Case Report

GIANT MUCINOUS CYSTIC NEOPLASM OF THE PANCREAS

A. Saroglu*, A. Julianov

Department of Surgery, Trakia Hospital, Stara Zagora, Bulgaria

ABSTRACT

Mucinous cystic neoplasms (MCN) of the pancreas occur mostly in females and are potentially sex hormone-sensitive. MCNs are more common in women with a peak incidence in the fifth decade. They are usually located in the distal pancreas, and frequently grow up to a size of 8–10 cm. We report a case of giant MCN of the pancreas in a 31-year old female patient, occupying entire left abdomen, successfully treated with distal pancreatectomy. Histology demonstrated MCN with low-grade dysplasia. At 4 year of follow-up, the patient is free of disease.

Key words: mucinous cystic neoplasms, pancreas

BACKGROUND

Mucin-producing cystic neoplasms of the pancreas is a rare exocrine tumor, encompassing a wide biological spectrum ranging from benign, but potentially malignant, to carcinoma with an aggressive behavior. Becourt first described cystic lesions of the pancreas in 1824. (1) More than century later, Compagno et al. made a clear distinction between cystic pancreatic tumors and classified them into serous cystic neoplasms (SCN) and mucinous cystic neoplasms (MCN), and identified MCN as a distinct disease, occurring almost exclusively in the pancreatic body and tail of middle-aged women and are defined by the presence of ovarian-like stroma on pathology. (2) Although mucinous cystic neoplasms (MCN) can be benign, they are most commonly premalignant or malignant, and represent approximately 25% of resected pancreatic cystic neoplasm (PCN). (3, 4) MCNs are more common in women (>95%), and are usually located in the distal pancreas (>95%), with a peak incidence in the fifth decade. (4-6) They frequently grow up to a size of 8–10 cm, but can be larger. We present a case of giant MCN in a female patient, occupying the entire left abdomen.

*Correspondence to: Azize Saroglu, MD, 1 Dunav street, Stara Zagora, Bulgaria, azize_saroglu@hotmail.com, +359 897433098

CASE REPORT

A 31-year-old woman was admitted to our hospital with a huge abdominal tumor visible through the wall of the left abdomen and associated with mild pain over the last month. The patient was nonsmoker; denied drugs and alcohol use and had no family history of cancer. Her past medical history included normal childbirth four years ago, and diagnosed polycystic ovarian disease during the pregnancy.

Physical examination revealed the presence of a huge, soft, tender mass, occupying entire left abdomen. Computed tomography (CT) revealed a 25x21 cm large cystic tumor, with thin septae, probably originating from the distal pancreas (**Figure 1**). Bilateral polycystic ovaries were also noted on CT. Blood tests were unremarkable including serum tumor markers CEA, CA 19-9 and CA 125. The patient was considered to have cystic pancreatic tumor and was scheduled to elective surgery. At laparotomy, a cystic tumor, originating from the body of the pancreas was discovered. Distal pancreatectomy (DPSP) was performed (**Figure 2A**).

Intra- and postoperative course were both uneventful. Cyst fluid cytology was negative for malignant cells and CA 19-9 in the cyst fluid was in reference range as well. Histology

demonstrated MCN with low-grade dysplasia (**Figure 2B**). Immunohistochemistry stains for estrogen receptor, progesterone receptor and human epidermal growth factor receptor-2

(HER) were negative. At 4 year of follow-up, the patient is free of symptoms and the follow-up CT was unremarkable.

Figure 1. Preoperative computed tomography - (A) axial, (B) coronal, and (C) sagittal images, demonstrating huge cystic tumor in the abdomen.

Figure 2. (A) Operative specimen of distal pancreatectomy with resected tumor. (B) Histology demonstrating mucinous cystic neoplasm with low-grade dysplasia.

DISCUSSION

In 1996 the World Health Organization separated the mucin-producing pancreatic neoplasms into intraductal papillary mucinous tumors and mucinous cystic tumors, when distinguished between IPMN and MCN, emphasizing the presence of ovarian stroma in the latter. Nowadays, these two distinct neoplasms are considered to have different biologic behaviour, pathologic features, and prognosis. (7, 8)

There is often heterogeneity within the lesion with benign and malignant-appearing regions, making it impossible to exclude malignancy with biopsy. MCNs are defined as mucin-producing and septated cyst-forming epithelial neoplasia of the pancreas with a distinctive ovarian-type stroma that stains for

estrogen and progesterone receptors and histopathologically can demonstrate a wide spectrum of cellular atypia ranging from mild mucinous hyperplasia to invasive adenocarcinoma. (8, 9) Communication of the MCNs with the pancreatic duct system is very rare, although some studies suggested that a small proportion of MCNs may show microscopic communication with the pancreatic ducts. (10, 11)

In the literature, invasive carcinoma incidence in MCN varies between 6% and 36% and the increasing degree of dysplasia and tendency for invasion have been correlated with activating point mutations in the *k-ras* and mutations in the *TP53*. (7, 8, 12, 13) The consensus conference of the International Association of Pancreatology in 2004

established that the histological presence of unique ovarian-type stroma was mandatory to diagnose MCN and that this was not found in other pancreatic neoplasms. (7, 14)

The majority of MCNs are slow growing and presents with a wide variety of symptoms but 36.7% were asymptomatic in a series of 212 consecutive patients with cystic pancreatic lesions. (15, 16) No individual symptom was significantly associated with a likelihood of malignancy. In spite of these lesions being occasionally discovered in patients scanned for other indications, sixty percent of patients complained of mild and vague abdominal pain, which was more frequent in benign than in malignant neoplasms and no specific symptom was significantly associated with a likelihood of malignancy, although increasing weight loss, palpable abdominal mass, and diabetes were more likely associated with malignant MCNs, (10-40%). (15-17, 19)

MCNs main differential diagnosis includes other neoplastic and non-neoplastic cystic lesions: serous cystic neoplasm and the intraductal papillary mucinous neoplasms and pancreatic pseudocysts. Preoperative diagnosis includes, tumor markers, CT and MRI, with cyst fluid analysis, and positron emission tomography (PET). High levels of CEA and CA 19-9 indicate a mucinous neoplastic lesion (70%-100%). (15, 20) A CEA level of more than 400 ng/mL is a valuable predictor of malignancy in MCNs. (21, 22) In spite of a complete diagnostic assessment, the surgeon's preoperative diagnosis is correct in one-third of cases, incorrect in another third, and non-specific in the remainder. (23-25)

The Ulm series reported 51% malignant histology in 39 patients with MCNs, including carcinoma in situ and advanced cancer. (8) Distal pancreatectomy is the most common operation for cystic neoplasms of the pancreas because of these neoplasms are usually localized at the body and tail of the pancreas, which is a safe procedure in high volume centers. (18, 26-28) In the absence of invasive carcinoma an 5 year overall survival rate of 100% after resection, since several studies have shown that there is no risk of recurrence following resection, patients do not need follow-up. (8, 19)

CONCLUSIONS

Surgery remains the only treatment option that offers definitive cure for patients with MCN of the pancreas. Surgical excision is indicated for

all MCNs as the malignancy cannot be ruled out preoperatively.

REFERENCES

1. Becourt PJ. Recherches sur le pancreas: ses fonctions et ses alterations organiques. Strasbourg: Levrault, 1830.
2. Compagno J, Oertel JE. Microcystic adenomas of the pancreas (glycogen-rich cystadenomas): a clinicopathologic study of 34 cases. *Am J Clin Pathol*, 69:289-298, 1978.
3. Thosani N, Thosani S, Qiao W, Fleming JB, Bhutani MS, Guha S. Role of EUS-FNA-based cytology in the diagnosis of mucinous pancreatic cystic lesions: A systematic review and meta-analysis. *Dig Dis Sci*, 55:2756-66, 2010.
4. Farrell JJ, Fernández-del Castillo C. Pancreatic cystic neoplasms: Management and unanswered questions. *Gastroenterology*, 144:1303-15, 2013.
5. Robinson SM, Scott J, Oppong KW, White SA. What to do for the incidental pancreatic cystic lesion? *Surg Oncol*, 23:117-25, 2014.
6. Fernández-del Castillo C. Mucinous cystic neoplasms. *J Gastrointest Surg*, 12:411-413, 2008.
7. Campbell F, Azadeh B. Cystic neoplasms of the exocrine pancreas. *Histopathology*, 52:539-551, 2008.
8. Reddy RP, Smyrk TC, Zapiach M, et al. Pancreatic mucinous cystic neoplasm defined by ovarian stroma: demographics, clinical features, and prevalence of cancer. *Clin Gastroenterol Hepatol*, 2:1026-1031, 2004.
9. Fred TB FC, Ralph HH, Neil DT (Eds): WHO Classification of Tumours of the Digestive System. Lyon: IARC, 2010.
10. Goh BK, Tan YM, Yap WM, et al. Pancreatic serous oligocystic adenomas: clinicopathologic features and a comparison with serous microcystic adenomas and mucinous cystic neoplasms. *World J Surg*, 30:1553-1559, 2006.
11. Volkan Adsay N. Cystic lesions of the pancreas. *Mod Pathol*, 20 (Suppl 1): S71-S93, 2007.
12. Beger HG, Rau BM, Gansauge F, Schwarz M, Siech M, Poch B. Duodenum-preserving total pancreatic head resection for cystic neoplasm: a limited but cancer-preventive procedure. *Langenbecks Arch Surg*, 393:589-598, 2008.
13. Thompson LD, Becker RC, Przygodzki RM, Adair CF, Heffess CS. Mucinous

- cystic neoplasm (mucinous cystadenocarcinoma of low-grade malignant potential) of the pancreas: a clinicopathologic study of 130 cases. *Am J Surg Pathol*, 23:1-16, 1999.
14. Hruban RH, Maitra A, Kern SE, Goggins M. Precursors to pancreatic cancer. *Gastroenterol Clin North Am*, 36:831-849, 2007.
 15. Garcea G, Ong SL, Rajesh A, et al. Cystic lesions of the pancreas. A diagnostic and management dilemma. *Pancreatology*, 8:236-251, 2008.
 16. Fernández-del Castillo C, Targarona J, Thayer SP, Rattner DW, Brugge WR, Warshaw AL. Incidental pancreatic cysts: clinicopathologic characteristics and comparison with symptomatic patients. *Arch Surg*, 138:427-433, 2003.
 17. Warshaw AL, Rutledge PL. Cystic tumors mistaken for pancreatic pseudocysts. *Ann Surg*, 205:393-398, 1987.
 18. Salvia R, Crippa S, Falconi M, et al. Branch-duct intraductal papillary mucinous neoplasms of the pancreas: to operate or not to operate? *Gut*, 56:1086-1090, 2007.
 19. Crippa S, Salvia R, Warshaw AL, et al. Mucinous cystic neoplasm of the pancreas is not an aggressive entity: lessons from 163 resected patients. *Ann Surg*, 247:571-579, 2008.
 20. Bassi C, Salvia R, Gumbs AA, Butturini G, Falconi M, Pederzoli P. The value of standard serum tumor markers in differentiating mucinous from serous cystic tumors of the pancreas: CEA, Ca 19-9, Ca 125, Ca 15-3. *Langenbecks Arch Surg*, 387:281-285, 2002.
 21. Van Dam J. EUS in cystic lesions of the pancreas. *Gastrointest Endosc*, 56:S91-S93, 2002.
 22. Sperti C, Pasquali C, Chierichetti F, Liessi G, Ferlin G, Pedrazzoli S. Value of 18-fluorodeoxyglucose positron emission tomography in the management of patients with cystic tumors of the pancreas. *Ann Surg*, 234:675-680, 2001.
 23. Sperti C, Pasquali C, Decet G, Chierichetti F, Liessi G, Pedrazzoli S. F-18-fluorodeoxyglucose positron emission tomography in differentiating malignant from benign pancreatic cysts: a prospective study. *J Gastrointest Surg*, 9:22-28, 2005.
 24. Le Borgne J, de Calan L, Partensky C. Cystadenomas and cystadenocarcinomas of the pancreas: a multiinstitutional retrospective study of 398 cases. *French Surgical Association. Ann Surg*, 230:152-161, 1999.
 25. Visser BC, Muthusamy VR, Yeh BM, Coakley FV, Way LW. Diagnostic evaluation of cystic pancreatic lesions. *HPB (Oxford)*, 10:63-69, 2008.
 26. DiMagno EP. Clinical and pathologic correlation of 84 mucinous cystic neoplasms of the pancreas: can one reliably differentiate benign from malignant (or premalignant) neoplasms? *Ann Surg*, 231:205-212, 2000.
 27. Rodríguez JR, Germes SS, Pandharipande PV, et al. Implications and cost of pancreatic leak following distal pancreatic resection. *Arch Surg*, 141:361-365, 2006.
 28. Lillemoe KD, Kaushal S, Cameron JL, Sohn TA, Pitt HA, Yeo CJ. Distal pancreatectomy: indications and outcomes in 235 patients. *Ann Surg*, 229:693-698; discussion 698-700, 1999.