

# Proximal migration of a 5 French pancreatic stent during bile stone extraction: A successful retrieval using mini-snare

Yu-Sheng Liao, Qiu Zhao<sup>1</sup>, Yan Fan, Jie Wu

Departments of Gastroenterology, Central Hospital, <sup>1</sup>Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China

## Abstract

Pancreatic stents are used for a variety of conditions during therapeutic endoscopic retrograde cholangio pancreatography (ERCP). Pancreatic duct stenting reduces the incidence of post-ERCP pancreatitis and facilitate biliary cannulation in difficult cases. Proximal migration of a pancreatic stent during bile duct stone extraction is an infrequent event, but its management can be technically challenging. We present a case that a double flanged pancreatic stent (5 French (Fr), 5 cm) was placed to facilitate the biliary cannulation during the bile duct stone extraction. The pancreatic duct stent migrated into the proximal pancreas duct at the end of the bile duct stone clearance. After two unsuccessful attempts to remove the impacted stent with a balloon catheter and forceps, wire-guided endoscopic snare retrieval was conducted. Firstly, a guide wire was placed in the pancreatic duct and a soft mini-snare was passed over the guide wire. Then, the mini-snare was advanced into the proximal pancreatic duct over the guide wire and the proximally migrated stent was removed successfully with the mini-snare. Wire-guided endoscopic snare retrieval of proximally migrated pancreatic stents is safe and effective. The successful case of the retrieval with mini-snare provides another option for proximal migration retrieval of pancreatic stent retrieval. Further studies are needed to confirm its effectiveness and elucidate its associated complications.

**Key words:** Endoscopic retrieval, migrated stent, mini-snare, pancreatic stent

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## Introduction

Pancreatic stents are used for a variety of conditions during therapeutic endoscopic retrograde cholangio pancreatography (ERCP). Therapeutic uses include treatment of pancreatic duct obstruction from stricture or malignancy, pancreatic fistula or pancreatic duct disruption and reduction of post-ERCP pancreatitis.<sup>[1]</sup> Pancreatic duct stenting is also a useful technique for facilitating biliary cannulation in difficult cases.<sup>[2]</sup> Stent migration (distal or proximal) is one of the stent-related complications. Proximal migration of pancreatic stent occurs in 2-5% of surgeries.<sup>[3,4]</sup> However, proximal migration of pancreatic stent during bile duct stone extraction has not yet been reported. In this

study, we report a case of proximal stent migration during the bile duct stone extraction that was successful retrieved using a mini-snare.

## Case Report

An 84-year-old female with common bile duct calculi was underwent ERCP in April 2010. The papilla was located at the right side wall of the duodenal diverticulum in the second part of the duodenum and the papilla orifice was toward the left side of the diverticulum. During ERCP,

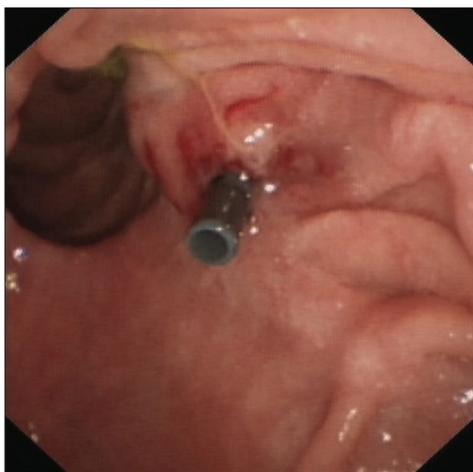
### Address for correspondence:

Prof. Jie Wu,  
Department of Gastroenterology, Central Hospital, 26 Sheng Li  
Street, Wuhan 430014, China.  
E-mail: liaoyu0617@sina.com

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biliary cannulation was difficult to pursue due to the abnormal location of the papilla. A variety of attempts to cannulate the common bile duct, including pre-cut sphincterotomy by using standard instruments were unsuccessful. A 5 Fr, 5 cm double flanged pancreatic duct stent (Wilson-Cook Medical Inc, Winston Salem, NC) was placed to facilitate biliary cannulation [Figure 1]. Subsequently, a guide wire was placed into the common bile duct successfully after attempts. Unfortunately, the pancreatic duct stent was found to have migrated into the proximal pancreas duct at the end of the bile duct stone clearance. Two subsequent attempts to remove the impacted stent were performed. Firstly, a stone extraction balloon catheter was placed alongside the stent to drag the stent distally. However, the stent migrated more proximally after three attempts. Secondly, a rat-toothed forceps was used to grasp the stent directly, but this was unsuccessful. Two days later, an ERCP was performed to retrieve the migrated stent. A 0.035 inch guide wire was placed in the pancreatic duct beyond the stent and a mini-snare (Reusable SD-17U-1 Electrosurgical Snare, Olympus, Japan) was cannulated into the pancreatic duct under the guidance of wire passing through the loop of the snare. Then the snare was slowly opened at the distal end of the stent under the fluoroscope surveillance [Figure 2]. The distal end of the stent was captured by closing the snare. With further traction, the stent could be kinked and withdrawn. All movements during the retrieval procedure were performed carefully to avoid vascular or ductal injury. A second 5 Fr, 5 cm single pigtail pancreatic stent was placed into the pancreatic duct to prevent post-ERCP pancreatitis and the stent was removed by gastroscopy 7 days later. The patient recovered without any complications after the procedures.



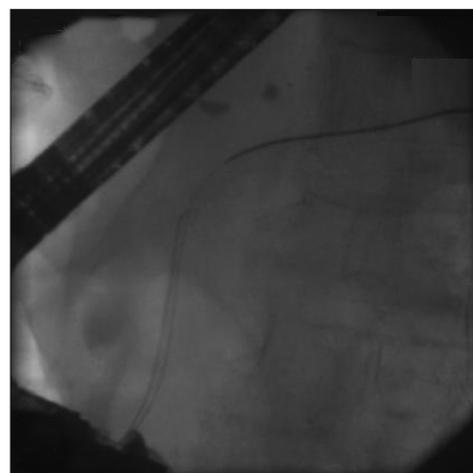
**Figure 1:** The papilla was positioned at the right side wall of the duodenal diverticulum in the second part of the duodenum and the papilla orifice was toward the left side of the diverticulum. A double flanged pancreatic duct stent (5 Fr, 5 cm) was placed to facilitate biliary cannulation

## Discussion

Proximal migration accounts for 2-5% of the complications of pancreatic stents, which is a useful endoscopic therapy in biliary diseases. In this study, we report for the first time that mini-snare was used for successful retrieval of proximal migration of pancreatic stents during the bile stone extraction.

Many complications can occur during pancreatic stent procedure, including migration of the stent. The occurrence of proximal migration has been elucidated to associate with a series of factors. The length of the stent is the most important factor leading to pancreatic stent migration. Johanson *et al.* reported that stent length greater than 7 cm was associated with an increased risk for proximal migration.<sup>[4]</sup> In our case, the length of the stent might not be associated with the occurrence of the migration since a 5 Fr 5 cm stent was used. The incidence of proximal pancreatic stent migration differs in various diseases. The risk for proximal migration seemed to increase in patients diagnosed with sphincter of Oddi dysfunction. In addition, migration of stents out of the common bile duct occurred more frequently in papillary stenosis.<sup>[4]</sup> In this case, the abnormal location of the papilla might play a role on the cause of stent migration. In addition, the stent migration was directly caused by the forces exerted from the right rotating duodenoscope, when we extracted the big bile stone.

As a foreign object keeping in the body, the migrated stent could result in complications including infection, stone formation and chronic pancreatitis. Percutaneous puncture, surgery and endoscopes were generally used for retrieval of the migrated stents.<sup>[5]</sup> Overall, endoscopic retrieval is the first option because it is least invasive. The endoscopic retrieval of a proximally migrated pancreatic stent involves challenging techniques and largely depends on the skills of



**Figure 2:** Fluoroscopic finding showing the retrieval of proximally migrated pancreatic duct stent using a mini-snare guided by a guide wire

the endoscopist.<sup>[6]</sup> Many devices, including balloon, basket, snare, forceps, papillotome and soehendra stent retriever, are currently used in the retrieval of the migrated stent. Due to the small diameter of the lumen of pancreatic duct, softer and smaller devices should be chosen to avoid pancreatic duct injury and pancreatitis.<sup>[6]</sup> In our case, initial attempts to retrieve the pancreatic stent were made using stone extraction balloon catheter and rat-toothed forceps, but failed due to small diameter of the pancreatic duct. Subsequently, a guide wire was placed in the pancreatic duct and a soft mini-snare was passed over the guide wire. Finally, the mini-snare was advanced into the proximal pancreatic duct over the guide wire. The proximally migrated stent was removed successfully with the mini-snare. The guide wire is critical in this retrieval. The guide wire facilitates the snare to pass into the pancreatic duct as it can not only provide support for the soft mini-snare, but also guide the snare. Therefore, the use of mini-snare for proximal migration retrieval should be combined with guide wire. This wire-guided endoscopic snare retrieval requires only minimal manipulation. Therefore, the complications are able to be minimized during the procedures.

In conclusion, wire-guided endoscopic snare retrieval of proximally migrated pancreatic stents is safe and effective.

The successful case of the retrieval with mini-snare provides another option for proximal migration retrieval of pancreatic stent retrieval. However, further studies are needed to confirm its effectiveness and elucidate its associated complications.

## References

1. Deviere J. Pancreatic stents. *Gastrointest Endosc Clin N Am* 2011;21:499-510, ix.
2. Goldberg E, Titus M, Haluszka O, Darwin P. Pancreatic-duct stent placement facilitates difficult common bile duct cannulation. *Gastrointest Endosc* 2005;62:592-6.
3. Choudhary A, Bechtold ML, Arif M, Szary NM, Puli SR, Othman MO, *et al.* Pancreatic stents for prophylaxis against post-ERCP pancreatitis: A meta-analysis and systematic review. *Gastrointest Endosc* 2011;73:275-82.
4. Johanson JF, Schmalz MJ, Geenen JE. Incidence and risk factors for biliary and pancreatic stent migration. *Gastrointest Endosc* 1992;38:341-6.
5. Tarnasky PR, Cotton PB, Baillie J, Branch MS, Affronti J, Jowell P, *et al.* Proximal migration of biliary stents: Attempted endoscopic retrieval in forty-one patients. *Gastrointest Endosc* 1995;42:513-20.
6. Gong B, Sun B, Hao LX, Bie L. Usefulness of an algorithm for endoscopic retrieval of proximally migrated 5Fr and 7Fr pancreatic stents. *Hepatobiliary Pancreat Dis Int* 2011;10:196-200.

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