



Primary gastric melanoma with pancreatic metastasis: a case report

Zhihuan Xiao[#], Gang Ma[#], Guichen Li, Anjiang Gou, Yuanhong Xu, Shaowei Song, Kejian Guo, Zhe Liu

Department of Pancreatic-Biliary Surgery, First Hospital of China Medical University, Shenyang, China

[#]These authors contributed equally to this work.

Correspondence to: Dr. Zhe Liu. 155 North Nanjing St, Shenyang 110001, China. Email: liuzhe4321@126.com.

Abstract: We report an extremely rare case of primary gastric melanoma with pancreatic metastasis. As far as we know, the concept of primary gastrointestinal melanoma is currently controversial, because there are very few reports of primary gastrointestinal melanoma. At the same time, isolated pancreatic metastases are also very rare. The patient was admitted to the hospital with a main complaint of decreased appetite, and then underwent gastroscopy and found a mass in the stomach. The mass was initially diagnosed as poorly differentiated adenocarcinoma following a gastroscopic biopsy. The patient underwent radical total gastrectomy, pancreatic body and tail resection, splenectomy, and Roux-en-Y esophagojejunostomy. After further immunohistochemical examination of the surgically removed tissue, malignant melanoma was diagnosed. The tumor cells were arranged in sheets or nests with infiltrating growth, the cell sizes were inconsistent, nucleoli were obvious, and melanin particles were seen in the cytoplasm of some cells. The tumor cells were positive for MITF and S-100. Detailed systemic and imaging examinations did not find any other primary lesions. The patient denied any melanoma and skin lesion history. We believe this is a manifestation of primary gastric melanoma. We report this rare case of gastric melanoma with the aim of increasing clinicians' awareness of non-cutaneous melanoma and its treatment methods.

Keywords: Melanoma; primary gastric melanoma; pancreatic metastasis; case report

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Introduction

Melanoma is a rare malignant tumor that originates from melanocytes. Melanocytes are mostly distributed in the skin, uvea, meninges, and mucous membranes, and the incidence of melanoma in these areas is 91.2%, 5.2%, 1.3%, and 2.2%, respectively (1). Gastrointestinal melanoma is very rare, and the main clinical manifestations are weight loss, anemia, loss of appetite, and other non-specific symptoms that pose a great challenge to early diagnosis. At present, it is believed that most melanomas that appear in the gastrointestinal tract are metastatic, although literature reports on gastrointestinal melanoma are gradually increasing. According to a previous study, 4% of skin melanoma patients had gastrointestinal metastasis before death, and up to 60% at autopsy (2). Therefore, a thorough physical examination, imaging examination, and laboratory tests are essential to confirm the diagnosis.

Since gastrointestinal melanoma cannot be distinguished from metastatic melanomas that regress on their own, the concept of primary gastrointestinal melanoma is still controversial. However, there is evidence that there are melanocytes in the anal canal and esophagus (3,4).

We report on a man who had multiple ulcerative lesions in the fundus and body of the stomach with lumps in the body and tail of the pancreas. His main symptoms were decreased appetite and rapid weight loss. Detailed pathological biopsy and immunohistochemistry confirmed that the lesion was melanoma. After thorough systemic and imaging examinations, we found no other primary lesions except for the metastases in the pancreas. We believe that this is a rare manifestation of primary gastric melanoma.

We present the following article in accordance with the CARE reporting checklist (available at <http://dx.doi.org/10.21037/apm-21-1170>).

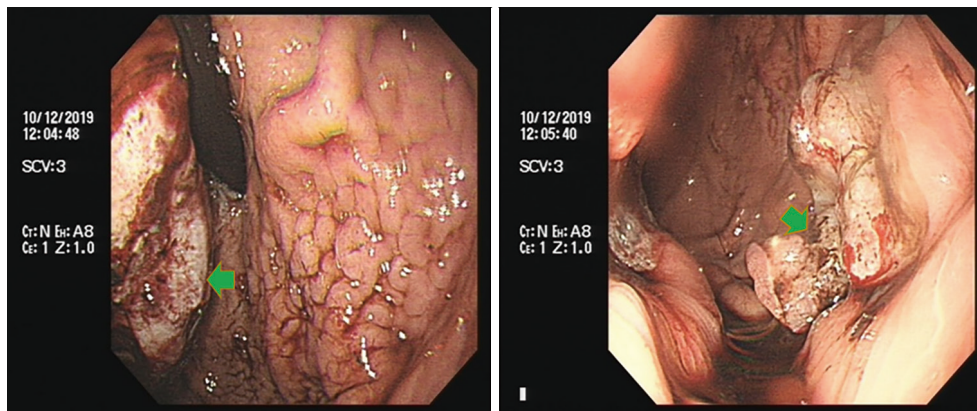


Figure 1 Irregular ulcerative lesions on the fundus and body of the stomach (green arrow).

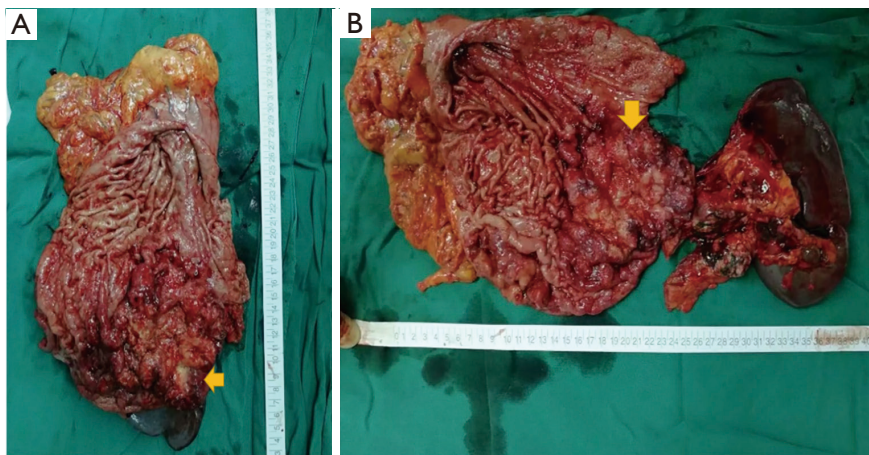


Figure 2 Macroscopic image of tumor cut surface of resected tumor specimen. (A) Ulcers and lumps in the stomach (yellow arrow). (B) The complete specimen removed by surgery. Stomach tumor invades the pancreatic parenchyma (yellow arrow).

Case presentation

A 65-year-old man came to our hospital with a 20-day history of decreased appetite, accompanied by flatulence, nausea, and rapid weight loss. The patient had no history of surgery, diabetes, hypertension, coronary atherosclerotic heart disease, hepatitis, tuberculosis, or other medical history. He denied a history of drinking, melanoma, or a family history of cancer. A gastroscopy showed multiple irregular ulcerative lesions in the gastric fundus and body, the largest one being 3.0 cm × 2.5 cm (*Figure 1*), and the pathology showed poorly differentiated adenocarcinoma of the fundus of the stomach. On admission, the tumor indicators, including CA19-9 and CEA, were normal. An enhanced CT showed that the gastric fundus was thickened

with uneven enhancement, and multiple enlarged lymph nodes were seen around the pancreatic body, the largest of which was 2.1 cm × 2.8 cm. There was a mass shadow on the tail of the pancreas measuring 3.1 cm × 3.9 cm. Its internal density was uneven and liquefied necrosis was observed. According to the patient's clinical manifestations, imaging findings, and gastroscopic pathological results, a preliminary diagnosis of poorly differentiated adenocarcinoma of the stomach with pancreatic metastasis was made. The patient underwent surgical treatment that included radical total gastrectomy, pancreatic body and tail resection, splenectomy, and Roux-en-Y esophagojejunostomy. In *Figure 2*, the surgically resected tissue can be seen as a 4.0 cm-diameter infiltrating tumor in the fundus of the stomach, and the tumor is seen invading the pancreatic parenchyma. *Figure 3*

shows a 3.0 cm mass on the tail of the pancreas, and the cut surface shows a typical black and white pigmentation. Immunohistochemistry showed that all resection margins



Figure 3 A pancreatic mass with black and white pigmentation on the cut surface (yellow arrow).

were negative, and there was no lymph node metastasis. In *Figure 4*, HE staining shows that the cells are of different sizes, and large nucleoli and melanin particles can be seen in the cells. The immunohistochemistry of the resected tissue was positive for MITF and S-100. Tumor KI67 expression was 70%, confirming the diagnosis of malignant melanoma (*Figure 5*). Postoperatively, the patient was generally in a stable condition. He was given general supportive treatment because he declined to receive conventional postoperative radiotherapy and chemotherapy. The patient was discharged 16 days later and died 3 months after discharge.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient.

Discussion

Primary gastrointestinal melanoma is very rare in clinical practice, and part of the reason can be explained by the

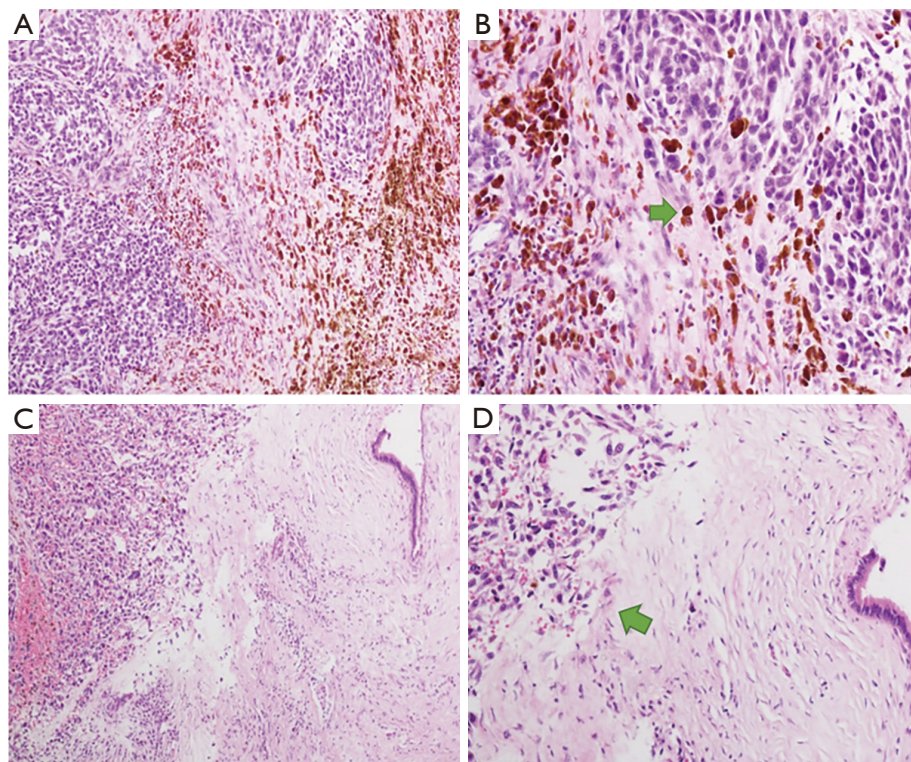


Figure 4 HE staining: Invasive growth of cancer cells, cell sizes are different, nucleoli are obvious, and melanin particles can be seen in some cells (green arrow). (A) $\times 100$ (B) $\times 200$. Tumor cells invade the pancreas, compressing pancreatic ducts (green arrow). (C) $\times 100$, (D) $\times 200$.

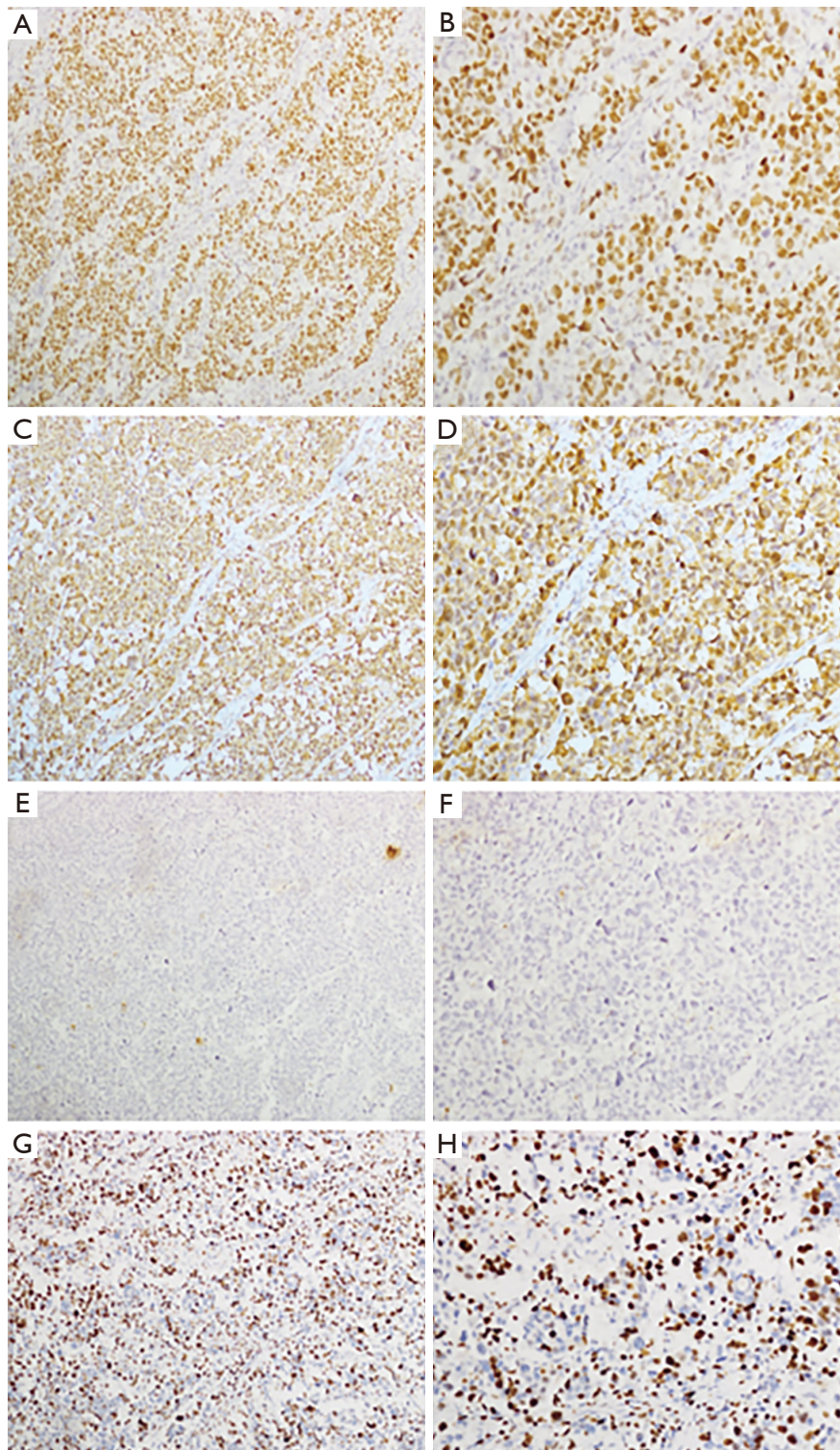


Figure 5 Histopathological appearance of resected tumor. Positive immunohistochemical (IHC) staining of MITF protein (A,B). Positive immunohistochemical (IHC) staining of S-100 protein Positive immunohistochemical (IHC) staining of S-100 protein (C,D). Negative immunohistochemical (IHC) staining of CK protein (E,F). Immunohistochemical (IHC) staining of KI67 expression is about 70% (G,H). (A,C,E,G) $\times 100$; (B,D,F,H) $\times 200$.

lack of ultraviolet radiation and the lack of melanocytes in the digestive tract. As far as we know, the vast majority of gastrointestinal melanomas are metastases from skin-derived lesions. However, we have found 12 cases of primary gastrointestinal melanoma in the literature (5-16). The pathogenesis and progression mechanism of primary gastrointestinal melanoma is still unclear, but two hypotheses have been proposed. First, the neural crest derivatives obtain the ability to differentiate into melanocytes and undergo malignant transformation, leading to melanoma (17,18). Second, the melanocytes from known sites, such as the esophagus, migrate ectopically to the gastrointestinal tract and undergo malignant transformation.

Diagnosis of gastrointestinal melanoma should also exclude skin melanoma metastasis where the primary lesion has resolved spontaneously. First, a complete patient history must be collected, such as whether skin lesions have been removed or resolved spontaneously, and secondly, extensive dermatological and imaging examinations are also necessary. The typical manifestations of primary gastric melanoma include non-specific symptoms such as anemia and rapid weight loss, so it is difficult to make a clear diagnosis before surgery. A PET-CT scan can clearly show the location of the lesion, the degree of metastasis, and the involvement, which is of great value for confirming the diagnosis (6).

Endoscopic observation of pigmented ulcer lesions often prompts the diagnosis of melanoma. Tissue immunohistochemical staining with HMB-45 and S-100 can confirm the presence of malignant melanocytes and is often used as the gold standard for diagnosis (4). Therefore, gastrointestinal endoscopy is the recommended method for confirming an early diagnosis of melanoma.

Mucosal melanoma is more aggressive and has a worse prognosis than cutaneous melanoma because there is a large supply of lymph and blood vessels in the gastrointestinal mucosa, and the inherently aggressive behavior of melanoma means that it will spread faster (19). Early detection and early surgical intervention are imperative for long-term treatment of mucosal melanoma (9), although the overall prognosis is still not optimistic.

In conclusion, gastric primary malignant melanoma remains a disease that has not been fully studied. Because of its initial non-specific symptoms, it is difficult to make an early diagnosis. Except for surgery, there is also a lack of effective treatment methods for non-cutaneous melanoma. Therefore, there is an urgent need to continue the search for other effective auxiliary or non-surgical treatments for

non-cutaneous melanoma when the patient is not suitable for surgery.

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Footnote

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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. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient.

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