

Case report

Successful endoscopic retrieval of a migrated pancreatic stent using a basket catheter for peroral cholangioscopy through a biliary plastic stent pusher tube: a case report

Koji Takahashi^{1,2}, Hiroshi Ohyama¹, Rintaro Mikata¹, Hiroki Nagashima¹, Izumi Ohno^{1,2}, Yuichi Takiguchi², and Naoya Kato¹

¹Department of Gastroenterology, Graduate School of Medicine, Chiba University, Japan

²Department of Medical Oncology, Graduate School of Medicine, Chiba University, Japan

Abstract

Objective: Retrieval is challenging once prophylactic pancreatic stents migrate deep into the pancreatic duct. Herein, we describe a case of successful endoscopic retrieval of a migrated prophylactic pancreatic stent using a basket catheter through a biliary plastic stent pusher tube.

Patient: A 71 year-old man was referred to our hospital for removal of a straight-shaped migrated 5-Fr 3-cm prophylactic pancreatic stent with a flap on the duodenal side. There were no subjective symptoms at the time of the hospital visit.

Results: During endoscopic retrograde cholangiopancreatography, we inserted an 8.5-Fr plastic biliary stent pusher tube in front of the migrated pancreatic stent. The stent was then grasped using a basket catheter for peroral cholangioscopy through the biliary stent pusher tube. The stent was pulled into the pusher tube and was successfully retrieved from the pancreatic duct. No complications were associated with endoscopic retrograde cholangiopancreatography.

Conclusion: Although rare, prophylactic pancreatic duct stent migration after pancreatic duct guidewire placement should be noted. In our case, endoscopic retrieval of a migrated prophylactic pancreatic stent using a basket catheter for peroral cholangioscopy through the biliary plastic stent pusher tube was successful.

Key words: endoscopic retrieval, migrated pancreatic stent, pusher tube

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Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) for biliary tract disease and pancreatic duct guidewire placement (PGW) is performed in patients with difficult selective biliary cannulation of the catheter. Stenting of the pancreatic duct is recommended to facilitate the flow of pancreatic juice during papilledema to reduce the incidence of post-ERCP pancreatitis after PGW¹⁾. It is difficult for

prophylactic pancreatic stents to migrate deep into the pancreatic duct because of their structures; for example, they are straight-shaped stents with flaps on the duodenal side or stents with a single duodenal pigtail. However, once stents migrate deep into the pancreatic duct, recovery is challenging because the pancreatic duct is curved and thinner than the biliary tract. Herein, we describe a case of successful endoscopic retrieval of a migrated prophylactic pancreatic stent using a basket catheter for peroral cholangioscopy through a biliary plastic stent pusher tube.

Case Presentation

A 71 year-old man was admitted to a hospital with fever and abdominal pain and was diagnosed with acute cholangitis due to common bile duct stones. The patient underwent ERCP for biliary drainage and stone removal. Selective biliary cannulation was challenging even when using the PGW method and was a failure. At that time, after precut with a sphincterotomy, a straight-shaped 5-Fr 3-cm prophylactic

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Correspondence: Koji Takahashi, Department of Gastroenterology, Graduate School of Medicine, Chiba University, 1-8-1 Inohana, Chuo-ku, Chiba 260-8670, Japan

E-mail: takahashi.koji@chiba-u.jp

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pancreatic stent with a flap on the duodenal side was inserted in the pancreatic duct, and during insertion, the stent migrated to the end of the pancreatic duct (Figure 1). The common bile duct stone was removed during the second ERCP; however, the pancreatic duct stent could not be re-

trieved. The patient was then referred to our hospital for the removal of the migrated pancreatic stent.

At the time of his visit to our hospital, there were no subjective symptoms such as abdominal pain, and blood tests (Table 1) revealed no findings suggestive of pancreatitis.

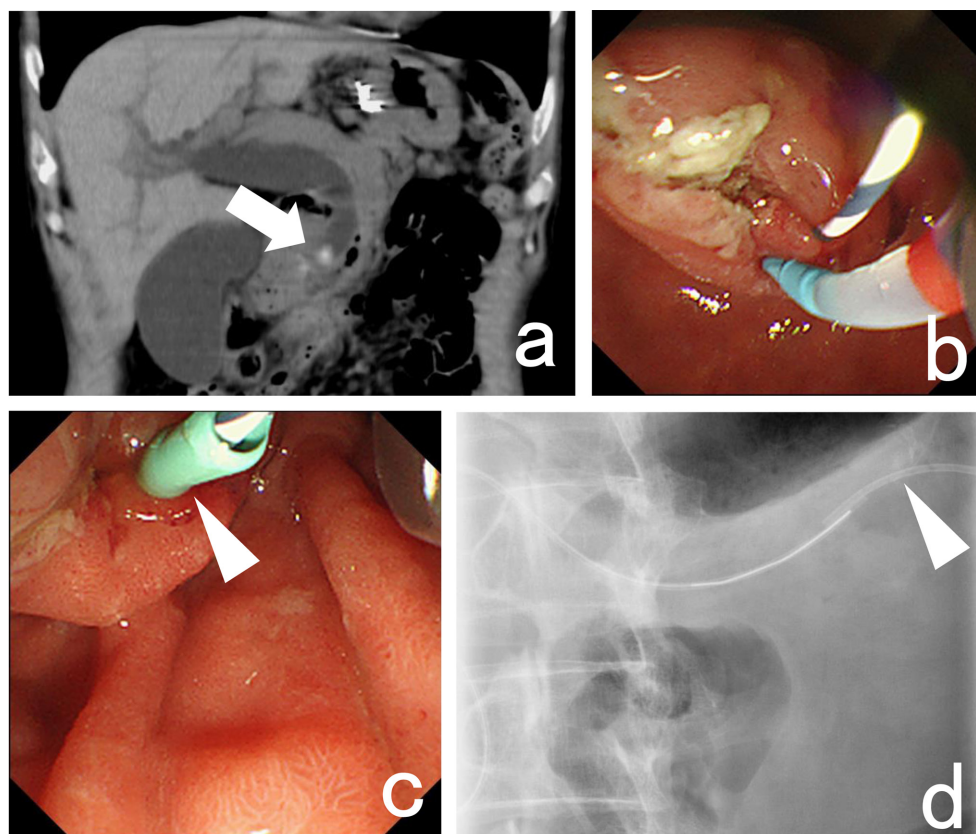


Figure 1 (a) Computed tomography revealing a common bile duct stone (arrow). (b) Selective biliary cannulation was challenging even when pancreatic duct guidewire placement method was performed. (c, d) After precut sphincterotomy, a straight-shaped, 5-Fr 3-cm prophylactic pancreatic stent (arrowhead) with a flap on the duodenal side was inserted into the pancreatic duct, and insertion, the stent migrated to the end of the pancreatic duct.

Table 1 Laboratory data

WBC	4,700 / μ L	TP	6.9 g/dL	ALP	50 IU/L
RBC	380×10^4 / μ L	Alb	3.8 g/dL	γ -GTP	13 IU/L
Hb	13.0 g/dL	BUN	12 mg/dL	T-Bil	0.6 mg/dL
Hct	37.9%	Cre	0.66 mg/dL	Amy	60 mg/dL
MCV	99.7 fL	Na	140 mEq/L	CK	69 IU/L
MCH	34.2 pg	K	4.1 mEq/L	CRP	0.01 mg/dL
MCHC	34.3 g/dL	AST	15 IU/L	PCT	0.17 ng/ml
Plt	19.2×10^4 / μ L	ALT	11 IU/L		
		LDH	124 IU/L		

WBC: white blood cells; RBC: red blood cells; Hb: hemoglobin; Hct: hematocrit; MCV: mean corpuscular volume; MCH: mean corpuscular hemoglobin; MCHC: mean corpuscular hemoglobin concentration; Plt: platelet; TP: total protein; Alb: albumin; BUN: blood urea nitrogen; Cre: creatinine; Na: sodium; K: potassium; AST: aspartate aminotransferase; ALT: alanine aminotransferase; LDH: lactate dehydrogenase; ALP: alkaline phosphatase; γ -GTP: γ -glutamyl transpeptidase; T-Bil: total bilirubin; Amy: amylase; CK: creatine kinase; CRP: C-reactive protein; PCT: procalcitonin.

Computed tomography revealed that the migrated pancreatic stent was at the end of the pancreatic duct (Figure 2). As the migrated stent may cause pancreatitis, we assumed that it was necessary to retrieve the migrated pancreatic stent.



Figure 2 Computed tomography revealing the migrated pancreatic stent (arrow) at the end of the pancreatic duct.

Although we considered surgery for stent retrieval, we decided to perform endoscopic retrieval with ERCP since it is less invasive than surgery. At the time of ERCP, we attempted to retrieve the migrated pancreatic stent using a wire-guided basket catheter and a wire-guided snare catheter; however, this was impossible. We then inserted an 8.5-Fr plastic biliary stent pusher tube in front of the migrated pancreatic stent. The stent was then grasped through the biliary stent pusher tube using a basket catheter for peroral cholangioscopy. The stent was pulled into the pusher tube and successfully retrieved from the pancreatic duct (Figure 3). Before ERCP was concluded, a nasal pancreatic drainage tube was inserted to prevent pancreatitis. After confirming that there was no occurrence of pancreatitis the next day, the endoscopic nasopancreatic drainage was removed. There were no complications associated with ERCP, and the patient's clinical course was uneventful. Oral intake was resumed on the second day after treatment, and the patient was discharged on the same day. The patient passed without any problems after discharge.

This study was conducted in accordance with the prin-

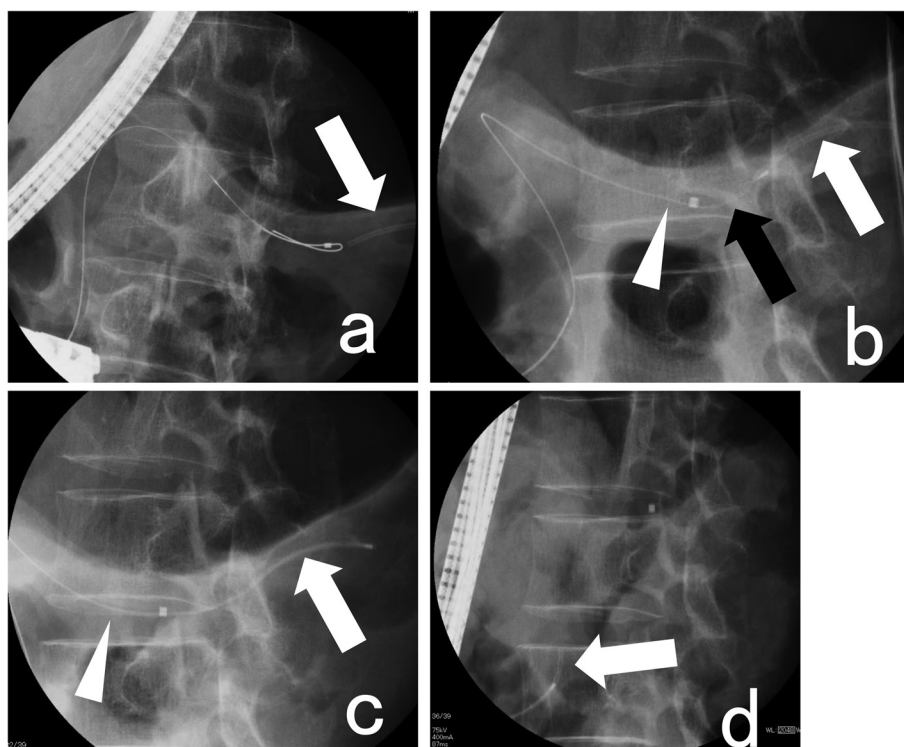


Figure 3 (a) We tried to retrieve the migrated pancreatic stent (white arrow) with a wire-guided basket catheter and a wire-guided snare catheter; however, stent retrieval was impossible. (b) We then inserted an 8.5-Fr plastic biliary stent pusher tube (arrowhead) in front of the migrated pancreatic stent (white arrow). Then, through the biliary stent pusher tube, the basket catheter (black arrow) for peroral cholangioscopy was inserted. (c) The stent (white arrow) was grasped with the basket catheter for peroral cholangioscopy through the biliary stent pusher tube. (d) The stent (white arrow) was pulled into the pusher tube and successfully retrieved from the pancreatic duct.

ciples of the Declaration of Helsinki. Oral informed consent was obtained from the patient for publication and accompanying images.

Discussion

Most prophylactic pancreatic stents used after PGW are straight-shaped stents with flaps on the duodenal side or stents with a single duodenal pigtail to prevent migration. Pancreatic stent migration and distal dislocation are late complications, and the frequency of migration is reported as 1.5%²⁾. Pancreatic stent migration risk factors have not yet been elucidated^{2, 3)}. Migrated pancreatic stents must be retrieved because they can cause pain, pancreatitis, pancreatic abscess, or pancreatic duct mucosal injury. Endoscopic treatment is less invasive than surgery for retrieving migrated pancreatic stents.

Various instruments, such as forceps, snare catheters, basket catheters, balloon catheters, and stent retrievers, are used for endoscopic retrieval of migrated pancreatic stents^{4–8)}. The methods and instruments used for migrated pancreatic stent retrieval are similar to those used for migrated biliary stent retrieval. However, inserting these instruments into the pancreatic duct is more challenging because the pancreatic duct is curved and thinner than the biliary tract²⁾, and it is even more challenging in the presence of pancreatic duct stenosis.

Although most pancreatic stent migrations are late complications, in our case, stent migration occurred during ERCP as the pancreatic duct stent got pushed too far. In our case, there was no pancreatic duct stenosis; however, it was

not dilated, and the curve was steep; thus, it was impossible to insert instruments that were not wire-guided deep into the pancreatic duct. Various wire-guided instruments were used; however, the migrated stent could not be retrieved. As the pancreatic duct was not dilated, peroral pancreatoscopy could not be performed to retrieve the migrated stent. We then tried using a biliary plastic stent pusher tube, commonly used in ERCP, as an introducer. This method made it possible for us to insert the basket catheter for peroral cholangioscopy, which was not wire-guided, deep into the pancreatic duct, and as a result, the migrated pancreatic stent was retrieved. This method is widely used.

Conclusion

Although rare, prophylactic pancreatic duct stent migration after PGW should be noted. In our case, endoscopic retrieval of a migrated prophylactic pancreatic stent with a basket catheter for peroral cholangioscopy through a biliary plastic stent pusher tube was successful.

Conflict of interest: The authors declare no conflicts of interest regarding the publication of this paper.

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References

1. Ito K, Fujita N, Noda Y, *et al.* Can pancreatic duct stenting prevent post-ERCP pancreatitis in patients who undergo pancreatic duct guidewire placement for achieving selective biliary cannulation? A prospective randomized controlled trial. *J Gastroenterol* 2010; 45: 1183–1191. [[Medline](#)] [[CrossRef](#)]
2. Kawaguchi Y, Lin JC, Kawashima Y, *et al.* Risk factors for migration, fracture, and dislocation of pancreatic stents. *Gastroenterol Res Pract* 2015; 2015: 365457. [[Medline](#)] [[CrossRef](#)]
3. Johanson JF, Schmalz MJ, Geenen JE. Incidence and risk factors for biliary and pancreatic stent migration. *Gastrointest Endosc* 1992; 38: 341–346. [[Medline](#)] [[CrossRef](#)]
4. Gong B, Sun B, Hao LX, *et al.* Usefulness of an algorithm for endoscopic retrieval of proximally migrated 5Fr and 7Fr pancreatic stents. *Hepatobiliary Pancreat Dis Int* 2011; 10: 196–200. [[Medline](#)] [[CrossRef](#)]
5. Sakai Y, Tsuyuguchi T, Ishihara T, *et al.* Cholangiopancreatography troubleshooting: the usefulness of endoscopic retrieval of migrated biliary and pancreatic stents. *Hepatobiliary Pancreat Dis Int* 2009; 8: 632–637. [[Medline](#)]
6. Lahoti S, Catalano MF, Geenen JE, *et al.* Endoscopic retrieval of proximally migrated biliary and pancreatic stents: experience of a large referral center. *Gastrointest Endosc* 1998; 47: 486–491. [[Medline](#)] [[CrossRef](#)]
7. Price LH, Brandabur JJ, Kozarek RA, *et al.* Good stents gone bad: endoscopic treatment of proximally migrated pancreatic duct stents. *Gastrointest Endosc* 2009; 70: 174–179. [[Medline](#)] [[CrossRef](#)]
8. Matsubayashi H, Ooka S, Kimura H, *et al.* Proximally migrated pancreatic stent successfully removed using needle-knife and forceps: complication after precut papillotomy assisted by pancreatic stenting. *Clin Res Hepatol Gastroenterol* 2011; 35: 321–324. [[Medline](#)] [[CrossRef](#)]