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Intrahepatic portal vein thrombosis due to postoperative biliary obstruction successfully treated by a partial thrombectomy combined with thrombolytic drug therapy

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ABSTRACT

INTRODUCTION: This case report aims to inform pancreatic surgeons about our perioperative management of intrahepatic portal vein thrombosis caused by an obstruction of hepaticojejunostomy (HJ) after pancreaticoduodenectomy (PD).
CASE PRESENTATION: A 65-year-old woman was diagnosed with pancreas head carcinoma involving the superior mesenteric vein (SMV). Pancreaticoduodenectomy combined with SMV resection was followed by HJ. Twisting or narrowing was not evident during anastomosis. Total bilirubin values progressively increased to 13 mg/dL on day 5. At that time, we suspected anastomotic occlusion and found complete portal thrombosis of the left liver. Therefore, emergency re-anastomosis of the HJ was followed by thrombectomy, which was not completely successful and did not completely recover initial portal flow. Thrombolytic drugs improved obstructive jaundice, eradicated the organized thrombosis and recovered the portal flow by day 30. The post-operative course was uneventful.
DISCUSSION: A thrombosis immediately formed in the portal vein due to biliary obstruction of an anastomotic site. We speculated that biliary dilation and related inflammation caused a relative increase in arterial flow and decreased portal flow at the localized part of the umbilical portion. Although early surgical thrombectomy was attempted soon after the primary operation, the organized thrombosis persisted. However, thrombolytic therapy eradicated the thrombosis.
CONCLUSION: Careful anastomosis of HJ during PD was necessary to avoid postoperative biliary stricture. This type of complication affects intrahepatic blood flow, particularly via the portal vein. Although immediate re-anastomosis or thrombectomy is applied, organized thrombosis cannot always be surgically removed.

1. Introduction

The only curative treatment option for pancreatic carcinoma is R0 resection [1]. However, this often requires combined vascular resections of the portal vein to avoid exposing the tumor surface at the dissection plane [2]. Portal flow during combined vascular resection can become transiently blocked within 30 min of vascular reconstruction. A 30-min block without a portal bypass is probably safe, but postoperative portal vein thrombosis (PVT) can arise after invasive procedures as hepatectomy or pancreaticoduodenectomy (PD) [3–5]. The mechanism of PVT might involve various factors such as the intraoperative occlusion of portal flow, a kinked portal trunk, stenosis of a vascular anastomosis and surrounding inflammation [3–8]. We have often experienced portal stenosis after postoperative intraabdominal infection or inflammation. Thus, we speculate that postoperative surrounding inflammation is one cause of postoperative PVT. The present patient underwent PD with a portal vein anastomosis due to combined resection of the portal and superior mesenteric veins. These procedures were immediately followed by postoperative PVT and obstructive jaundice due to stenosis of a hepatico-jejunostomy (HJ).

2. Case presentation

A 65-year-old woman was admitted to our institution with a tumor of the pancreatic head. Endoscopic fine needle aspiration confirmed pancreas head ductal adenocarcinoma.

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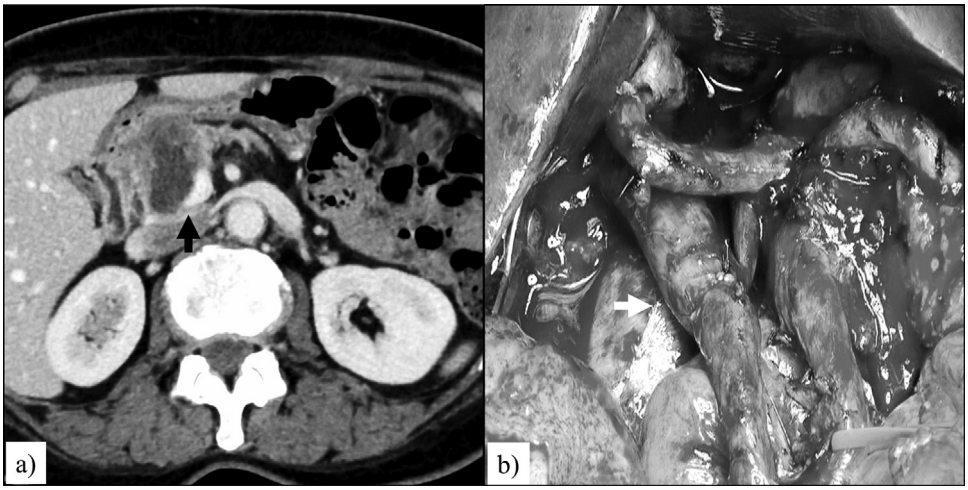

Fig 1. Enhanced computed tomography findings.
(a) Black arrow, pancreas head carcinoma has invaded SMV. (b) White arrow, resection and anastomosis of involved SMV combined with pancreaticoduodenectomy.

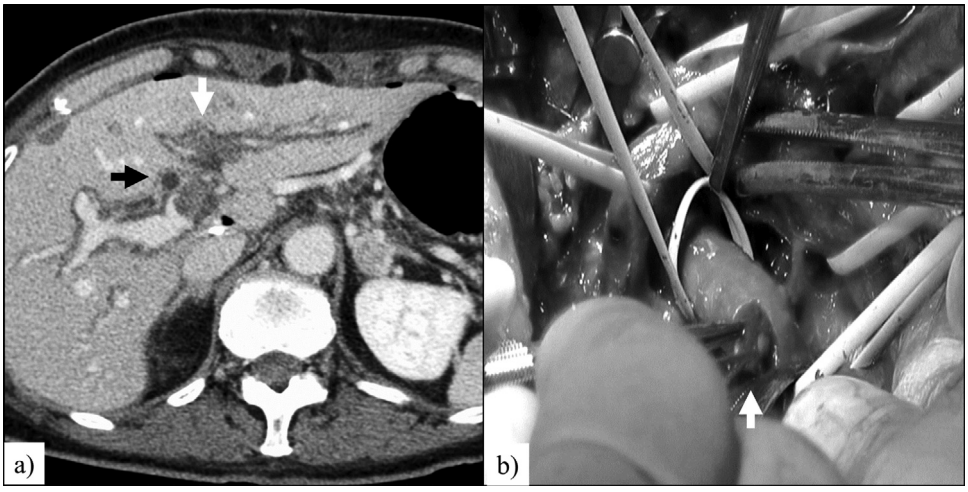

Fig. 2. Postoperative enhanced computed tomography findings at day 5 after PD.
(a) Black arrow, anastomotic stricture has caused dilated intrahepatic duct; white arrow accompanying complete thrombosis of left liver. (b) White arrow, removal of a part of the portal vein thrombosis.

The main PA involved the superior mesenteric vein (SMV; Fig. 1a) and PD combined with SMV and vascular anastomosis was scheduled. Distant tumor metastasis was not evident and thus the scheduled operation proceeded followed by direct anastomosis of the portal trunk and the SMV (Fig. 1b). R0 resection was achieved without tumor exposure at the dissection plane. Intraoperative Doppler ultrasonography confirmed sufficient flow in the intrahepatic portal vein (PV) and artery. The size of the orifice of the hepatic duct stump was about 10 mm and the HJ was achieved by end-to-side anastomosis using 5-0 absorbable surgical thread. Twisting or narrowing of the anastomotic site was not evident at that time.

Hyperbilirubinemia was confirmed on day 1 after PD and total bilirubin values progressively increased to 13 mg/dL on day 5 after PD. The entire intrahepatic bile duct was dilated and we suspected an occluded anastomotic site. Follow-up ultrasonography showed decreased left PV flow and enhanced computed tomography at day 5 showed complete portal thrombosis of the left liver (Fig. 2a). Emergency surgery for the biliary stricture and PV thrombosis immediately proceeded on the same day. Macroscopic assessment of the intraoperative findings did not show showed a constricted HJ, but the sutures were removed and the HJ was re-anastomosed with careful placement of an intraductal tube biliary stent. We then attempted thrombectomy via the umbilical portal vein or the main portal trunk under cut-down, but little thrombus was removed (Fig. 2b). We considered that the intra-portal thrombosis might be organized, and if so, it would be very difficult to mechanically remove during surgery. The thrombectomy was not sufficient enough to allow good portal flow. We therefore administered 15,000 units of intravenous heparin for 10 days followed by oral warfarin to dissolve the PV thrombosis. This approach dramatically improved obstructive jaundice and obliterated the organized thrombosis by day 30 (Fig. 3). Thus, the patient was discharged on day 31 without any further complications. The post-operative course followed up at an out-patient clinic was uneventful.

3. Discussion

The cause and mechanism of PVT after PD in the present patient could not be defined, but PV reconstruction can result in PVT by transient occlusion [3–5]. However, Doppler ultrasonography confirmed intrahepatic portal flow. The wide lymphadenectomy around the portal vein might also have caused PVT via mechanical injury caused by holding or lifting the portal vein. Considering these operative procedures, the subsequent events might have been avoided. The PV anastomosis required no more than 20 min