Pancreatodudodenectomy after coronary artery bypass grafting with use of an in situ right gastroepiploic artery graft

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Abstract

Nowadays more old and comorbid patients, such as patients with a history of multiple coronary artery bypass grafting (CABG), are surgical candidates for pancreaticoduodenectomy (PD) [1]. Harvesting of the right gastroepiploic artery (RGEA) is one of the most commonly used methods when multiple CABGs are required. We report a case of pancreaticoduodenectomy performed in a patient who had the RGEA used as an in situ graft for CABG. The RGEA was successfully preserved, with an uneventful postoperative course.

Keywords: Pancreatodudodenectomy • Coronary artery bypass grafting • Right gastroepiploic artery • Pancreatic adenocarcinoma • Lymphadenectomy • Skeletonization

INTRODUCTION

Nowadays more old and comorbid patients, such as patients with a history of multiple coronary artery bypass grafting (CABG), are surgical candidates for pancreaticoduodenectomy (PD) [1]. Harvesting of the right gastroepiploic artery (RGEA) is one of the most commonly used methods when multiple CABGs are required [2]. However, the RGEA is classically ligated along with the gastroduodenal artery (GDA) during a radical PD performed for adenocarcinoma of the pancreatic head. We report the case of PD performed with the preservation of a right gastroepiploic artery graft (RGEAG).

CASE REPORT

A 71-year-old male patient with a 5-cm moderately differentiated pancreatic head adenocarcinoma was referred to our centre. Past medical history included a quadruple CABG for ischaemic cardiomyopathy with an RGEAG 8 years before. Preoperative cardiovascular exploration, including coronarography, demonstrated good patency of the RGEA, which was anastomosed to the posterior descending coronary artery. Given that no signs of GDA invasion were present at the preoperative imaging, a PD with preservation of the RGEA was planned.

Abdominal exploration revealed a 7-mm well-pulsating RGEAG passing behind the pylorus, over the anterior surface of the left hepatic lobe and reaching the pericardium through a diaphragmatic window localized 5 cm anterior to the oesophageal hiatus (Fig. 1A). Full mobilization of the duodenum and of the pancreatic head was obtained by using the Kocher manoeuvre. An extended lymphadenectomy was performed around the hepatic pedicle and along the coeliac trunk and the right side of the superior mesenteric artery. The GDA and the RGEA were preserved after ligation of the anterior and posterior superior pancreaticoduodenal arteries (Fig. 1B). After gastric, biliary and pancreatic transection, a complete excision of the retroportal lamina was performed. Digestive reconstruction was performed by pancreaticogastrostomy, hepaticojejunostomy and gastrojejunostomy.

On pathological examination, a moderately differentiated ductal adenocarcinoma was found, which was invading the peripancreatic fat tissue, with a single metastatic lymph node (one of 33).

The postoperative course was uneventful, and the patient was discharged on the 14th postoperative day.

DISCUSSION

Pancreatodudodenectomy is a morbid procedure, but it remains the only chance for cure in patients with resectable adenocarcinoma of the pancreatic head [1]. A significant number of patients undergoing PD have a previous history of multiple CABG, and the presence of an RGEA provides a noteworthy technical challenge for pancreatic surgery.

Right gastroepiploic artery grafting has proven good clinical results, and this constitutes the arterial graft of first choice for right coronary artery bypass surgery. The RGEA has histological similarity to the internal thoracic artery and is characterized by greater resistance to atherosclerosis [3]. Two major methods of harvesting a RGEA are used, namely a pedicled graft and a skeletonized graft. The latter is more commonly employed.
Only two reports have described PD in the presence of CABG with RGEAG [4, 5]. In both cases, resection of the RGEAG was followed by revascularization using an interposed saphenous vein graft. However, when the GDA has not been invaded, as in the present case, the RGEAG can be preserved without compromising the oncological principles of pancreatic surgery. A detailed preoperative analysis of the surgical anatomy of the coeliac and pancreaticoduodenal region is necessary in order to clarify the preoperative strategy. This can be obtained by combining computed tomography with vascular reconstruction and coronarography. Computed tomography excludes the presence of direct tumoural infiltration of the GDA, whereas coronarography demonstrates the patency of the RGEAG, thereby indicating whether it can be preserved, ligated or reimplanted using saphenous graft.

Intraoperatively, safe handling of the RGEAG that avoids any stretching, bending or damage to the graft is mandatory. Graft injuries may suddenly cause critical complications, such as coronary failure and fatal arrhythmia. Prevention of vessel spasm should be carried out, together with adequate monitoring of the systemic circulation. In order to avoid postoperative graft dissection, fine suture ligation rather than metallic clips is preferred to control bleeding spots, and any sort of kinking or twisting should be avoided.

In conclusion, the presence of CABG using an RGEAG should not be considered as a contraindication to PD. This conduit can be preserved while respecting the principles of oncological pancreatic surgery.

**Conflict of interest:** none declared.

**REFERENCES**