International Journal of Surgery 12 (2014) S123–S125

Contents lists available at ScienceDirect

International Journal of Surgery

journal homepage: www.journal-surgery.net

Original research

Meso-pancreatectomy for pancreatic neuroendocrine tumor

Alessia Ferrarese*, Alessandro Borello, Valentina Gentile, Marco Bindi, Yuri Ferrara, Mario Solej, Valter Martino, Mario Nano

University of Turin, Department of Oncology, School of Medicine, Teaching Hospital "San Luigi Gonzaga", Section of General Surgery, Regione Gonzole 10, 10043 Orbassano, Turin, Italy

ARTICLE INFO

Article history:
Received 23 March 2014
Accepted 3 May 2014
Available online 22 May 2014

Keywords:
A meso-pancreatectomy
Glucagonoma

ABSTRACT

We report a case of a meso-pancreatectomy performed on a pancreatic glucagonoma in a 58 years-old woman. MP is a conservative surgical treatment consisting in a resection of the body of the pancreas with the aim of reducing postoperative hormone insufficiency.

This approach is curative in benign or low-malignant neoplasm of the central part of the pancreas.

1. Introduction

Glucagonoma is a neuroendocrine neoplasm of the pancreas accounting for less than 10% of the pancreatic neuroendocrine tumors; it was described for the first time by Becker in 1942. Patients with glucagonomas are classically 40–70 years of age with no significant preference for gender [1,2].

These pancreatic tumors usually originate in the body of the gland and they can be associated with other tumors in Multiple Endocrine Neoplasia syndrome 1 (MEN 1), but this association is rare and comprises no more than 3% of glucagonomas [3]. Diagnosis of Pancreatic Glucagonoma (PG) is established by bio-humoral characterization (glucagon, chromogranin A) and instrumental investigation (CT, EUS) but its presence is uncommon and symptoms are often vague; consequently the tumor may be relatively large when diagnosed. In 80% of cases PG is associated with diabetes and weight loss; the prognosis is unfavorable in 75% of cases.

The optimal treatment for Pancreatic Neuroendocrine Tumors is surgery [4] and they can be safely resected. Malignant cases should be treated with aggressive radical surgery to achieve complete tumor resection [5] but in well-differentiated lesion we can perform a procedure preserving most of the parenchyma, like partial pancreatectomy.

2. Case report

A 58 years old woman was admitted to our Emergency Department for epigastric pain, nausea and weight loss. The patient had diabetes mellitus and arterial hypertension. Physical examination revealed nothing pathological and routine laboratory analyses (WBC, PCR) were normal. Abdominal US revealed a15 × 13 mm lesion of the pancreatic corpus with hypoechoic patterns and positive Doppler evaluation. Abdominal CT described a microcystic lesion of 19 mm, with disomogenic matter and positive enhancement in arterial phase. Bio-humoral evaluation of Chromogranin A, Glucagon, carcinoembryonic antigen, carbohydrate antigen 19-9 and ENS (Enolase Neuronal Specific) was in range. During EUS (Endoscopic UltraSound) an intrapancreatic hypoechoic lesion without lymphadenopathy was observed. Biopsy revealed a hypercellular lesion with papillar pattern, muciparous secretion and nuclear anomalies. Explorative laparotomy revealed a capsulated lesion of the pancreatic corpus without vascular invasion. There was no evidence of intra-abdominal metastases. We performed a parenchyma preserving meso-pancreatectomy (MP). Upon exposure the lesion was all intrapancreatic and during intraoperative Ultrasound no vascular invasion was confirmed. The pancreas was released by posterior vessels and the parenchyma was divided at 1 cm proximally and distally from the lesion. The anatomical preparation was submitted to a pathologist that confirmed the lesion and declared that the margins were cleared. Reconstruction was accomplished with anastomosis between the ileus and the tail of the pancreas, performed with absorbable monofilament suture; we performed a Roux-en-Y with pancreaticojejunostomy reconstruction to distal

* Corresponding author.
E-mail address: alessia.ferrarese@gmail.com (A. Ferrarese).

http://dx.doi.org/10.1016/j.ijsu.2014.05.031
1743-9191/

pancreatic stump. A pancreatic stent was inserted in Wirsung's stump tract and the head tract was clamped. We placed a two tube drain in para-anastomotic position. A glucagon-producer endocrine tumor with uncertain biological behavior was diagnosed at the time of pathologic evaluation. On immunohistochemical evaluation Chromogranin A, Cytokeratin and Glucagon levels were positive and Ki67 mutation percentage was 1%. After surgery an antibiotic therapy was set. On the 7th postoperative day a pancreatic fistula (Drainage Amy = 15.000) was detected from the head section, that was solved with a conservative approach, parenteral nutrition, antibiotic and analgesic therapy. The nasogastric tube was removed on the 3rd postoperative day and drains on the 27th and 30th day. The patient was discharged on the 36th postoperative day.

A CT scan was performed on the 90th postoperative day and after 6 and 12 months with no evidence of complications.

The patient has been followed-up as an out-patient for 5 years and she has no sign of local recurrence or distant metastases.

3. Discussion

Pancreatic endocrine tumors represent a heterogeneous group with varying tumor biology and prognosis. These neoplasms are classified as functional if they are associated with a hormone-related clinical syndrome caused by hormone release from the tumor, or non-functional if the tumor is not associated with a hormone-related clinical syndrome [6]. Glucagonoma is a slow-growing alpha-cell tumor of the pancreatic islets of Langerhans. It is characterized by necrolytic migratory erythema (NME), hypoaminoacidemia, cheilosis and diabetes mellitus that is found in 80% of patients with glucagonoma syndrome [7–9].

A glucagonoma may appear as a benign and localized alpha-cell adenoma but at least 50% of cases will have metastatic disease when diagnosed [4]. Disease progression is often slow even in the presence of metastases, and the patients may need sequential excision of lymph node or liver metastases during a long disease course, with often 5 years or more between recurrent lesions. In literature the reported 10-year survival is about 50% [10]. The optimal treatment for glucagonoma is surgery, but 50% of the tumors have metastasized at time of diagnosis [4,11].

We performed a meso-pancreatectomy because, according to literature, we believe that the parenchymal preservation is essential and appropriately selected patients will benefit from extended central pancreatectomy because of the maintenance of endocrine and exocrine function [12]. Furthermore, in selected cases of central pancreatic lesion, central pancreatectomy is associated with less perioperative morbidity and mortality than extended classic resection [13,14]. In Adham's series, central pancreatectomy led to effective preservation of both cephalic and distal pancreatic remnants without a significant increase in postoperative morbidity compared with conventional pancreatectomy [15,16]. Furthermore, long-term local recurrence after extended central pancreatectomy is similar to the recurrence rates after extended classic resection [13,17].

In our case we assisted at the onset of a fistola; in literature pancreatic fistula and delayed gastric emptying are the most prevalent complications of pancreatectomy but in the majority of cases they can be managed by conservative measures [3].

4. Conclusion

In selected cases, the MP is a great technique when performed by experienced hands. Parenchymal preservation, in order to avoid endocrine and exocrine pancreatic insufficiency, remains a critical decision for the patients outcome.

Ethical approval

None.

Conflict of interest/financial support

The Authors have no conflict of interest or any financial support.

Funding

None.

Author contribution

Alessia Ferrarese: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

Alessandro Borello: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Valentina Gentile: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

Marco Bindi: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

Yuri Ferrara: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Mario Solej: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

Valter Martino: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Mario Nano: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

References

[1] G. Kerstro-m, P. Hellman, O. Hessman, L. Osmak, Surgical treatment of endocrine pancreatic tumours, Neuroendocrinology 80 (Suppl. 1) (2004) 62–66.
[2] G.M. Doherty, Rare endocrine tumours of the GI tract, Best. Pract. Res. Clin. Gastroenterol. 19 (2005) 807–818.
[3] P.G. Castro, A.M. de León, J.G. Trancón, et al., Glucagonoma syndrome: a case report, J. Med. Case Rep. 22 (5) (2011) 402.
[4] P. Hellman, M. Andersson, J. Rastad, et al., Surgical strategy for large or malignant endocrine pancreatic tumors, World J. Surg. 24 (2000) 1353–1360.
[5] C. Gao, X. Fu, Y. Pan, Q. Li, Surgical treatment of pancreatic neuroendocrine tumors: report of 112 cases, Dig. Surg. 27 (3) (2010) 197–204.
[6] K. Öberg, Pancreatic endocrine tumors, Semin. Oncol. 37 (2010) 594–618.
[7] H.L. O'Grady, K.C. Conlon, Pancreatic neuroendocrine tumours, Eur. J. Surg. Oncol. 34 (2008) 324–332.
[8] R. Eldor, B. Glaser, M. Fraenkel, et al., Glucagonoma and the glucagonoma syndrome – cumulative experience with an elusive endocrine tumour, Clin. Endocrinol. 74 (5) (2011) 593–598.
[9] R. Colović, S. Matić, M. Micev, et al., Glucagonoma without glucagonoma syndrome, Srp. Arh. Celok. Lek. 138 (3–4) (2010) 244–247.
[10] G. Akerstrom, P. Hellman, Surgical aspects of neuroendocrine tumours, Eur. J. Cancer 45 (Suppl. 1) (2009) 237–250.
[11] W.J. Liu, Y.P. Zhao, T.P. Zhang, Q. Liao, L. Cong, Clinical experience in diagnosis and treatment of glucagonoma, Zhonghua Wai Ke Za Zhi 47 (5) (2009) 333–336.
[12] S. Hirono, H. Yamaue, Middle pancreatectomy for pancreatic neoplasms, J. Hepatobiliary Pancreat. Sci. 17 (6) (2010) 803–807.
[13] G. Cataldegirmen, C.G. Schneider, D. Bogoevski, et al., Extended central pancreatic resection as an alternative for extended left or extended right

resection for appropriate pancreatic neoplasms, Surgery 147 (3) (2010) 331–338.
[14] P. Chirletti, N. Peparini, R. Caronna, G. Fanello, G. Delogu, R.L. Meniconi, Roux-en-Y end-to-end and end-to-side double pancreaticojejunostomy: application of the reconstructive method of the Beger procedure to central pancreatectomy, Langenbecks Arch. Surg. 395 (1) (2010) 89–93.
[15] M.1 Adham, A. Giunippero, V. Hervieu, et al., Central pancreatectomy: single-center experience of 50 cases, Arch. Surg. 143 (2) (2008) 175–180.
[16] A. Dicitore, M. Caraglia, G. Gaudenzi, G. Manfredi, et al., Type I interferon-mediated pathway interacts with peroxisome proliferator activated receptor-γ (PPAR-γ): at the cross-road of pancreatic cancer cell proliferation, Biochim. Biophys. Acta 1845 (1) (2014 Jan) 42–52, http://dx.doi.org/10.1016/j.bbcan.2013.11.003.
[17] H. Cheng, M. Chen, G. Yang, et al., Diagnosis and treatment of glucagonoma: report of one case, Nan Fang. Yi Ke Da Xue Xue Bao 33 (4) (2013) 618.