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A Case of Inconspicuous Pancreatic Cancer with Invasion of the Celiac Axis and Superior Mesenteric Artery

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Abstract

A 66-year-old man was referred to our hospital due to carbohydrate antigen 19-9 (CA19-9) elevation. Further examination revealed no obvious malignancy, but abdominal enhanced computed tomography (CT) showed soft tissue density around the celiac axis and superior mesenteric artery (SMA). Although pancreatic cancer was considered as a possible diagnosis, there was no clear evidence within the pancreas itself. Furthermore the patient was observed without intervention. Another abdominal enhanced CT performed 10 months later showed a dilated pancreatic duct in the tail of the pancreas, along with a low density area measuring 10 mm in the body of the pancreas. Endoscopic ultrasound guided-fine needle aspiration (EUSFNA) led to a diagnosis of pancreatic cancer. In the present case, the tumor in the pancreas was inconspicuous, but it might be characterized by extensive extrapancreatic invasion.

Keywords: Small pancreatic cancer; Arterial invasion; Computed tomography

Introduction

Pancreatic cancer is the common and highly fatal with an overall 5-year survival rate of less than 5% [1]. Even with advanced imaging technologies, detecting a pancreatic tumor measuring less than 10 mm is difficult [2]. In some cases, the tumor in the pancreas is inconspicuous and indicated by extensive peri-pancreatic artery invasion.

Case Report

A 66-year-old man was referred to our hospital for evaluation of an elevated serum carbohydrate antigen 19-9 (CA19-9) level (130.9 U/mL, normal: <37 U/mL). His physical examination showed normal condition, with all other laboratory tests within normal range. Enhanced computed tomography (CT) revealed no abnormalities in the pancreas, but soft-tissue density in the region surrounding the celiac axis and superior mesenteric artery (SMA) was present (Figure 1). On subsequent endoscopic ultrasound (EUS) examination, the softtissue density surrounding the peri-pancreatic arteries was not clearly visualized except for that of the celiac trunks. CT scans performed at 2 months and 5 months revealed no abnormalities in the pancreas and



Figure 1: Transverse dynamic computed tomography image shows the presence of soft-tissue density in the region surrounding the celiac artery, splenic artery, common hepatic artery, and superior mesenteric artery (orange arrow).

no changes in the soft tissue surrounding the celiac axis and SMA. In addition, the serum CA19-9 level remained stable. Abdominal CT performed at 8 months revealed no marked changes in the soft-tissue density; however, mild dilation of the main pancreatic duct in the tail of the pancreas and a low-density area measuring 10 mm in the body of the pancreas were visualized (Figure 2). EUS also revealed a low-echoic mass measuring 10 mm in the pancreatic body (Figure 3). Subsequent EUS-guided fine needle aspiration (EUS-FNA) was performed for the pancreatic mass, and the histopathological diagnosis was ductal adenocarcinoma (Figure 4). There were no metastasis diseases, however we thought the tumor had directly invaded the celiac axis and SMA. According to the above, we diagnosed it as an unresectable locally advanced pancreatic cancer (T4aN0M0). Then chemotherapy was prescribed, resulting in reduction of the tumor size and shrinkage of the soft-tissue density. In addition, serum CA19-9 levels were followed and have remained relatively stable with time. The patient has survived more than two years.

Discussion

Various imaging modalities are useful for early detection of small pancreatic cancer, and EUS is considered particularly useful for this purpose because it has few blind spots and allows direct visualization of small pancreatic tumors [3]. However, we could not distinguish the pancreatic cancer at the first examination because the tumor might have been very small at that stage. The sign of thickened peripancreatic arteries is not so specific to pancreatic cancer; however we couldn't deny the pancreatic cancer because other causes have not been found. This case was already a locally advanced unresectable pancreatic cancer at the diagnosis; however we were able to find the tumor in the

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Figure 2: Transverse dynamic computed tomography image shows the presence of mild dilation of the main pancreatic duct in the tail of the pancreas (white arrow) and a low-density area measuring 10 mm in the body of the pancreas (orange arrow).



Figure 3: EUS-FNA performed on the tumor of pancreatic body.



Figure 4: Histological sections (hematoxylin and eosin, HE) of the tissue obtained by EUS-FNA ($\times 100).$

smallest size and starting the treatment before worse led to the long-term survival.

Pancreatic cancer tends to invade the areas along the neural plexus. Since there are arteries running along the celiac plexus, pancreatic cancer readily invades the associated arteries [4]. Megibow et al. have reported that neoplastic encasement obliterates the margins of the affected artery and gives the vessel a thickened appearance [5]. In addition, pancreatic cancer may initially present as a soft tissue cuff around the celiac axis or SMA without an identifiable pancreatic mass [6]. On the other hand, some researchers have reported that the finding of a thickened peri-pancreatic artery is not a specific CT finding of pancreatic cancer because the feature is recognized in many diseases such as pancreatitis and lymphoma [7]. In our case, pathological confirmation of soft-tissue density in the region surrounding the celiac axis and SMA as an invasion of pancreatic cancer had not been obtained, but we diagnosed the thickened peri-pancreatic artery as neoplastic encasement because it has reduced after the chemotherapy.

We reconfirmed that soft-tissue density surrounding the peripancreatic arteries may indicate extension to an extra-pancreatic site of pancreatic cancer without a visible mass. Not only a single modality but also combined multiple imaging modalities and close follow-up may lead to early diagnosis of small pancreatic cancer.

Conclusion

Without focal pancreatic mass or ductal dilatation, thickened peripancreatic arteries in CT findings may be an early sign of cancer. Keep in mind the possibility of the cancer, close follow-up is very important.

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