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Sarcomatoid Carcinoma of the Pancreas
- A Case Report -

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We report here on an unusual case of a 73-year-old Korean female with sarcomatoid carcinoma. This tumor was composed of pancreatic ductal adenocarcinoma and a malignant fibrous histiocytoma-like stroma. The CT imaging revealed a multiseptated heterogenous hypodense mass that was 15 cm in size. The mass was located in the body and tail of the pancreas, spleen and gastrosplenic area. The pathologic examination showed that the carcinomatous component was negative for vimentin, and the sarcomatous component was positive for vimentin and CD 68. The ultrastructural examination showed that both the carcinomatous and sarcomatous components had desmosomes at the cell-cell contact sites. The patient refused postoperative adjuvant chemotherapy and she died of cachexia with generalized tumor extension about 3 months later. This report presents special data that can clarify the clinicopathological features and pathogenesis of this rare neoplasm.

Key Words : Pancreas; Sarcomatoid carcinoma

A malignant tumor that is composed of malignant epithelial and sarcomatous components has been linked to sarcomatoid carcinoma (SC) and carcinosarcoma (CS). SC or CS occurs very rarely in the pancreas. Furthermore, SC of the parcreas has not been well described to date, although it has been reported in many organs, including the breast,[1] lung,[2,3] uterus,[4] urinary bladder,[5] skin,[6,7] head and neck,[8] pancreas,[9-15] and prostate.[16] We describe here a 73-year-old Korean female patient suffering with SC of the pancreas, and present the supporting immunohistochemical and ultrastructural findings.

CASE REPORT

A 73-year-old Korean female presented with unexplained asthenia and a disturbed appetite for the 2 months previous to her admission. She had a mild fever (38.0℃) and she reported weight loss (10 kg/year). Her past medical history was significant for diabetes insipidus, which had been treated with sulfonylurea for the past 2 years. The liver function tests, serum CA 19-9 and serum carcinoembryonic antigen were within normal limits. The computed tomography scan showed a multiseptated heterogenous hypodense mass that was 15 cm in size located in the body and tail of the pancreas, spleen and gastrosplenic area (Fig. 1). Intraoperatively, the mass was partly excised for frozen sections; adenocarcinoma was diagnosed based on tissue analysis. An en bloc resection of the distal pancreas, spleen, a segment of the stomach and the splenic flexure of the colon was performed because of the firm adhesion of the pancreatic tumor to the adjacent organs. Complete excision of the tumor was not possible. No adjuvant therapy was administered because the patient declined postoperative adjuvant chemotherapy. The patient died of cachexia with generalized tumor extension 3 months later. Autopsy was not performed.

On gross examination, a relatively well circumscribed yellow white tumor measuring 20.0×15.0×13.0 cm at the greatest

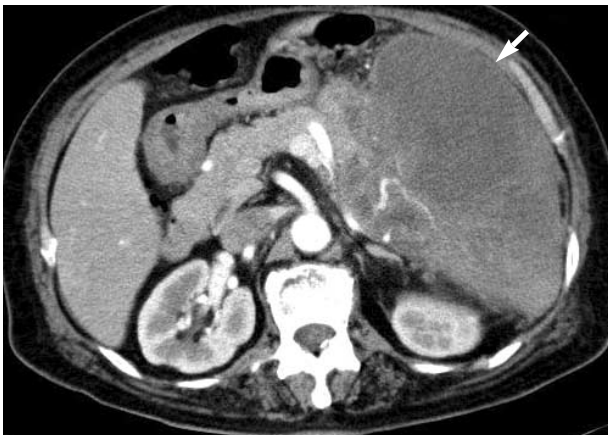

Fig. 1. Abdominal computed tomography reveals a large heterogenous hypodense neoplasm in the distal pancreas and spleen (arrow).

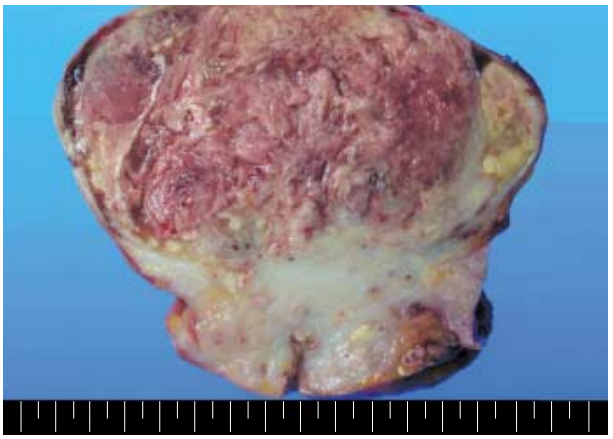

Fig. 2. The cut section of the peripheral area of the tumor is pinkish and mostly solid.

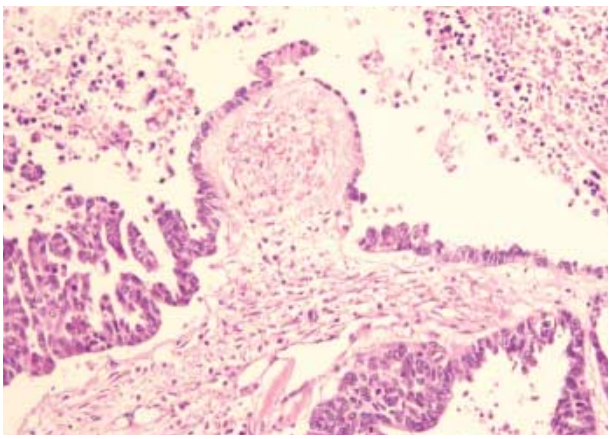

Fig. 3. Intraductal focus of the well-differentiated ductal adenocarcinoma involving the medium-sized pancreatic duct is present.

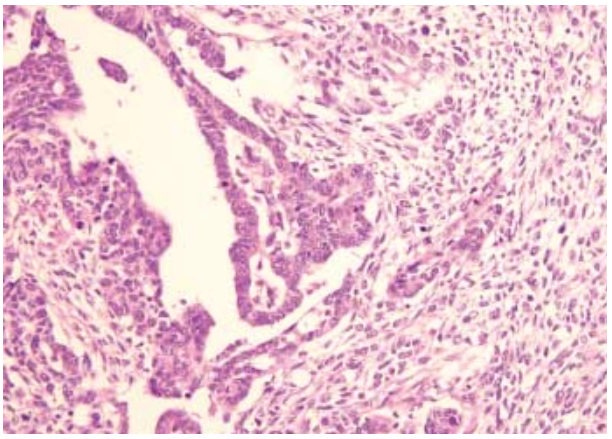

Fig. 4. In limited areas, divergent sarcomatous differentiation associated with a carcinomatous component is noted.

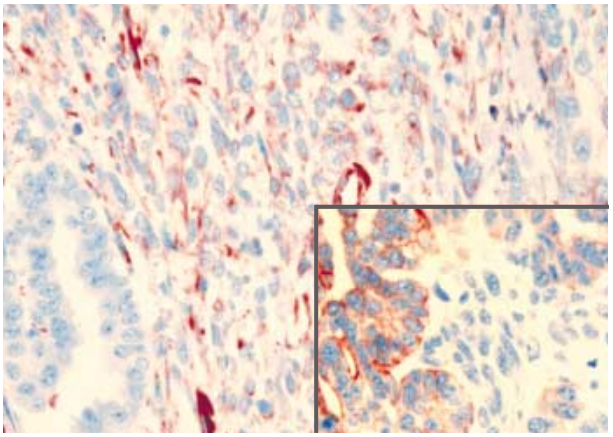

Fig. 5. Immunohistochemical examination shows that the sarcomatous component is positive for vimentin. This area is negative for pan-cytokeratin (inset).

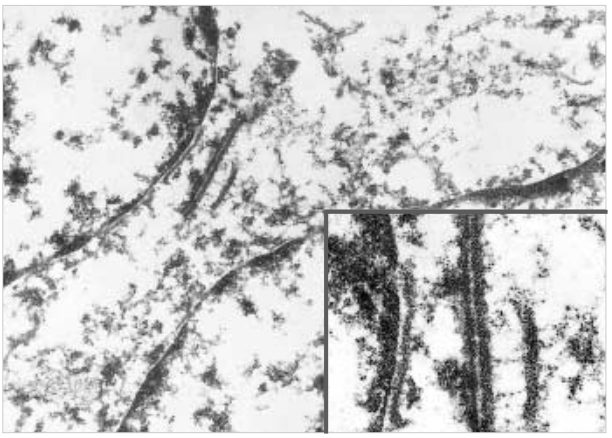

Fig. 6. Sarcomatoid component shows focal desmosomal cell junctions (large panel ×10,000, inset ×25,000).

dimensions was observed in the pancreas. The tumor was multiseptated, solid and fleshy with variegated areas of hemorrhage and necrosis (Fig. 2). The tumor extended to most of the spleen, and was adhered to the adjacent stomach and colon. A retroperitoneal lymph node was also involved by the tumor.

Microscopically, the tumor showed both carcinomatous and sarcomatous components. The ratio of the carcinomatous component to the sarcomatous component was approximately 10:1. The carcinomatous component was a moderately differentiated ductal adenocarcinoma with an in situ lesion (Fig. 3), the adenocarcinoma showed infiltration into the spleen and stomach wall. The sarcomatous component was comprised of highly cellular areas with undifferentiated short spindle or anaplastic round cells that contained abundant eosinophilic cytoplasm and hyperchromatic nuclei. Occasional multinucleated giant cells were also present. However, no heterologous elements such as neoplastic bone, cartilage and skeletal muscle were observed. Most of the sarcomatous areas were extensively vascularized with areas of marked necrosis and hemorrhage. The cytomorphologic features were those of a malignant fibrous histiocytoma. In some areas, the sarcomatous tumor cells were connected with the carcinomatous glandular cells (Fig. 4).

The immunohistochemical studies revealed that the carcinomatous cells were strongly and diffusely positive for pan-cytokeratin (CK), CK7 and epithelial membrane antigen (EMA), whereas these same cells were negative for vimentin, CK20, S-100, smooth muscle actin (SMA), CD68, carcinoembryonic antigen (CEA), estrogen receptor (ER) and progesterone receptor (PR). On the other hand, the sarcomatous cells were strongly and diffusely positive for vimentin (Fig. 5) and they were partially positive for CD68, whereas these same cells were negative for pan-CK, CK7, CK20, EMA, S-100, SMA, CEA, ER, and PR. Both the carcinomatous and the sarcomatous areas were diffusely positive for p53. The MIB-1 proliferation indices in the carcinomatous and sarcomatous components were 3% and 0%, respectively.

An electron microscopic study was performed using the paraffin-embedded block; however, complete qualitative analysis could not be performed. The ductal adenocarcinoma cells showed desmosomes at the cell-cell contact sites; however, no microvilli and intracytoplasmic mucin were observed. The sarcomatous cells revealed focal desmosomal cell junctions, and this is evidence of the carcinomatous origin of the sarcomatous component (Fig. 6).

The histological, immunohistochemical, and ultrastructural findings of this case are compatible with the diagnosis of primary sarcomatoid carcinoma of the pancreas

DISCUSSION

CS or SC that is comprised of both sarcomatous and carcinomatous components rarely occurs in the pancreas.[9-15] We encountered 7 cases of pancreatic epithelial neoplasm with a sarcomatous component in the literature (Table 1).[9,11,12,15,17] In our case, we observed areas of ductal adenocarcinoma in situ, conjunctions between the carcinomatous and sarcomatous areas, and focal desmosomal cell junctions in the sarcomatous areas. The sarcoma-

Table 1. Review of pancreatic epithelial neoplasm with sarcomatous component

Author	Age/Sex	Tumor site	Diagnosis	Immunohistochemical staining for sarcomatous component	Months to death
Wenig *et al.*[9]	67/M	Tail	Mucinous cystadenocarcinoma & Malignant spindle cellular stroma	CK–, SMA+	<15 mo
Wenig *et al.*[9]	48/F	Tail	Mucinous cystic neoplasm with no invasion & Malignant spindle cellular stroma	CK–, SMA+	>12 mo*
Wenig *et al.*[9]	65/F	Tail	Mucinous cystic neoplasm with no invasion& Malignant spindle cellular stroma	CK–, SMA+	< 9 mo
Higashi *et al.*[12]	74/M	Head	Invasive ductal carcinoma & Malignant spindle cellular stroma	CK+, Vimentin–, Desmin–	<3 mo
Darvishian *et al.*[11]	74/M	Head	Invasive ductal carcinoma & Malignant spindle cellular stroma	CK+(focal), Vimentin+, SMA–, CD68–	<4 mo
Watanabe *et al.*[15]	76/M	Head	Invasive ductal carcinoma & Mixed osteoclastic/pleomorphic type tumor	CK+, Vimentin+, CD68+	<1 mo
Hansen *et al.*[17]	54/M	Head	Invasive ductal carcinoma & Mixed osteoclastic/pleomorphic type tumor	CK–, Vimentin+, CD68+	>0.5 mo
Our case	73/F	Body & tail	Invasive ductal carcinoma & Malignant spindle cellular stroma	CK–, Vimentin+, CD68+	<3 mo

*Patient remains alive and well at 12 months of follow-up.

tous components were hypercellular, and in contrast to the carcinomatous areas, marked necrosis was observed in most of the sarcomatous areas. Immunohistochemical study revealed that the sarcomatous cells had features of malignancy without any evidence of epithelial differentiation, however, the electron microscopic study revealed a few desmosomal cell junctions. Although the origin of sarcomatous components remains speculative, the carcinomatous origin of the sarcomatous component was suggested based on the findings that most of the tumor consisted of the carcinomatous component, with the sarcomatous component was mixed the malignant ductal component, and desmosomal cell junctions were observed in the sarcomatous component.

The nomenclature and histogenesis of a carcinoma that has some sarcomatoid elements and involves many organs has been debated for many years. Controversy exists concerning the mechanisms and terminology (undifferentiated carcinoma, anaplastic carcinoma, CS, SC). The recent World Health Organization (WHO) classification of pancreatic tumors defined undifferentiated (anaplastic) carcinoma as a combination of 3 variants of ductal adenocarcinoma, i.e., giant cell carcinoma, pleomorphic large cell carcinoma, and SC.[18] The histogenic mechanism of undifferentiated (anaplastic) carcinoma is believed to be the result of either two independent clones or a single cell of a monoclonal origin with the subsequent differentiation into the carcinomatous and sarcomatous components.[10,19] Guarino *et al*.[20] described that CS might arise from a single carcinomatous clone. In the lung, it is believed that CS and SC lie together in a single morphological spectrum of epithelial tumors. Van den Berg *et al*.[10] demonstrated that the genetic alterations between the sarcomatous and epithelial components of the pancreatic mucinous cystic neoplasms with a sarcomatous stroma are virtually identical. In fact, these results must be viewed as the preliminary results because of the small number of SC or CS cases. In support of this theory, our case showed an identical p53 overexpression in both the carcinomatous and sarcomatous areas and in the desmosomal cell junctions between the sarcomatoid cells.

We have described here a rare case of pancreatic ductal adenocarcinoma with a sarcomatous stroma. Our pathologic findings, including the desmosomal cell junctions between the sarcomatous cells, an identical p53 overexpression in both two components, and admixture of the carcinomatous and sarcomatous components, support the current concept that carcinomas with sarcomatoid stroma represent a morphological spectrum of epithelial tumors. Our case presents special data on the clinicopathological features and pathogenesis of SC of the pancreas.

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