



Histopathologic Characteristics of Pancreatic Clear Cell Carcinoma: A Distinctive Biomarker HNF-1, or Liver Nuclear Factor

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Description

It is not widely known that clear cell carcinoma is a kind of pancreatic ductal carcinoma. A unique biomarker for female genital tract clear cell tumours has been found as hepatocyte nuclear factor-1, a transcription factor. The objective of this study was to thoroughly examine pancreatic clear cell carcinoma and the distinctive biomarker hepatocyte nuclear factor-1. Pathological examination and immunohistochemical evaluation of 84 pancreatic adenocarcinomas using the hepatocyte nuclear factor-1 antibody were both performed. PAS, DPAS, and mucicarmine stains were used to further analyse the detected clear cell carcinomas. Clinical follow-up and pathologic characteristics were recorded. Of them, 12 clear cell carcinomas and 8 ductal adenocarcinomas with clear cell component (or 24%) were recognised as pancreatic adenocarcinomas. The clear cell carcinomas had clear cytoplasm with atypical nuclei that were positioned in the middle. The absence of glycogen or mucin buildup as the cause of the transparent cytoplasm was established by the PAS, DPAS, and mucicarmine stains. Hepatocyte nuclear factor-1 is overexpressed in all clear cell carcinomas and in the clear cell components of eight ductal carcinomas with clear cell characteristics, according to the results of immunostaining. Hepatocyte nuclear factor-1, in contrast, showed generally mild or focally moderate staining in typical ductal adenocarcinoma; only eight instances (15%) were significantly positive, of which 38% were high grade and 63% were moderate grade. However, when instances of mixed and clear cell carcinoma were added, those with strong hepatocyte nuclear factor-1 staining appeared to correspond with lower survival than those with weak staining across morphologies ($P=0.01$). Thus, pancreatic clear cell carcinoma is a prevalent subtype of pancreatic ductal adenocarcinoma. Hepatocyte nuclear factor-1 can be used

as a marker to recognise these clear cell carcinomas, and its overexpression may help stratify survival rates.

In terms of cancer-related deaths, pancreatic carcinoma ranks fourth among both men and women and has a very poor 5-year survival rate, even after pancreatectomy. Pancreatic lesions are now more frequently recognised at earlier stages of detection thanks to the development of more advanced imaging technology and improved accessibility made possible by advancements in surgical techniques. Histologically, pancreatic adenocarcinoma with optically clear cells has been reported; however, outside of a few case reports, there is no comprehensive review of this entity's actual existence. It is widely acknowledged that ductal adenocarcinomas typically feature cells with extensive cytoplasm and that mucin is frequently the cause of clear cell transformation.

Pathology specimens

The electronic database at our institution's records allowed searches for all pancreatic resections spanning the 45-month period from October 2002 to the present point of this investigation. These procedures comprised pancreaticoduodenectomies and distal pancreatectomies. Adenocarcinoma of the ductal type cases were gathered and examined.

Samples of life

Searches for all pancreatic resections occurring during the 45-month period from October 2002 to the current point of our inquiry were possible using the electronic database at our institution. Pancreaticoduodenectomies and distal pancreatectomies were included in these surgeries. Cases of ductal adenocarcinoma were obtained and analysed.

Features of clear cell carcinoma histopathology

We analysed 84 cases of ductal pancreatic adenocarcinoma that had previously been diagnosed. 12 of these

had at least 75% of the infiltrating ductal carcinoma cells with clear cell characteristics, making them clear cell carcinomas. Of these, 20 (24%) cases were determined to have a considerable degree of involvement by a clear cell component. The remaining eight cases combined the typical ductal and clear cell morphologies, with less than 75% of the tumour cells being clear cells. The classification for these was mixed ductal carcinoma with clear cell characteristics.

Histologically, the clear cell component's architecture ranged from glandular or ductal to nested structures made up mostly of a single layer of polygonal cells with identifiable cell boundaries and varying degrees of nuclear atypia. Other regions displayed stacked-up layers bordering a still-visible duct. However, it appears to be particular to a cell type that is optically obvious

on standard H&E staining in both the pancreatic and the ovary. HNF1B regulation may be important, whatever the mechanism causing the clear cell variety. A HNF1B mutation that has not yet shown up visually in clear cells may be present in the rare cases of significant staining in our typical ductal carcinoma cases. However, when the cases of mixed and clear cell carcinoma with high staining were added, regardless of morphology, this group appeared to correspond with lower survival than the group with weak staining across morphologies. To assess the importance of this staining pattern in relation to tumour biology and malignant behaviour, more research is required.