Distal Gastrectomy with Reconstruction of the Right Gastroepiploic Artery for Gastric Cancer After Coronary Artery Bypass Grafting: Report of a Case

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Abstract
A 61-year-old man was found to have anemia 3 years after an aortic valve replacement (AVR) and coronary artery bypass grafting (CABG) of the left intrathoracic artery to the left anterior descending artery and the right gastroepiploic artery (RGEA) to the right coronary artery (RCA) for aortic insufficiency and angina pectoris. A IIc gastric cancer in the antrum was subsequently diagnosed. Computed tomography (CT) and coronary angiography showed lymph node metastasis at the root of the RGEA, which perfused a large area of the inferoposterior wall of the heart. To prevent cardiac ischemia and perform complete #6 lymph node dissection, percutaneous intervention was carried out on the RCA before distal gastrectomy with D2 lymph node dissection, and the RGEA was reconstructed as a free graft to the left gastric artery. This procedure may be a surgical option for gastric cancer in patients who have undergone CABG using the RGEA.

Key words Coronary artery bypass grafting · Gastric cancer · Gastroepiploic artery · Distal gastrectomy · Computed tomographic angiography

Introduction
The right gastroepiploic artery (RGEA) and the internal thoracic arteries are preferentially used in coronary artery bypass graft (CABG) surgery for their superior long-term patency. However, the development of gastric cancer after CABG using the RGEA is a major concern, because of the detailed strategy necessary to perform complete #6 lymph node dissection and prevent cardiac ischemia. We describe how we performed distal gastrectomy with D2 lymph node dissection and free autografting of the RGEA to the left gastric artery (LGA) in a patient found to have gastric cancer several years after CABG.

Case Report
A 63-year-old man was found to be slightly anemic during a routine follow-up examination 3 years after an aortic valve replacement and CABG of the left intrathoracic artery to the left anterior descending artery and the RGEA to the right coronary artery (RCA) for aortic insufficiency and angina pectoris. An upper gastrointestinal (GI) endoscopy, done to rule out GI bleeding, showed a small depressed mucosal lesion (a IIc lesion) on the posterior wall of the antrum and histological examination of a biopsy specimen confirmed a diagnosis of moderately differentiated adenocarcinoma. He was hospitalized for further evaluation of the gastric cancer and cardiac function.

The patient was 165 cm tall and weighed 58 kg. Apart from a hemoglobin value of 9.5 g/dl and a carcinoembryonic antigen (CEA) value of 28.5 ng/ml, laboratory data were normal. A preoperative double-contrast barium swallow study showed a IIc lesion in the stomach. Preoperative computed tomography (CT) showed apparent #3 and #6 lymph node metastasis and the posterior wall of the antrum was stained on contrast enhancement. Coronary arteriography revealed severe stenosis of the RCA and LCA (#1, 90%; #2, 75%; #3, 99%; #4, PD 50%; #6, 50%; #7, 90%), but both bypasses were patent (Fig. 3A). The RGEA-RCA bypass perfused a large area of the inferoposterior wall of the heart. To prevent cardiac ischemia during surgery, percutaneous coronary intervention (PCI) was done in advance. We performed balloon dilation and rotablation to #1, #2, #3, #4 PD and #3–4 PL, then placed bare metal stents, which restored native coronary flow after...
PCI (Fig. 3C). After 2 weeks of antiplatelet therapy, the patient underwent distal gastrectomy with D2 lymph node dissection and RGEA reconstruction.

A three-dimensional (3-D) CT showed that the RGEA graft had adhered to the abdominal wall (Fig. 4), so we performed upper median laparotomy carefully to avoid damaging it. The graft was dissected carefully from the abdominal wall up to the point where it penetrated the diaphragm. There was no evidence of ascites, peritoneal dissemination, or liver metastasis. The tumor was slightly palpable in the posterior wall of the antrum, but it had not infiltrated the serosa. The #3 and #6 lymph nodes were enlarged and the root of the RGEA was completely consumed by the #6 lymph nodes. We ligated the RGEA at the bifurcation of the gastroduodenal artery and 6 cm distal from this point, in order to dissect the #6 lymph nodes en bloc with the proximal part of the RGEA. The remaining distal RGEA was clamped with bulldog forceps, which were intermittently opened to allow backflow and prevent coagula-

Fig. 1. Preoperative gastrointestinal endoscopy showed an irregular open ulcer with fold convergence in the lesser curvature of the lower gastric body. The lesion was not stained by indigo carmine.

Fig. 2. Preoperative computed tomography showed apparent #6 lymph node swelling (arrow) at the origin of the right gastroepiploic artery graft.

Fig. 3. A Preoperative coronary angiography showed severe stenosis of the right coronary artery. B The right gastroepiploic artery graft was patent. C Native coronary flow was restored after percutaneous coronary intervention.