

# Laparoscopic Revision of Benign Hepaticojejunostomy Stricture Following Previous Open Pancreaticoduodenectomy

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## ABSTRACT

Post-pancreaticoduodenectomy (PD) benign hepaticojejunostomy stricture (PDHJS) is an infrequent long-term complication. The therapeutic options in these patients are endoscopic or percutaneous balloon dilatation and surgical revision of the anastomosis. We herein describe the preoperative diagnosis and operative steps of laparoscopic revision hepaticojejunostomy (LRHJ) in an elderly male presenting with a hepaticojejunostomy stricture (HJS) 12 years post-open PD who had a failed percutaneous intervention.

**Keywords:** Benign hepaticojejunostomy stricture, Laparoscopic revision hepaticojejunostomy, Pancreaticoduodenectomy, Post-pancreaticoduodenectomy hepaticojejunostomy stricture.

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## INTRODUCTION

Post-pancreaticoduodenectomy benign hepaticojejunostomy stricture is reported in 2.6% of patients.<sup>1</sup> We herein report a case of HJS masquerading as hilar cholangiocarcinoma who underwent LRHJ.

## CASE DESCRIPTION

A 70-year-old male patient who had undergone a Whipple PD for ampullary carcinoma and adjuvant chemotherapy 12 years before presented now with low-grade cholangitis and was evaluated at another hospital. The diagnosis of hilar cholangiocarcinoma with left duct extension was made based on imaging, namely, multi-detector computed tomography (MDCT) (Fig. 1A), magnetic resonance cholangiopancreatography (MRCP) (Fig. 1B), and positron emission tomography with computed tomography (PET-CT) (Fig. 1C). A left hepatectomy/caudate resection had been advised there, and he was subsequently reviewed by us. After the review of LFT (total Bilirubin 0.36 mg/dL and ALP, GGT 89, 87 U/L, Serum albumin 3.34 gm/dL) and imaging, a possibility of benign HJS with hepatolithiasis was considered. The percutaneous transhepatic cholangiogram (PTC) (Fig. 1D) showed filling defects at hilar bile duct, left hepatic duct, and a non-dilatable tight biliary stricture with only a streak of contrast entering the jejunum. Percutaneous transhepatic biliary drainage (PTBD) was left as an interno-external drain. Two weeks later, he underwent an LRHJ under general anesthesia (GA) in a supine/leg split position. The operative steps were as follows:

- Step I: Port-placement: Illustrated in Figure 2.
- Step II: Adhesiolysis: Adhesions were lysed from anterior abdominal wall and subhepatic regions. Hepatic flexure was taken down and further adhesiolysis was done with harmonic shears to define the HJS.
- Step III: Exposure of common hepatic duct (CHD): HJS site was looped with umbilical tape (Fig. 3A). Traction on umbilical tape helped further dissection, exposure of CHD up to biliary confluence.

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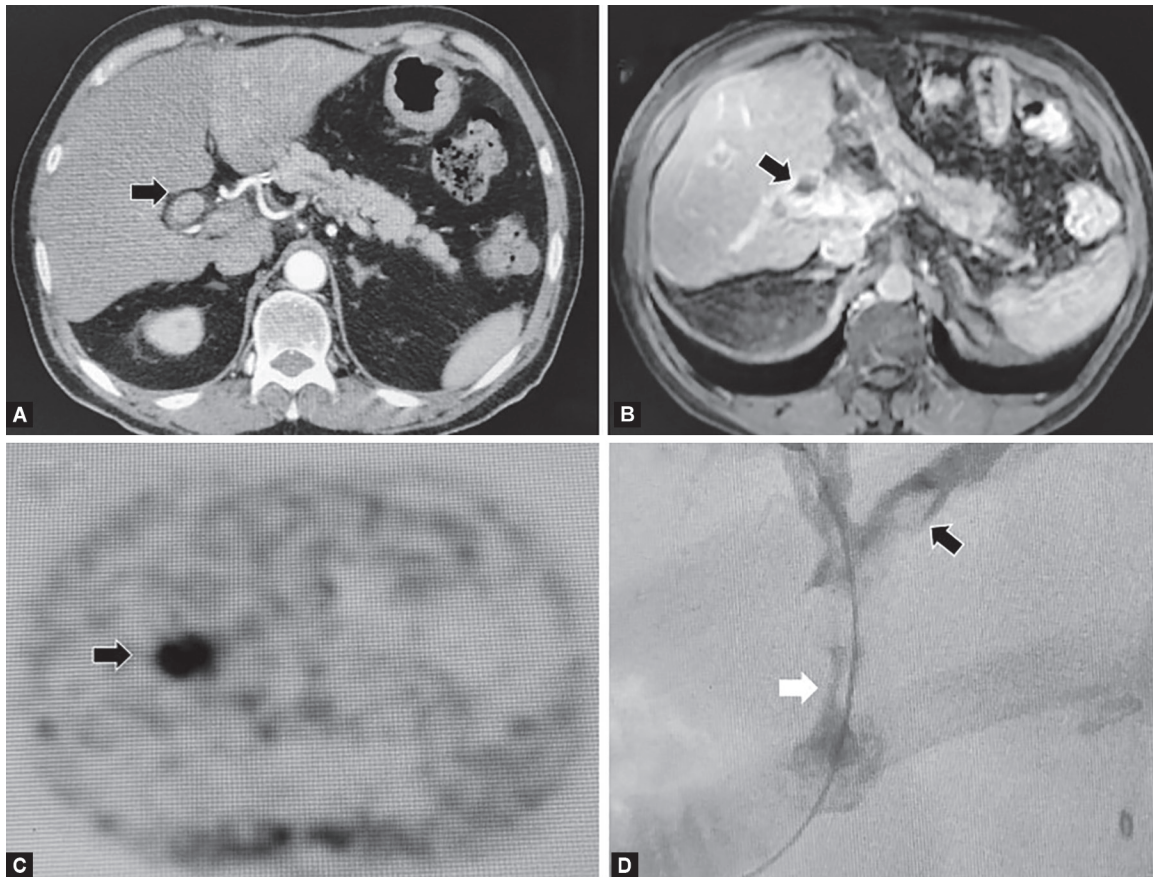
- Step IV: Jejunostomy, choledochotomy, and choledochoscopy: A jejunostomy (Fig. 3B) was made below HJS and across HJS into the normal CHD. The PTBD catheter was flushed and cleared of sludge and stones. Choledochoscopy (Fig. 3C) revealed no residual calculi and normal intra hepatic biliary mucosa.
- Step V: Revision HJ: The vertically aligned hepaticojejunostomy was closed horizontally with V-lock 3–0 suture in a continuous manner (Fig. 3D). Check PTBD-gram showed no leak from suture line.
- Step VI: Peritoneal lavage and subhepatic drains was placed. Sheath at 10-mm port sites were closed and skin with staples.

He made an uneventful recovery; subhepatic drain was removed on postoperative day (POD3) and he was discharged on POD6.

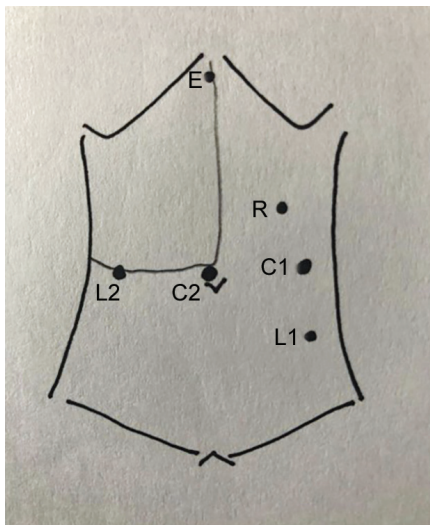
Furthermore, PTBD-gram done after 3 weeks showed free flow of contrast across HJ with no evidence of leak, and it was removed. At 12-months follow-up, he remains asymptomatic with normal LFT and no biliary dilatation on ultrasonography (USG).

## DISCUSSION

Post-pancreaticoduodenectomy benign hepaticojejunostomy stricture is due to a recurrence of cancer, benign HJ stricture or a second primary malignancy. A hilar cholangiocarcinoma following PD is most often seen in patients who had a distal common bile duct (CBD) cholangiocarcinoma to start with.<sup>1</sup> Imaging modalities



**Figs 1A to D:** (A) Depiction of MDCT showing soft tissue lesion filling hilar bile duct; (B) MRCP showing filling defect; (C) PET-CT increased uptake at hilum; (D) PTC demonstrating calculi in CHD and left hepatic duct. Black arrows show the lesions and calculi; white arrow shows HJS



**Fig. 2:** Illustration of port sites; C1, camera port during initial adhesiolysis; C2, camera port during later part of procedure; R, right-hand working port; L1, left-hand working port during the initial part of the procedure; L2, left-hand working port during the later part of procedure; E, epigastric retraction port

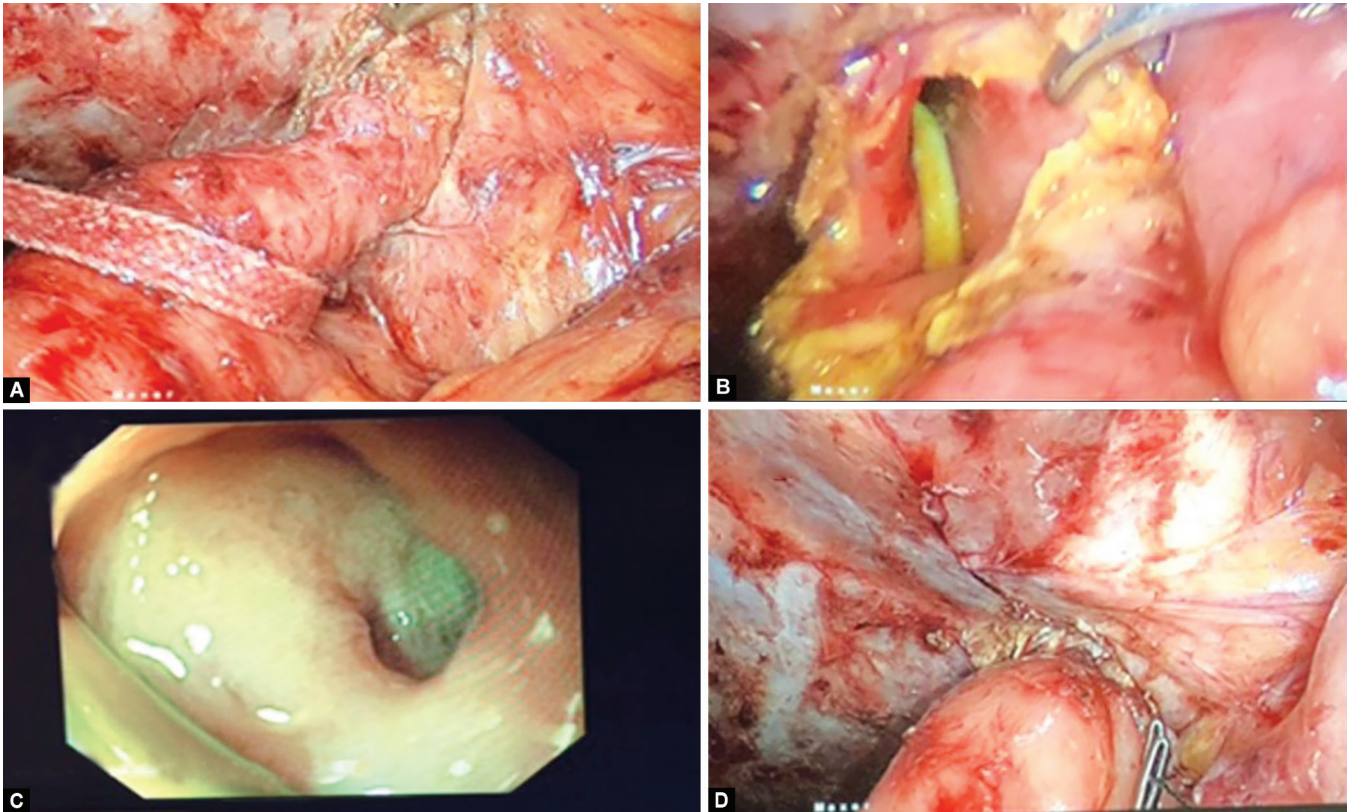
used for diagnosis of HJS are MDCT, MRCP, and PTC which help in characterizing the lesion as benign or malignant.<sup>2</sup> Although the initial evaluation elsewhere had suggested hilar malignancy in the

present case, clinical course, findings on PTC/PTBD led us to a higher suspicion of benign stricture with hepatolithiasis. The higher uptake on PET-CT seems to be because of inflammation at stricture and associated cholangitis corroborated later at surgery and mistaken to be a second primary at initial evaluation.

Therapeutic options for PDHJS are percutaneous or endoscopic dilatation of the HJS, and surgical revision of the anastomosis.<sup>3</sup> The percutaneous and endoscopic approaches usually require multiple sittings to achieve satisfactory dilatation of HJS and are generally preferred over a surgical revision which is often accomplished by an open operation. There seemed to be a little merit in considering an endoscopic approach in a patient with "non-dilatable" HJS by percutaneous approach and we elected to do a minimally invasive surgical repair.

Zayne B et al. reported feasibility of robotic revision HJ.<sup>4</sup> By planning port placement for the initial adhesiolysis, and with patient dissection, the HJS could be clearly delineated. Also, the jejunostomy permitted choledochoscopy which confirmed normal biliary mucosa, thereby permitting us to proceed with the revision surgery. We feel, the previous open pancreaticoduodenectomy alone should not be a contraindication for repair of PDHJS, among groups with experience in minimally invasive hepatobiliary surgery. The laparoscopic approach brings with it the advantages of lesser pain; shorter hospital stay; fewer wound-related complications and can be achieved at a lesser overall cost than a robotic repair. To our knowledge, this is the first report of laparoscopic revision HJ for HJS following open PD.





**Figs 3A to D:** (A) Looping of HJS with ribbon tape; (B) Hepaticojejunostomy and PTBD catheter seen *in situ*; (C) Choledochoscopy showing normal mucosa; (D) Suture line after revision hepaticojejunostomy

## CONCLUSION

Laparoscopic repair of PDHJS stricture following a previous open PD is safe and feasible, and brings with it all the short-term benefits of minimal access surgery.

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