

Endoscopic Management of Pancreatic Duct Stricture and Intra-Ductal Pancreatic Duct Stones Through Per-Oral-Endoscopic Pancreatoscopy: A Case Report and Literature Review

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Abstract

In this report, we described the management of a patient with refractory Main Pancreatic Duct (MPD) stricture. The case was characterized by dominant stricture of the MPD that persisted for more than a year even after plastic stenting. The patient relapsed with symptoms of chronic pancreatitis and features of obstructive pancreatitis. In addition to the case description, we have reviewed the topic and explained the role of pancreatoscopy in the management of refractory MPD stricture and stone extraction from the MPD. Eventually, with the help of pancreatoscopy, the stricture was dilated, and stents were placed. The patient improved after following extraction of stones, MPD stricture dilation, and pancreatic stenting treatment.

Keywords: Pancreatic duct structure; Pancreaticoscopy; Main pancreatic duct

Introduction

Chronic Pancreatitis (CP) patients often suffer from chronic abdominal pain secondary to Pancreatic Duct (PD) obstruction. CP patients usually develop Main Pancreatic Duct (MPD) obstructions from MPD stricture or stone or from both. This in turn causes pancreatic duct hypertension and outflow obstruction. ^[1,2] In this case report, we are describing a novel technique of per-oral-pancreatoscopy for the treatment MPD stricture. We have done dilation of the MPD stricture with the help of pancreatoscopy, then the PD stones were cleared, and a PD stent was placed.

Case Study

A 30-year-old male has been suffering from recurrent episodes of upper abdominal pain for the last ten years. Often, severe abdominal pain begins in the epigastric area, and it radiates to the back, and sometimes the pain attacks were associated with nausea and vomiting. The first episode of the epigastric pain was diagnosed as acute biliary pancreatitis secondary to gallbladder stones. After the first attack, he had undergone an ERCP and a cholecystectomy.

The patient had recurrent attacks of acute pancreatitis despite ERCP with clearance of CBD stones and cholecystectomy. From the age of 20 years to 27 years, the patient had many episodes of pancreatitis. The frequency of pancreatitis ranged from eight to ten attacks per year. He is a teetotaler.

Meanwhile, three years ago, at the age of 27 years, MPD stricture and PD stone was diagnosed. For this, the patient underwent multiple times ERCP dilatations and stentings. The patient remained symptomatic despite dilations and PD stenting and was referred to our center for pancreatic surgery.

The clinical evaluation from our center confirmed the history of recurrent pancreatitis on the background of chronic pancreatitis. In addition, recently, he had 5 kilograms loss of weight. But there was no history of steatorrhea or diabetes mellitus. Clinical examination was unremarkable.

The MRI and magnetic resonance that was done in our center on August 25th, 2019, showed an irregular pancreatic duct stricture in the head portion, without a definable mass, and PD was irregular in the pancreatic body and neck portions, and it measured 0.6 cm. The entire pancreas showed low signal intensity on T1 weighted signals and abnormally reduced lobulations. The intrahepatic and common bile duct were normal.

From our center, he was given another chance of ERCP on September 11, 2019. ERCP demonstrated a tight structure at the head region of the pancreas. The MPD stricture was dilated with a biliary dilator to 7 Fr, then a 7 French, 5 cm pancreatic stent was inserted. After this ERCP and stenting, the patient remained symptom-free more than a year.

The patient presented to us three months ago with history of few more attacks of pancreatitis that needed hospital admissions with decreased quality of life. Because of the recurrence of symptoms, the MRCP was repeated on June 26, 2021. It showed the pancreatic duct bifurcates into two ducts, one drains into

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How to Cite this Article: Alfadda AA, et al. Endoscopic Management of Pancreatic Duct Stricture and Intra-Ductal Pancreatic Duct Stones Through Per-Oral-Endoscopic Pancreatoscopy: A Case Report and Literature Review. *Ann Med Health Sci Res.* 2021;11:18-21.

minor papilla, and the other one was the dominant duct, which drains into major papilla. A persistent focal MPD stricture at the head measuring 0.4 cm was demonstrated. There were new intraductal stones, measuring 0.7 cm × 0.4 cm, another tiny stone at the distal dorsal pancreatic duct. There were no intraductal or pancreatic parenchymal masses. A mild volume loss was noted at the pancreatic tail region as a sequela of chronic pancreatitis.

He had one more ERCP on July 7th, 2021. The papilla was seen with no pancreatic stent. The pancreatic duct was cannulated from the first attempt. A wire was able to go through the pancreatic head area but was then coiling with the inability to go through the whole pancreatic duct. We dilated the pancreatic sphincter using a max force balloon dilator of 6 mm width, 4 cm length then a single use pancreatoscopy (Spy Glass DS II Direct Visualization system) spy-glass was introduced into the pancreatic duct (Boston Scientific, Natick, MA, USA). We encountered a tight stricture at the junction between the head and neck of the pancreas. The guidewire was passed distal to the stricture with guidance from the spyglass [Figure 1]. Then the PD stricture was dilated up to 6 mm. After that pancreatoscope was passed through PD stricture and was able to reach till to the tail of the pancreas and retrieved two stones using a spyglass basket. Few other stones were fragmented and removed with irrigation. At the end of the procedure a single pigtail stent of 7 French, 8 cm was introduced successfully [Figures 2-4]. We did not encounter any complications immediately. He was given adequate intravenous hydration and a rectal suppository of diclofenac sodium. Post-procedure, on days one and two he developed mild upper abdominal pain that was managed by acetaminophen injections.

On an outpatient follow up two months after the procedure, the patient reported no symptoms. He was able to perform his



Figure 1: Images of main pancreatic duct using single use pancreatoscopy (spy glass DS II) showing mild inflammation, superficial ulceration and stricture formations.



Figure 2: Normal MPD view with direct visualization pancreatoscopy distal to the MPD stricture after dilatation with an opened spy scope basket for stone retrieval.



Figure 3: MPD stone captured by spy glass basket before extraction.

daily activities and did not miss his work. He was continued on pancreatic enzyme supplementation and proton pump inhibitors with a regular follow up in our center.

Discussion

Pancreatic duct obstruction due to pancreatic stricture and or stone is a very common complication of chronic pancreatitis. Endoscopic treatment of painful chronic pancreatitis with Main Pancreatic Duct (MPD) is to insert stent across a dominant

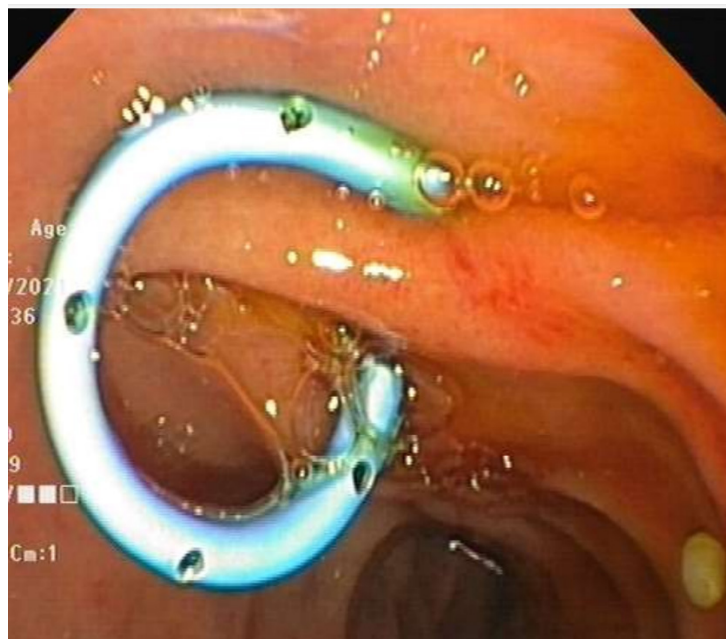


Figure 4: A single pigtail stent of 7 French, 8 cm introduced successfully through the MPD with one pancreatic duct stone extracted to the duodenal lumen.

MPD stricture or the most proximal one in the case of multiple strictures. European Society of Gastrointestinal Endoscopy (ESGE) recommended a single 10 Fr plastic stent for one uninterrupted year if symptoms improve after initial successful MPD drainage.^[3] As needed, stent might be exchanged, if they develop stent dysfunctions. The surgery or multiple side-by-side plastic stents might be needed for symptomatic MPD strictures persisting beyond 1 year after the initial single plastic stenting.^[3-7] Fully Covered Self-Expandable Metal Stents (FCSEMSs) also appears to be effective and safe in the management of MPDS caused by symptomatic CP.^[8]

The second-generation spyglass DS was developed in 2015. A digital image with 4x greater resolution and a wider field-of-view (110° vs. 70°), and a redesigned accessory channel for easier use has increased its clinical utility.^[9,10] It has many advantages over the standard ERCP due to its ability for direct visualization of biliary and pancreatic ducts. Clinical utility of cholangioscopy in visualization and management of difficult biliary stones, strictures, doing visually guided biopsies, applying radiofrequency ablation of ductal tumors, etc. have been established recently.^[10,11]

From Spain, out of 107 SOCP procedures done, seven patients with chronic calcifying pancreatitis underwent pancreatoscopy. From their series, most cases had a single stone with a mean measurement of 11 mm (range: 7 mm-15 mm), which was in the main pancreatic duct. EHL was employed in three cases and the technical and complete success of the procedure was 100% in both cases. In four cases, complete cleaning was achieved during the first procedure.^[12]

A study from Saudi Arabia reported that from 84 cholangioscopy procedures for 66 patients, only one case had pancreatoscopy for a migrated PD stent. They were able to visualize whole of the PD, but unfortunately the stent had migrated to the retroperitoneum before the procedure.^[11]

We have explained a novel technique of pancreatoscopy in our patient. The patient had dilatation followed by passage of guidewire with the help of spyglass, and then dilation of the stricture and retrieval of the pancreatic duct stones using spyglass basket. ESWL was not used before the ERCP. Complete clearance of the PD was achieved with this measure.

Conclusion

In this case report, we have described a novel technique of management of MPD stricture and the removal of PD stones with the help of single use pancreatoscopy.

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