Clinical Case Report

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Pancreatic carcinosarcoma mimics malignant intraductal papillary mucinous neoplasm

A rare case report and literature review

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Abstract

Rationale: Carcinosarcoma, an extremely rare pancreatic primary tumor, is characterized by coexistence of both carcinomatous and sarcomatous components. Due to its rarity, the clinical manifestation and imaging features have not been recognized. An accurate diagnostic method has not been available and a widely accepted guidelines instructing treatment has not been established.

Patient concerns: We present an uncommon case of pancreatic carcinosarcoma (PCS) which has been preoperatively diagnosed as pancreatic malignant intraductal papillary mucinous neoplasm. A radical resection, including total pancreatectomy (TP) and splenectomy, was performed.

Diagnosis: The diagnosis of PCS was confirmed by postoperative pathology.

Interventions: A radical resection, including TP and splenectomy, was performed. The patient was followed up by abdominal contrast-enhanced computed tomography scan and blood tumor marker examination.

Outcomes: The patient is still alive and self-sufficient 7 months after the surgery. No evidence of tumor recurrence is found during follow-up.

Lessons: Although, until recently, there are no widely accepted guidelines instructing treatment for PCS, a radical resection is still a possible way. All the pancreatic neoplastic patients with high surgical risk should be transferred to a specialized high-volume pancreatic center to get precise preoperative evaluation, fine operation technique, and careful postoperative management.

Abbreviations: EUS = endoscopic ultrasonography, IPMN = intraductal papillary mucinous neoplasm, MPD = main pancreatic duct, PCS = pancreatic carcinosarcoma, TP = total pancreatectomy.

Keywords: carcinosarcoma, pancreas, splenectomy, total pancreatectomy, treatment

1. Introduction

Pancreatic carcinosarcoma (PCS) is an uncommon entity that contains both carcinomatous and sarcomatous elements as demonstrated by immunohistochemical reactivity to cytokeratin and vimentin, respectively. The histogenesis of carcinosarcoma is still unknown. Several hypotheses have been put forward to explain the characteristic biphasic appearance of carcinosarcomas, which include conversion, combination, and collision. According to a limited number of patients who has been immunohistochemically proved PCS, the prognosis was very dismal. Here we present a patient who was diagnosed with malignant intraductal papillary mucinous neoplasm (IPMN) of the pancreas preoperatively and received total pancreatectomy (TP) discharged from hospital on the tenth day with unremarkable recovery. Nevertheless, the efficacy of radical surgery as well as adjuvant chemotherapy is still unknown, and the efficacy of comprehensive treatment still need to be examined by further investigations.

2. Case presentation

In April, 2016, a 60-year-old male was admitted into our hospital with a 7-month history of progressively aggravated steatorrhea and the presence of a huge right upper abdominal palpable mass. During the past 7 months, he had a weight loss of 8 kg. He did not complain of jaundice, fever, epigastric and back pain, inappetency, vomiting, hematemesis, melena, hematochezia, or obstipation. He denied cigarette abuse and diabetes mellitus. Physical examination was positive for a 9×6-cm round-like, nontender mass with rough texture, obscure boundaries, and smooth surface palpated in the right upper quadrant. Abdominal contrast-enhanced computed tomography (CT) scan showed

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B-QL and Q-FL have contributed equally to the article.

Ethics: This report was approved by the Peking Union Medical College Hospital Ethical Committee. Consent to participate in this study was obtained from the patient.

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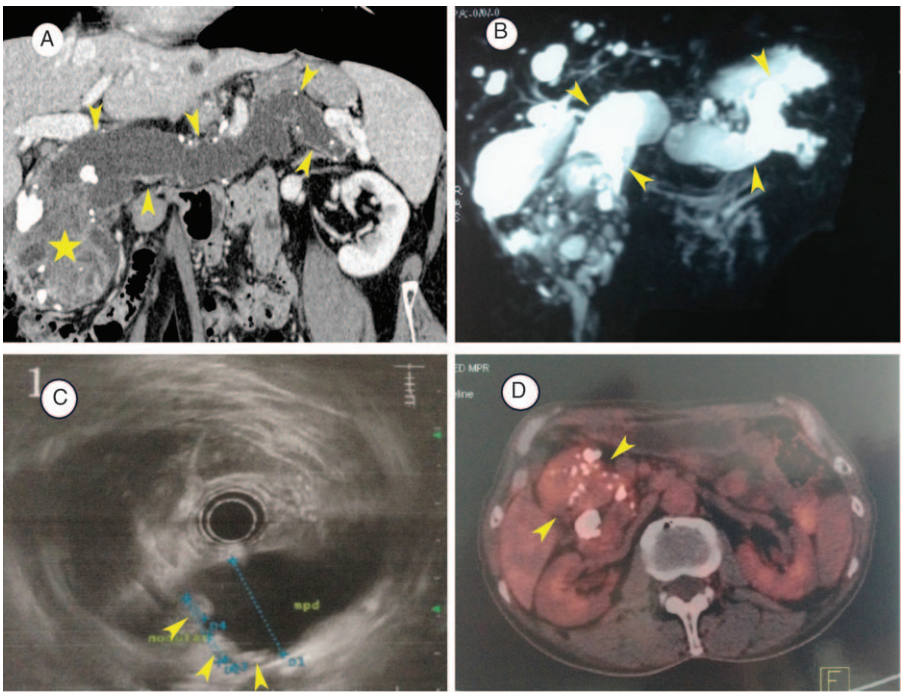

Figure 1. An irregular huge solid–cystic mass located in the pancreatic head with multiple patchy calcifications. The solid components showed obvious enhancement as it progressed from the arterial phase to the portal phase (star). The whole course of the main pancreatic duct (MPD) was dilated (arrows) and several calcifications can be seen along the pancreatic ductal wall (A). Magnetic resonance cholangiopancreatography showed the dilated MPD (arrows) (B). Endoscopic ultrasonography showed several syncretic mucal nodules in the head and neck parts of the MPD (arrows) (C). 18F-fluorodeoxy glucose positron emission tomography showed the irregular uptake of FDG at the mass of the pancreatic head (arrows) (D).

an irregular solid–cystic mass of about 8×7 cm located in the pancreatic head with multiple patchy calcifications. The solid components showed obvious enhancement. The whole course of the main pancreatic duct (MPD) was dilated with atrophy of the pancreatic parenchyma (Fig. 1A). Magnetic resonance cholangiopancreatography found the dilation of MPD (Fig. 1B). Endoscopic ultrasonography (EUS) also showed several syncretic mural nodules in the proximal MPD (Fig. 1C) and that the solid–cystic mass communicated with the MPD. On 18F-fluorodeoxy glucose (FDG) positron emission tomography, the irregular uptake of FDG was visible at the mass of the pancreatic head with the maximum standardized uptake value of 3.8 (Fig. 1D). Laboratory tests indicated the tumor markers, including carbohydrate antigen (CA) 19-9, carcino-embryonic antigen, and CA724 were significantly elevated. The patient was presumptively diagnosed with intraductal papillary mucinous carcinoma.

In consideration of no distant metastasis, we attempted to perform radical resection for the patient. During surgical exploration, a hard mass with intact capsule was found in the pancreatic head. The dilated MPD together with the atrophic pancreatic parenchyma manifested as a intestinal canal. TP and splenectomy were performed (Fig. 2A). Although the procedure was challenging, it was uneventful and the total operation time was 6 hours, the blood loss was 400 mL, and no blood transfusion was performed. Grossly, there was a $10 \times 9 \times 9$-cm polypoid mass mainly in the dilated MPD of the pancreatic head. Sectioning through the mass revealed a cystic–solid tumor with grayish yellow color, multicalcification, and clear circumscription. Several irregular solid mural nodules fulfilled the segment of MPD next to the ampullam. Postoperative pathology demonstrated that the tumor consisted of dual sarcomatous and carcinomatous components. The sarcomatous components manifested cartilaginous and osteal differentiation and the carcinomatous area contained adenocarcinoma and squamous carcinoma cells (Fig. 2B–D). The surface of the mass was mostly lined by squamous carcinoma. The tumor invaded the muscular layer of the duodenum focally. Surgical margins were negative and none of the 7 lymph nodes was positive for metastasis. The principal pathologic diagnosis was carcinosarcoma of the pancreas. The patient had an uneventful recovery and was discharged 10 days after the operation. The patient is still alive and self-sufficient until this writing.

3. Discussion

Carcinosarcomas are extremely rare entities with both epithelial and mesenchymal components.[1] The pathogenesis of carcinosarcoma is still unknown. Several hypotheses have been put forward to explain the characteristic biphasic appearance of carcinosarcomas, which include conversion,[2] combination, and collision.[3] The conversion theory indicates that the sarcomatous component is derived from the carcinoma during the evolution of the tumor. The combination theory describes that both components are derived from a single stem cell that undergoes diverse differentiation at the initial of the tumor formation. The collision theory suggests that the carcinoma and sarcoma are 2 independent neoplasms and they proliferate side by side. However, the 2 components of the PCSs were more likely to be monoclonal neoplasms derived from a single stem cell for investigators have found that the 2 components shared a common clonal origin in pancreatic mucinous cystic neoplasms (MCNs) with sarcomatous stroma.[4,5] Although carcinosarcomas are predominantly located in the uterus,[6] they have also been

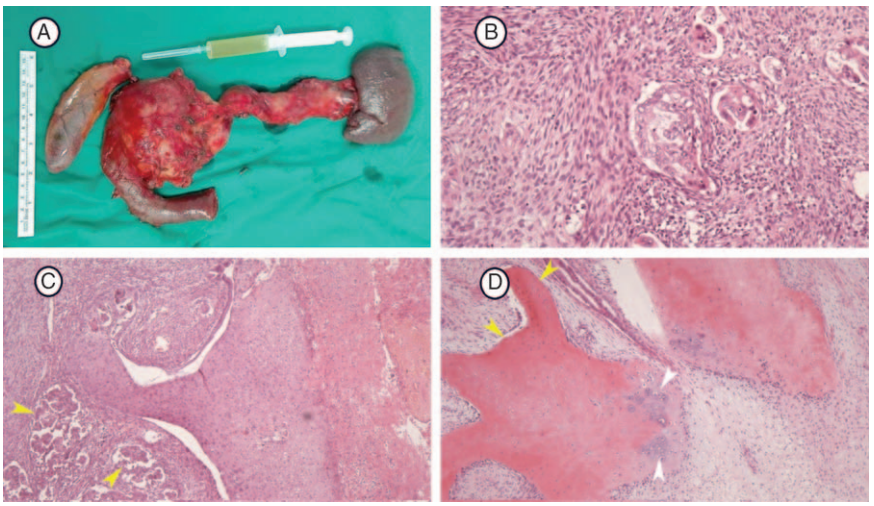

Figure 2. Total pancreatectomy and splenectomy were performed. Clear light-yellow liquid was extracted from the dilated main pancreatic duct (A). Sarcomatous and adenocarcinomatous components (B). Squamous carcinomatous components (arrows) (C). The sarcomatous components manifested cartilaginous (white arrows) and osteal (yellow arrows) differentiation (D).

reported in a variety of organs, including the pancreas. Only a handful of patients of PCS have been reported in the literature which are summarized in Additional file 1 (refer to Additional file 1, which summarizes the literatures; http://links.lww.com/MD/B729).[5,7–23]

In the pancreas, calcification has been described in the serous and MCNs, solid pseudopapillary tumors, and neuroendocrine tumors.[24] According to the literature, the calcification can be observed in about 20% of IPMNs.[25–27] Coarse calcification is more often seen in malignant IPMNs.[28] The size of the mural nodules, especially in branch-ductal IPMNs, is an important sign for malignant lesions[29] and even the presence of mural nodules is deemed as a main indication for surgery.[30] However, multiple huge fused lesions in the MPD is rarely reported. In this case, we made a misdiagnosis of malignant IPMN[31] based on the image examination and the significantly elevated tumor markers. Due to its rarity, the imaging features of PCS have not been recognized. Shi et al[17] pointed out that the carcinosarcoma in the pancreatic head more frequently appears as a solid mass with cystic regions and necrosis, which can cause MPD and intra- and extrahepatic bile duct dilatation. It was very likely that the obvious dilation of the MPD in our patient was caused by the obstructive effect of the tumor rather than a primary manifestation. Interestingly, rare patient of intraductal carcinosarcoma arising from intraductal papillary mucinous carcinoma has also been reported.[5] Whether the dilation of the MPD is a primary manifestation or secondary manifestion is rather complicated to tell when only based on the preoperative images. Preoperatively, according to the International consensus guidelines 2012 for the management of IPMN and MCN of the pancreas,[30] all the imaging features, including dilated MPD, enhancing solid conponents, and multiple mural nodules, indicated a cystic–solid mass with high-risk stigmata needing surgery. It still confuses us that whether it is appropriate to perform TP and whether it is better to reserve the distal pancreas to maintain pancreatic endocrinal function. Most of the time, however, it is impossible to make an accurate diagnosis before surgery and a negative margin by intraoperative frozen section does not mean that there is no possibility of high-grade intraepithelial neoplasia or carcinoma existing in the distal MPD. The preoperative evaluation, including enhanced CT scan and EUS, showed the MPD were dilated throughout the whole pancreas and the pancreatic parenchyma atrophied significantly. During the operation, we found that the neck, body, and tail of the pancreas looked like a thin-walled cyst and nearly no normal pancreatic tissue could be seen which could be proved by the postoperative pathology. As the preservation of the distal pancreas would do no good to the postoperative blood-glucose-control for this patient but to increase the risk of tumor residual or tumor relapse, we decided to perform a TP. The patient was referred to an endocrinal group of our hospital to receive insulin pump treatment after discharge. The diabetic state after TP is considered so severe that it has been termed “brittle diabetes”. However, in recent years, improvements in insulin regimens and specialist nurse-led diabetic care have dramatically improved diabetic outcomes post-TP. Hemoglobin A1c levels after TP were acceptable, ranging from 7.3% to 8.0%.[32–34] Post-TP quality of life is now reported to be comparable to that of type-1 diabetics.[34–36]

According to the limited reported patients, PCS has an extremely dismal prognosis and the patients survived an average of only 6 months after surgery.[9] Radical resection is the only possible method to cure the disease and the efficacies of chemotherapy and radiotherapy are not definitive. One case report where a patient lived for more than 20 months who received 6 cycles of chemotherapy after radical pancreaticoduodenectomy showed promising prospects in adjuvant therapy following radical resection.[9] On the contrary, 1 patient who received 3 cycles of chemotherapy after radical surgery lived for only 4 months.[22] Although how to improve the prognosis of the PCS is still unknown, we think that comprehensive treatment based on surgery is still the most promising curative method. However, it still needs further explorations. Because of the huge volume of the tumor and the chronic inflammation of the pancreas as well as the peripancreatic soft tissues, the risk of operation was extremely high. However, due to our precise preoperative evaluation, fine operation technique, and careful postoperative management, the patient had an uneventful recovery. We recommend that all the pancreatic neoplastic patients with high surgical risk should be transferred to a specialized high-volume pancreatic center as soon as possible.

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