Case Report

Rectal metastasis from a previously resected carcinoma of the pancreas: a case report

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Abstract: Pancreatic cancer is associated with a very poor prognosis highlighted by the close association between the disease incidence and mortality. Pancreatic cancer commonly metastasizes to the liver, peripancreas, common bile duct, stomach, duodenum, and retroperitoneum. Conversely, rectal metastasis from pancreatic cancer is extremely rare. We report a rare case of a 75-year-old man with rectal metastasis from a primary pancreatic carcinoma resected 2 years prior. The patient underwent radiotherapy and chemotherapy, but the patient died of increased tumor load. Our understanding of pancreatic cancer has advanced dramatically in the past decade. Distant metastasis should be taken into account when a patient has a medical history of pancreatic adenocarcinoma, even when a rare metastasis site is involved. Histopathological characteristics and immunohistochemical tests are helpful for diagnosis.

Keywords: Pancreatic cancer (PC); rectal metastasis; radiochemotherapy; case report

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Introduction

Pancreatic cancer (PC) is the fifth most frequent cause of cancer death in the world (1,2), and its overall 5-year survival is less than 4% (3). At diagnosis, many cases are in well-advanced stages of metastasis and dissemination with peripheral invasion of the retroperitoneum vascular system or nerves (4-6), and the types of PC recurrence frequently involve liver metastasis (LM) and peritoneum dissemination (7-9). In contrast, rectal metastasis is extremely rare. Here, we report a case of an elderly patient with metastatic disease to the rectum who previously presented with a primary pancreatic adenocarcinoma. This case report was prepared following the CARE Guidelines (10).

Case presentation

A 75-year-old man with a previous history of rectal polypectomy in 2013 underwent a pancreatoduodenectomy (PPPD) in December 2014 for pancreatic head cancer (*Figure 1A*). The patient didn't have any special medical, family and psycho-social history. Histopathology showed an adenocarcinoma with perineuronal invasion (*Figure 1B*). Only one regional lymph node was resected, with no invasion. No cancer cells were found in the margin of the resected tissue, indicating an R0 resection. The pathologic staging of the adenocarcinoma was IIA stage (pT3N0M0) according to American Joint Committee of Cancer (AJCC) criteria, eighth edition. We didn't collect genetic information because few mutations were found in pancreatic adenocarcinoma and there were few effective targeted therapies for pancreatic adenocarcinoma.

The patient received no further treatment after the surgery until April 2016, when an increase in serum carbohydrate antigen 19-9 (CA19-9), at 102.4 U/mL (N<30.0), was found

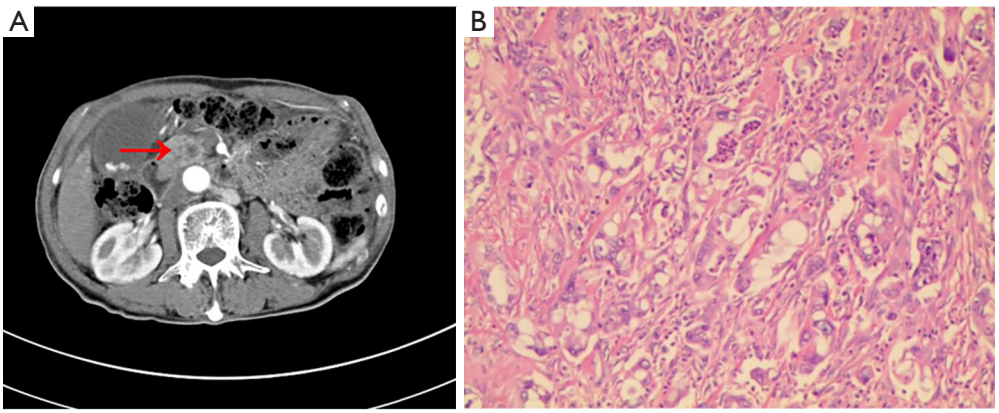

Figure 1 The primary tumor in pancreas. (A) CT imaging indicated a tumor in the head of the pancreas (arrow); (B) histology indicated an adenocarcinoma (H&E staining, ×400).

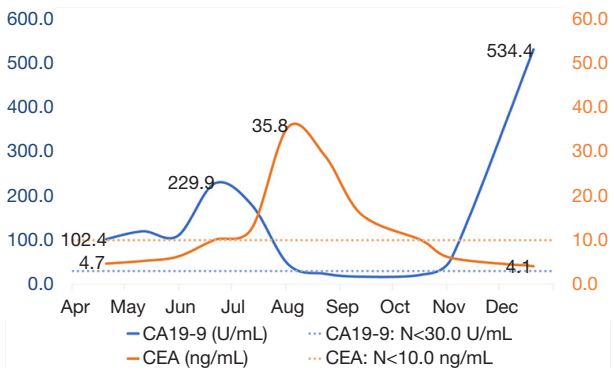

Figure 2 Serum CA19-9 levels from Apr. 2016 to Dec. 2016. CA19-9, carbohydrate antigen 19-9; CEA, carcinoembryonic antigen.

during follow-up. Nine courses of chemotherapy with gemcitabine (1,000 mg/m^2, days 1 and 8, 3 weeks for one cycle) and capecitabine (1,250 mg/m^2, days 1 to 14, 3 weeks for one cycle) was applied, despite a lack of radiological [computed tomography (CT)] evidence of relapse or metastasis. For subsequent maintenance, the patient was treated for two courses with capecitabine (1,250 mg/m^2, days 1 to 14, 3 weeks for one cycle). During chemotherapy, routine CT scans were performed every 2 months, with no sign of relapse or metastasis noted. The serum CA19-9 level had decreased to 17.2 U/mL in September 2016, but there was a sudden re-increase to 534.4 U/mL in December 2016 (*Figure 2*).

In January 2017, the patient started complaining of bloody stool with increased defecation frequency (3–4 times per day). Chest and abdomen CT on February 17 revealed a high-density shadow in the thickening wall of the cecum (*Figure 3A*). Magnetic resonance imaging (MRI) of the lower abdomen on February 27 revealed a mass located in the middle and lower section of the rectum, with the peritoneum refolded (*Figure 3B*). Multiple small lymph nodes around the tumor were noted. A soft-tissue shadow with high metabolic activity in front of the right kidney and multiple enlarged lymph nodes behind the retroperitoneum were observed by positron emission tomography-computed tomography (PET-CT) (*Figure 3C*). Colonoscopy revealed an irregular mass at about 5–7 cm from the anus in the rectum, occluding 50% of the lumen (*Figure 3D*). Histological examination (hematoxylin and eosin staining) of biopsy specimens taken from the mass revealed an adenocarcinoma. However, a further increase in serum CA19-9 to 3,426 U/mL prompted us to further explore the possibility of relapse or metastasis of the previous pancreatic adenocarcinoma. Subsequent immunohistological analysis showed the specimens to be positive for cytokeratin 7 (CK7), cytokeratin 19 (CK19), CDX2 protein, Ki-67 protein, mucoprotein 1 (MUC1), and negative for cytokeratin 20 (CK20) and mucoprotein 2 (MUC2) (*Figure 3E*). These results indicated that the rectum lesion might have originated from the pancreas adenocarcinoma that was previously resected.

From March 9, 2017, palliative radiotherapy (50 Gy/25 fractions) targeting the rectum neoplasm and pelvic lymph drainage was administered; however, in consideration of the patient's poor physical status, concurrent chemotherapy was not applied. After radiotherapy, the serum CA19-9 level had decreased significantly on April 7 to 1,255 U/mL (*Figure 4A*). On May 24, the patient received rectal MRI, revealing a slightly shrunken tumor (*Figure 4B*). On July 7, the patient was admitted to the emergency department for a severely distended abdomen. CT examination revealed an enlarged gastric cavity

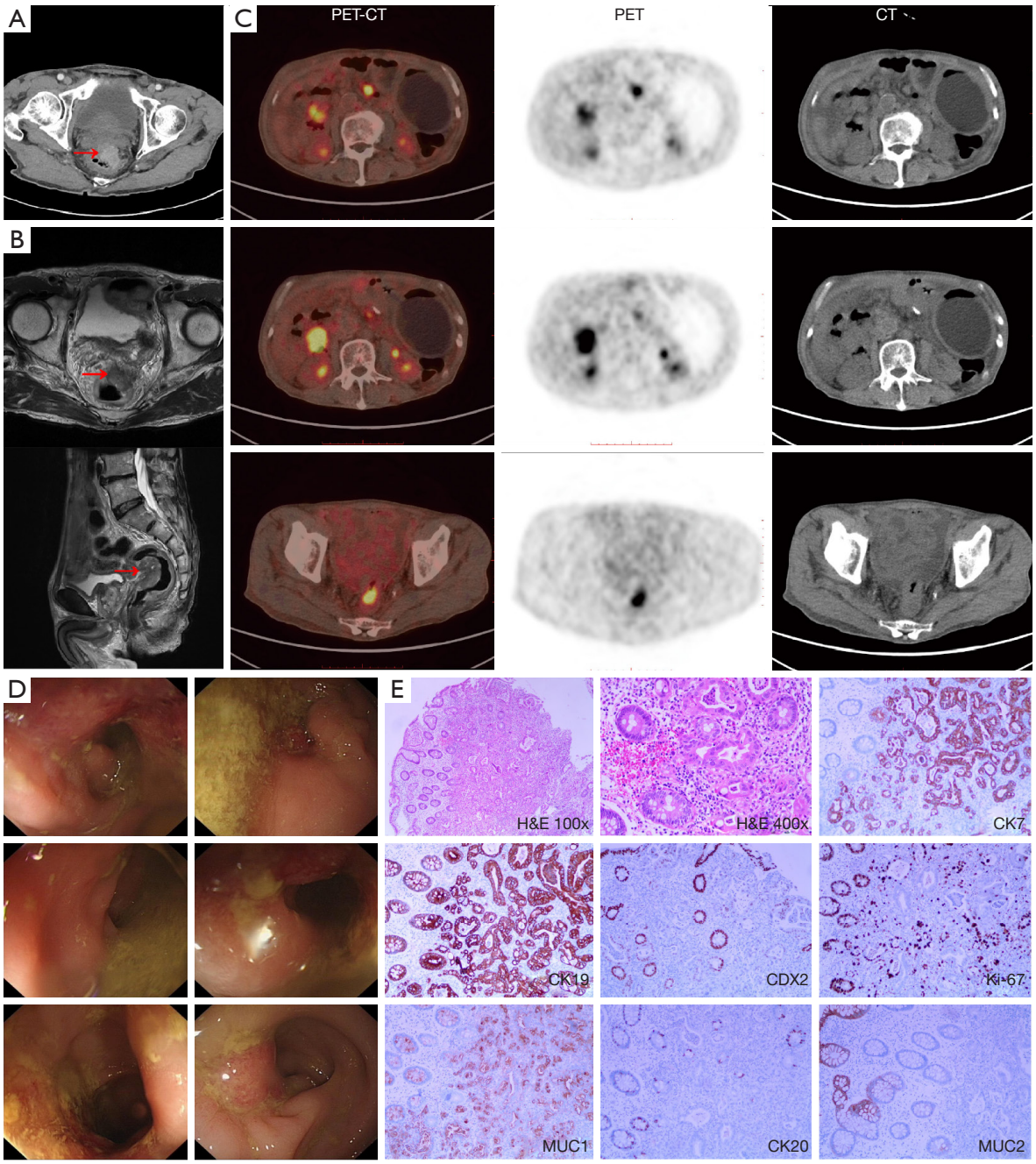

Figure 3 Examinations of cecum when the patient started complaining of bloody stool with defecation frequency increased. (A) Enhanced CT on February 17, 2017, revealed a high-density shadow in the thickening wall of the cecum (arrow); (B) magnetic resonance imaging (MRI) of the lower abdomen on February 27 revealed a mass located in the middle and lower sections of the rectum; (C) PET-CT revealed a soft-tissue shadow with high metabolic activity in front of the right kidney and multiple enlarged lymph nodes behind the retroperitoneum; (D) colonoscopy showed an irregular mass at about 5–7 cm from the anus in the rectum, occluding 50% of the lumen; (E) histological examination (hematoxylin and eosin staining) and immunohistological examinations of the biopsy specimens taken from the mass revealed an adenocarcinoma. Immunohistologically, the specimens were positive for cytokeratin 7 [CK7(+)], cytokeratin 19 [CK19(+)], CDX2 protein [CDX2(+)], Ki-67 protein [Ki-67(+)], and mucoprotein 1 [MUC1(+)] and negative for cytokeratin 20 [CK20(–)] and mucoprotein 2 [MUC2(–)]. PET-CT, positron emission tomography-computed tomography.

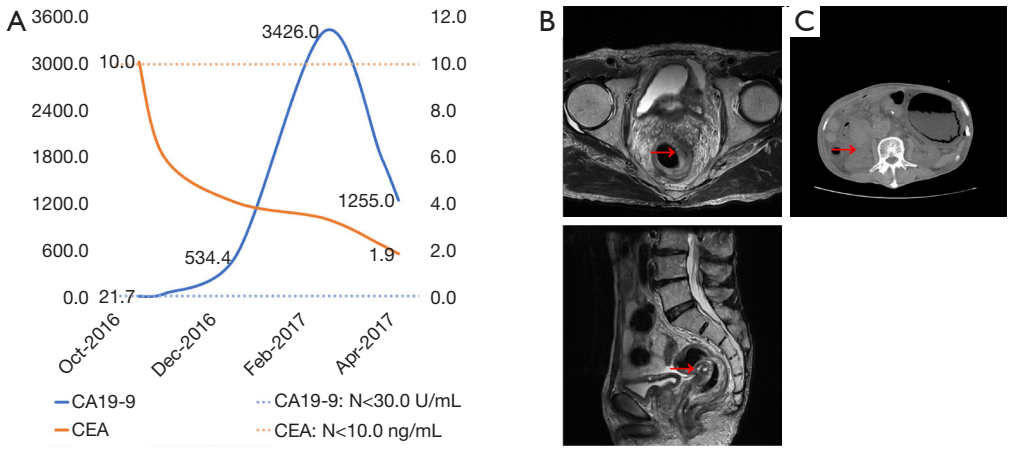

Figure 4 The development of the disease after radiotherapy. (A) Serum CA19-9 levels from October 2016 to April 2017; (B) MRI on May 24 revealed that the tumor had shrunken slightly (arrow); (C) CT examination on July 7 revealed an enlarged gastric cavity and an irregular soft tissue shadow (arrow). CA19-9, carbohydrate antigen 19-9; CEA, carcinoembryonic antigen; MRI, magnetic resonance imaging; CT, computed tomography.

with retention of contents and an irregular soft tissue shadow in front of the right kidney (*Figure 4C*). The patient ultimately died on August 28 due to the increased tumor load (*Table 1*).

A recheck of the previous CT images from November 2017 showed a small, high-density shadow inside the rectal wall (*Figure 5A*) that was not observed in the images from September 2017 (*Figure 5B*). Because of the patient's previous history of rectal polypectomy, the shadow was neglected by both the radiologist and the oncologist.

Discussion

PC is one of the leading causes of cancer mortality and one of the most lethal malignant neoplasms worldwide (11). Approximately 60–70% of PCs arise in the head of the pancreas, whereas 20–25% arise in the body and the tail (12). The two main pathological types of PC are adenocarcinoma (approximately 85% of cases) and pancreatic endocrine tumors (less than 5% of all cases) (13). Despite the use of multiagent chemotherapy and radiotherapy, PC treatment has remained a great challenge because few patients are eligible for resection and the median survival is only 6 to 12 months for those with metastatic diseases. Pancreatic adenocarcinoma usually metastasizes to regional lymph nodes, the liver, adjacent organs and the lung (14,15). However, metastasis to the rectum is so rare that no such case has been reported to date. In this case, the mass found on the rectum would have been misdiagnosed as primary rectal cancer if immunohistological analysis had not been performed, as H&E staining only suggested an adenocarcinoma. Therefore, it is crucial to conduct a comprehensive analysis of medical history, tumor biomarkers, and a series of thorough examinations, including immunohistochemistry if necessary, to diagnose gastrointestinal adenocarcinomas in patients with a previous history of pancreatic adenocarcinoma.

Common routes of pancreatic adenocarcinoma metastasis include lymphatic metastasis, hematogenous metastasis and implantation metastasis. Because the pancreas and the lower part of the rectum are both extraperitoneal organs, it is anatomically possible for tumor cells to break through the capsule of the pancreas and seed directly into the serosa of the rectum. In this case, PET-CT revealed multiple abdominal metastases, especially in the retroperitoneum, possibly implicating implantation metastasis.

In this case, CA19-9 and carcinoembryonic antigen (CEA) detection showed good sensitivity and predictive value of a curative effect. In addition, according to changes in CA19-9 and CEA levels, the tumor was relatively sensitive to chemotherapy and radiotherapy. Regardless, this tumor exhibits a tendency toward widespread abdominal metastases, and its overall prognosis is very poor.

Collectively, rectal metastasis is a rare metastasis site of PC, which may cause misdiagnosis. If possible, genetic testing should be carried out to determine the molecular characteristics of the tumor, which may help up to have a

Table 1 Organization of the case into a timeline

Time	Treatment [T]/symptoms [S]/examination [E]
2013	[T] Rectal polypectomy
Dec. 2014	[T] PPPD
Apr. 2016	[E] Elevated Serum CA19-9 at 102.4 U/mL (N<30.0)
Apr. 2016	[T] Chemotherapy with gemcitabine and capecitabine
Oct. 2016	[T] Chemotherapy with capecitabine for maintenance therapy
Sep. 2016	[E] Serum CA19-9 level decreased to 17.2 U/mL
Dec. 2016	[E] Serum CA19-9 suddenly re-increased to 534.4 U/mL
Jan. 2017	[S] Bloody stool with defecation frequency increased (3–4 times per day)
Feb. 2017	[E] Chest and abdomen CT revealed a high-density shadow with wall thickening of the cecum
	[E] Magnetic resonance imaging (MRI) of the lower abdomen revealed a mass located in the middle and lower section of the rectum, with the peritoneum refolded
	[E] Serum CA19-9 at 3,426 U/mL
	[E] Immunohistological analysis indicated metastasis
Mar. 9. 2017	[T] Palliative radiotherapy started
Apr. 7, 2017	[T] Palliative radiotherapy ended
	[E] Serum CA19-9 level decreased significantly to 1,255 U/mL
May 24, 2017	[E] Rectal magnetic resonance imaging revealed that the tumor was slightly shrunken
Jul. 7, 2017	[T] The patient was admitted to the emergency department
	[E] CT examination revealed an enlarged gastric cavity with retention of contents and irregular soft tissue shadow in front of right kidney
Aug. 28, 2017	[S] The patient died

PPPD, pancreatoduodenectomy; CA19-9, carbohydrate antigen 19-9; CT, computed tomography.

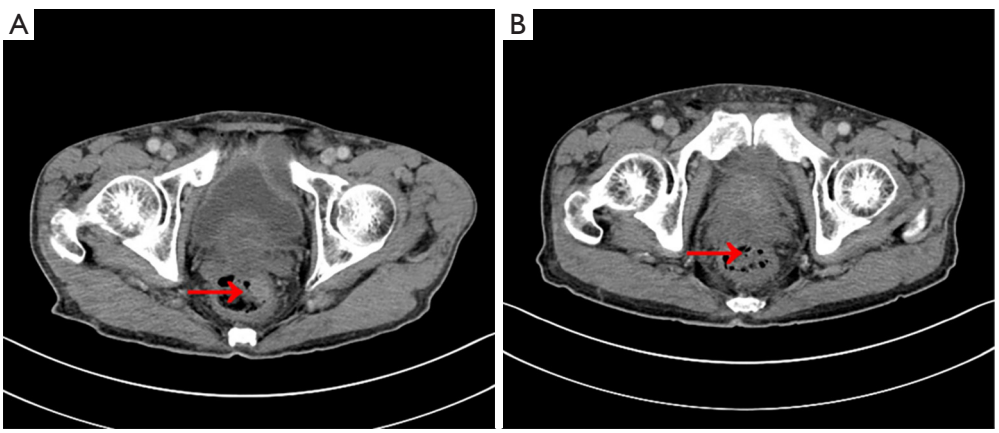

Figure 5 CT images in previous follow-up. A small high-density shadow inside the rectal wall (arrow) could be observed on CT images in November 2017 (A) but not in the images from September 2017 (B). CT, computed tomography.

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deeper understanding of it.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/tcr.2020.02.74). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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