J Ped Surg Case Reports 11 (2016) 50–54

Contents lists available at ScienceDirect

Journal of Pediatric Surgery CASE REPORTS

journal homepage: www.jpscasereports.com

A method of reconstruction after pancreaticoduodenectomy for pancreatic malignancies in very young children: Two cases reports

Angela Inviati [a,*], Marco Vito Martino Marino [a], Olena Kolesnik [b], Grigoriy Klimnuk [b], Galyna Shabat [b], Andrey Lukashenko [b], Gaspare Gulotta [a], Sebastiano Bonventre [a]

[a] Department of Surgical and Oncological Sciences, University of Palermo, Via L. Giuffrè 5, 90127 Palermo, Italy
[b] National Cancer Institut of Ukraine, 33/43 Lomonosova str., Kyiv 03022, Ukraine

ARTICLE INFO

Article history:
Received 24 January 2016
Received in revised form
7 April 2016
Accepted 9 April 2016

Key words:
Pancreatic tumors
Young children
Pancreaticoduodenectomy

ABSTRACT

Pancreatic tumors are very rare diseases in very young children. Most information about those diseases in children was published in cases reports. Due to the rare nature of pancreatic tumors in children, there remains the absence of diagnostic algorithms, clear radiographic and morphological assessments as well as evidence based best treatment options. Because of the young age of patients and the rare occurrence of pancreatic neoplasms, tumor detection remains poor. For malignancies affecting the head of the pancreas the only possibility for achieving clear surgical margins is performing a pancreaticoduodenectomy (PD). We describe two cases of diagnostic and treatment of pancreatic tumor of very young children what was done in our institute.

Pancreatic tumors are very heterogeneous neoplasms, and very rare at a young age. Represent only 0.1% of all pancreatic malignancies in children and adults younger than 20 years of age [1]. The main histological types of pancreatic malignancies, among children, are: solid pseudopapillary tumors (SPTs), pancreatoblastomas, acinar cell carcinomas, neuroendocrine tumors, sarcomas and lymphomas [2–4]. The 5-year overall survival is approximately 88% for SPTs, 66% for pancreatoblastomas, 58% for neuroendocrine tumors, and 33% for carcinomas [3]. Despite a good prognosis, the rate of metastases and the local involvement of adjacent organs is 19.5% for SPTs and more then 33% for pancreatoblastomas at the time of diagnosis [5].

The radical surgery is the standard cure for nonmetastatic diseases, the pancreaticoduodenectomy (PD) is the best choice when the tumor is localized in the head of the pancreas.

The PD in adults is a complicated surgery that, in spite of a significantly reduced mortality, has a high morbidity, 30–50% [6,7]. The complications were related to the pancreatic remnant, such as a pancreatic fistula, anastomotic dehiscence, abscess formation, and septic hemorrhage [6,7]. In general, the PD has been avoided in children because of its technical difficulty and the problems associated with further growth and development, or chronic cholangitis and reflux gastritis. Previous reports have described the long-term effects of pancreatic function [8] and morphological changes of the pancreatic remnant [9] after a PD in adults. However, these findings have not been confirmed in children. Determination of the best pancreatic anastomosis technique and reconstruction after PD, in young children, remains to be reported [8].

Therefore, the main objective of our study was to identify a reconstruction surgical technique that can reduce complications and, in particular, to prevent pancreatic fistula.

1. Case report

1.1. Case 1

A 5-year old girl was referred to our institute with a palpable abdominal mass in the right upper quadrant. One month earlier, the patient was underwent an intraoperative biopsy of a large tumor of the pancreatic head in another center, and she was referred after adjuvant chemotherapy by us. The histological type is a SPTs. There was no history of abdominal pain or steatorrhea. On hospital admission, the serum liver enzymes, tests of pancreatic function and tumor markers were normal. An abdominal ultrasound (US) and magnetic resonance imaging (MRI) were showed a well-defined heterogeneous mass measuring about 8.5 × 7.7 × 6.7 cm^3 that encased the superior mesenteric vein (SMV) at the level of the

* Corresponding author. Tel.: +39 3396085629.
E-mail address: surgeryangela@hotmail.it (A. Inviati).

2213-5766/
http://dx.doi.org/10.1016/j.epsc.2016.04.004

inferior pancreaticoduodenal vein (IPDV) (Fig. 1 A and B). The MRI showed no metastatic lesions. Moreover, during a type 3 MRI arterial reconstruction of the hepatic artery, an anatomical variation as per Michel's classification was noted [10]. The right hepatic artery origin was by superior mesenteric artery (SMA) and was located behind the tumor. The patient was scheduled for a laparotomy.

1.2. Surgical approach

A standard bilateral subcostal (Chevron) incision was performed, the intraoperative exploration show the mass which involved the pancreatic head and adhered to the SMV at the region of the IPDV. Standard PD with distal gastrectomy and an intestinal reconstruction 'Totally isolated Roux-en-Y' was performed (Fig. 2 A and B). We chose this type of reconstruction to reduce the most feared complication of this type of surgical procedure, or the pancreatic fistula. Special attention was focused on meticulous dissection of the uncinate process from underneath the SMV and the SMA with identification and careful preservation of the variant right hepatic artery (Fig. 3).

Reconstruction times:

1 End-to-side duct-to-mucosa pancreaticojejunostomy.
2 Antecolic end-to-side gastrojejunostomy.
3 Hepaticojejunostom.
4 Braun's enteroenterostomy.

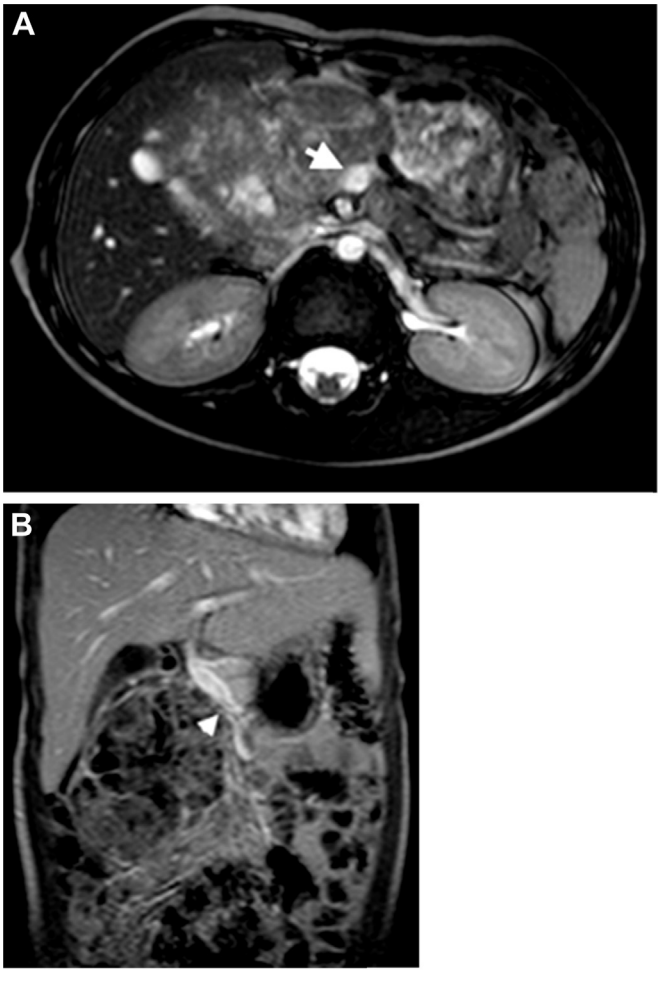

Fig. 1. (A) Case 1: Preoperative magnetic resonance imaging (MRI) showing tumor in the head of the pancreas encasing the superior mesenteric vein (arrow), (A)Axial MRI, (B) Frontal MRI. The tip of the arrow in the figure indicates the head of the pancreas tumor that wraps around the superior mesenteric vein.

5 A second enteroenterostomy "Roux-en-Y."

We have previously excluded jejunal loop, long about 40 cm, with this we have made a pancretico-jejunal anastomosis end-to-side (T-L) and entero-enteric anastomosis "Roux-en-Y." The second jejunal loop was used for gastrojejunal anastomosis, hepaticojejunostomy end-to-side, entero-enteric anastomosis according to Braun downstream of the previous anastomosis biliary and gastric, The pancreatojejunostomy was prformed through the mesocolon and in an end-to-side manner.

The incision of the jejunum was performed on the anti-mesenteric side. A small hole to match the caliber of the pancreatic duct was made using electrocautery and forceps. Interrupted sutures were placed in the inner layer using 6–0 monofilament absorbable sutures with atraumatic double-ended needles. No stenting, external or internal drainage of the pancreatic duct was performed. The second blind end that formed the jejunal loop was used for an antecolic end-to-side gastrojejunostomy. Finally, a microgastrostomy, per Witzel's method, using 4–0 absorbable interrupted sutures, was performed; this avoided the need for postoperative nasogastric intubation.

Hepaticojejunostomy was performed at the antecolic pathway on the same jejunal loop, 30 cm downstream from the gastro-jejunostomy. The remnant hepatic duct diameter was 4 mm; a typical end-to-side hepaticojejunostomy, in one-layer fashion, was put in place. Stenting, as well as external and internal drainage of the biliary duct was not performed.

In addition, a Braun anastomosis was added 10 cm downstream from the hepaticojejunostomy and then the afferent limb of the hepaticojejunostomy was closed with a linear stapler to isolate the gastric and biliary anastomoses from cross reflux and prevent back-flow of bile to the stomach. The hepaticojejunostomy was excluded from gastric passage using a two layer Braun anastomosis 10 cm from the gastrojejunostomy and then the afferent limb was closed with a linear stapler. The FJL was connected to the second jejunal loop in a Roux-en-Y fashion 10 cm downstream from the Braun anastomosis. At the end of the procedure, one drain was placed at the superior margin of the pancreatic anastomosis without any protection of the anastomosis. The patient's abdomen was closed in standard fashion.

1.3. Postoperative management

The patient was monitored closely for excessive discharge from the microgastrostomy and the abdominal drain, a high fever, elevation of the white blood cell count and C-reactive protein. Proton pump blockers and histamine H_2-receptor antagonists were administered for five days. Octreotide was used subcutaneously, 50 μg one times daily, for three days. The surgically placed drain was removed on day five after confirmation of the absence of a high amylase in the drain fluid. Oral fluids were started 12 h after surgery and oral nutrition on day 3 after contrast radiography confirmed sufficient passage through the true gastrojejunostomy. Pain medication was given by epidural catheter for 3 days. Currently, the patient is followed closely and doing well.

The structure of the neoplasm and its immunophenotype confirm a solid pseudopapillary tumor. The surgical margins of the pancreatic head, duodenum and gallbladder were negative for malignant cells (on histopathology). Two lymph nodes were free of metastatic disease.

1.4. Case 2

A 1-year-10-month-old boy was admitted to the hospital for a palpable mass in the right upper abdominal quadrant. No tumor-associated family history was noted. Physical examination showed