A Giant Cell Tumor of the Pancreas: A Tumor of Acinal Cell Origin

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Abstract: An autopsied case of giant cell tumor of the pancreas in a 70-year-old male is presented. The tumor was characterized histologically by coexistence of giant cell tumor and adenocarcinoma. Electronmicroscopically, intracisternal granules and tight junctions were found in the tumor cells. These findings suggested that the giant cell tumor of the pancreas was acinal cell origin.

Two types of giant cell cancer of the pancreas have been recognized. One is pleomorphic carcinoma first reported by Sommer and Meissner in 1954. It is a variant of adenocarcinoma and is characterized by the most bizarre histological findings with malignant-looking bizarre giant cells. The other is giant cell tumor of the pancreas found by Rosai in 1968. It has very similar histological findings to those of giant cell tumor of the bone with benign-looking osteoclast-like giant cells. As these two tumors are characterized histologically by the presence of multinucleated giant cells, confusion had been seen in the literature about the nomenclature and the difference between these two (Freund, 1973, Guillan and Macmahon, 1973, Kay and Harrison, 1969, Robinson *et al.*, 1977).

Up to the present, reported cases of giant cell tumor of the pancreas, do not exceed 10 in number. It's origin was considered as acinal cell (Rosai, 1968), epithelial cell (Robinson *et al.*, 1977, Posen, 1981, Trepeta *et al.*, 1981), or stromal cell (Freund, 1973).

We report a case of giant cell tumor of the pancreas with a light and electron microscope.

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CASE RERORT

A 70-year-old Japanese man was admitted to Nagasaki University Hospital, complaining of constipation and abdominal fullness. Two years before the admission, he began to have constipation and then noticed abdominal distension. In the last one week before the admission, he lost 7 kg in weight. On examination his abdomen was distended with ascites. No abdominal mass was found. Laboratory studies gave normal values.

Three weeks after the admission, an about fist sized localized rigidity with tenderness of the abdominal wall in the left lower quadrant was first noted. A firm, nodular, unmovable and tranversely located tumor was also found in the epigastrium when a large amount of ascites were removed by aspiration procedure. The patient died 7 weeks after the admission.

AUTOPSY FINDINGS

Main findings were limited to the abdomen. In the abdomen, 3200 ml. of bloody ascites and peritonitis carcinomatosa were noted. In the pancreas, an about thumb-tip sized greyish-white, firm, and partially hemorrhagic tumor, locating at the body, was found. An about fist sized plate-like metastasis was found in the abdominal wall in the left lower quadrant.

HISTOLOGIC FINDINGS

The tumor had two characteristic histological features. One is that of a usual adenocarcinoma and the other is that of a giant cell tumor. These two features coexisted in the pancreatic tumor and metastatic foci. The feature of the giant cell tumor predominated over that of the adenocarcinoma.

The adenocarcinoma was easily detectable by the presence of neoplastic ducts, which stained positively with mucicarmine and P. A. S. stain (Fig. 1).

The giant cell tumor was composed of multinucleated giant cells and tumor cells surrounding the giant cells (Fig. 2). Inflammatory cells, such as lymphocytes and histiocytes were not prominent.

The multinucleated giant cells were osteoclast-like giant cells, measuring about 20 to 60 micron in diameter. They contained 5 to 40 centrally located nuclei. The giant cells which had 10 to 20 nuclei were prevalent. They had similar nuclei in appearance to those of the tumor cells surrounding the giant cells. The cytoplasm of the giant cells was abundant and slightly granular and stained positively with P. A. S. stain. A few giant cells phagocytized the tumor cells (Fig. 3).

The tumor cells were round, oval, or spindle-shaped, varied in size from 12 to

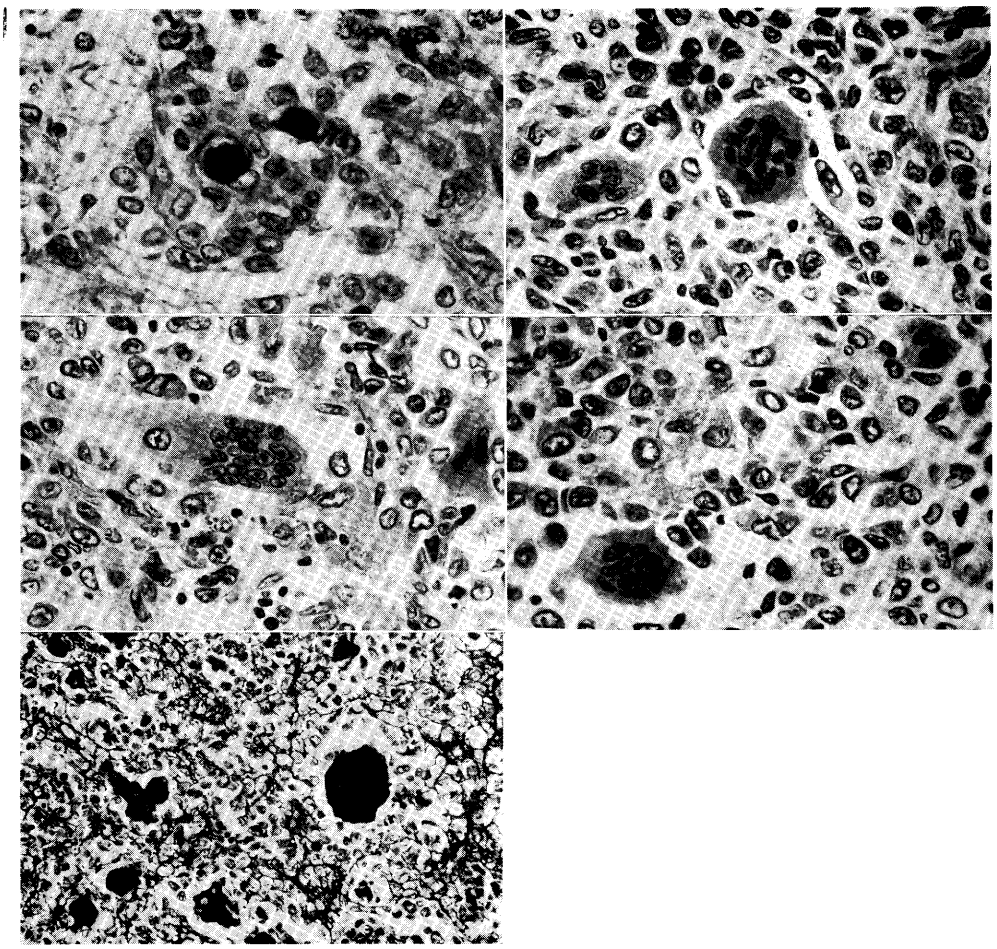

Fig. 1 (upper, left). Adenocarcinoma. Neoplastic glandular cells showing positive P.A.S. stain. (Original magnification, ×400)

Fig. 2 (upper, right). Multinucleated giant cells surrounded by tumor cells. (H&E. Original magnification, ×400)

Fig. 3 (center, left). Giant cells phagocytizing tumor cells. Note the similarity of nucleoli between the giant cell and the tumor cell. (H&E. Original magnification, ×400)

Fig. 4 (center, right). Partial epithelial arrangement of tumor cells. (H&E. Original magnification, ×400)

Fig. 5 (lower, left). Sinus-like cavities surrounded by proliferated reticulin fibers. (Silver impregnation method. Original magnification, ×200)

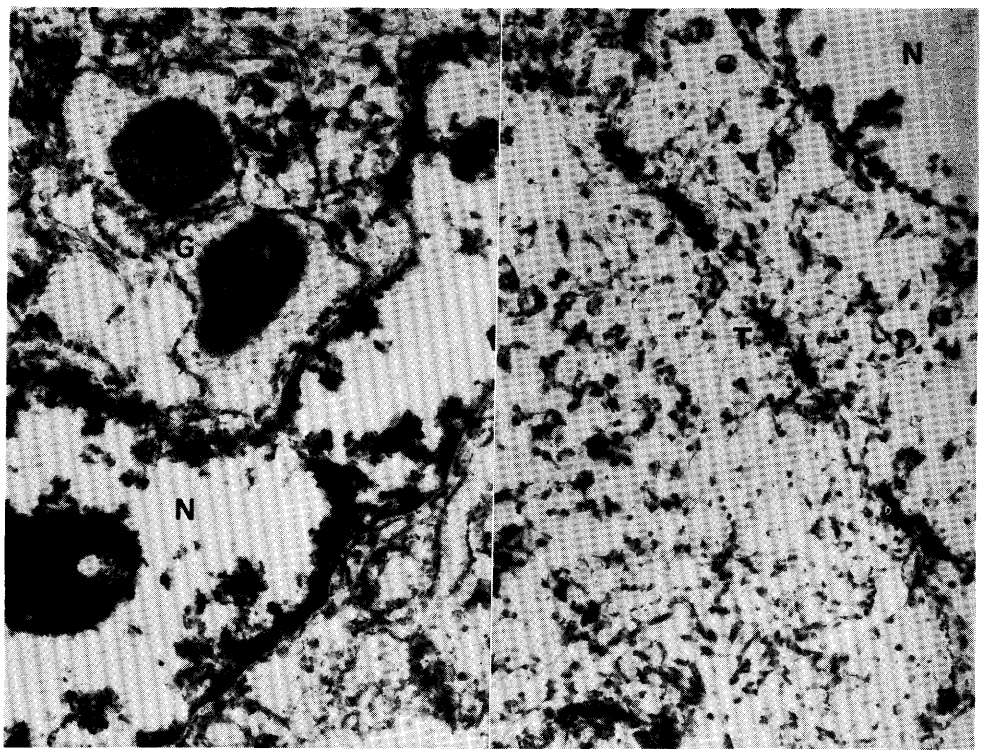

Fig. 6 (left). Intracisternal granules (G) in tumor cells. (EM. ×10,000)
Fig. 7 (right). Tight junctions (T) of tumor cells. (EM. ×6,400)

30 micron in diameter. Most of the tumor cells had single large nucleus, but a few had two to four nuclei. Most of the nuclei were round, but occasionally angulated, irregular, indented or lobated. They were moderately to highly hyperchromatic and their chromatin were condensed along the nuclear membrane. The nucleoli varied from none to five in number, inconspicuous to prominent in appearance, and eosinophilic to basophilic in stained color. The tumor cells had abundant, slightly granular cytoplasm stained faintly positive with P. A. S. stain. No phagocytosis was seen in the tumor cells. They showed loosely detached arrangement but focally epithelial arrangement was noted (Fig. 4). The silver impregnation method revealed round sinus-like cavities surrounded by proliferated reticulin fibers throughout the lesion (Fig. 5). In such cavities, where a giant cell and several tumor cells coexisted, the giant cell occupied the central area and was surrounded by the tumor cells.

Electron microscopic study was performed on a formalin fixed abdominal tumor obtained at autopsy. Intracisternal granules were found in the tumor cells (Fig. 6). Where tumor cells fused, tight junctions were found (Fig. 7).

DISCUSSION

Tschang et al. collected 15 cases of pleomorphic carcinoma of the pancreas and stated that pleomorphic carcinoma was different from giant cell tumor of the pancreas by the presence of distant metastases and bizarre giant cells with a few number of (fewer than 5) pleomorphic, peripherally located nuclei (1977). According to them, present tumor which showed similar histological findings to giant cell tumor of the bone was a giant cell tumor of the pancreas and was not a pleomorphic carcinoma for the following reasons: 1) Distant metastases were not seen. 2) Giant cells with more than 5 nuclei were numerous. Their nuclei located centrally and showed inconspicuous pleomorphism.

Most authors considered that giant cell tumor of the pancreas was epithelial origin. They found an associated adenocacinoma (Posen, 1981), desmosomes in the tumor cells (Rosai, 1968, Robinson et al., 1977) or both (Trepeta et al., 1981).

Rosai found intracisternal granules in the tumor cells and stated that giant cell tumor of the pancreas was acinal cell origin. Intracisternal granules have been found in pancreatic acinal cells in various animals in normal and experimental conditions, and in a patient with Zollinger-Ellison syndrome (Ghadially, 1975). We agreed with Rosai that giant cell tumor of the pancreas was acinal cell origin because we also found intracisternal granules in the tumor cells. An associated adenocarcinoma was probably formed from dedifferentiated neoplastic acinal cells.

Although the osteoclast-like giant cell is a very characteristic cell in giant cell tumor, its origin and pathological meaning have not yet been settled.

In the lesions of the thyroid and the breast, this giant cell was considered as a reactive cell fused from endothlial cells or histiocytes (Rather, 1951, Agnantis and Rosen, 1979, Factor et al., 1977, Hashimoto et al., 1980).

In the pancreatic lesions, this giant cell was considered to be formed from the tumor cells because of the presence of microvilli in the giant cell (Rosai, 1968) and/or subcellular similarity between the tumor cells and the giant cells (Rosai, 1968, Robinson et al., 1977, Trepeta et al., 1981).

We could not find any ultrastructural evidences of epithelial origin of the giant cells in this study, however, we have supposed that the giant cells were fused from the tumor cells becuase of poor histiocytic responce, similarity of nucleli and characteristic arrangement between the giant cells and the tumor cells.

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腺房細胞起源と考えられる膵巨細胞腫瘍の一例

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70才男子の巨細胞性の膵腫瘍で，病理組織学的には巨細胞腫と腺癌との両者の像を示す例を呈示した．従来，膵臓の巨細胞性腫瘍の組織学的起源について論議されているが，本例の電顕的検索によって intracisternal granules および tight junctions を見出したことにより膵巨細胞腫瘍の起源は膵腺房細胞であると考えられた．

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