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Case Report

Pancreatic metastasis from colon adenocarcinoma: a case report

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Abstract: Pancreatic metastasis from colon adenocarcinoma is an exceedingly rare clinical entity. Here, we report a 65-year-old female who presented with a 1-month history of epigastric pain, abdominal distension, nausea, and vomiting. An initial abdominal computed tomography (CT) scan revealed a hypodense pancreatic mass accompanied by incomplete intestinal obstruction. Given the diagnostic uncertainty, endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) of the pancreatic lesion and colonoscopic biopsy of the colon were performed. Histopathological and immunohistochemical analyses confirmed the pancreatic tumor as a metastatic tumor originating from primary colon adenocarcinoma. The patient was eventually transferred to the oncology department for further antitumor treatment. EUS-FNA, when paired with immunohistochemical profiling, is an indispensable tool for differentiating pancreatic metastases from primary pancreatic adenocarcinoma, thereby guiding appropriate oncologic management and reducing the risk of misdiagnosis.

Keywords: Colon adenocarcinoma, pancreatic metastasis, EUS-FNA, colonoscopic biopsy

Introduction

Colorectal cancer is the third most common malignancy and the second leading cause of cancer-related mortality worldwide, with the liver and lungs being the most frequent sites of distant metastasis [1]. Pancreatic metastasis from colorectal malignancy is rare in clinical work due to a lack of distinct characteristic clinical manifestations. Its imaging manifestations are similar to those of primary pancreatic carcinoma, making clinical differentiation difficult. This diagnostic dilemma carries significant clinical implications, as the treatment strategies and prognosis of the two conditions diverge substantially.

While the utility of EUS-FNA in diagnosing primary pancreatic lesions is well-established, its specific role and diagnostic challenges in the context of solitary pancreatic metastases from colorectal cancer are not sufficiently highlighted in the literature. Furthermore, there is a paucity of detailed reports outlining the integrative diagnostic pathway that combines colonoscopic biopsy with EUS-FNA for definitive diagnosis. This case report describes a patient with a pancreatic mass initially suspicious for primary carcinoma, who was ultimately diagnosed with metastatic colon adenocarcinoma through this combined approach. We present this rare case to highlight the critical importance of considering metastatic disease in the differential diagnosis of a pancreatic mass, especially in patients with a history of colorectal cancer, and to underscore the pivotal role of a systematic diagnostic workflow in resolving such challenging clinical scenarios. This rare case was reported as follows.

Case report

A 65-year-old female patient presented with a 1-month history of epigastric pain associated with abdominal distension, nausea, and vomiting. The pain was mild, constant, dull aching, and aggravated by postural changes or sudden physical activity. She also displayed fatigue and

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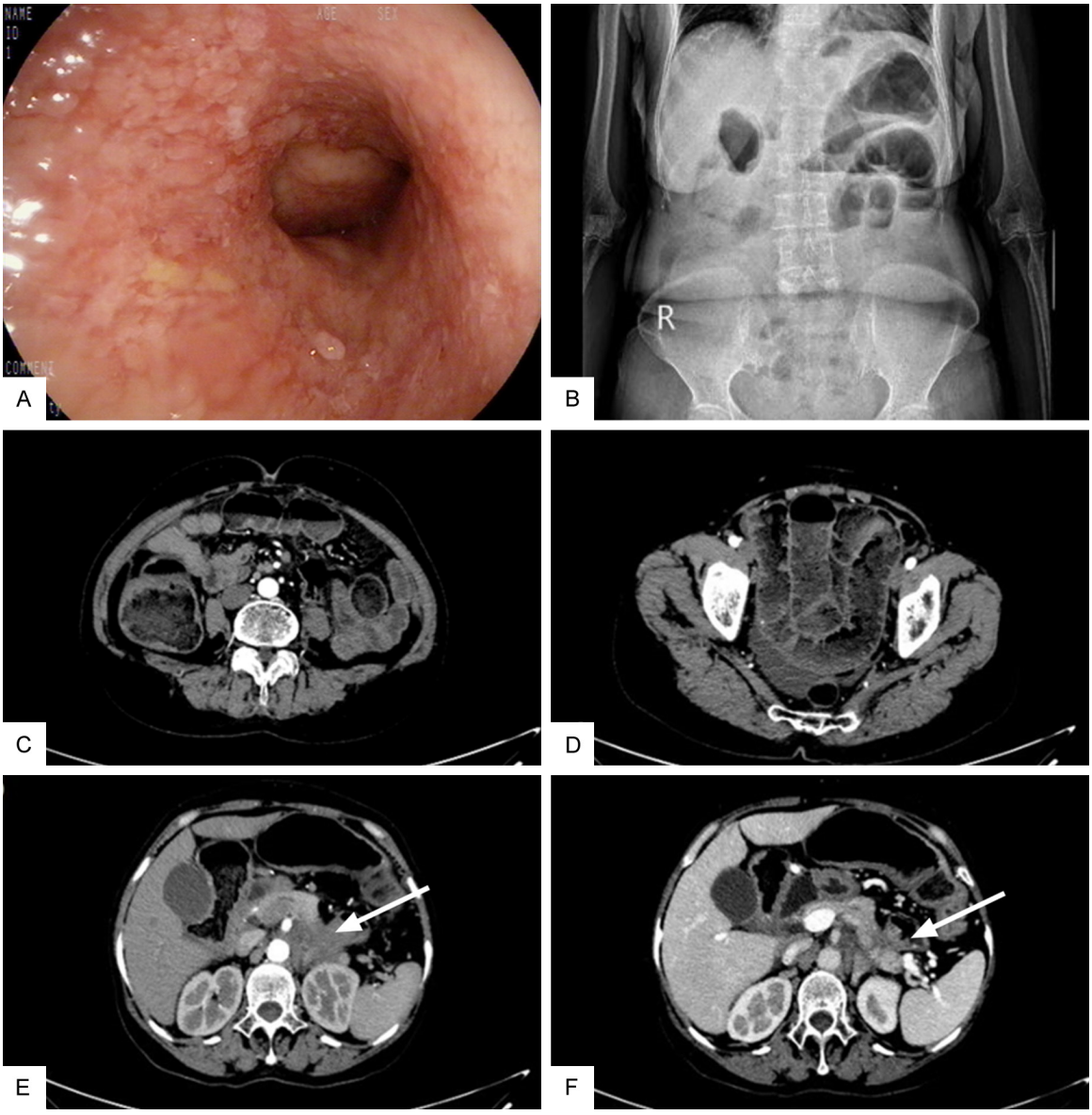

Figure 1. Endoscopic and radiological manifestations of the patient. (A) Colonoscopy revealed congestion and edema of the descending colonic mucosa with marked luminal narrowing. (B) An upright abdominal radiograph revealed dilated bowel loops with air-fluid levels. (C-F) Abdominal computed tomography (CT) revealed dilated bowel loops with air-fluid levels (A-D). Bowel wall thickening was observed in the proximal descending colon, and a mass (white arrow) was detected in the pancreatic body and tail.

weight loss of 10 kg in 1 month. The patient denied any history of fever, jaundice, gastrointestinal bleeding, or lower extremity edema. She had no history of trauma, radiotherapy, hormone therapy, hepatitis, blood transfusion, smoking, or alcohol consumption. Her family history was unremarkable for malignancies.

The physical examination was unremarkable except for tenderness in the upper abdomen without rebound tenderness or hepatosplenomegaly. Clinical laboratory tests were normal, including complete blood count, liver function tests, hepatitis B and C serological markers, carcinoembryonic antigen, alpha-fetoprotein, and carbohydrate antigen 19-19 (CA19-9).

An upright abdominal radiograph suggested incomplete intestinal obstruction (**Figure 1B**). Abdominal CT revealed a pancreatic mass measuring 2.8 cm × 2.0 cm, as well as irregular thickening of the local intestinal wall, dilated lumen of the proximal descending colon, and gas-fluid levels (**Figure 1C-F**). The patient was

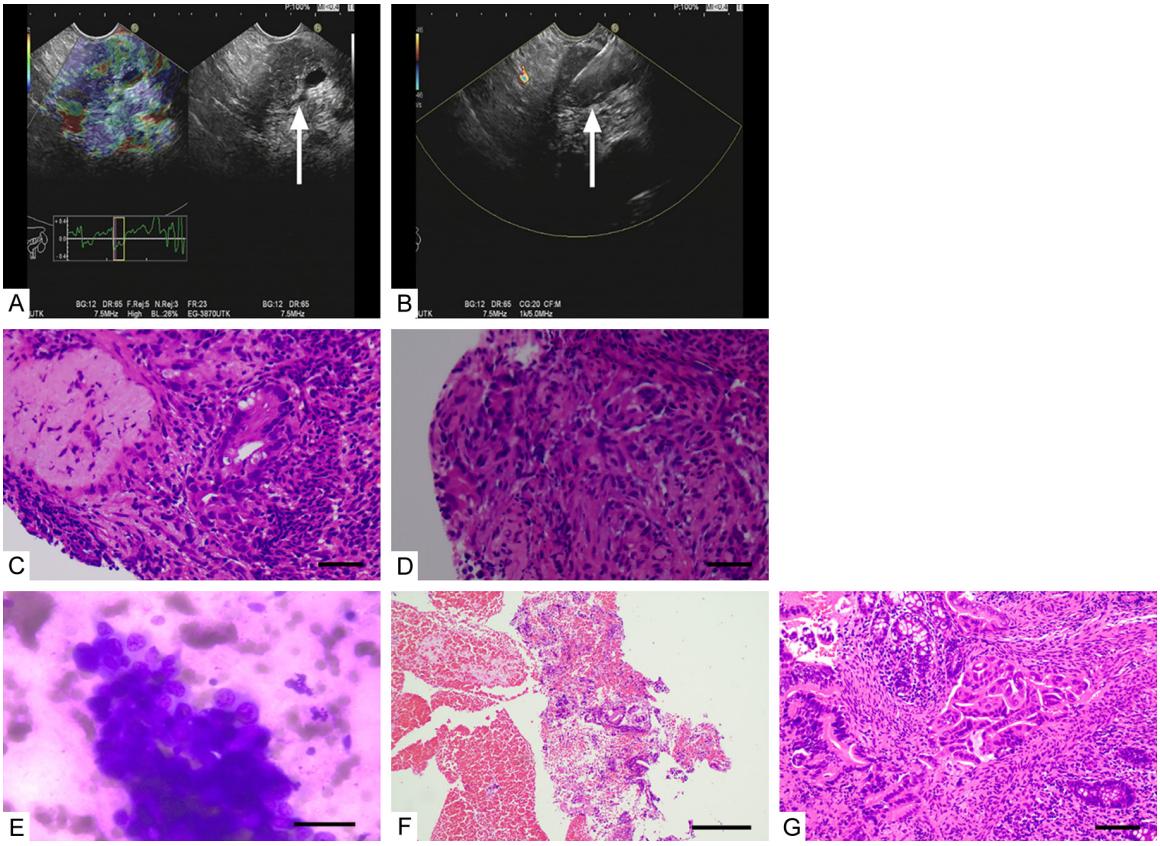

Figure 2. Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA), histological and cytological findings. A, B. EUS revealed a hypoechoic mass in the pancreatic body and tail (A, white arrow), and elastography indicated a mild lesion with regular margins. EUS-FNA (B, white arrow; 22-gauge needle; Olympus, Japan) was subsequently performed. C, D. Histological examination of the first colonoscopic specimen revealed chronic inflammatory changes with extensive inflammatory cell infiltration within the intestinal wall (Hematoxylin and Eosin (HE) staining, magnification: ×400, scale bar = 50 μm). E. Puncture cytology of the pancreatic lesion revealed adenocarcinoma. Microscopic observation of cytological smears demonstrated clustered distribution of tumor cells with enlarged and hyperchromatic nuclei (magnification: ×1000, scale bar = 20 μm). F. Biopsy of the pancreatic lesion revealed pancreatic metastasis (HE staining, magnification: ×100, scale bar = 200 μm). Immunohistochemical staining findings were as follows: CK7 (+), CK19 (+), CA19-9 (+), CDX-2 (-), SATB-2 (-), Villin (+), CK20 (-), Napsin-A (-), Pax-8 (-), TTF-1 (-), Ki-67 (LI: 20%), p53 (+, wild-type), WT-1 (-), GATA-3 (-). These immunohistochemical results confirmed metastatic carcinoma of colonic origin. G. Histological examination of the second colonoscopic biopsy specimen confirmed colon adenocarcinoma. Tumor cells with enlarged and hyperchromatic nuclei were visible on HE staining (magnification: ×400, scale bar = 50 μm).

diagnosed with intestinal obstruction. Conservative treatment yielded unsatisfactory outcomes, and surgery was indicated. Laparoscopic exploration was performed on the 3rd day after admission. During the operation, approximately 200 ml of clear ascites was found in the abdominal cavity. The ileum, cecum, ascending colon, and transverse colon presented marked dilation with accumulation of gas, fluid, and feces, and the intestinal wall was edematous. Meanwhile, a hard mass was palpated in the descending colon during the operation. Due to the limited laparoscopic field of view, it was decided to perform a double-barrel transverse colostomy after communication with the patient's family members. The operation was uneventful, and the patient recovered well.

However, the underlying etiology of intestinal obstruction remained unclear. Although a pancreatic mass was confirmed by CT, whether the intestinal obstruction was attributable to this pancreatic lesion remained uncertain. To clarify the cause of intestinal obstruction, the first colonoscopy was performed on postoperative day 10. The examination showed that the descending colon mucosa was congested and edematous, and the colonic lumen was so nar-

rowed that the endoscope could not pass through it (**Figure 1A**). Pathology analysis of the descending colon revealed chronic inflammatory changes (**Figure 2C**, **2D**). Given the fragile texture of the endoscopically observed lesion, we strongly suspected that the lesion was not merely a benign chronic inflammatory change, despite the initial pathological result of chronic inflammation. Therefore, a second colonoscopy was performed on postoperative day 14. Meanwhile, to characterize the nature of the pancreatic mass, EUS-FNA was carried out using a 22-gauge needle (Olympus, Japan) (**Figure 2A**, **2B**). The biopsy obtained during the second colonoscopy confirmed descending colon adenocarcinoma. Immunohistochemical staining serves as an indispensable tool to differentiate tumor origin in such confusing cases. CK7, CK20, and CDX-2 are classic markers for distinguishing intestinal tumors from pancreatobiliary malignancies. Typical colorectal adenocarcinoma shows CK7 (-), CK20 (+), and CDX-2 (+), whereas our case presented an atypical immunophenotype with CK7 (+), CK20 (-), and CDX-2 (-), which increased the difficulty of differential diagnosis. Ki-67 is applied to assess tumor cell proliferation, and the 20% labeling index in this case suggested moderate tumor proliferation. Wild-type P53 expression implied normal function of the tumor suppressor gene. Together with other auxiliary markers such as Villin, these indicators comprehensively verified that the pancreatic lesion was a metastasis from colon adenocarcinoma. The cytologic and histologic examinations, along with immunohistochemical staining of the EUS-FNA specimens, eventually confirmed that the pancreatic lesion represented metastasis of colorectal origin (**Figure 2E-G**). After definitive diagnosis, the patient was transferred to the oncology department for further antitumor treatment.

Discussion

Pancreatic metastasis is uncommon, accounting for 2%-5% of all pancreatic malignancies [2]. Multiple studies have demonstrated that renal clear cell carcinoma, small cell lung cancer, breast cancer, and gastric cancer are common primary tumors capable of metastasizing to the pancreas [3-5]. In contrast, pancreatic metastasis originating from colon adenocarcinoma is exceedingly rare. The clinical manifestations of pancreatic metastasis are similar to those of primary pancreatic cancer, such as abdominal pain, abdominal distension, anorexia, and weight loss. The clinical symptoms of pancreatic metastasis have no obvious specificity.

Pancreatic metastases are usually detected accidentally by imaging examinations such as CT. CA19-9 elevation is very common in patients with primary pancreatic cancer, with a sensitivity of 78% and a specificity of 83%. In contrast, most patients with pancreatic metastasis exhibit normal CA19-9 levels, consistent with the findings in the present case. Pancreatic metastases can occur in any anatomical region of the pancreas, with no significant difference in incidence among the pancreatic head, neck, body, and tail [6]. Imaging differentiation between pancreatic metastasis and primary pancreatic carcinoma remains challenging, frequently leading to clinical misdiagnosis [7]. Positron emission tomography-computed tomography (PET-CT) aids in distinguishing pancreatic metastasis and primary pancreatic cancer [8], but it cannot provide pathological evidence. Overall, the pathological diagnosis of pancreatic metastasis is rather challenging.

EUS-FNA has been validated as a safe and effective modality for diagnosing pancreatic metastases. Typical EUS features of pancreatic metastases include regular margins, solitary presentation, hypoechogenicity, homogeneous echo texture, and minimal invasion of blood vessels, bile ducts, and the main pancreatic duct. In the present case, the pancreatic metastatic lesion was clearly visualized on EUS and exhibited irregular hyperenhancement on contrast-enhanced imaging [9, 10]. In addition to allowing real-time observation of pancreatic lesions, EUS facilitates fine-needle aspiration biopsy. Collectively, EUS-FNA represents a minimally invasive, safe, and efficient technique for the differential diagnosis of pancreatic masses.

Notably, synchronous implementation of colonoscopy and EUS-FNA also yields prominent synergistic diagnostic advantages. Completion of the two examinations under one anesthesia session enables simultaneous confirmation of the primary intestinal tumor and pathological verification of pancreatic metastatic lesions. Colonoscopy accurately identified the primary

colon adenocarcinoma, whereas EUS-FNA provided valid pathological evidence of pancreatic metastasis. The combination of endoscopic macroscopic observation and minimally invasive puncture pathology significantly improves diagnostic comprehensiveness and accuracy. Moreover, this one-time combined examination strategy effectively avoids repeated anesthesia, shortens the diagnostic time window, reduces patients' economic burden and procedural risks, and achieves superior clinical diagnostic efficiency compared with separate staged examinations.

Conclusion

In this case, colonoscopic biopsy combined with EUS-FNA of the pancreatic mass ultimately confirmed colon adenocarcinoma with pancreatic metastasis, a rare clinical entity. Pancreatic metastasis should be included in the differential diagnosis of pancreatic masses, particularly in patients with a known history of colorectal or other malignancies, even when tumor markers such as CA19-9 remain within normal limits. As illustrated herein, reliance solely on imaging or serum biomarkers may result in misdiagnosis or delayed diagnosis. EUS-FNA serves as a minimally invasive, safe, and effective technique for pathological confirmation in such challenging clinical scenarios. Therefore, EUS-FNA is recommended for patients with extrapancreatic malignancies who present with pancreatic lesions to minimize the risk of misdiagnosis or missed diagnosis.

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Disclosure of conflict of interest

None.

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