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Pancreatic true cysts - diagnosis and treatment difficulties

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Rezumat

Chistul de pancreas - probleme de diagnostic ș tratament

Chistele pancreatice reprezintă un grup rar de tumori pancreatice, heterogen din punct de vedere histologic, cu atitudine terapeutică diferită în funcție de terenul pacientului, localizare şi, în special, riscul estimat de malignitate. Obiectivul lucrării este analiza a 7 cazuri de chiste pancreatice diagnosticate şi operate în clinică în perioada Ianuarie 2004 - Ianuarie 2010: 2 bărbați şi 5 femei, cu vârste cuprinse între 24 şi 61 de ani; dimensiunile chistelor au variat între 3,5 şi 15 cm, iar topografia a fost cefalică în două cazuri şi corporeocaudală în 5 cazuri. Au fost efectuate enucleerea chistului (două cazuri), splenopancreatectomie (3 cazuri), o duodenopancreatectomie şi o splenopancreatectomie subtotală. Structura histologică a fost de chistadenom seros (un caz), chistadenom mucinos (două cazuri), chistadenom papilar mucinos intraductal (un caz), şi chistadenocarcinom papilar (3 cazuri). Rezultatele imediat postoperatorii au fost favorabile în toate cazurile, cu 3 fistule pancreatice externe, remise sub tratament conservator; nu s-au înregistrat cazuri cu diabet zaharat postoperator determinat de rezecția pancreatică. În concluzie, ținând cont de riscul de malignizare (în evoluție sau preexistentă) al formațiunilor chistice pancreatice se impune îndepărtarea chirurgicală a acestora, cel puțin în absența unor dovezi histologice ferme de benignitate. Rezecțiile pancreatice pentru chiste pancreatice pot fi efectuate cu succes, cu morbiditate şi mortalitate acceptabile.

Cuvinte cheie: tumoră chistică pancreatică, chistadenom pancreatic, chistadenocarcinom pancreatic

Abstract

Pancreatic true cysts represent a rare, heterogeneous group of pancreatic tumors; therapeutic strategy is based on patient's general status, cyst topography, and especially the estimated risk of malignancy. This paper aim is to present 7 cases of pancreatic true cysts, operated on a six years period (January 2004-January 2010) in our surgical clinic: 2 men and 5 women, aged between 24-61 years old; cyst diameter varies between 3.5-15 cm, tumor location being pancreatic head in two cases and the distal pancreas in 5 cases. Surgical treatment consisted in cyst enucleation (two cases), splenopancreatectomy (three cases), duodenopancreatectomy (one case), and subtotal splenopancreatectomy (one case). Histology was represented by serous cystadenoma (one case), mucinous cystadenoma (2 cases), intraductal papillary mucinous cystadenoma (one case), and papillary cystadenocarcinoma (3 cases).Postoperative results were good in all cases, with 3 postoperative pancreatic external fistulas, resolved conservatory; no case of post-pancreatectomy diabetes mellitus was registered. In conclusion, surgical removal of the pancreatic cystic tumors is necessary, especially due to the risk of malignancy, at least in the absence of rigorous histological proofs of benignancy. Postoperative results are favorable in terms of postoperative morbidity and mortality.

Key words: pancreatic cystic tumor, pancreatic cystadenoma, pancreatic cystadenocacinoma

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Introduction

Pancreatic cysts represent a rare pathology, with increasingly incidence in daily surgical practice, especially due to incidental ultrasonographic detection (so-called „pancreatic incidentaloma"). (1,2)

The detection of a pancreatic cyst raises several diagnostic and therapeutic problems: is there a true cyst, or a pancreatic pseudo-cyst? Is there a benign or a malignant proliferation? In case of symptomatic cyst, surgical removal is essential in order to relief the symptoms, but in case of incidentaloma, is operative risk justified? In case of surgical removal and pathologic proof of benignancy, is there a follow-up protocol need to be instated?

Due to the rarity of these lesions in medical literature, there are no definite conclusions about these questions, though we decided to present our experience with pancreatic true cysts.

Cases presentation

Between January 2004 and January 2010 there were 7 cases of pancreatic cysts operated in our clinic, representing 5.69% of all pancreatic tumors.

Case 1. *Patient G.G., female, 45 years-old, from Craiova was admitted in our clinic for abdominal pain and palpable mass in the upper left abdominal quadrant; abdominal ultrasound detected a round cystic tumor, 10 cm in diameter (Fig. 1). Routine blood and urine tests and thoracic X-ray were normal. Intraoperatively is discovered a 15 cm diameter cystic tumor, occupying entirely pancreatic body and tail, and a large portion of the pancreatic head. A subtotal splenopancreatectomy (including a large portion of the pancreatic head) was carried out. Postoperative evolution was uneventful. Histology revealed the intraductal papillary mucinous cystadenoma structure.*

Case 2. *Patient B.A., female, 51 years-old, from Craiova was admitted in our clinic for incidentally discovery of a 6-7 cm pancreatic tumor. CT aspect of the pancreatic tumor is presented in Fig. 2. On laparotomy we discovered an 8 cm diameter, well-defined tumor of the pancreatic head; the tumor was developed through the mesentery root, and it was attached to the pancreatic head through a short pedicle, which allowed a relatively easily enucleation. On section, the tumor's cavity was microcystic, with serous fluid inside. Postoperative evolution was normal. Histology showed the structure of a serous microcystic pancreatic cystadenoma.*

Case 3. *Patient M.N., male, 59 years-old, from Bailesti was admitted in our clinic for pain in the upper abdomen and bilious vomiting; patient is known with diabetes mellitus type II. Blood and urine tests were normal; abdominal ultrasound and abdominal CT reveal on the pancreatic tail a 37 mm diameter mass, well-defined, with multiple cavities inside. On the laparotomy on the pancreatic body and tail was discovered a 5 cm diameter tumor, with smooth walls and serous fluid content (Fig. 3 and 4). A distal splenopancreatectomy was carried-out, with postoperative course interrupted by a pancreatic external small fistula (75-100 ml/day), solved conservatory. Histology showed mucinous pancreatic cystadenoma features.*

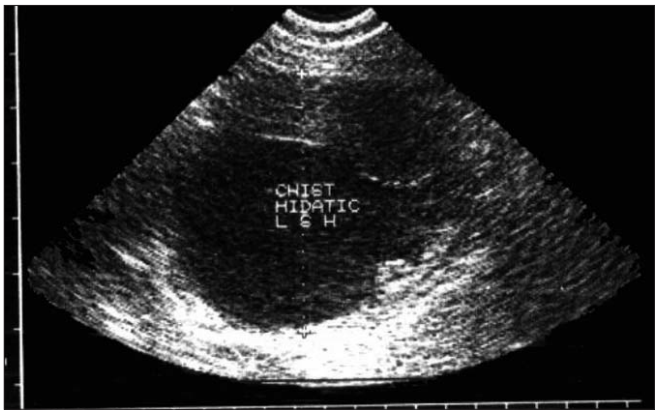

Figure 1. *Abdominal ultrasound: a round cystic tumor, 10 cm in diameter in immediate relation with left lobe of the liver (suspected hydatic cyst of the liver)*

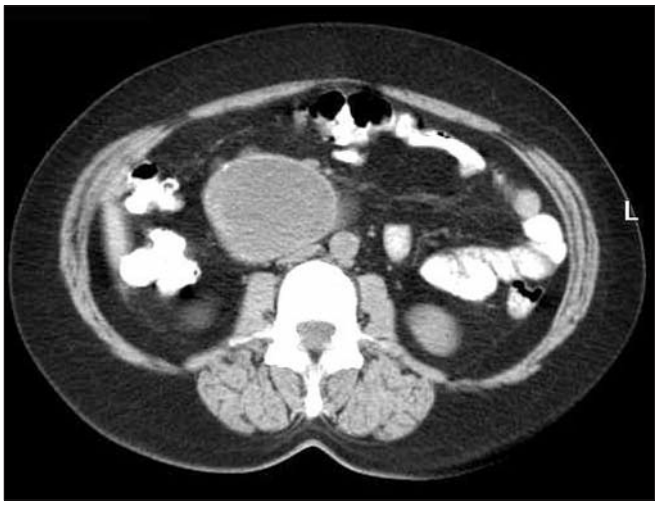

Figure 2. *Abdominal CT: a round well contoured tumor with intraparietal microcalcifications in the pancreatic head, with compressive effect on inferior vena cava*

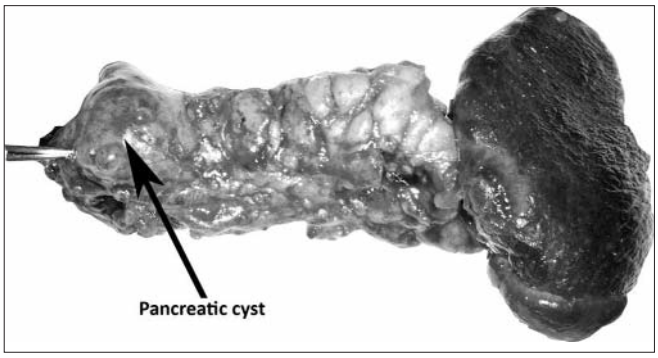

Figure 3. *Fresh resection specimen: a 5 cm diameter tumor on the pancreatic body*

Case 4. *Patient C.M., female, 43 years-old, from Craiova was admitted in our clinic for moderate pain in the upper*

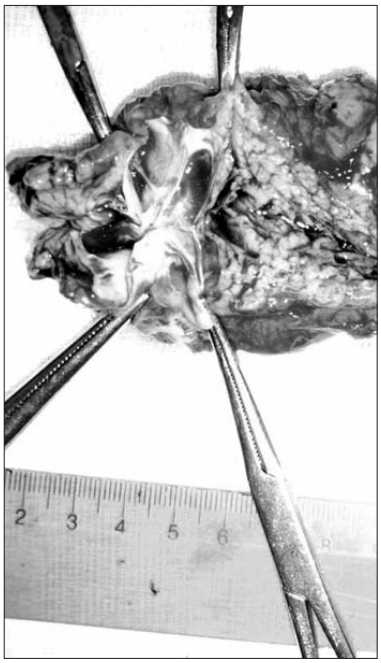

Figure 4. *The same tumor with smooth walls and macrocavities on fresh specimen sectioning*

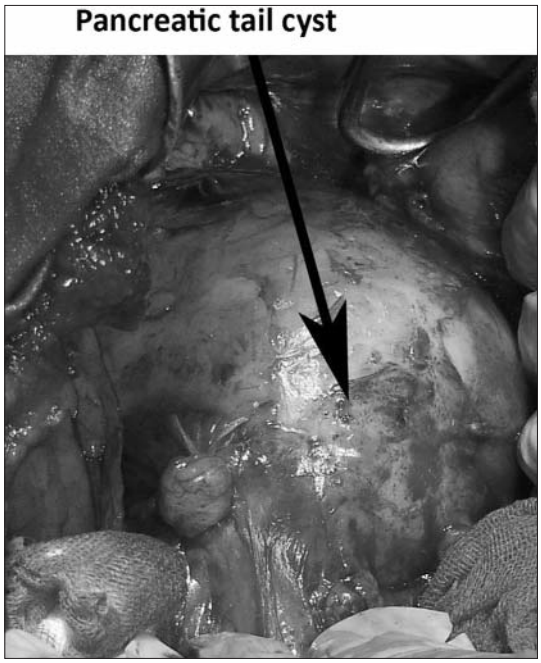

Figure 5. *Intraoperative aspect: a 12 cm cystic tumor of the pancreatic tail and body (mucinous cystadenoma)*

abdomen. Abdominal ultrasound and CT revealed in the distal pancreas a 10 cm, round, well-defined mass, with mixed densities (fluid and solid), and small calcifications. On laparotomy a cystic tumor, 12 cm in diameter, adjacent to the Treitz angle was identified and removed through a splenopancreatectomy, with uneventful postoperative course. On histology, a cystic papillary pancreatic adenocarcinoma was diagnosed.

Case 5. *Patient M.G., male, 51 years-old, from Caracal, was admitted in our clinic for abdominal pain and palpable mass in the upper quadrant. From patient's history, we noticed a gastric resection for duodenal ulcer (20 years ago), a type II diabetes mellitus, and a sequelar myocardial infarction (15 years ago). Blood and urine tests were normal, also EKG and thoracic X-ray. Abdominal ultrasound and CT diagnosed a 12 cm diameter, transsonic mass between the pancreatic tail, spleen and left kidney; the tumor was well-defined, homogenous, with smooth contour and impression on the surrounding organs and splenic vessels. On laparotomy the 12 cm, well-defined tumor of the pancreatic tail and body was confirmed (Fig. 5) and a splenopancreatectomy was carried-out. Postoperative course is complicated by a small pancreatic external fistula (50 ml/day), solved conservatory. On histology, the mucinous pancreatic cystadenoma diagnosis was established.*

Case 6. *Patient P.E., female, 61 years-old, from Craiova, known with diabetes mellitus, was admitted for obstructive jaundice (bilirubine level of 13.25 mg%, with direct fraction of 11.28) and 12 kg weight loss. Routine blood and urine tests and thoracic X-ray were normal. On abdominal ultrasound and abdominal CT: distended gall bladder, with no calculi detected, dilated intrahepatic bile ducts and a 20 mm main bile duct; also, a 35 mm cephalopancreatic mass was identified. The patient is proposed for seriate surgery and a cholecysto-gastrostomy was performed, followed 30 days later by a duodenopancreatectomy with pancreatic remnant abandoning. During surgery, a 4 cm diameter cephalopancreatic tumor invading the duodenum (Fig. 6) was discovered with posterior cleavage plan; no liver or distant peritoneal metastasis was found. Postoperative evolution is complicated by an external pancreatic fistula, solved after 72 days of conservatory*

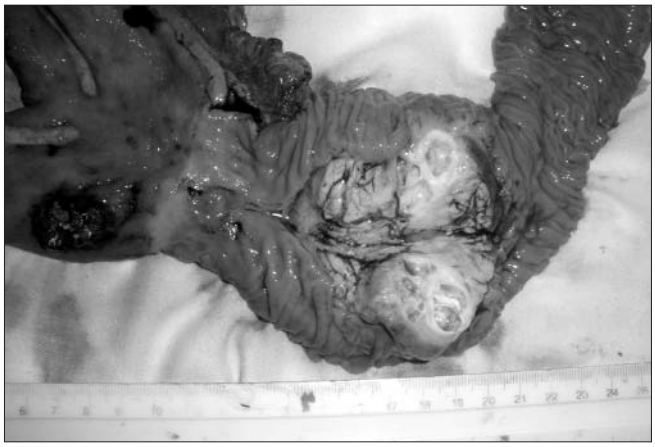

Figure 6. *Postoperative resection specimen: a 4 cm diameter cystic tumor invading the duodenum (papillary pancreatic cystadenocarcinoma)*

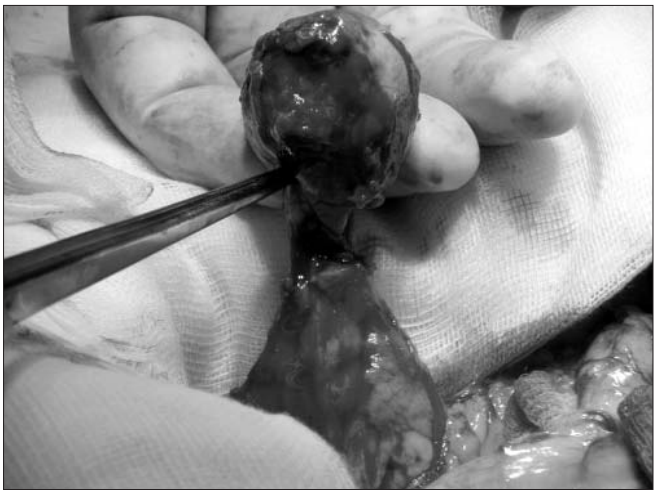

Figure 7. *An enucleated cystic tumor of the pancreatic body (paraffin-embedded sections revealed the structure of a pancreatic papillary adenocarcinoma)*

treatment. Histology revealed the cystic papillary carcinoma structure, with direct invasion of the duodenal wall and Vater's papilla; 16 lymph nodes were examined but no metastases were found.

Case 7. *Patient I.A.M., female, 24 years-old, from Craiova, with no symptoms was detected on a routine abdominal ultrasound with a 3 cm pancreatic tumor located on the pancreatic tail, confirmed by an abdominal CT. Patient was admitted in our clinic and on surgical exploration a 3.5 cm cystic tumor located on the anterior surface of the pancreatic body was discovered; a tumor enucleation was performed (Fig. 7), and frozen-section histology established the benign papillary pancreatic cystic tumor diagnosis. Postoperative course was uneventfully still on paraffin-embedded sections the papillary adenocarcinoma diagnosis was established. The patient presented into another surgical unit, where an inter-pancreatic resection was performed.*

Discusions

The pancreatic true cysts represent a heterogeneous group of pancreatic tumors (benign, malign, or borderline) characterized by the presence of an epithelial line on the interior surface of the cyst wall. (1,2,3)

In this study, we analyzed only pancreatic true cysts, excluding pseudocysts; hence, the pancreatic true cysts incidence in our clinic was 5.69% of all pancreatic malignant tumors (123 cancers of the pancreatic head, body and tail in the same period). The incidence of pancreatic cysts was higher in female than male (71.42%), with an average age of 47.71 ± 12.36 years, similar to other reports. (4,5,6)

In the presence of a pancreatic cystic tumor, the first diagnostic step is to differentiate a true cyst from a pancreatic pseudocyst (postnecrotic cyst), which has a much higher incidence; in fact, most of the authors report an incidence of only 10-15% pancreatic true cysts among pancreatic cystic tumors. This is important especially due to the fact that pseudocysts may regress spontaneously, or, if an active management is necessary, they often require a drainage procedure; obviously, these procedures are unable to resolve a true pancreatic cyst, which, in addition, carries the risk of malignancy. (1,2,5,7,8,9)

The differential diagnosis with a pancreatic pseudocyst was essentially made by the patient's history (no history of acute or chronic pancreatitis, no history of pancreatic trauma); also, no imagistic signs of chronic pancreatitis were present. Still, in small lesion preoperative differential diagnosis may be challenging. (1,2,10)

In our study, the differential diagnosis between pancreatic cyst and pseudocyst was most challenging in the fifth case: duodenal ulcer resection history and associated diabetes mellitus raised the possibility of a cyst associated with chronic pancreatitis. The indication for surgery was imperative anyway, due to the symptoms caused by the cyst's big diameter, the only discussions being related to the type of surgery: an internal drainage, easier and less risky to perform, or cyst resection? Intraoperatively, we decided to perform resection, in order to obtain a definite pathologic result.

The second step in the diagnosis of the pancreatic cystic tumors is represented by differential diagnosis between malignant (pancreatic cystic carcinoma), potentially malignant (mucinous and papillary mucinous tumors) and non-malignant lesions (serous cystadenoma).

The preoperative imaging exploration is essential to differential diagnosis: abdominal ultrasound, abdominal CT or MRI represent the main diagnostic imaging modalities. Although some specific imaging signs (central scar, highly suggestive for cystadenoma, or peripheral eggshell calcifications, specific to mucinous tumors) were described, they are not as frequent as to become a reliable source of information about cyst's histological nature. Adding endoscopic ultrasonography to the mentioned imaging modalities it offers more details about the cyst's characteristics; still, the efficiency in differentiating between neoplastic and non-neoplastic lesions remains debatable. (2,6,7,11)

The best method of evaluating preoperatively the malignant potential of the pancreatic cysts, is represented by endoscopic ultrasound with cyst's fine needle aspiration; a combination of cytology, pancreatic enzyme level dosage and tumor markers is necessary in order to establish a conservative approach over the cyst. High levels of CEA in fluid cyst were confirmed to be specific to mucinous lesions, but the cutoff values remain debatable. Obviously, these tests are mandatory only in asymptomatic, highly risk cases, in which the diagnosis of a small cystadenoma may lead to expectancy; symptomatic cases of cystadenoma will require surgery in order to relief the symptoms, and, in some cases, to exclude a cystadenocarcinoma. (5,7,12,13,14)

In our cases, the pancreatic cystic tumor diagnosis was established easily in six cases, using abdominal ultrasound and abdominal CT; only in the sixth presented case, these imaging modalities failed to describe the cystic nature of the tumor. Endoscopic ultrasound wasn't available in any of the reported cases, but it wasn't considered necessary to the diagnosis

work-up, especially in symptomatic cases, in patients with acceptable operative risk.

In the end, establishing the final accurate diagnosis remains to pathologic postresectional examining. The importance of the pathologic exam is emphasized by the case presented by Golabek and col., in which a papillary cystic adenocarcinoma was repeatedly confused with a pancreatic pseudocyst. (9) Examining on frozen-sections doesn't always offer the best diagnosis (an estimated accuracy below 50%), therefore paraffin-embedded sections and multiple sections examination remains the best diagnostic modality. In our study in two cases, frozen sections were unable to identify the malignancy, revealed by the paraffin-embedded sections. (7)

In the reported cases, "incidentaloma" represented 28.57% of cases (two cases), both discovered after a routine abdominal ultrasound. The first case of incidentaloma has clearly had operative indication due to the cyst's big diameter, but in the second case of incidentaloma, the operative indication could be controversially, due to the small size of the cyst. We took into consideration the young age of the patient, which allows a long period of development of the cyst, and the lower operative risk in a young patient with an estimated distal pancreatectomy, all of these considerations allowing us to establish the indication for surgery. Surgery was the best fitted therapeutic modality in all our cases, allowing the entire removal of the tumors and an accurate pathologic result. (4, 10,15,16,17,18)

In our study, only one tumor was a serous cystadenoma (with a very low risk of malignancy), three other tumors showing mucinous or papillary mucinous features, carrying the risk of malignancy. Moreover, three cases showed malignant pathologic structure, the malignancy being suspected in only one case preoperatively (obstructive malignant jaundice). These results lead us to a more aggressive approach over the pancreatic cysts, regardless of the presence or absence of the symptoms and the cyst's diameter. What remains in debate is the best surgical option: cyst's enucleation had been proved unreliable in our experience, since in one case reoperation was necessary after the final pathologic examination. Therefore, in low-risk cases, pancreatic resection seems to be a more safely procedure. (3,5,6,19,20,21,22)

The extent of the pancreatic resection remains also to be established, especially in intraductal papillary mucinous tumors, opinions varying between total pancreatic resection and more conservative procedures. (20,23,24,25,26,27)

Surgical results were good in all cases, all pancreatic leakages having a benign course thus allowing us to manage them conservatory. (28)

Conclusions

1. Establishing the best diagnostic and therapeutic strategy in pancreatic true cyst depend on cyst topography and subsequently the type of surgery needed (duodenopancreatectomy, central pancreatectomy or splenopancreatectomy); patient's terrain, clinical sufferings, cyst diameter play also a major role.
2. Maybe the most important factor influencing the diagnostic and therapeutic work-up is the impossibility to assess preoperatively the differential benign/malign features; being given the risk of pancreatic cyst malignancy (preexistent or in evolution) surgical resection seem to be the best option, at least in low risk cases.
3. Pancreatic resections may be done successfully with acceptable risk of postoperative morbidity and mortality; still, conservative procedures (cyst enucleation) may be insufficient, due to the risk of subsequent malignancy.

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