Segmental Resection of the Third Portion of the Duodenum for a Gastrointestinal Stromal Tumor: a Case Report

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Received March 31, 2003; accepted June 18, 2003

We describe a case in which segmental resection of the third portion of the duodenum was performed for a gastrointestinal stromal tumor (GIST). A 31-year-old woman was found to have a 3.5 cm hypovascular tumor at the posterior inferior aspect of the pancreatic head. Preoperative duodenal biopsy revealed that the tumor was positive for c-kit and vimentin, and was diagnosed as a duodenal GIST. Segmental resection of the third portion of the duodenum with papilloplasty and duodenojejunostomy was carried out and there were no postoperative complications. Pancreatoduodenectomy is not always necessary in the treatment of a duodenal GIST. This duodenectomy procedure can serve as a less extensive resection for a duodenal GIST located in the third portion of the duodenum.

Key words: GIST – duodenectomy – less extensive – papilloplasty

INTRODUCTION

Surgical resection is given the first preference in the treatment of gastrointestinal stromal tumors (GIST) (1–4). Duodenal GIST comprises 4.5% of all GISTs (1), but the optimal surgical procedure for duodenal GIST remains unclear (5). Since GISTs grow expansively and rarely give rise to lymph node metastases (3–6), pancreatoduodenectomy, which has been used to treat about 40% of the reported duodenal GISTs (5), may be an excessive means of treating this disease. On the contrary, pancreas-sparing duodenectomy has only been performed in a few institutions, because the procedure requires precise anatomical knowledge of the pancreatic head (7–10). In this study, we describe a case in which segmental resection of the third portion of the duodenum, and papilloplasty were successful in treating a duodenal GIST.

CASE REPORT

An asymptomatic 31-year-old woman was admitted to our department for the treatment of a tumor in the inferior head of the pancreas. A computed tomography (CT) scan demonstrated a well-demarcated round tumor, measuring 3.5 cm in diameter at the posterior inferior aspect of the pancreatic head, which was compressing the inferior vena cava (Fig. 1). An abdominal ultrasound examination showed intratumoral hypoechoic components that suggested cystic parts of the tumor, and definite tumor staining from the inferior pancreaticoduodenal artery was observed on an angiogram. Endoscopic examination revealed an elevated lesion, resembling a smooth muscle tumor with two small ulcers, which was located 1 cm distal to the ampulla of Vater. A diagnostic duodenal biopsy and immunohistochemical staining revealed that the tumor was positive for c-kit and vimentin, and resulted in a histological diagnosis of GIST with a low-grade malignancy potential.

An intraoperative ultrasonography also showed a well-demarcated hypoechoic tumor in the inferior head of the pancreas, and mobilization of the duodenum revealed a tumor protruding from the duodenal wall, posterior to the head of the pancreas. The inferior portion of the pancreatic head was dissected from the duodenal wall, thus severing the duodenal branches of the anterior inferior pancreaticoduodenal vessels (Fig. 2). The tumor-feeding branches of the posterior inferior pancreaticoduodenal vessels were ligated and divided at the posterior aspect of the pancreatic head (Fig. 3). The duodenum was first divided 2 cm distal to the tumor, and the proximal dissection was performed just below the ampulla of Vater and 5 mm proximal to the tumor. The ampulla of Vater was preserved on the duodenal wall, but since it was very close to the duodenal margin, we performed a papilloplasty in order to secure exocrine outflow through the papilla. A stenting catheter was introduced into the bile and the pancreatic ducts through the cystic duct and jejunal loop, respectively, and a side-to-end
duodenojejunostomy was performed (Fig. 4). The operation time was 5 h 15 min, and blood loss was 160 ml. The postoperative course was uneventful, and the patient was discharged 1 month after surgery.

DISCUSSION

GISTs are low-grade malignant tumors that may arise anywhere in the alimentary tract, and in the past, most of them were diagnosed as intestinal leiomyoma or leiomyosarcoma (1). Recently, they have been classified as c-kit- or CD34-positive mesenchymal tumors based on immunohistochemical and electronmicroscopic approaches (11). GISTs grow expansively without being invasive, and sometimes metastasize to the liver and recur locally (2–4). Surgery with negative surgical margins and no tumor rupture is a necessary and adequate means of treating such tumors. Extensive lymph node dissection is unnecessary, because GISTs rarely metastasize to the regional lymph nodes (1–4). When technically feasible, this makes duodenal resection preferable to pancreatoduodenectomy (5). However, the optimal surgical treatment for duodenal GISTs has never been fully assessed.

Recent anatomical knowledge of the head of the pancreas (12) has facilitated various methods of pancreatic resection for low-grade malignancies (13–15), and duodenal resection preserving the pancreatic head can now be performed safely. In
our patient, the most important surgical clues for successful duodenal resection were the dissection of the tumor from the posterior segment of the pancreatic head resulting in severing the duodenal branches of the anterior and posterior inferior pancreaticoduodenal vessels, because the tumor appeared to involve the pancreatic parenchyma on preoperative imagings. Papilloplasty was an adequate means of securing the bile and pancreatic ducts’ patency, because the duodenojejunal anastomosis line was very close to the ampulla of Vater.

Duodenal resection is rarely indicated, except in the case of duodenal GISTs and early-stage adenocarcinoma. However, segmental resection of the third portion of the duodenum, preserving the pancreatic head, should be beneficial for patients since it does not involve the excessive resection associated with pancreatoduodenectomy.

References