

Laparoscopic Distal Pancreatectomy for Retrieval of a Proximally Migrated Pancreatic Stent

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ABSTRACT

Background and Objectives: Pancreatic stents placed by ERCP are common in the treatment of benign and malignant pancreatic and biliary disease. Proximal migration of the stent into the duct occurs in 2% to 5% of cases, often resulting in pancreatitis. Although technically challenging, proximally migrated pancreatic stents can usually be removed endoscopically. Little has been written about surgical management of irretrievable stents, and no reports of laparoscopic approaches were found.

Methods: We report on a case of unsuccessful ERCP retrieval of a proximally migrated pancreatic stent.

Results: Using laparoscopy, we exposed the pancreas and used ultrasound to locate the distal end of the stent. We incised the pancreas at that point, removed the stent, and completed the distal pancreatectomy with splenectomy.

Discussion: Several case series on retrieval of migrated pancreatic stents are reviewed.

Conclusion: Although ERCP is often successful and sometimes requires several attempts, we recommend surgical consultation after the first or second failed ERCP.

Key Words: Pancreatic stent, ERCP, Laparoscopic ultrasound, Distal pancreatectomy.

INTRODUCTION

Endoscopically placed pancreatic stents are common in the treatment of a variety of biliary and pancreatic conditions, including obstruction from strictures, stones, or tumors, pancreas divisum, drainage of pancreatic pseudocysts, and prophylaxis against post-ERCP pancreatitis.¹⁻⁵ With increasing use of pancreatic stents, many complications have been identified, including acute pancreatitis, cholangitis, duct rupture, stent occlusion, chronic inflammatory and fibrotic ductal changes, and distal and proximal stent migration.⁶⁻⁸

Proximal migration of pancreatic stents is reported in 2% to 5% of cases.^{9,10} Sphincter of Oddi dysfunction (SOD) and long pancreatic stents were found to be risk factors for proximal migration. To clarify an anatomic point, the surgical distal pancreas contains the proximal main pancreatic duct. Distal, or downstream, migration is rarely harmful, as the stent passes into the duodenum and is excreted. However, proximal, or upstream, migration often results in pancreatitis.

Although technically challenging, proximally migrated stents can usually be retrieved endoscopically using baskets, balloons, snares, forceps, and stent retrievers.⁶ Because stents occlude over time⁷ and cause chronic ductal inflammation,⁸ retained stents should probably be removed in most cases. Little has been written about surgical management of irretrievable stents, and no reports of laparoscopic approaches were found.

CASE REPORT

The patient is a 29-year-old woman referred for removal of a proximally migrated pancreatic stent. She had previously undergone a laparoscopic cholecystectomy for biliary dyskinesia and an ERCP with sphincterotomy for SOD, which provided several months of relief. Recurrent abdominal pain prompted a repeat ERCP with sphincterotomy. A prophylactic plastic 5-Fr x 5-cm pancreatic pigtail stent was deployed during this procedure to reduce the risk of post-ERCP pancreatitis.

The stent was immediately noted to migrate proximally into the pancreatic duct (**Figure 1**). The endoscopist re-

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Figure 1. CT image of the pancreas. The images progress from superior to inferior. The stent has migrated proximally into the pancreatic duct. A nasogastric tube is seen in the duodenum.

ported that the stent was loaded correctly but suspected that it may have been deployed too deeply. Multiple unsuccessful attempts were made at that time to retrieve the stent with an extraction balloon, basket, and stent

extractor. The patient developed acute pancreatitis. A second unsuccessful attempt at endoscopic retrieval was made several days later using similar techniques.

The patient was referred for consideration of surgical stent retrieval. The initial plan was to treat nonoperatively and await resolution of the pancreatitis, which was likely caused or exacerbated by multiple retrieval attempts. However, 15 days after initial stent placement, the pancreatitis continued to worsen, both clinically and on laboratory analysis. Her pain was unmanageable with narcotics. The stent was thought to be impacted and possibly occluded, causing an ongoing insult to her pancreas that could lead to severe pancreatitis. The decision was made to proceed with a laparoscopic stent removal and distal pancreatectomy.

Exposure to the pancreas was obtained via the lesser sac. Acute and chronic inflammatory changes were noted with an edematous, friable, and woody pancreas. The use of a laparoscopic ultrasound allowed precise localization of the stent (**Figure 2**) and planning for the level of transection. An epigastric hand-assist port was inserted to assist with mobilization of the inflamed pancreas. Ultrasonic shears were used to incise the pancreas down to the pancreatic duct near the distal end of the stent. The stent was easily removed (**Figure 3**). Due to extensive inflammation and the inability to safely develop a plane between the pancreas and splenic vessels, a spleen-preserving operation was not attempted. The remaining pancreas and splenic vessels were divided with a linear stapler, and the specimen was removed.

The patient's postoperative course was complicated by a pancreatic leak that resolved with nonoperative management.

DISCUSSION

A review of the literature found 2 case series of proximally migrated main and dorsal pancreatic duct stents. One series described 26 proximally migrated pancreatic stents and intraductal stent fragments.¹¹ Seven of 21 patients presented with pancreatitis or abdominal pain, and the rest were asymptomatic. Twenty of 26 stents were retrieved endoscopically. Seven patients required multiple ERCPs (up to 3) for successful removal. Three patients had up to 3 unsuccessful endoscopic attempts at removal but remained asymptomatic. Three symptomatic patients had up to 5 unsuccessful endoscopic retrieval attempts before proceeding to surgery (1 distal pancreatectomy, 2 cases not described).

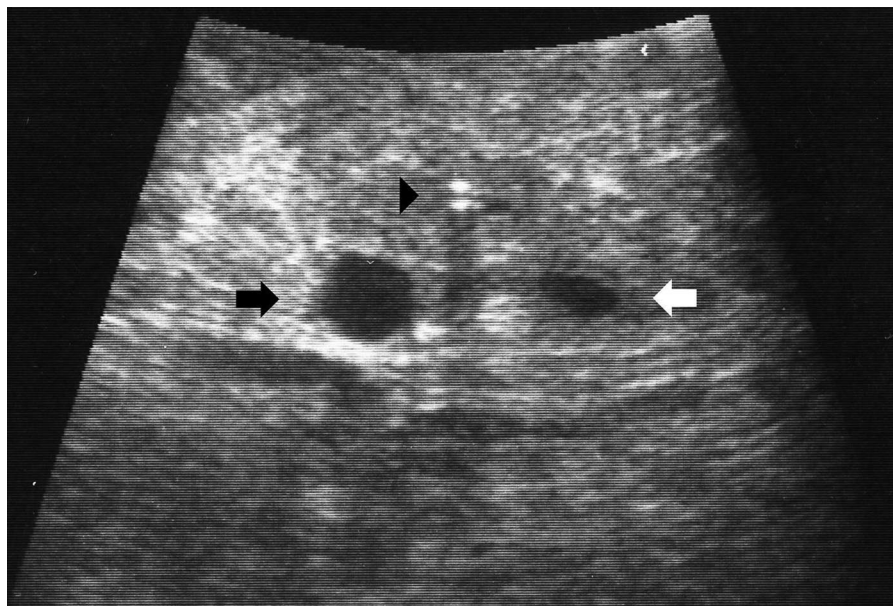


Figure 2. Laparoscopic ultrasound of the distal pancreas. The hyperechoic stent (black arrowhead, with posterior shadowing) is seen in close proximity to the splenic artery (black arrow) and vein (white arrow, compressed by ultrasound probe). There are no clear tissue planes seen between these structures.



Figure 3. Laparoscopic image of the distal pancreas. The proximal portion of the incised pancreas is grasped by the hand assist on the left side of the picture. The distal pancreas is on the right. The divided stent protrudes from both cut ends of the pancreatic duct.

A more recent case series reports on 23 proximally migrated pancreatic duct stents.¹⁰ Six of 23 patients presented with abdominal pain, and the rest were asymptomatic. Eighteen of 23 stents were recovered endoscopically. Nine patients required multiple ERCPs (up to 4); some of

these stents were successfully retrieved (after up to 3 attempts) while others required surgery. Stents could not be retrieved by ERCP in 5 patients. Four were symptomatic and proceeded to surgery.

CONCLUSION

Several conclusions can be drawn from these reports and our experience. Up to 78% of proximally migrated stents can be retrieved endoscopically. While the majority of successful ERCP retrievals occurred at the first procedure, up to 35% of migrated pancreatic stents required multiple ERCPs for successful retrieval. Each additional attempt risks causing or worsening pancreatitis and may make surgery more difficult. We recommend close coordination between endoscopists and surgeons after the first or second failed ERCP to determine the best course of action, which must be tailored to the individual patient.

Laparoscopic ultrasound was helpful in determining the appropriate location to incise the pancreas. By necessity, this operation may have to be undertaken during an acute episode of pancreatitis. A high likelihood of postoperative pancreatic leak should be anticipated and drains placed. However, if the clinical course is improving preopera-

tively, delaying surgery to allow for decreased inflammation is advised. If this is not possible, the surgeon should prepare for a difficult dissection and a high likelihood of concomitant splenectomy.

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