Embolization of the Replaced Common Hepatic Artery Before Surgery for Pancreatic Head Cancer: Report of a Case

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Abstract
We report the case of a patient with pancreatic head cancer, whose replaced common hepatic artery (RCHA) arose from the superior mesenteric artery (SMA). We performed preoperative embolization of the RCHA, after which the liver blood flow was well maintained by the left gastric artery. The patient underwent a radical operation involving en bloc resection of the RCHA without any serious complications.

Key words Embolization of hepatic artery · Replaced common hepatic artery · Pancreatic head cancer · Collateral pathway · Interventional radiology

Case Report
A 73-year-old man was referred to our hospital for investigation and treatment of a tumor in the head of pancreas, which was found incidentally on a CT scan done after he presented to a local hospital with pain in his lower extremities. Physical examination revealed no abnormalities, but his serum carbohydrate antigen, CA19-9, was remarkably elevated at 481.4 U/ml. A diagnosis of carcinoma of the head of the pancreas was made, but serial CT arterial images revealed that the RCHA branched from the SMA (Fig. 1a), and was surrounded by the tumor (Fig. 1b). No nodal, hepatic, or peritoneal metastasis was detected. The surgeons decided to perform a radical pancreateoduodenectomy with en bloc resection of the RCHA. Therefore, preoperative embolization of the RCHA was done to increase collateral blood flow to the liver, and prevent ischemic complications such as liver necrosis.

Angiography was done using a 5-F angiographic catheter (Medikit, Tokyo, Japan) and a 5-F sheath (Supersheath; Medikit) via the right femoral artery. Celiac arteriography demonstrated only the splenic, left gastric, and right inferior phrenic arteries, but there was no aberrant left hepatic artery originating from the left gastric artery (Fig. 2a). The RCHA originated from the SMA (Fig. 2b). We advanced a microcatheter (Rapid Transit 2; Johnson & Johnson, New Brunswick, NJ, USA) superselectively into the RCHA, which was embolized with several platinum microcoils (Trufill; Johnson & Johnson) (5–6 mm in diameter, 10–50 mm in length) (Fig. 2c). The posterior superior pancreaticoduodenal artery was also embolized with microcoils (Trufill and Tornade; Cook, Bloomington, IN, USA) (2–3 mm in diameter, 6–40 mm in length). A postembolization celiac arteriography showed the proper hepatic artery via the left gastric artery (Fig. 3a). No complications occurred during or after the embolization, and the levels of serum aspartate aminotransferase...
and alanine aminotransferase did not increase. Arteriography was done again on postembolization day 10. The arterial blood flow to the liver was maintained through the enlarged left and right gastric artery (Fig. 3b). There was no apparent blood flow to the liver from the right inferior phrenic artery. On postembolization day 12, pancreaticoduodenectomy with en bloc resection of the RCHA was performed. At surgery, the left and right gastric arteries were easily palpable. The pathological diagnosis of the pancreatic lesion was invasive ductal carcinoma of the moderately differentiated type. On histological examination, the RCHA was filled with fresh thrombi induced by the microcoils (Fig. 4). The patient had an uneventful postoperative course and there were no complications related to hepatic ischemia. He was discharged on postoperative day 33.