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Case Study

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Metastatic renal cell carcinoma diagnosed by capsule endoscopy and double balloon endoscopy

Authors' Contribution:
A Study Design
B Data Collection
C Statistical Analysis
D Data Interpretation
E Manuscript Preparation
F Literature Search
G Funds Collection

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Summary

Background: Renal cell carcinoma commonly metastasizes to lung, liver, and bone. Small intestinal metastases are exceedingly rare.

Case Report: A 75-year-old man presented at our hospital with tarry stools. He had undergone a right nephrectomy for renal cell carcinoma (RCC) 6 years previously; in addition, he had received antiplatelet treatment for ischemic heart disease. Esophagogastroduodenoscopy, total colonoscopy, and computed tomography did not identify any cause for the gastrointestinal bleeding. He underwent capsule endoscopy (CE), which revealed an ulcerated submucosal tumor in the jejunum. We performed a double-balloon endoscopy (DBE), and histological findings identified a clear cell carcinoma. We diagnosed metastasis from the RCC. We performed a jejunectomy to resect the tumor and thus eliminate the source of the bleeding.

Conclusions: CE and DBE are useful diagnostic tools. We recommend investigating the possibility of small intestinal metastases in cases of intestinal bleeding or anemia in patients with a history of malignant tumor.

key words: **renal cell carcinoma • small intestinal metastasis • b capsule endoscopy • double-balloon endoscopy • occult gastro-intestinal bleeding**

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Background

The most frequent sites of metastasis from renal cell carcinomas (RCC) include the lung, lymph nodes, liver, bone, adrenal glands and contralateral kidney [1,2]. The incidence of small intestinal metastases from a RCC is reported to be rare. We report the first case of metastatic RCC to the small intestine identified by capsule endoscopy (CE) and diagnosed, preoperatively, by double-balloon endoscopy (DBE).

Case Report

A 75-year-old man had undergone a right nephrectomy for RCC 6 years previously; the tumor was composed of clear-cell and spindle-cell elements. Two years after nephrectomy, he had undergone right gluteus resection for metastasis. Furthermore, 3 years after the first operation, he was administered interferon-alpha therapy (IFN-α) for multiple muscle metastases. In addition, he had received radiation for metastasis of the right scapula at the 5th year after the first operation. He could not be treated with a molecularly-targeted drug because of severe cardiac dysfunction. However, IFN-α had stopped the progression of carcinoma.

He also had a history of myocardial infarction, 14 years previously, which had been treated by percutaneous coronary intervention, coronary artery bypass graft and antiplatelet therapy. He was admitted for the investigation of tarry stools. Physical examination revealed a body temperature of 37.2°C. His blood pressure was 138/60 mm Hg and pulse rate 120 per minute. Examination revealed his abdomen to be soft and flat, without any pain or tenderness. Blood tests revealed anemia (hemoglobin 5.3 g/L) and total protein levels of 5.4 g/dL. Except for this iron deficiency anemia and hypoproteinemia, his other laboratory values were within the normal ranges. Esophagogastroduodenoscopy, total colonoscopy, and computed tomography (CT) did not identify any cause for the gastrointestinal bleeding. We suspected small intestinal bleeding. He underwent a CE, which revealed a submucosal tumor with ulceration in the jejunum (Figure 1); and a DBE subsequently identified a protruding tumor that was covered with normal mucosa, but which was associated with central ulceration and mild bleeding (Figure 2). There was no other tumor in the small intestine. Biopsy specimens showed a carcinoma with a classic clear cell pattern, consistent with metastatic RCC. Partial jejunectomy (6cm in length) was thus performed to remove the tumor and prevent re-bleeding. The resected specimen contained a tumor measuring 12×17mm, with central ulceration (Figure 3). Microscopically, the tumor was composed of solid nests of clear and sharply outlined cells, separated by a stroma with prominent vessels (Figure 4A,B). No metastases were found in the regional lymph nodes, and the surgical margins were negative for tumor cells. The patient was discharged 12 days later in good condition. He has continued to receive IFN-α for his muscle and bone metastases as an outpatient. At 6 months' follow-up, he did not report any episodes of bleeding.

Discussion

Autopsy studies have shown that metastatic disease of any type to the small intestine is unusual and accounts for only 1–2% of all metastases [3]. Furthermore, RCC very rarely

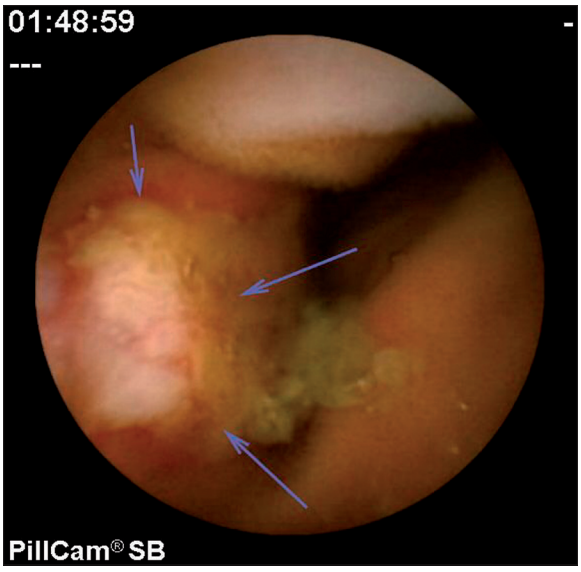

Figure 1. Capsule endoscopy revealed a submucosal tumor with ulcer in the jejunum.

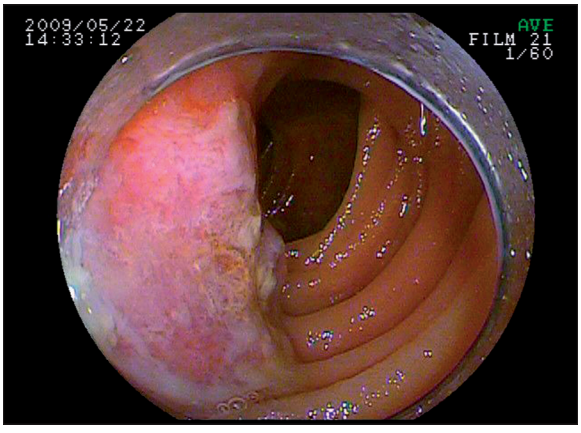

Figure 2. Double-balloon endoscopy identified protrusions that were covered with normal mucosa with central ulceration and mild bleeding.

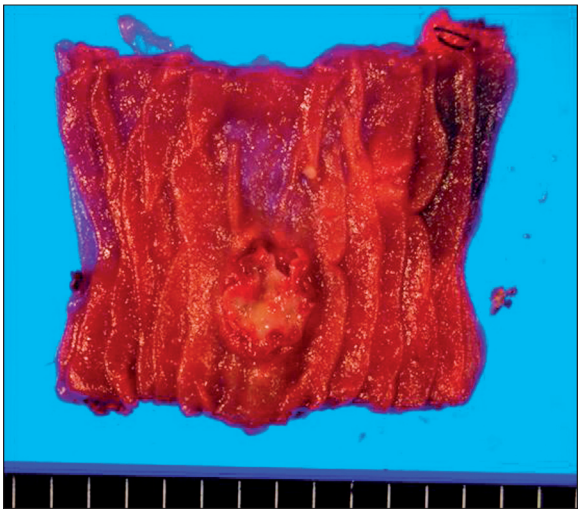

Figure 3. The resected tumor measured 12×17 mm, with a central ulceration.

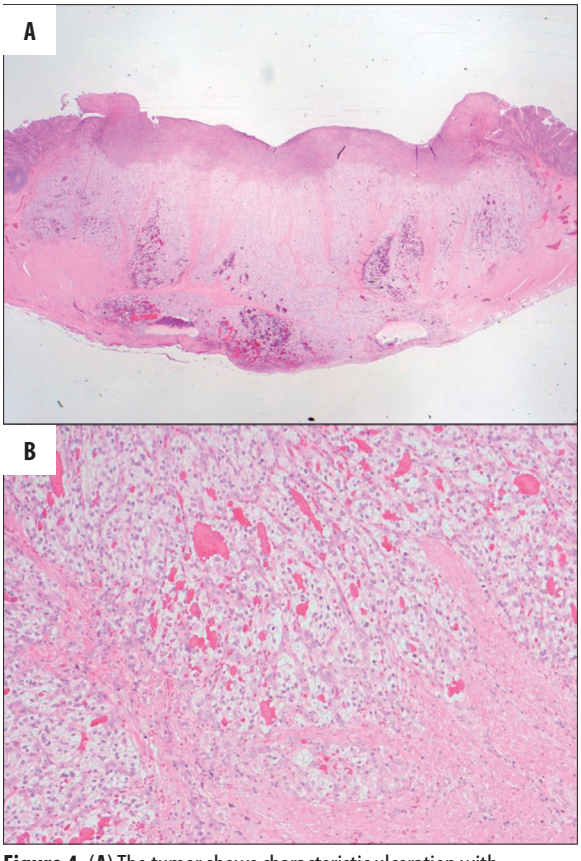

Figure 4. (**A**) The tumor shows characteristic ulceration with submucosal involvement and extension through the muscularis propria into the subserosa (Hematoxylin-Eosin stain, ×2). (**B**) The tumor is consistent with metastatic clear cell carcinoma (Hematoxylin-Eosin stain, ×100).

metastasizes to the small intestine. Commonly, renal cell metastases present many years after initial treatment, with recurrences reported up to 17.5 years after initial surgery [4]. Our case had small intestinal metastasis 6 years after his initial surgery.

Some patients with gastrointestinal bleeding remain undiagnosed even after upper endoscopy and a total colonoscopy, and most of these will have bleeding sites in the small bowel. Traditional methods of investigating the small intestine such as barium follow-through and CT have a low yield for tumors. Tumors can be found anywhere along the small intestine in 3–9% of patients undergoing CE for obscure gastrointestinal bleeding or other suspicions of small bowel disease [5]. CE is a simple, safe, and comfortable diagnostic technique, but does not allow biopsies. On the other hand, DBE is a very useful method for histological confirmation of small bowel lesions [6]. Using the combination of CE and DBE, we obtained clear endoscopic images of the lesions and histological diagnosis before the patient underwent surgery.

Conclusions

Based on the case presented here, we recommend investigating the possibility of small intestinal metastases in cases of intestinal bleeding or anemia in patients with a history of a malignant tumor. We think that CE is a reliable approach to such screening and DBE is a reliable approach to the histological diagnosis of small intestinal neoplasms. It should be used early in the course of investigations of suspected small bowel disease, avoiding the delay that has led to many patients having advanced disease at diagnosis.

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