DOI: 10.7860/JCDR/2025/76764.21062

Case Report

Surgery Section

Anastomotic Strictures after Whipple Procedure: A Report of Two Cases

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ABSTRACT

Whipple procedure is a major surgery performed for periampullary cancers. With improved surgical techniques and intensive care, perioperative mortality has become a rare event, occurring in less than 2% of cases; however, morbidity remains common, occurring in 30-50% of cases. Hereby, authors present a case report of two patients who were operated on for periampullary cancer and have now presented with anastomotic site strictures, hepatolithiasis and pancreatitis. Case 1 was a 58-year-old male who underwent the Whipple procedure with pancreaticojejunostomy 13 years ago for periampullary growth. The patient now presented with pancreatitis, dilated Main Pancreatic Duct (MPD), hepatolithiasis and a peptic ulcer with stricture at all three anastomotic sites. A lateral pancreaticojejunostomy, revision of hepaticojejunostomy with removal of calculi and redo gastrojejunostomy were performed using the same Roux limb. Case 2 was a 58-year-old male who underwent the Whipple procedure with pancreaticogastrostomy four years ago for a serous cystadenoma of the pancreas and presented with pancreatitis, dilated MPD and pleural effusion. The patient was diagnosed with pancreatitis due to anastomotic stricture at the pancreaticogastrostomy site and laparotomy with lateral pancreaticojejunostomy was performed. Both patients were discharged uneventfully. While individual anastomotic strictures and their management have been discussed in the literature following the Whipple procedure, Case 1, which presented with strictures at all three sites simultaneously and Case 2, which presented with pancreatitis, are noteworthy and unique. Surgery is the best approach to managing anastomotic strictures, as it offers a one-time solution.

Keywords: Hepaticojejunostomy stricture, Late complications, Pancreaticojejunostomy site stricture

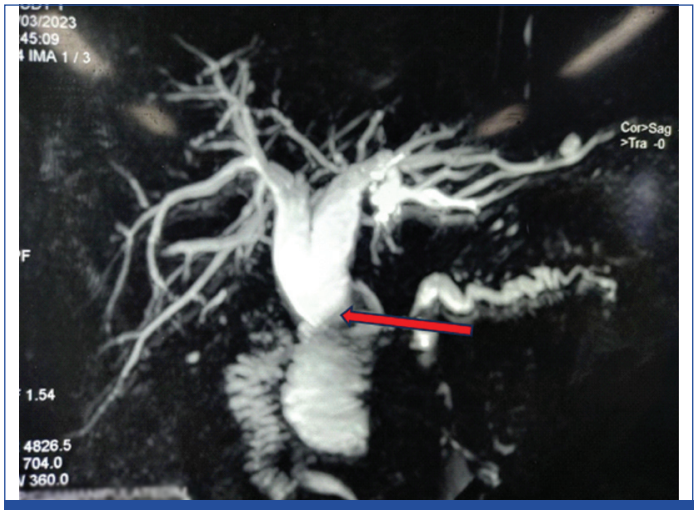
CASE REPORT

Case 1

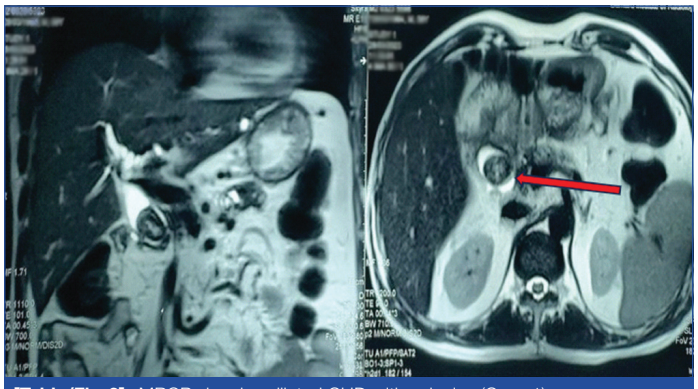
A 58-year-old male underwent a Whipple procedure 13 years ago for periampullary growth. Histopathological Examination (HPE) showed infiltrating well-differentiated adenocarcinoma classified as pT1N0Mx. The patient received adjuvant chemotherapy consisting of six cycles of gemcitabine and cisplatin. He subsequently presented with dull, aching abdominal pain, symptoms of gastric outlet obstruction and obstructive jaundice for the past three months. Blood investigations revealed a total bilirubin of 5.3 mg/dL, direct bilirubin of 4.3 mg/dL and alkaline phosphatase of 540 IU/L. The Cancer Antigen (CA) (19-9) level was normal.

Magnetic Resonance Cholangiopancreatography (MRCP) [Table/Fig-1,2] revealed bilateral central and peripheral Intrahepatic Biliary Radical Dilatation (IHBRD) with evidence of multiple calculi noted in the Common Hepatic Duct (CHD), the largest measuring 2.3×1.7 cm, causing upstream dilatation of the biliary system. Another calculus of size 6.4×6.3 mm was observed in the right hepatic duct. Positron Emission Tomography with Computed Tomography (PET CT) showed no active uptake anywhere. Upper gastrointestinal endoscopy showed an ulcer at the Gastrojejunostomy (GJ) site with anastomotic narrowing; the scope passed with difficulty. A biopsy from the ulcer also showed no evidence of malignancy.

After anaesthetic clearance, the patient was taken for surgery. Intraoperatively, dilated MPD [Table/Fig-3], dilated CHD [Table/Fig-4] with calculi and a distended stomach were noted, along with stricture at the pancreaticojejunostomy, hepaticojejunostomy and gastrojejunostomy sites. The original pancreaticojejunostomy was taken down using an 80 mm linear stapler and a lateral pancreaticojejunostomy was performed [Table/Fig-5]. The hepaticojejunostomy was revised, including the removal of calculi and a redo gastrojejunostomy was conducted with the same Roux limb.

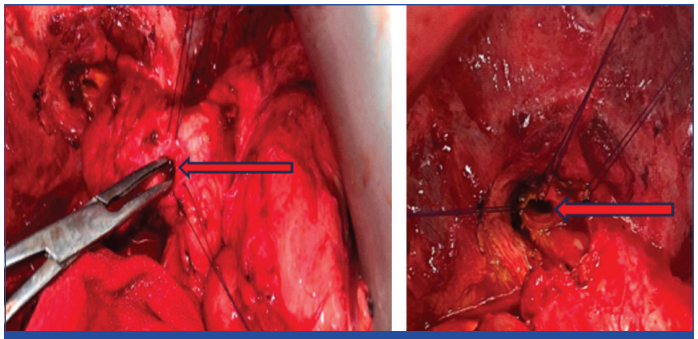


[Table/Fig-1]: MRCP showing dilated CHD and MPD with abrupt cut-off (Case 1).

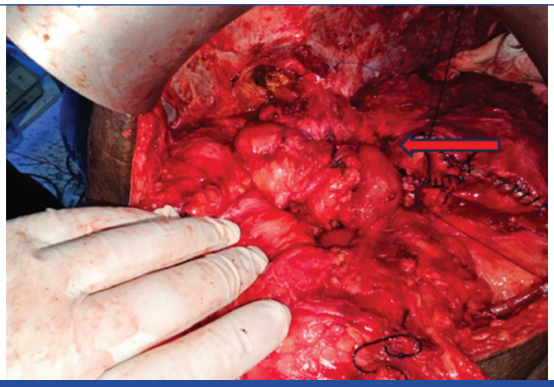


[Table/Fig-2]: MRCP showing dilated CHD with calculus (Case 1).

The postoperative course was uneventful with a decline in bilirubin levels. The patient was able to tolerate an oral solid diet and was discharged on postoperative day 15.



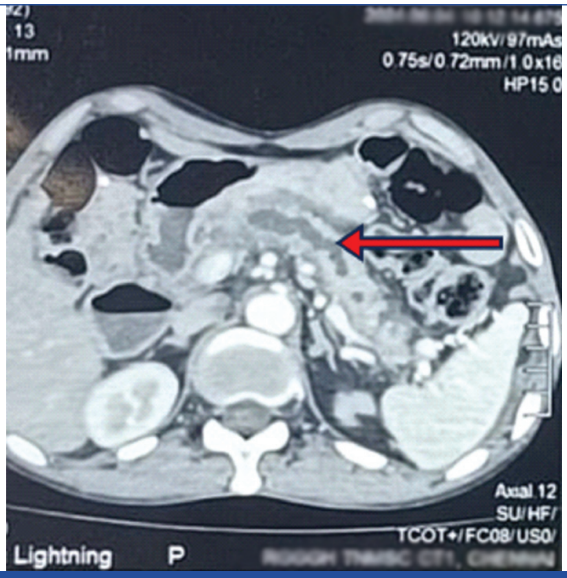
[Table/Fig-3]: Showing intraoperative image of opened pancreatic duct (Case 1).
[Table/Fig-4]: Showing intraoperative image of opened CHD (Case 1). (Images from left to right)



[Table/Fig-5]: Showing intraoperative image after reconstruction of lateral PJ (Case 1).

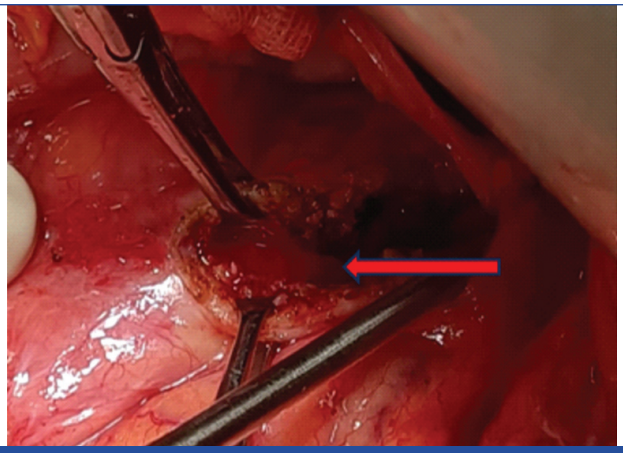
Case 2

A 58-year-old male underwent a Whipple procedure with pancreaticogastrostomy four years ago for serous cystadenoma of the pancreas. He now presents with sharp epigastric pain for the past month, radiating to the back, which is aggravated by food intake and relieved by oral analgesics. Upon evaluation, the patient was found to have a loculated left pleural effusion. Blood investigations were normal. Contrast-Enhanced Computed Tomography (CECT) of the abdomen showed an atrophic pancreas with a dilated MPD measuring 1 cm and peripancreatic fat stranding [Table/Fig-6]. The patient was diagnosed with pancreatitis and anastomotic stricture at the pancreaticogastrostomy site and he was taken for laparotomy.



[Table/Fig-6]: Showing atrophic pancreas with dilated MPD (Case 2).

Intraoperatively, the pancreatic duct was observed to be dilated to approximately 2 cm [Table/Fig-7]. A feeding tube could not be passed through the pancreaticogastrostomy site; therefore, a lateral pancreaticojejunostomy was performed. The postoperative course was uneventful and the patient was discharged on postoperative day 7.



[Table/Fig-7]: Showing dilated MPD with stricture at pancreaticogastrostomy site (Case 2).

DISCUSSION

With improved surgical techniques and intensive care, perioperative mortality after the Whipple procedure has become a rare event, occurring in less than 2% of cases. However, morbidity remains common, affecting 30-50% of cases [1]. Late complications of the Whipple procedure are rare, mainly because survival after surgery for malignant disease is typically short, which limits the time for such complications to arise. Late complications include incisional hernia (17.7%), biliary stricture or cholangitis (8.0%), pancreatitis (5.7%), small bowel obstruction (4.3%) and peptic ulcer (3.2%) [2].

For patients who undergo surgery for benign diseases or for whom the prognosis is favourable, survival can be long enough for late complications to occur. One of the most frequent complications is pancreaticoenteric anastomotic stenosis, which can occur after both pancreaticogastrostomy and pancreaticojejunostomy. A literature review [3] showed that the incidence of pancreaticoenteric anastomotic stricture after the Whipple procedure ranges from 1.4% to 11.4%, with a median time interval of 34 months and no specific risk factors were identified. Symptoms tend to be inconsistent, but the most common include postprandial abdominal pain, recurrent acute pancreatitis and impaired pancreatic function [4].

Endoscopic techniques, primarily Endoscopic Ultrasound (EUS)-assisted rendezvous and EUS-guided puncture of the MPD, have been available since 2010, yet the failure rate can be as high as 25% [5], necessitating repeat procedures. Revision surgery for pancreatic-enteric anastomotic stenosis following Pancreaticoduodenectomy (PD) has been associated with a low risk of pancreatic fistula, approximately 5% and an overall morbidity rate of around 20% [6].

Seven studies have reported successful outcomes in terms of pain relief following repeat surgical reconstruction of the anastomosis [6-12]. In the majority of cases, pain and pancreatitis were linked to a stricture at the pancreaticojejunostomy. Surgical interventions mainly involved revising the pancreaticojejunostomy, with pancreaticogastrostomy performed in one case. Oida T et al., described an alternative hybrid technique involving the insertion of a trans-anastomotic stent after a surgical approach to the afferent limb [12]. Demirjian AN et al., reported a series of seven patients, two of whom underwent a modified Puestow procedure that involved a side-to-side pancreaticojejunostomy with a 2 cm incision on the anterior aspect of the MPD [13]. This technique offers the advantage of eliminating the need for Roux-en-Y limb reconstruction.

Since the choice between pancreaticojejunostomy and pancreaticogastrostomy does not significantly affect the fistula rate following PD, neither anastomotic approach can be definitively recommended over the other for reoperative procedures. Consequently, the choice between the two techniques is left to the discretion of the surgeon, based on experience, personal preferences and intraoperative findings. In the present cases, the authors successfully managed pancreaticoenteric anastomotic

stricture by performing a lateral pancreaticojejunostomy with the same Roux limb.

Another common late complication is stenosis of the bilioenteric anastomosis, which can lead to jaundice and/or cholangitis. The cumulative probability of biliary stricture at one year is 2.9% (range 0-6.0%) and at five years, it is 8.2% (range 1.9-14.1%) [14]. Magnetic Resonance Cholangiopancreatography (MRCP) is the investigation of choice for diagnosing this condition.

For initial treatment, endoscopic interventions, such as balloon dilation, lithotomy and stenting, can be performed. For patients with larger stones, revision hepaticojejunostomy serves as the best option. GJ anastomotic stricture following the Whipple procedure is best managed by performing a redo gastrojejunostomy, which is associated with a very low complication rate [15].

In certain cases, due to dense adhesions from previous surgery, redo surgery can be difficult and complicated, with an increased risk of bleeding. However, the authors have not encountered any such difficulties in their patients.

CONCLUSION(S)

Anastomotic strictures following the Whipple procedure have recently been described in the literature; however, none have documented a stricture occurring simultaneously at all three sites. These anastomotic strictures can manifest many years after the Whipple surgery. Surgical intervention is the best option for managing stricture sites, as it offers rapid relief of symptoms. The rare presentation and successful management of these cases make for a very interesting case report.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Nov 14, 2024
- Manual Googling: Jan 27, 2025
- iThenticate Software: Jan 29, 2025 (5%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Nov 13, 2024**
Date of Peer Review: **Jan 06, 2025**
Date of Acceptance: **Jan 31, 2025**
Date of Publishing: **Jun 01, 2025**