Title: Macrocystic Serous Neoplasm of the Pancreas Treated By Central Pancreatectomy: Case Report.

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Abstract:

Background: *Macrocystic serous cystadenoma neoplasm (SCN) is an unusual benign pancreatic tumor. Enucleation of these benign or low-grade malignant tumor types is not always possible because of pancreatic duct involvement or because of a pancreatic neck or body location. These patients have traditionally been treated with distal subtotal pancreatectomy or extended Pancreaticodudenectomy (PD). Recently central pancreatectomy (CP) has gained much attention.*

Aim of the work*: Clinical and pathological features of this rare tumor are presented with analysis of the indications and the results of the parenchyma-sparing central CP.*

Case report: *We report on 55-year-old woman who presented with recurrent epigastric pain. A cystic lesion at the junction neck/proximal body of the pancreas was revealed by abdominal computed tomography and Magnetic resonance imaging (MRI). The lesion was well-defined and embedded on the pancreas, with some septations and discrete lobulation. The lesion was symptomatic with intractable abdominal pain (2 episodes of mild pancreartitis) and a mucinous cystadenoma couldn't be ruled out. A central pancreatectomy (CP) was performed with closure of the proximal remnant pancreas and end to side Pancraticogastrostomy (PG). The course was uneventful. The histopathological diagnosis was macrocystic SCN of the pancreas with cystic epithelial neoplasm composed of serous-type glycogen-rich epithelial cells.*

Conclusion: *Clearly, a role exists for CP in select patients with benign or low grade tumors. Preoperative selection of patients is of utmost importance. Good collaboration between surgeons, radiologists and gastroenterologists is necessary for optimal management of cystic tumors of the pancreas.*
Key-words*: macrocystic serous cystadenoma, pancreas, central pancreatectomy, Pancraticogastrostomy.*

Introduction:

Serous cystadenoma (SCs) of the pancreas is a benign cystic tumor. The macrocystic variant is uncommon and raises diagnostic problem with others macrocystic lesions such as pseudocysts and mucinous cystadenomas (MCs).

We report a case of a woman with macrocystic serous cystadenoma identified on pathologic examination after central pancreatectomy and for which the diagnosis of Mucinous cystadenoma was suggested preoperatively.

We aim to describe the clinical and pathological features of this rare tumor and to discuss the indications and the results of the parenchyma-sparing CP.

Case report:

A 55-year-old woman was admitted to our department of surgery with a diagnosis of acute pancreatitis. Her medical history was significant for hypertension. Five months prior to this admission, she was admitted in the emergency department for acute abdominal pain and mild elevation of amylase serum level. The CT-scan was considered normal and the patient was discharged but she continues to complain of intermittent abdominal pain. Actually, the physical examination was unremarkable. Laboratory data including hematology and biochemistry were within normal values. Amylase Serum level was 365u/l (three times the

normal limit) and lipase serum level was 668u/l (7 times the normal limit). She was treated for acute pancreatitis. An abdominal CT- scan showed a well-defined 3x2.5 cm, hypodense, cystic lesion in the proximal part of the body of the pancreas (Fig.1). The cyst was embedded in the pancreatic parenchyma. MRI described a well-defined hypo intense cystic lesion with no enhancement after gadolinium injection. The mass was hyper-intense in T2 weight MRI. There was no communication with the main pancreatic duct (Fig.2a+b).

The preoperative diagnosis was a probable mucinous cystic neoplasm (MCN) or macrocystic serous neoplasm (SCN). The lesion was symptomatic. So, cystic removal was indicated. The cystic neoplasm was deep in the pancreatic parenchyma so enucleation was inappropriate and central pancreatectomy was an optimal choice of treatment since lymphadenectomy was not necessary.

The patient was placed supine on the operating table. A bilateral sub costal incision was done. We enter le lesser sac through dissection of the transverse colon from the omentum. The pancreatic gland is exposed. Macroscopically, there was a well-defined, multilocular lesion, which was filed with a clear fluid, and with no solid part. We begun by incising of the posterior peritoneum along the superior and inferior margin of the isthmus and the body of the pancreas. The pancreatic segment harboring the lesion is then mobilized and its posterior surface is carefully dissected from the splenic vein and its superior margin from the splenic artery (Fig.3). Two marginal stitches were placed respectively on the cephalic side and distal side. The proximal end is transected with a knife and the distal one. Homeostasis of the two surfaces was achieved with interrupted 4/0non absorbable stitches. The wirsung's duct on the cephalic stump is sutured selectively with 4/0non-absorbable stitches. A row of 4/0 monofilament, interrupted stitches of the mattress type were placed to close the cephalic stump (Fig.4). A pancreatico-gastrostomy was carried out with a single layer of 4/0 non absorbable interrupted stitches with a small catheter was inserted into the wirsung and passed through the stomach and fixed to the abdominal wall (Fig.5). A double soft drain was brought out on the right and left side around the pancreatic anastomosis. The fluid collected from the drain were checked for amylase level on postoperative days3 and 5 and the level were under normal values. Right and left closed suction drains were progressively mobilized and then removed respectively at the 8^{th} and 9^{th} post-operative day. On day 11 after operation the patient was discharged. She was followed up 14 months later and there were no signs of pancreatic exocrine or endocrine insufficiency. The postoperative pathological result showed microscopically that the glands or cysts were lined by a simple cuboidal serous epithelial cells with clear cytoplasm and uniform, rounded nuclei. Periodic acid-Shiff (PAS) staining was focally positive in the cytoplasm of the epithelium (Fig.6a+b).

Discussion:

Pancreatic serous cystadenoma (SCs) is known as microcystic cystadenoma and frequently occurs in the head of the pancreas. It is composed of numerous micocysts with different diameter from 0.1 cm to 2 cm. so that at section it likes honeycombs. The cyst fluid is clear and is rich in glycogen. SCA is lined by a simple, glycogen-rich cuboidal epithelium. Several atypical features may be seen like solid variant, uniloculated cyst and excessive growth which raise the question of differential diagnosis [1,2]. Lewandrosky in 1992 was the first who described the macrocystic form of SCs as a distinct variant [3]. There is a female preponderance and the age of reported cases are usually 60 years or over [2,4-6]. The presenting symptoms are abdominal pain, vomiting, and abdominal mass, jaundice and rarely like our patient acute pancreatitis. The macroscopic features of MaSC can be unilocular or oligocystic. It is characterized by a limited number of cysts, usually less than 6, with a diameter > 2 cm. imaging modalities are the mainstay in the detection and characterization of pancreatic cysts [1,6,7,8]. The radiologic features of MaSC may resemble those of pseudocyst or MCs or branch-duct intraductal papillary neoplasms (BD- IPMN) which both have a malignant potential. Clinical history, radiological features (CT and MRI) can differentiate pseudocyst with its heterogeneous components, few lobulations or calcifications in the cyst wall. The cyst wall is thin with enhancement after injection. The MCs which predominates in women of preimenopausal age, as thick-walled multilocular cystic mass in the distal body and tail of the pancreas [9-11]. Cohen et al, in their series, they identified that the location in the pancreatic head, the lobulated contours, thin wall/capsule and absence of wall enhancement were specific radiologic features for MSC [10]. MRI with its high resolution is better

suited to detect thin septa, papillary projection, contrast enhancement, and the communication or not with the main pancreatic duct [1,2,5]. Even with specific characteristics, it seems difficult to make the distinction by imaging studies preoperatively as described by Procacci et al in their studies of 30 cases of MSC [4] and Lewandrowski et al.[3] Usually the final diagnosis is achieved by histological examination of the operative specimen.. In these difficult cases, the role of endoscopic ultrasound (EUS) is controversial. It is a diagnostic tool which provides morphologic detail and sampling of fluid from the lesion for measurement of enzymes, cytology and tumor markers. A high concentration of amylase is diagnostic of a pseudocyst. A high carcinoembryonic antigen (CEA) is indicative of a MCs. Mucin and mucinous cells are characteristic of mucinous cystic neoplasm, glycogen,-staining cells are seen in SCs. In our opinion, the efficacy of EUS needle aspiration depends on the volume of the material and the expertise of the endoscopist. The European expert consensus provide in their recent recommendations that diagnostic CT and/or MRI are indicated in all patients with pancreatic cystic lesions. EUS with cyst fluid analysis may be used but there is no evidence to suggest it as a routine diagnostic tool [12]. So not surprisingly in many case, the diagnosis is made by final histological examination of the surgical specimen [1,5,12].In accordance to the European consensus, the presence of symptoms is an indication for surgery independently of preoperative diagnosis. For asymptomatic SCA, resection is indicated in the case of inability to distinguish SCA from pre-malignant tumor, like in our case of MaSC [12]. In the case of surgery, the detection of aggressive radiologic features is important to choose the surgical approach between radical surgery of pancreas or preserving procedure like in our patient, we had chosen a CP.

Central pancreatectomy (CP) is a segmental pancreatic resection to remove benign or low - grade malignant tumors of the isthmus or proximal portion of the body not suitable for enucleation. The rational for this resection is to remove tumors and preserve functional parenchyma so limiting the risk of diabetes and exocrine insufficiency with preservation of the digestive continuity [13,14]. This group of tumors include endocrine tumors, cystadenomas, non-invasive intraductal papillary tumors, solid cystic papillary tumors and others rare neoplasms. Two others advantages of CP are splenic preservation and avoidance of major modification of the biliary and digestive tract as compared to PD.

The major limitation to the widespread acceptance of the central pancreatectomy are the higher rate of pancreatic fistula reported in the literature. The presence of soft pancreatic remnant, a small pancreatic duct, and two transected surfaces of the pancreas are factors explaining the higher rate of pancreatic leaks [14-17]. The main factor that permits us to offer this kind of resection is the ability to predict accurately the preoperative pathological features of the lesion. This is related to the various radiological investigations usually used for this purpose.

In the review of Roggin et al; with 207 patients from 16 different series, the rate of pancreatic fistula was 22% [14]. In the Meta analysis of C. Iacono et al, compelling 49 studies, involving 963 patients undergoing CP. Post-operative morbidity and pancreatic fistula rates were 454.3 and 40.9% respectively [18]. Compared with DP, CP had a higher postoperative morbidity rate and higher incidence of pancreatic fistula, but a lower rate of endocrine and exocrine insufficiency. In this systematic review, the distal stump was usually dealt by pancréatico-jejunostomy (57.7%) and by pancréatico-gastrostomy (38.4%). The proximal stump was closed by sutures with or without elective ligation of the main pancreatic duct (63.5%), followed by stapling (30.3%). The author had compared 20 studies with PJ and 10 studies with PG. the cumulative incidence of pancreatic fistula was higher but not significantly after PG. the cumulative incidence of exocrine insufficiency was higher after PJ [18]. Crippa et al. in their comparative study between Mp en extended left pancreatectomy, the authors reported no difference between the two groups regarding the rate of clinically pancreatic fistula (grade B and C) 17%vs 13% respectively [15].

The most attractive feature of the CP is the potential preservation of pancreatic parenchyma and so, preservation of exocrine and endocrine function. The CP is advantageous due to the preservation of the tail of the pancreas where's the islets of Langerhans are predominantly present [19-22]. The low frequency of exocrine insufficiency is well established in the review of Roggin et al, who's reported a rate of 3% of 197 patients required enzyme therapy and 3.6% of patients that had clinically impaired endocrine function after CP [14]. Crippa et al also, confirmed in his comparative study, that the rate of exocrine insufficiency and

endocrine insufficiency was significantly higher after left pancreatectomy than CP (16% vs5%) and (38%vs 4%) respectively [16]. In these studies the endocrine and exocrine function were assessed by different methods. Endocrine function was evaluated by use of antidiabetic treatment, fasting glycamia, hemoglobin A1C treatment, oral glucose tolerance test, and World Health Organization criteria. Exocrine function insufficiency ranged from symptoms to the need for pancreatic enzyme supplementation and functional tests.

Many cases of laparoscopic CP have been described with succeful outcome compared with open CP. It was associated with lower blood loss, shorter hospital stay and the other advantages of the minimally invasive techniques [17,20].

Conclusion:

Macrocystic SCs is a rare and benign tumor which would not require surgery. But, the presence of symptoms and the impossibility to distinguish it from aggressive mucinous tumor could justify resection. In this situation; CP is a reasonable technique.

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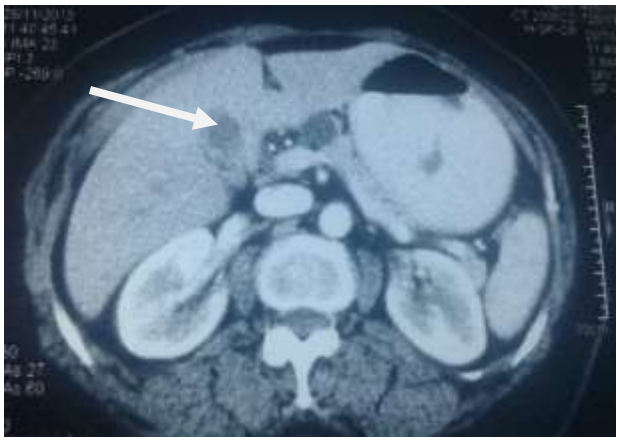

Fig.1

Abdominal CT with contrast showing a well-defined hypodense, cystic lesion in the proximal portion of the body of the pancreas (white arrow).

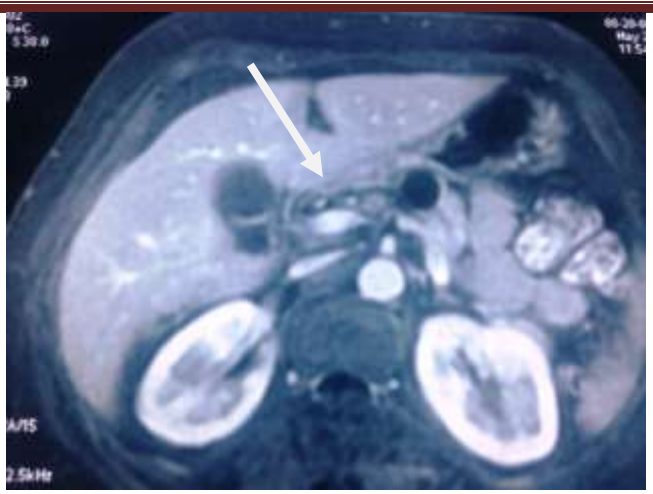

Fig.2a

Axial T1 weighted MRI image showed a well-defined hypo intense cystic lesion with no enhancement of the lesion (white arrow).

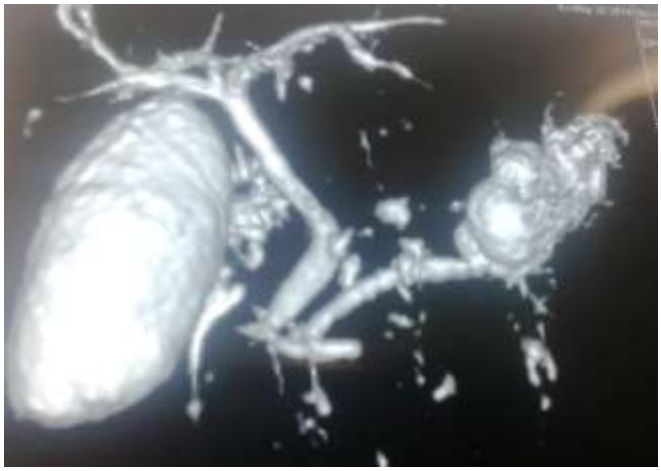

Fig.2b

Cholangio pancreatico IRM with T2 weighted image showed a multilocular cystic hyper intense lesion without communication with the main duct.

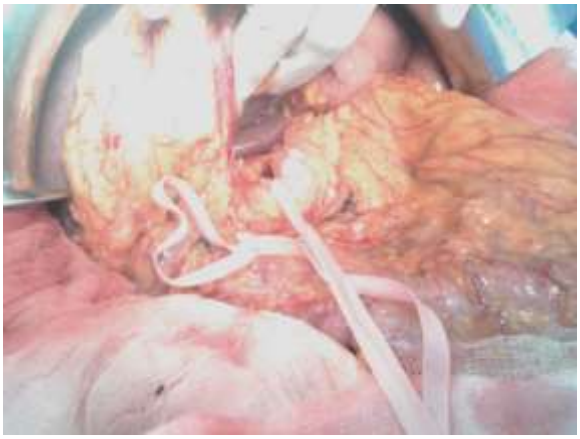

Fig.3

Operative view: Pancreatic isthmus and proximal body are mobilized. A rubber tape is placed behind the pancreas, elevating it off the superior mesenteric vein.

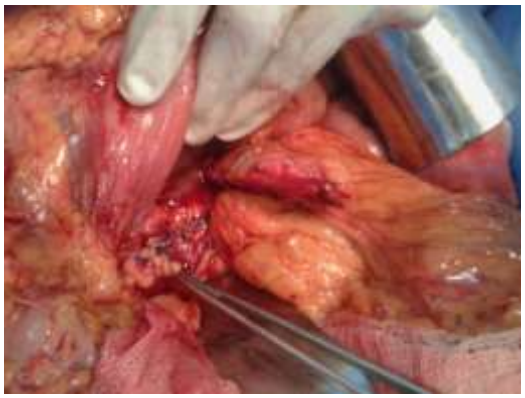

Fig.4

Operative view: Proximal and distal pancreatic stumps after resection of the isthmus.

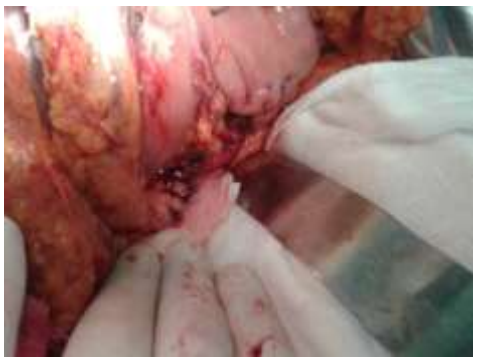

Fig.5:

Operative view: Pancreatico-gastrostomy with suture of the proximal remnant stump.

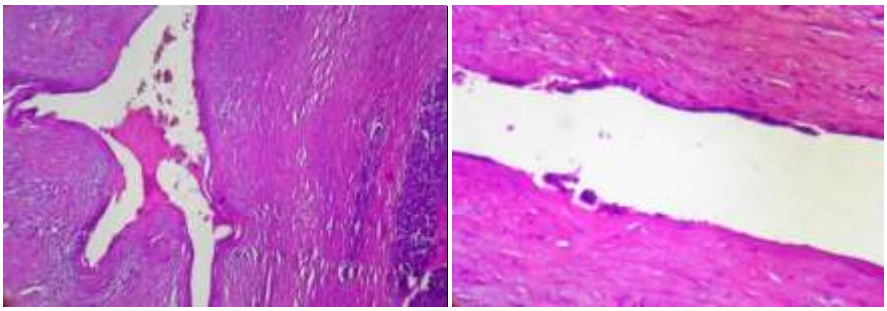

Fig.6:

a- A unilocular cyst within an unremarkable pancreas (H§E)x25
b- Cyst lined by simple cuboidal serous epithelial cells with clear cytoplasm and uniform, rounded nuclei (H§E) x200.