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Preoperative segmental embolization of the proper hepatic artery prior to pylorus-preserving pancreaticoduodenectomy: A case report

Masanobu Taguchi[a,*], Naohiro Sata[a], Yuji Kaneda[a], Masaru Koizumi[a], Masanobu Hyodo[a], Alan Kawarai Lefor[a], Hirotoshi Kawata[b], Yoshikazu Yasuda[a]

[a] Department of Surgery, Jichi Medical University, 3311–1 Yakushiji, Shimotsuke, Tochigi 329–0498, Japan
[b] Department of Pathology, Jichi Medical University, Japan

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ABSTRACT

INTRODUCTION: Radical resection of bile duct carcinoma may require resection of hepatic arteries. Preoperative segmental embolization of the hepatic artery for resection of hilar cholangiocarcinoma has been reported. We report a patient with bile duct carcinoma infiltrating the proper hepatic artery.
PRESENTATION OF CASE: A 66-year old male with jaundice was diagnosed with mid-distal bile duct carcinoma. A replaced left hepatic artery originated from the left gastric artery. Pylorus-preserving pancreaticoduodenectomy (PPPD) with combined resection of hepatic artery was planned. To promote the development of collateral blood flow after excision of the hepatic artery, preoperative segmental embolization of the proper hepatic artery was performed. The patient underwent PPPD with concurrent resection of the common hepatic, right hepatic, and middle hepatic arteries without arterial reconstruction. He received adjuvant chemotherapy with gemcitabine for six months and is alive three years after surgery without tumor recurrence.
DISCUSSION: The growth of collateral vessels after selective embolization of the proper hepatic artery has been used for hilar lesions and bile duct lesions. Resection of the hepatic artery without the need for complex arterial reconstruction, allowing a radical resection, may have contributed to this patient's relatively unremarkable recovery and long-term survival. Retroperitoneal mobilization of the pancreatic head and duodenum must be limited as important collaterals may originate in that area.
CONCLUSION: Preoperative segmental embolization of the hepatic artery before PPPD for a patient with a replaced left hepatic artery encouraged the growth of collateral blood supply, allowing radical resection including the vessels and obviated the need for arterial reconstruction.

1. Introduction

A radical resection by pancreaticoduodenectomy (PD) or pylorus-preserving PD (PPPD) is the only way to achieve a complete cure of mid-distal bile duct carcinoma. Bile duct carcinoma often infiltrates surrounding tissues with invasion of hepatic arteries and the surrounding neural plexus [1]. In this situation, a combined resection of hepatic arteries is needed to perform a radical resection [2]. The need for hepatic artery reconstruction is a source of controversy, which greatly complicates the operative procedure, in part because anomalies of the hepatic arteries are common [3,4]. There are many patterns of tumor infiltration to the hepatic arteries and many patterns of hepatic collateral vessels.

We report a patient with bile duct carcinoma, which was suspected to infiltrate the proper hepatic artery with a replaced left hepatic artery. We have previously reported the efficacy of preoperative segmental embolization of the proper hepatic artery for the resection of hilar cholangiocarcinoma with left hepatectomy [5]. Applying this strategy, the patient underwent preoperative segmental embolization of the proper hepatic artery to encourage the development of collateral pathways and then performed a PPPD with concurrent resection of the proper hepatic artery.

2. Presentation of Case

The patient is a 66-year old male who previously underwent cholecystectomy secondary to cholecystitis. He presented to an outside clinic with jaundice and was diagnosed with bile duct carcinoma after evaluation. He underwent endoscopic retrograde biliary drainage and was referred to our institution. Physical examination showed a generally healthy appearing man with jaundice. There were no significant findings on the physical examination.

Abbreviations: CT, computed tomography; PPPD, pylorus preserving pancreaticoduodenectomy; PD, pancreaticoduodenectomy.

* Corresponding author. Tel.: +81 285 58 7371; fax: +81 285 44 3234.
E-mail address: tcvtag@jichi.ac.jp (M. Taguchi).

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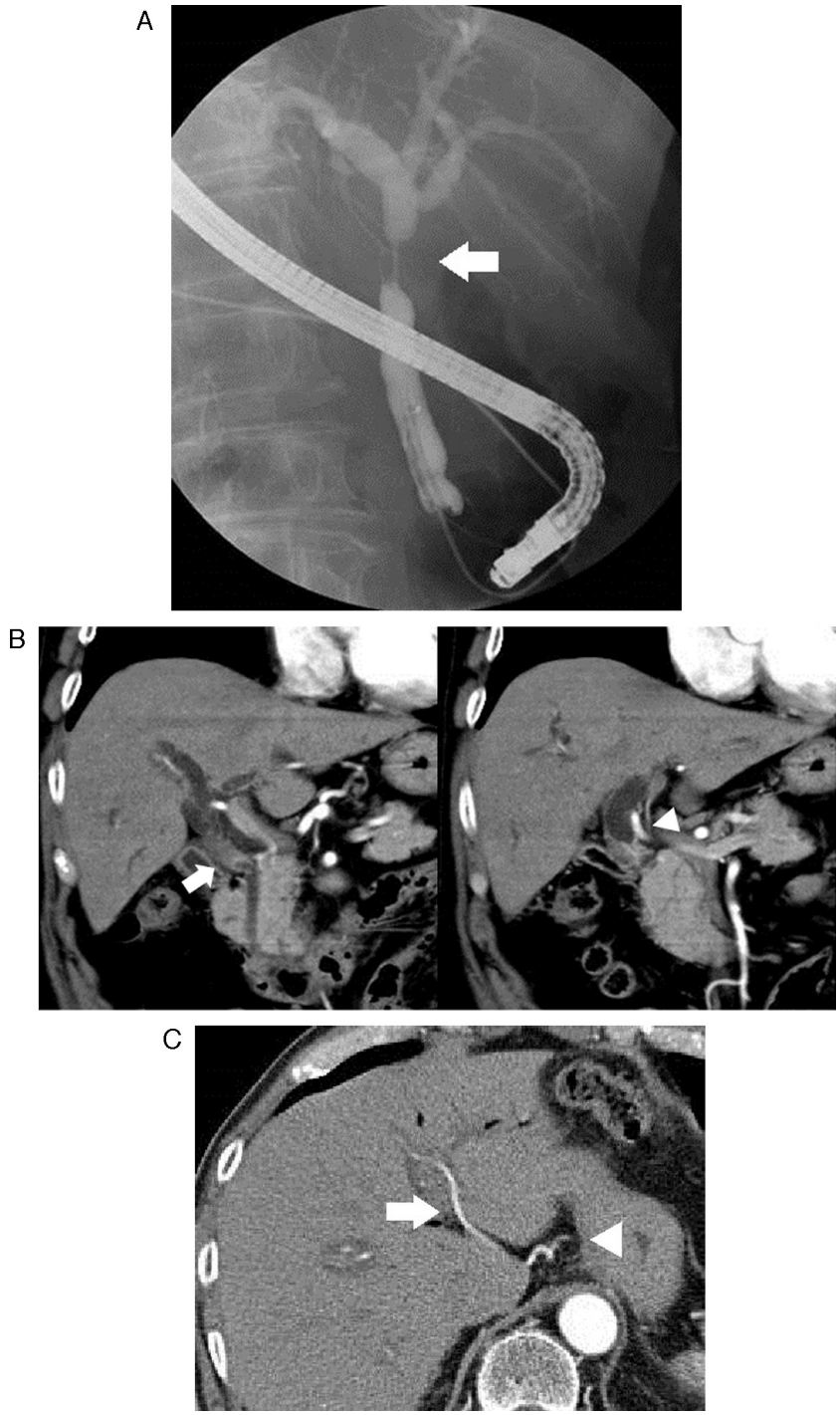

Fig. 1. Preoperative imaging studies.
(A) Endoscopic retrograde cholangiopancreatography showed an approximately 2 cm stricture of the common bile duct (arrow).
(B) The tumor is seen to be infiltrating the upper pancreas (arrow) and is very close to the proper hepatic artery (arrowhead).
(C) Axial image of contrast-enhanced CT scan showed that the left hepatic artery (arrow) originated from the left gastric artery (arrowhead).

Serum chemistries showed a total bilirubin 3.2 mg/dl, alanine transaminase 150 mU/ml, aspartate transaminase 80 mU/ml, carbohydrate antigen 19–9 130 U/ml, and carcinoembryonic antigen 2.7 ng/ml. Endoscopic retrograde cholangiopancreatography showed an approximately 2 cm stricture in the mid-distal bile duct (Fig. 1A). Contrast-enhanced CT scan revealed existence of tumor in mid-distal bile duct infiltrating to upper pancreas and the distance between tumor and the proper hepatic artery was as close as 3 mm and infiltration was suspected (Fig. 1B). A replaced left hepatic artery originated from the left gastric artery (Fig. 1C). Bile duct biopsy showed well differentiated adenocarcinoma.

We planned to perform PPPD with combined resection of the hepatic artery, rather than hepatectomy, as a radical resection due to the invasion of the pancreas seen on imaging studies. In order to promote the development of collateral blood flow from the replaced left hepatic artery to the right side of the liver after excision of the hepatic artery, preoperative segmental embolization of the proper hepatic artery with coils was performed (Fig. 2A). There