CASE REPORT

Synchronous pancreatic cancer and pancreatic serous cystic neoplasm: A case report

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Abstract

Pancreatic cancer is a highly malignant digestive tract tumour with a poor prognosis. We herein report the case of a 58-year-old female who presented, in June 2019, because of upper abdominal discomfort after eating. Initially, the patient was diagnosed with chronic non-atrophic gastritis with erosion and multiple gastric polyps by gastroscopic examination. Subsequently, CT and MRI examinations revealed that dilatation of the pancreatic duct and low-density nodular shadows enhanced in the neck and body of the pancreas. Endoscopic ultrasonography identified the echo foci in the same position. Additionally, a high-level of CA19-9 in the patient's serum was noted, which was a tumour marker of pancreatic cancer. Finally, the patient was diagnosed with poorly differentiated pancreatic cancer with squamous carcinoma and plasmacytoid microcystic adenoma. In conclusion, imaging examination has exhibited a vital functional role in the diagnosis of many cancers, which help gain valuable treatment time and prolong the life of patients.

Keywords: Pancreatic serous cystic neoplasm; Magnetic resonance imaging; Computed tomography; Endoscopic ultrasonography.

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Introduction

Pancreatic cancer is an aggressive, low-survival malignancy, which accounts for only 3% of new cancer cases but results in 98% mortality rate each year. The five-year survival rate of pancreatic cancer at the time of diagnosis is 10% since approximately 80-85% of patients present with either the unresectable or metastatic disease. Even for the small subset of patients diagnosed with localised, resectable tumours, the prognosis remains poor, with only a 20% five-year survival rate following surgery.[1,2]

Computed tomography (CT) is the preferred imaging technique for suspected cases of pancreatic cancer. In clinical practice, multiple imaging techniques, such as magnetic resonance imaging (MRI), endoscopic ultrasonography (EUS), etc., are often combined to evaluate the feasibility of preoperative diagnosis, staging, and surgical resection to improve the diagnosis and treatment rate. Histopathology is the 'gold standard' for the diagnosis of pancreatic cancer. Given the unique histopathological characteristics and aggression of pancreatic cancer, a pathological examination must be conducted to confirm the diagnosis before starting the treatment. Herein, we report a case of simultaneous presence of pancreatic cancer with squamous carcinoma and plasmacytoid microcystic adenoma by imaging examination.

Case Report

A 58-year-old Chinese woman, with a history of hypertension for 34 years, presented on June 21, 2019 to the Fourth Affiliated Hospital Zhejiang University School of Medicine in Yiwu, Zhejiang Province, China; with 'upper abdominal discomfort after eating'. Gastroscopy revealed that "chronic non-atrophic gastritis was accompanied by erosion and multiple stomach polyps". However, symptoms such as chest distress, nausea and vomiting, acid reflux, heartburn, haematemesis haematochezia were not reported. On July 1, 2019, biopsy conducted on a mass in the pancreatic neck using gastroscopy ultrasound showed the presence of abnormal cells, indicating pancreatic cancer. However, tumour cells were not found on the mass puncture smear of the pancreatic body.

A CT examination showed clear pancreatic structures, and the pancreatic duct was slightly dilated, while a tubercular shadow of 2.3×2.1cm in size (red arrow in Figure 1) was detected in the neck of the pancreas, which enhanced after the image was enhanced. An oval low-density shadow of about 2.7×2.4cm in size (blue arrow in Figure 1) was seen on the pancreatic body, showing a separation on the growth. Multiple small sac-like low-density shadows with clear boundaries were also seen. Abnormal changes were not observed around the pancreas, while enlarged lymph nodes were not observed in the retroperitoneum.

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MRI showed a clear pancreatic structure and a slightly dilated pancreatic duct. The nodular shadow in the neck of the pancreas had an unclear boundary and was 2.3×2.1cm in size (red arrow in Figure 2). The nodular shadow in the body/tail of the pancreas had a clear boundary and was 2.5×2.2cm in size (blue arrow in Figure 2). Abnormalities were not observed around the pancreas, while enlarged lymph nodes were not observed in the retroperitoneum.

As shown in Figure 3, the main pancreatic duct in the cervical section of the pancreas was slightly dilated, and the diameter of the widest area was 4.3mm. A low echo lesion was visible at the proximal section of the pancreas, with a cross-sectional area of approximately 18.2×18.9mm2, while a few blood flow signals were visible on the Doppler (Figure 3A, 3B). A round high echo focus with a cross-sectional area of approximately 18.9×23.5mm^2 was identified in the body of the pancreas, and the echo was noted to be uneven. Multiple low-echo foci with clear boundaries were visible inside, and blood flow signals were also visible in the Doppler (Figure 3C, 3D).

All the parameters of the patient were examined, and the results of tumour markers are shown in Table. Serum CA 19-9 has always been considered a critical pancreatic adenocarcinoma marker. Reports on the significant increase in CA 19-9 have been widely reported in

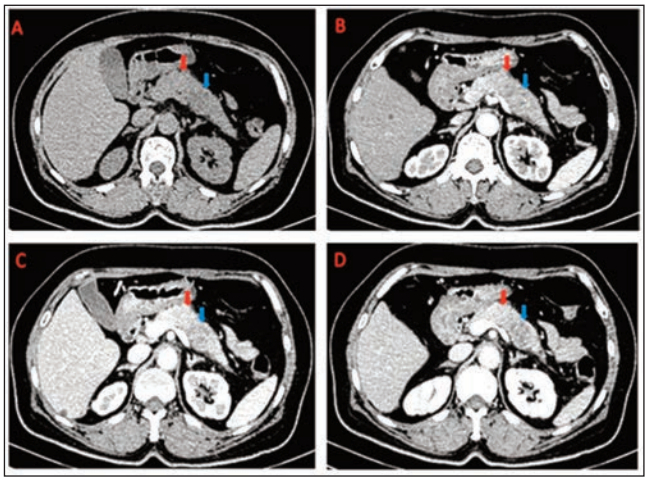

Figure-1: (A) Computed tomography imaging of scan period; (B) arterial phase; (C) Portal phase; and (D) venous phase are shown. Tubercular shadows were detected in the pancreatic neck and body, measuring 2.3x2.1cm (red arrow) and 2.7x2.4cm (blue arrow), respectively. Multiple small sac-like low-density shadows with clear boundaries were also seen.

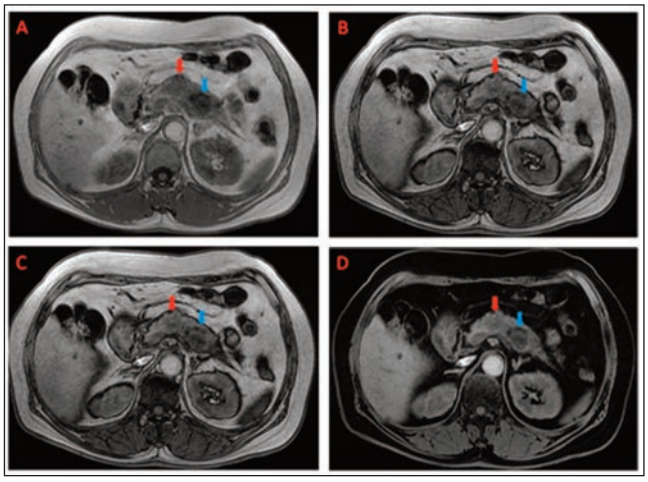

Figure-2: (A) Magnetic resonance imaging of in-phase; (B) out of phase ; (C) LAVA fat image; and (D) LAVA water image are shown. The nodular shadow in the neck of the pancreas was 2.3×2.1cm (red arrow), while another nodule in the body/tail was 2.5×2.2cm (blue arrow), with a slightly dilated pancreatic duct.

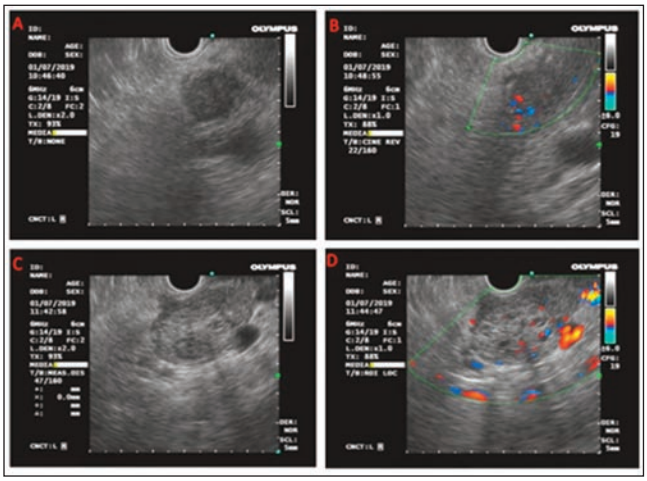

Figure-3: The findings on endoscopic ultrasonography are shown. A low echo lesion and a high echo focus, with cross-sectional areas of 18.2x18.9 and 18.9x23.5 mm^2, respectively, were identified in the pancreas. Multiple low-echo foci with clear boundaries were also detected.

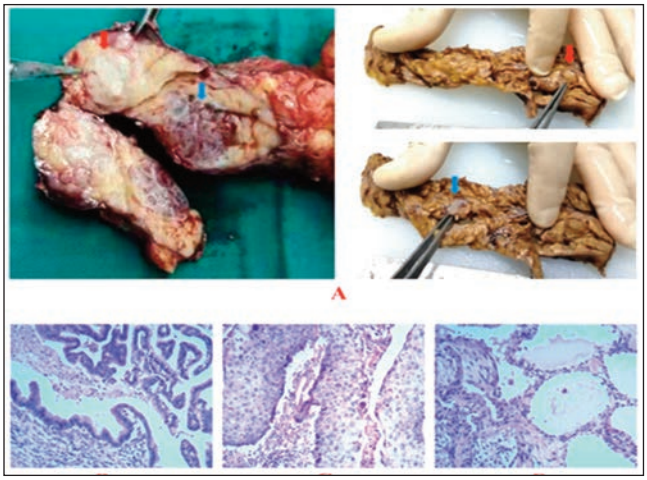

Figure-4: (A) There were nodular masses in the neck and body of the resected pancreas (as red and blue arrows shown in). Pathological findings of (B) nodular mass of adenocarcinoma, (C) nodular mass with squamisation, and (D) cystic nodule were shown. Pathological findings on haematoxylin-eosin stained sections are shown (x10).

Table: The expression of tumour markers in the patient's serum.

Characteristics	Measured value	Changes	Reference value
Chorionic gonadotropin β	0.38		<7.00 mIU/ml
Carcinoembryonic antigen	3.04		<5.00 ng/ml
Neuron-specific enolase	18.29	↑	<16.30 ng/ml
Cytokeratin 19 fragment	3.47	↑	<2.08 ng/ml
CA 19-9	134.89	↑	<43.0 U/ml
CA 125	20.01		<22.0 U/ml
CA 72-4	8.82	↑	<6.90 U/ml
Squamous cell carcinoma associated antigen	1.99	↑	<1.50 ng/ml
Carbohydrate antigen 15-3	11.15		<20.0 U/ml

Abbreviations: CA, carbohydrate antigen.

pancreatic patients. In this case, serum CA 19-9 levels showed a remarkable increase, suggesting pancreatic malignancy.

On October 7, 2019, the laparoscopic pancreatic body/tail and spleen were resected under general anaesthesia, followed by abdominal flushing and drainage. Two round masses with diameters of about 2.5cm and 3cm were observed in the neck and body/tail of the pancreas, respectively. The masses were noted to have adhered to the surrounding tissue in the spleen and colon, while no apparent abnormalities were seen in other areas.

The pancreatic body and spleen biopsy specimens were examined using gastroscopy. The size of the pancreas was 11×4×2.5cm, while a 2×2 cm sized sallow nodule was observed on the surface of the section (Figure 4A). Haematoxylin-eosin stain showed that the tumour cells had infiltrated in the form of a patch nest with prominent squamisation. A vacuolated cytoplasm and highly differentiated tubular structures were also detected (Figure 4B, 4C). A multilocular cystic nodule with a diameter of 2cm was observed adjacent to the nodule (Figure 4A). The multilocular cyst wall was lined by a single cuboidal epithelium, with no atypia in the nucleus (Figure 4D).

The results of the pathological diagnosis were: 1) poorly differentiated adenocarcinoma of the pancreas with squamisation in the neck of the pancreas and 2) microcystic cystadenoma on the pancreatic body/tail. The immunohistochemistry results were as follows: CD 56 (-), CK (AE1/AE3) (+), CgA (-), NSE (-), Ki-67 (30%+), Syn (-), CK 5/6 (+), CDX-2 (-), CK 20 (-), CK 19 (-), CK 7 (+) and P 40 (+).

Discussion

Compared with normal pancreatic tissue, pancreatic cancer tissue receives a lower blood supply, and arterial phase enhancement is not apparent and is presented as homogeneous or non-homogeneous low-density lesions. Moreover, in pancreatic cancer, invasion of the peripheral duct often narrows or occludes the lower biliary tract, while the upper biliary tract is dilated and the gallbladder is enlarged, along with pancreatic duct dilation.[3,4] CT images can show the slight dilatation of the pancreatic duct. A low-density nodule shadow was detected in the neck of the pancreas, which was then enhanced but was observed to be weaker than the pancreatic parenchyma, which is a characteristic of pancreatic cancer. Meanwhile, a low-density nodule shadow in the body of the pancreatic tissue was observed that, when enhanced, showed a separation. Multiple follicular low-density shadows with clear boundaries, which were considered to be cystadenomas, were also observed.

Compared to CT, MRI has a high degree of contrast and resolution. Due to the presence of many water-soluble proteins, an abundance of endoplasmic reticulum, and a high concentration of paramagnetic manganese in acinar cells, pancreatic tissue produces a strong signal in MRI images. In contrast, tumorous pancreatic tissue only produces a weaker, equal, or mildly stronger signal.[5] In this study, MRI image of the patient showed that the pancreatic duct was slightly dilated and that the T1W 3-dimensional gradient recalled echo (LAVA) water phase of the two nodules produced weak signals, lipid imaging produced an equally strong signal, while the in-phase and out-phase produced mildly strong signals, which is consistent with the imaging characteristics of pancreatic cancer. Unfortunately, diffusion-weighted imaging (DWI) and an enhanced scan were not performed on this patient.

Endoscopic ultrasonography (EUS) can detect lesions with a minimum diameter of 2-3mm, while the proximal relationship between tumour and blood vessels can be observed, and the anastomosis rate between the examination results and surgical exploration is 85-100%.[6] In EUS images, a tumorous pancreas can be observed as an uneven, crab-like hypoechoic mass with irregular pancreatic parenchyma margins. Tumour necrosis and liquification may lead to anechoic areas, cystic dilatation of the pancreatic duct, or involvement of peripheral tissues and vessels.[7,8] An irregular low-echo lesion, which was diagnosed as a pancreatic tumour, was observed in the proximal neck of this patient. In the pancreatic body, high echo foci with uneven echoes were detected, along with multiple low-echo foci with clear boundaries. The CT diagnosis showed multiple small sac-like low-density shadows, indicating that the CT diagnosis was consistent with the EUS results, supporting the diagnosis of pancreatic cancer.

Conclusion

As with malignant tumours with high malignancy and intense aggression, the definite diagnosis of pancreatic

cancer is critical due to its highly malignant and highly aggressive nature. MRI and CT imaging can accurately determine the location, size, and nature of the tumours; moreover, compared with CT, MRI can better display the lesion and invasion into adjacent tissues in patients with pancreatic cancer.[9] As an additional tool, EUS can effectively detect small pancreatic cancers, which offset the inability in using MRI and CT imaging to detect small pancreatic cancers.[10]

A combined diagnosis is often used to improve the diagnosis rate further before clinical treatments are administered. In this case, MRI, CT, and EUS investigations confirmed the presence of tumours in the head and body of the pancreas, which was diagnosed as poorly differentiated pancreatic cancer with squamisation and serous microcystic cystic adenoma, respectively. This was quite a rare case, and as far as we are aware, a similar case has not been reported previously.

Disclaimer: None.

Ethics Statement: Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Conflict of interest: None.

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References

1 Kim VM, Ahuja N. Early detection of pancreatic cancer. Chin J Cancer Res 2015; 27: 321-31.

2 Ilic M, Ilic I. Epidemiology of pancreatic cancer. World J Gastroenterol. 2016; 22: 9694-705.

3 Tani R, Hori T, Yamada M, Yamamoto H, Harada H, Yamamoto M, et al. Metachronous pancreatic metastasis from rectal cancer that masqueraded as a primary pancreatic cancer: a rare and difficult-to-diagnose metastatic tumour in the pancreas. Am J Case Rep 2019; 20: 1781-7.

4 Zheng LC, Xing HQ, Li F, Huo L. Focal autoimmune pancreatitis mimicking pancreatic cancer on FDG PET/CT imaging. Clin Nucl Med 2018; 43: 57-9.

5 Vachiranubhap B, Kim YH, Balci NC, Semelka RC. Magnetic resonance imaging of adenocarcinoma of the pancreas. Top Magn Reson Imaging 2009; 20: 3-9.

6 Kobi M, Veillette G, Narurkar R, Sadowsky D, Paroder V, Shilagani C, et al. Imaging and management of pancreatic cancer. Seminars in Ultrasound, CT and MRI 2020; 41: 139-51.

7 Kitano M, Yoshida T, Itonaga M, Tamura T, Hatamaru K, Yamashita Y. Impact of endoscopic ultrasonography on diagnosis of pancreatic cancer. J Gastroenterol 2019; 54: 19-32.

8 Wangermez M. Endoscopic ultrasound of pancreatic tumours. Diagn Interv Imaging 2016; 97: 1287-95.

9 Mizrahi JD, Surana R, Valle JW, Shroff RT. Pancreatic cancer. Lancet 2020; 395: 2008-20.

10 Hussein O, Mahmoud W, Hossam AE, Yahya E. Preoperative EUS-guided tattooing of a small, firm, deep pancreatic mass. Gastrointest Endosc 2020; 93: 769-71.