Clinical Cases

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A Posterior Approach Pancreaticoduodenectomy with Portal Vein Resection in a Large Adenocarcinoma of the Uncinate Process of the Pancreas - Case Report

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Rezumat

Duodenopancreatectomie cefalică prin abord posterior, în bloc cu rezecție de venă portă pentru adenocarcinom voluminos de proces uncinat pancreatic - prezentare de caz

Invazia de venă portă nu mai este considerată la momentul actual ca și contraindicație pentru rezecție în cancerul de pancreas, dar se poate însoți de rate crescute de complicații și mortalitate postoperatorie. Este prezentat cazul unei paciente diagnosticate cu o tumoră voluminoasă la nivelul procesului uncinat pancreatic, căreia i s-a practicat duodenopancreatectomie cefalică prin abord posterior, în bloc cu rezecție parcelară de venă portă, și excizie completă de mezopancreas. Un abord posterior permite obținerea unei piese de rezecție cu margini negative, cu un bun control local al bolii, în pofida dimensiunii crescute, invaziei venoase și localizării tumorii.

Cuvinte cheie: cancer de pancreas, duodenopancreatectomie, abordul primar al arterei mezenterice superioare, rezecția de venă portă

Abstract

A portal vein invasion is no longer a contraindication for resection in pancreatic cancer, but increased morbidity and mortality rates can be encountered. Hereby it is presented the case of a patient diagnosed with a large adenocarcinoma of the uncinate process of the pancreas, who underwent a posterior approach pancreaticoduodenectomy, with en bloc tangential resection of the portal vein, and total mesopancreas excision. A posterior approach allows a negative resection margins pancreaticoduodenectomy, with a good local control of the disease, despite the increased tumor size, tumor location, and vascular involvement.

Key words: pancreatic cancer, pancreaticoduodenectomy, artery first approach, portal vein resection

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Introduction

Pancreatic cancer has a dismal prognosis because most of the patients presents with advanced disease. Thus, up to 90% of

the patients are diagnosed with locally advanced and/ or systemic diseases (1). Invasion of the portal/ superior mesenteric vein is no longer a contraindication for resection in pancreatic cancer, if a safe venous reconstruction is possible (2). Recent studies have shown that a venous resection during pancreaticoduodenectomy might be associated with increased mortality and morbidity rates, compared with the patients without a venous resection (2,3). However, no differences of survivals were observed between patients with pancreaticoduodenectomies for pancreatic cancer, with and without a venous resection (2,3). Nevertheless, histological proof of a venous invasion predicts a poor survival (3).

Over the years, there were proposed several modifications of the technique for pancreaticoduodenectomy, with the aim to facilitate a venous resection and a safe reconstruction (4-6). The posterior approach takes part from a broad spectrum of technical refinements of the standard pancreaticoduodenectomy, classified as "artery first" approaches (7).

Hereby it is presented the surgical approach in a patient diagnosed with a large adenocarcinoma of the uncinate process of the pancreas, with suspected portal vein invasion. The patient underwent a posterior approach pancreaticoduodenectomy, with en bloc tangential resection of the portal vein, and total mesopancreas excision.

Case report

A 59-year old Caucasian female patient presented in emergency with jaundice, upper abdominal pain, weight loss (5 kg in 3 months) and loss of the appetite. Clinical examination reveals a palpable gallbladder and mild tenderness in the right hypochondrium.

Her medical history included a severe form of essential thrombocytosis (diagnosed 5 years ago, under treatment with anagrelide), de Quervain thyroiditis and pulmonary tuberculosis (treated in childhood).

The blood laboratory tests confirmed the biliary obstruction (total bilirubin = 12 mg/ dl, direct bilirubin = 9.5 mg/dl; alkaline phosphatase = 970 U/ L); no other abnormalities were observed except for the thrombocytosis (700,000/ microliter). The CA 19-9 serum level was slightly elevated (57 U/ ml).

The contrast enhanced computed tomography revealed a large tumor mass (6 cm maximal diameter), located to the uncinate process of the pancreas, with extension to the pancreatic head, involving the distal common bile duct, with secondary bile duct and Wirsung duct dilation; the tumor had interface with the superior mesenteric artery, but a close relationship to the portal vein was observed; the tumor compressed the inferior vena cava without invasion; no distant metastases were observed (Fig. 1).

The ultrasound endoscopy examination confirmed the tumor of the uncinate process of the pancreas, without an involvement of the superior mesenteric artery, but no interface with the portal vein was observed. Fine needle biopsy was performed, and the diagnosis of adenocarcinoma was established.

A multidisciplinary approach committee for digestive cancers established in the hospital ruled in favor of surgical exploration and resection, without any prior biliary stent or neoadjuvant treatment.

At laparotomy, macroscopically distant metastases to the liver or peritoneum were ruled out. After an extensive Kocher maneuver, the tumor appeared to encase the superior mesenteric vessels (Fig. 2).

Intraoperative ultrasound examination showed an intimate contact of the tumor with the portal vein in a limited area, but no invasion of the superior mesenteric artery was observed. A posterior approach pancreaticoduodenectomy was initiated with a technique that was previously described (5,8). Thus, it was confirmed that the tumor did not involve the superior mesenteric artery. The right hemi circumference of the superior mesenteric artery was gradually freed from the retroportal lamina harboring the tumor, with complete mesopancreas excision (Fig. 3, A).

Without any attempt to detach the portal vein from the tumor, the common bile duct and the pancreatic isthmus were divided. Finally, the pancreatic head with the tumor was only attached to a limited posterior right area of the portal vein (Fig. 2). Thus, the operative specimen (i.e., pancreaticoduodenectomy) was removed en bloc with a tangential posterior right resection of the portal vein. The venous defect was sutured without any graft.

Digestive reconstruction was performed using a continuous

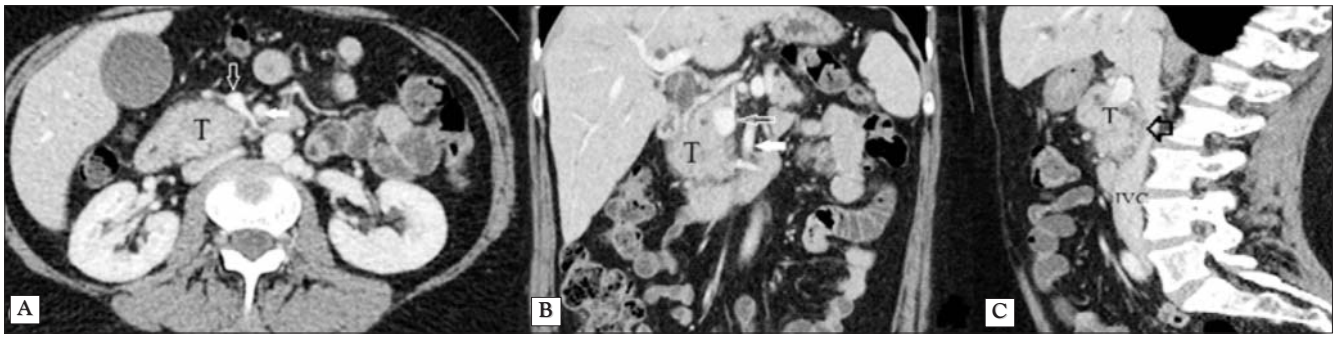

Figure 1. *Contrast enhanced computed tomography aspects of a tumor of the uncinate process of the pancreas:* ***(A)*** *transverse,* ***(B)*** *coronal and* ***(C)*** *sagittal sections (T – tumor; IVC – inferior vena cava; the white open arrow shows the portal vein and the white filled arrow shows the superior mesenteric artery; the black arrow shows the tumor compression of the inferior vena cava)*

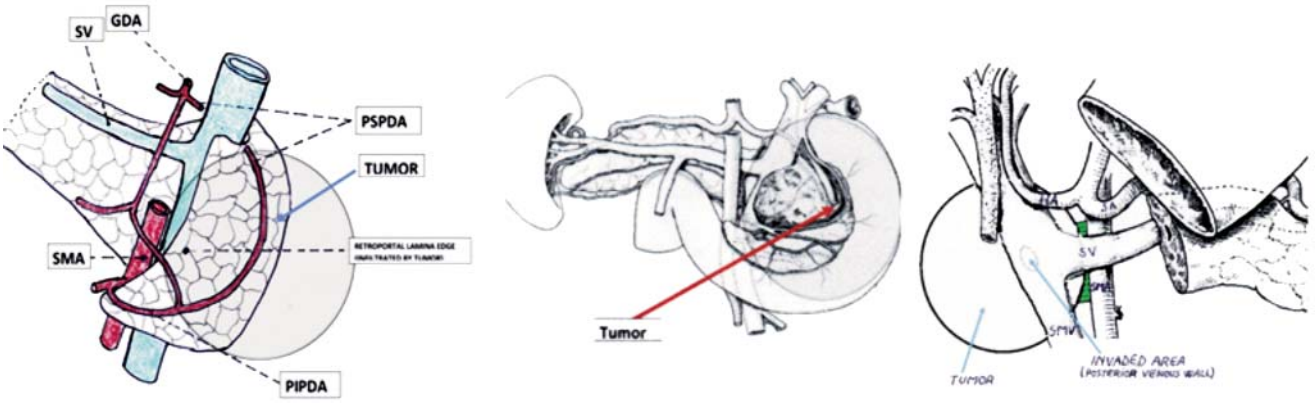

Figure 2. *Schematic representation of the pancreatic tumor and its relationship with the surrounding structures (SMA – superior mesenteric artery; SMV – superior mesenteric vein; SV – splenic vein; GDA – gastro-duodenal artery; PIPDA – posterior-inferior pancreatico-duodenal artery; PSPDA – posterior-superior pancreatico-duodenal artery)*

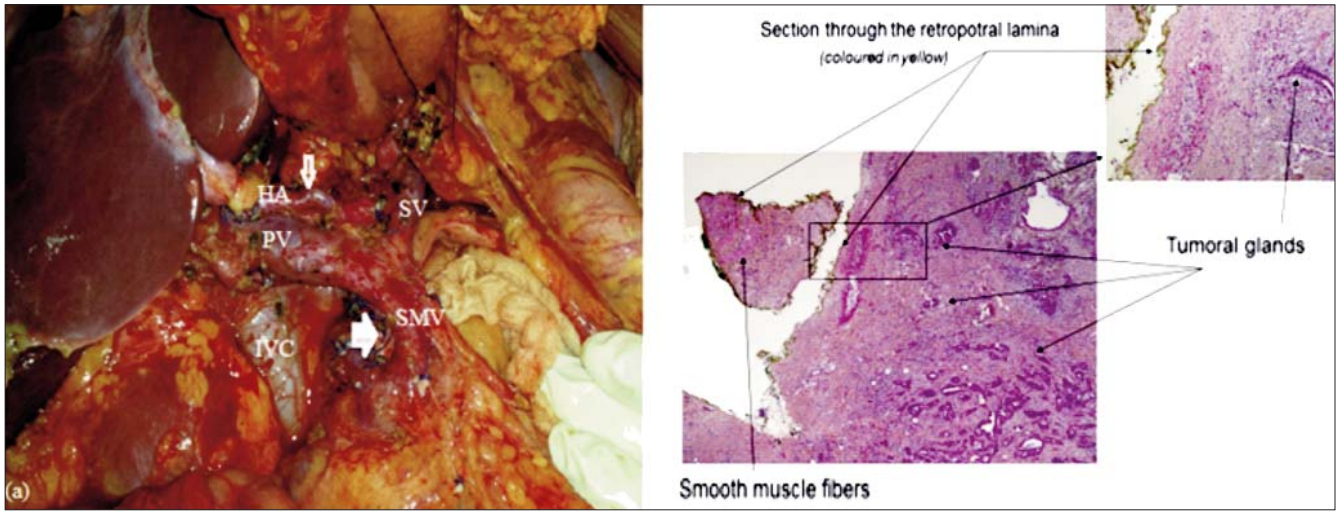

Figure 3. ***(A)*** *Intraoperative final aspects after pancreaticoduodenectomy (SMV – superior mesenteric vein; PV – portal vein; SV – splenic vein; IVC – inferior vena cava; HA – hepatic artery; the white open arrow shows the gastro-duodenal artery stump and the white filled arrow shows the right side of the superior mesenteric artery after total mesopancreas excision);* ***(B)*** *Histological aspects showing the presence of the tumor cells into the retroportal lamina, but with negative resection margin (Hematoxylin & eosin staining)*

jejunal loop: a duct-to-mucosa anastomosis to the remnant pancreas, with an internal stent, an anastomosis to the common bile duct and stomach.

The postoperative course was uneventful.

The anagrelide therapy for essential thrombocytosis was carried on from the postoperative day 2 via the naso - jejunal feeding tube.

The computed tomography examination in the postoperative day 7 did not identify any abnormalities.

A port - a cath was implanted in the postoperative day 21, the patient being transferred healed after surgery into the hematological ward, for treatment readjustment.

The final pathology report confirmed a 6 cm ductal pancreatic adenocarcinoma with negative resection margins (Fig. 3, B). The operative specimen was dyed after excision with four different colors for its resection margins (retro-peritoneal, portal, anterior and pancreatic cut surface). One of the 10 identified retrieved lymph nodes presented metastases. The histological examination of the resected segment of the portal vein did not identify any microscopical tumor invasion.

An adjuvant treatment with gemcitabine was completed.

At 18 months after resection the patient was alive, without any imaging signs of loco-regional recurrence, but with multiple small liver metastases. The liver metastases were detected by the imaging follow-up at 15 months after resection and a palliative chemotherapy was started.

Discussion

A posterior approach pancreatico-duodenectomy represents a relatively new technical refinement of the standard pancreaticoduodenectomy (4,5,9). An "artery-first" approach

has been proposed mainly in the context of a borderline resectable pancreatic cancer (6,7). Invasion of the portal/ superior mesenteric vein in pancreatic cancer is classified as a borderline resectable tumor (10).

A posterior approach has been demonstrated to be useful in patients submitted for a pancreaticoduodenectomy and with abnormal hepatic artery variants (11,12). Compared with the standard pancreaticoduodenectomy, a posterior approach appears to have no added morbidity, and it was associated with decreased blood loss (13,14). Furthermore, several studies have reported increased negative resection margins rates (15), decreased loco-regional recurrence rates (13) and even improved survival rates (16) after a posterior approach pancreaticoduodenectomy with total mesopancreas excision for periampullary malignancies. However, the real benefit of a posterior approach on the long-term outcome after pancreaticoduodenectomy for pancreatic cancer remains controversial (6,17,18).

A posterior approach in pancreaticoduodenectomy has been suggested to be useful for detection of the superior mesenteric artery invasion in pancreatic head cancer, in an early setting, thus, avoiding a palliative resection (5). A posterior approach has been advocated to facilitate resection for the tumors located to the uncinate processes (11).

The usefulness of a posterior approach in patients who underwent pancreaticoduodenectomy with portal/ superior mesenteric vein was highlighted in some previous papers (5,8) and was confirmed by recent studies (19).

Nevertheless, a posterior approach facilitates total mesopancreas excision in pancreaticoduodenectomy for pancreatic head cancer (15,20). Total mesopancreas excision is considered a key point to obtain negative resection margins and to reduce the local recurrence rates after resection of pancreatic cancer (15,20). The margins along the superior mesenteric artery and vein were previously demonstrated to have a prognostic value after resection for pancreatic cancer (17). However, at this time, it is hard to say that the total mesopancreas excision has the same prognostic value as the total mesorectum excision in rectal cancer (21).

Although a posterior approach pancreaticoduodenectomy has become a standard in some surgical centers (15), a selective use appears to be more appropriate (7).

In conclusion, a posterior approach allows a negative resection margins pancreaticoduodenectomy, with a good local control of the disease, despite the increased tumor size, tumor location, and vascular involvement.

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