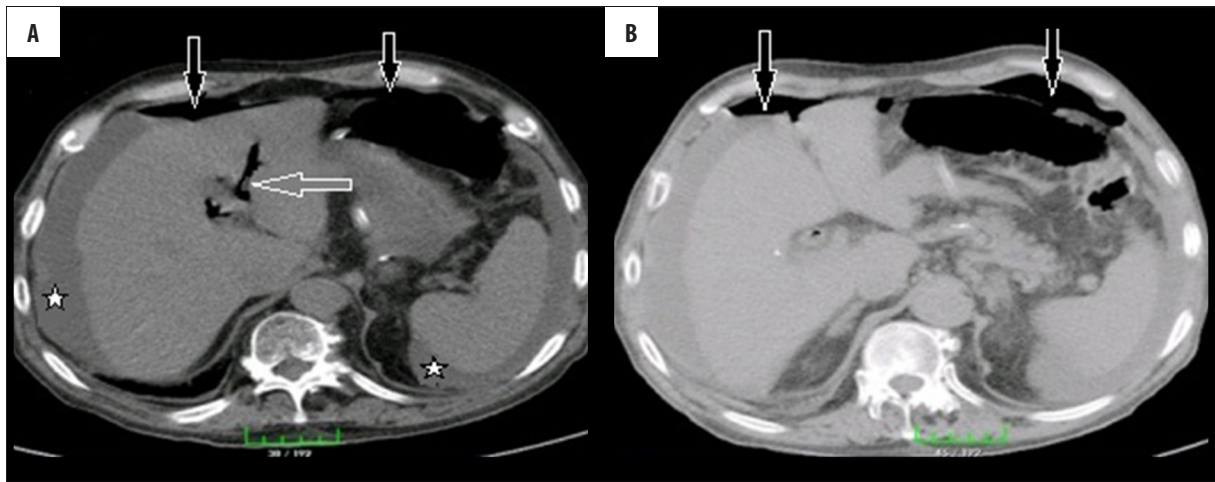


Figure 1. Axial MDCT sections acquired from the upper abdomen. (A) Soft tissue window; (B) Pulmonary parenchymal window. Air in the intrahepatic bile ducts (A, gray arrow) (pneumobiliar, bilioenteric communication). Free air anterior to the liver and anterior peritoneal compartments in the left upper quadrant (A and B, black arrows) (pneumoperitoneum, consistent with gastrointestinal perforation). There was also free fluid in perihepatic and perisplenic space (A, stars). Pulmonary parenchymal window better delineates pneumoperitoneum.

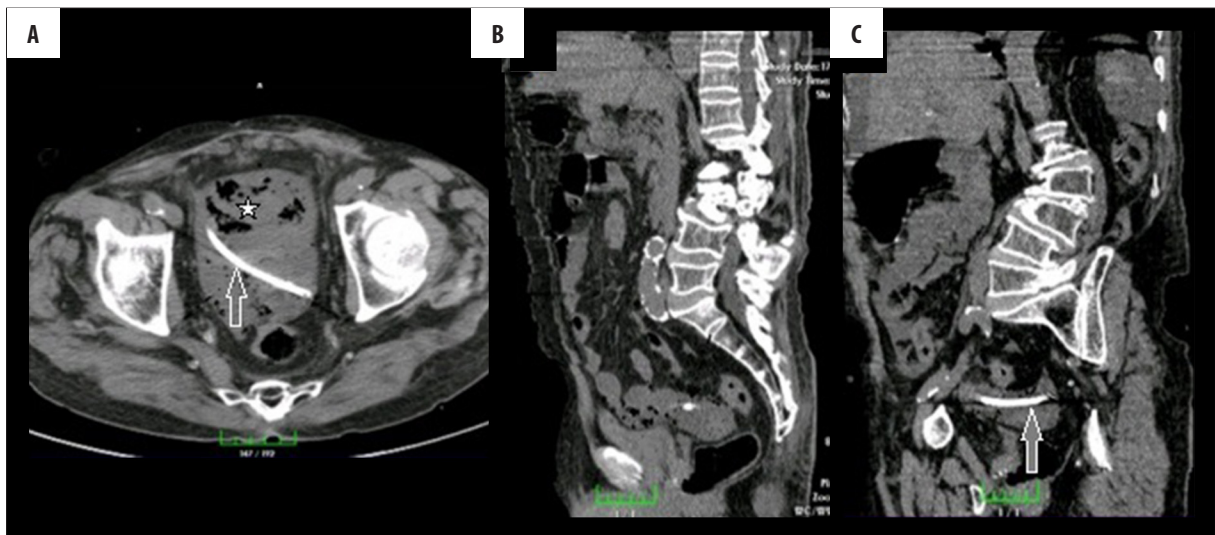
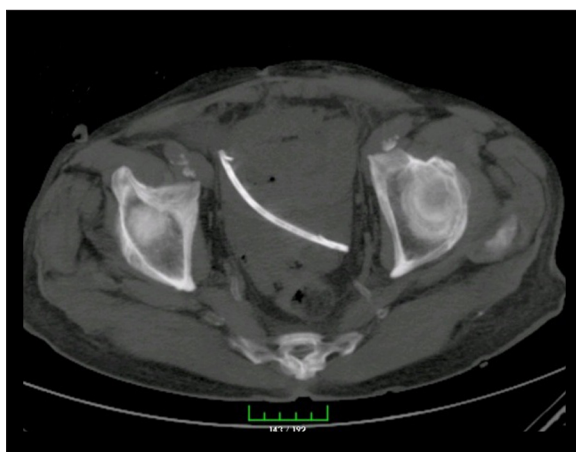


Figure 2. Axial (A), sagittal reformation (B), and coronal oblique reformation (C) images. There is a tubular foreign body density (arrow) in the free air and fluid levels (star).



Discussion

The endoscopic internal drainage of the biliary tract is a frequently employed method in the treatment of stenosis caused by benign and malignant etiologies. Endoscopic biliary stent insertion is a well-defined and commonly used method to treat obstruction in biliary outflow associated with benign and malignant diseases [3]. While the popularity of the endoscopic retrograde drainage technique is gradually increasing, this is accompanied by an increase in the rate of complications including cholangitis and stent occlusion and cholecystitis, duodenal perforation, hemorrhage, pancreatitis, stent fracture, and stent migration [1,4]. While

Figure 3. In the bone window, the axial maximum intensity projection (MIP) image shows complete morphology of a tubular object in the peritoneum in the pelvic region (consistent with biliary stent).

the migration of both metal and plastic biliary stents has a reported incidence of 8–10%, perforation rarely occurs following migration [5]. Biliary stent migration is a somewhat uncommon occurrence, observed in approximately 6% of cases [6]. However, the placement of multiple biliary stents reduces the incidence of stent migration. Benign biliary strictures were associated with a higher risk of migration than malignant biliary strictures [4]. Thus, patients affected by a benign disease exhibited a higher frequency of migration [7].

The stent can migrate in a proximal or distal direction. In the study previously conducted by Johanson et al., the rates of proximal and distal stent migration were reported at 4.9% and 5.9%, respectively [1,6]. Risk factors for complications caused by the migration of distal stents include diverticular disease, previous intra-abdominal surgery, hernia, and straight plastic stents [4]. Another study reported that approximately 43% of distally migrating stents cross the intestines without resulting in any complications [8].

However, perforation in the small bowel or colon can occur if the stent has migrated distally to the Treitz ligament [1]. Intestinal perforations most frequently occur in the duodenum due to retroperitoneal fixation [9]. Studies in the literature have also reported perforations in the liver, sigmoid colon, caecum, and pancreas [3,10]. A literature review performed in 2007 described 11 cases in which migrating stents caused colonic perforation [7]. A number of studies have also reported that bowel wall penetration is associated with complications such as perforation of the small bowel, sigmoid diverticular perforation, and enteroenteric fistula formation [4].

The incidence of distal migration has increased in the presence of post-sphincterotomy or sphincter of Oddi dysfunction, long stents (longer than 7 cm), and benign disorders particularly in papillary stenosis [6]. In addition, the distal migration of stents was determined to be closely related to post-cholecystectomy strictures and proximal strictures [7].

References:

1. Yaprak M, Mesci A, Colak T, Yildirim B: Biliary stent migration with duodenal perforation. *Eurasian J Med*, 2008; 40(3): 154–56
2. Namdar T, Raffel AM, Topp SA et al: Complications and treatment of migrated biliary endoprosthesis: a review of the literature. *World J Gastroenterol*, 2007; 13(40): 5397–99
3. Belyaev O, Müller CA, Uhl W: Double sigmoid colon perforation by a migrated biliary stent. *Acta Chir Belg*, 2008; 108(1): 125–26
4. Rasalkar DD, Paunipagar BK, Sonavane B: Migrating biliary stent with final destination at the ileocecal junction causing intestinal obstruction and obstructive biliopathy. *Indian J Radiol Imaging*, 2010; 20(4): 304–6
5. El Zein MH, Kumbhari V, Tieu A et al: Duodenal perforation as a consequence of biliary stent migration can occur regardless of stent type or duration. *Endoscopy*, 2014; 46(Suppl.1 UCTN): E281–82
6. Johanson JF, Schmalz MJ, Geenen JE: Incidence and risk factors for biliary and pancreatic stent migration. *Gastrointest Endosc*, 1992; 38(3): 341–46
7. Warnocka JM, Thompsona RJ: A potentially fatal complication of biliary stent migration. *J Med Cases*, 2013; 4(1): 49–51
8. Chen CT, Soon MS, Su WW, Yen HH: Single-balloon endoscopic retrieval of a distally migrated biliary stent. *The Changhua Journal of Medicine*, 2013; (11): 59–62
9. Miller G, Yim D, Macari M, Harris M, Shamamian P: Retroperitoneal perforation of the duodenum from biliary stent erosion. *Curr Surg*, 2005; 62(5): 512–15
10. Barut I, Tarhan OR: Cecum perforation due to biliary stent migration. *Saudi Med J*, 2014; 35(7): 747–49

In the present study, the biliary stent migrated distally and was located extraluminally in the pelvic area. Despite its rare occurrence, perforation secondary to biliary stent dislocation must be suspected in all cases presenting with fever and abdominal pain after insertion of a biliary stent. Plain radiographs of the abdomen show the position and migration of the stent. If serial radiographs do not show gradual passage of the stent in the bowel lumen, endoscopic extraction or laparotomy is required to avoid perforation [1]. However, MDCT scans will be more helpful in determining the exact stent location, the presence of perforation and other complications, and in establishing the treatment approach. MDCT is an important diagnostic tool in evaluating extraluminal air shadows, inflammation, and abscess formation.

Despite the rare occurrence of intestinal perforation secondary to stent migration, it remains a serious late-term and life-threatening complication requiring early diagnosis and treatment. Due to the fact that biliary stent insertion becomes a more common procedure, this serious complication must always be remembered in patients presenting with abdominal pain after stent insertion. Thus, it is both necessary and important to closely monitor patients who have biliary stents. MDCT is a valuable method in delineating the exact location and extraluminal extension of the stent.

Conclusions

In conclusion, the current case highlighted the necessity of taking into account the possibility of visceral organ perforation in patients with biliary stents who present with acute abdominal pain – especially if they exhibit any one of the above- mentioned co-morbidities.

Conflict of interest

No potential conflict of interest relevant to this article was reported.