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Case Report

Dynamic CT findings of a polypoid gastric metastasis of clear renal cell carcinoma: a case report with literature review

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ABSTRACT

Metastatic disease involving the stomach is very rare. The gastric metastases of renal cell carcinoma (RCC) have rarely been reported, occurring in 0.2% of all RCC cases. Sometimes gastric metastases cause gastrointestinal bleeding and require treatment.

We present the case of an 85-year-old woman with gastric metastasis from RCC diagnosed by anemia and bleeding. A dynamic contrast-enhanced computed tomography revealed a pedunculated and hypervascular polypoid mass approximately 100 mm in size with a washout enhancement pattern in the stomach. In addition to describing the case of our patient, we have reviewed computed tomography findings of gastric metastases from clear RCC.

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Introduction

Metastatic disease involving the stomach is very rare [1]. The lifetime prevalence among patients with known malignancies is only 0.7%–1.7% [2]. The common primary sources of gastric metastases are breast, lung, and esophageal cancers and

malignant melanoma [2,3]. In the literature, gastric metastases of renal cell carcinoma (RCC) have rarely been described, occurring in 0.2% of RCC cases [4]. Clear RCC is a well-known hypervascular tumor [5]; however, imaging findings of the gastric metastases from clear RCC have not been well established due to the rarity of this tumor.

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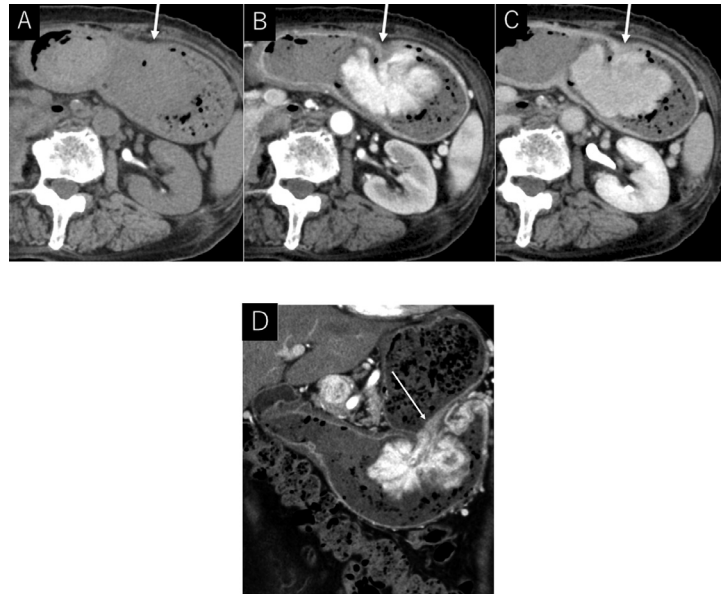


Fig. 1 – Dynamic contrast-enhanced computed tomography (CT) scans.

(A) Non-contrast-enhanced CT scan.

(B) Contrast-enhanced CT scan (arterial phase).

(C) Contrast-enhanced CT scan (excretion phase).

(D) Contrast-enhanced CT scan (arterial phase), coronal image.

Contrast-enhanced CT scans showed a heterogeneous, hypervascular, pedunculated, polypoid mass in the stomach (100 mm in maximum diameter; arrow). This soft tissue mass showed early enhancement and a washout pattern (A–C, arrow). In the coronal image (D), the peduncle and its attachment are clearly depicted (arrow).

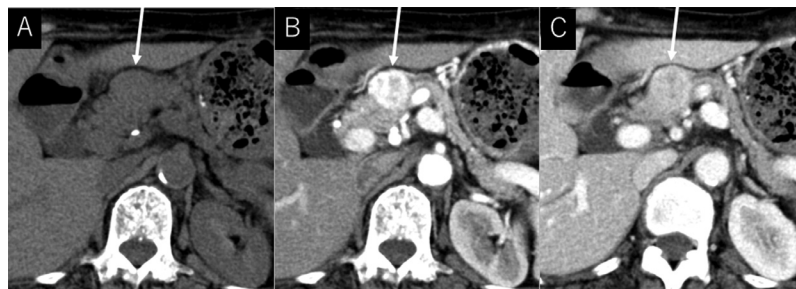


Fig. 2 – (A) Non-contrast-enhanced CT scan.

(B) Contrast-enhanced CT scan (arterial phase).

(C) Contrast-enhanced CT scan (portal phase).

Non-contrast-enhanced CT scan showed a mass with a soft tissue density (arrow) similar to that of the normal pancreatic tissue.

Contrast-enhanced CT scans showed well-defined hypervascular mass in the head of pancreas (23 mm in maximum diameter; arrow). This pancreatic mass (A–C, arrow) showed early enhancement and a washout pattern similar to gastric mass.

Case report

An 85-year-old woman presented to the emergency department because of anemia with melena and temporary loss of consciousness. She had undergone right nephrectomy 15 years ago for clear RCC (80 mm in maximum diameter, Fuhrman classification grade 2, pT2N0, no evidence of distant metastasis at the time of nephrectomy).

At the time of admission, the patient's clinical symptoms were stable and hemorrhagic shock was not present (heart rate, 85 bpm; blood pressure, 135/85 mm Hg). Laboratory test results indicated a low hemoglobin level (8.6 g/dL); other biological parameters were within reference limits.

A dynamic contrast-enhanced computed tomography (CT) scan revealed a heterogeneous, lobulated, hypervascular, polypoid mass with a washout enhancement pattern on the anterior wall of the middle gastric body (100 mm in maximum

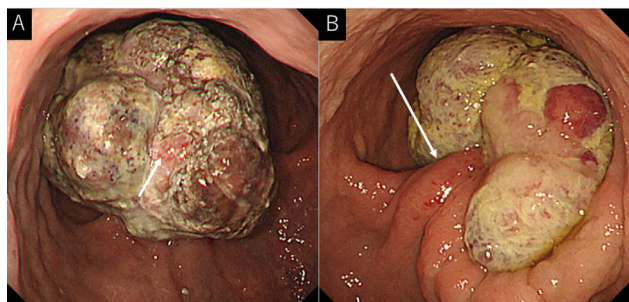


Fig. 3 – Esophagogastroduodenoscopy. Esophagogastroduodenoscopy showed pedunculated polypoid mass in the greater curvature of gastric body (A). The arrow in (A) showed the bleeding point. (B) showed the stalk of the polypoid mass (B, arrow).

diameter; Fig. 1). In this CT, a pancreatic tumor showing a similar contrast enhanced pattern to gastric tumor was observed simultaneously (23 mm in maximum diameter; Fig. 2).

Esophagogastroduodenoscopy was performed, which revealed a pedunculated polypoid mass with slow and venous bleeding in the greater curvature of the gastric body (Fig. 3). The bleeding points were immediately cauterized, and endoscopic biopsy was performed. Pathological examination revealed that the polypoid tumor was clear RCC (Fig. 4). Endoscopic treatment was planned to control bleeding. The mass was removed with a diathermic snare. During the endoscopic resection, a small perforation occurred at the site of the polyp stalk; this was immediately resolved by placing multiple hemoclips at the site. Because of the perforation, the resected tumor was not able to be retrieved. After endoscopic resection, a CT scan of the abdomen and pelvis

was performed. It showed a small amount of free air and the elevated intra-abdominal fat density. Surgery is usually selected for the repair of perforation. In this case, small perforation seemed to be repaired endoscopically referring to CT findings. Conservative treatment with antibiotic drugs was commenced, following which the patient's condition improved. She did well postoperatively and was subsequently discharged. No recurrence of abdominal symptoms or melena was observed at 2 years' follow-up examination.

Discussion

The gastric metastasis that occurred 15 years postoperatively had a polyp-like form with arterial enhancement in the middle gastric body. A dynamic contrast-enhanced CT imaging showed early enhancement in the arterial phase and washout in the equilibrium phase; this pattern was indicative of primary clear RCC [6].

The mechanism of metastasis of RCC to the stomach usually involves hematogenous spread to the submucosal layer, where the end artery of the gastric wall is present [6-8]. Gastric metastases are most often observed in the gastric body [7,8], which is associated with gastric vascularity, that is, blood flow stagnation due to the anastomoses of right and left gastric arteries and gastroepiploic arteries. Metastases from RCC are usually hypervascular, showing a CT pattern similar to that of a primary clear RCC [5-8].

According to some single case reports, gastrointestinal involvement by a recurrent RCC, mostly clear RCC, most often manifests as an intraluminal polypoid mass on CT [6,7]; a heterogeneous hyper enhancement of tumor is also a common finding [6-8]. Other macroscopic findings include mucosal lesions, ulcers or ulcerated tumor, and submucosal

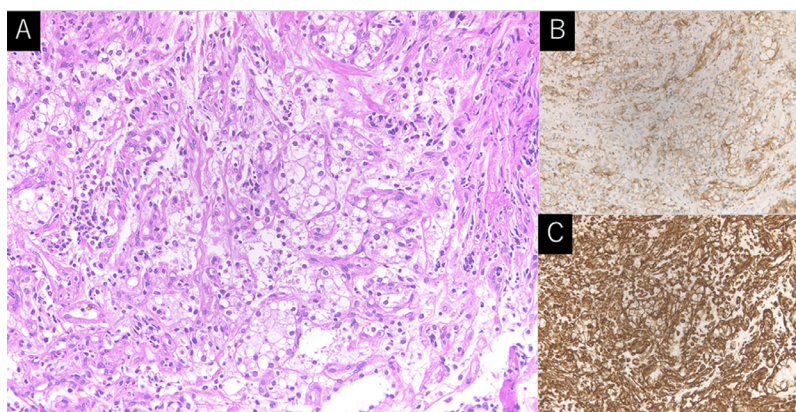


Fig. 4 – Pathological examination
(A) Hematoxylin and eosin staining, x 200.
(B) CD10 immunostaining, x 100.
(C) Vimentin immunostaining, x 100.

Tumor cells had abundant clear cytoplasm that was vacuolated with indistinct cell borders (A). Tumor cells nuclei had variable atypia and haphazard orientation with abnormal chromatin (A). CD10 (B) and Vimentin (C) were expressed in tumor cells. Pathological examination using immunostaining showed that gastric polypoid tumor was the metastasis of clear renal cell carcinoma.

tumors. Therefore, gastric metastasis of RCC is characterized by submucosal involvement at an early stage. The reason for the polypoid form is not clear; possible explanations are the influence of peristaltic motion and a gravitational effect. In detail, first, when a solid tumor occurs in the mucosa or submucosa, it produces a mild bump. If further bulging occurs due to tumor growth, it may be further bulged to the luminal side such as the advanced part of the intussusception due to peristaltic movement and gravity effect. As a result of tumor growth, tumor stalk grows.

According to the classification proposed by Satomi et al, the growth rate of RCC is basically classified as slow or rapid [9]. In the present case, as the metastatic lesion was detected 15 years after the first surgery, it was considered a slow-growing type, in addition to being a late relapse.

Treatment options for RCC with metastases include surgery, endoscopic resection, intervention, and drug and palliative therapies. Surgical treatment is recommended for affected patients with a good performance status; a long disease-free period and complete resection can be expected. In cases with resectable oligometastasis from RCC, 5-year survival rate is relatively high (72.6%) [10]. Although our patient was an older adult, her performance status was good. Before treatment, the diagnosis of gastric metastasis of RCC could be made on the basis of the lesion site, form, and contrast-enhanced CT pattern. The properties and shape of the tumor could be clearly evaluated in detail on CT scan; thus, endoscopic treatment was performed and good results were obtained. In the present case, detailed morphological evaluation helped diagnose pedunculated gastric metastasis and guided endoscopic treatment.

Conclusion

Gastric metastases of RCC are typically pedunculated polypoid masses with markedly early enhancement and washout pattern, similar to the CT features of a primary clear RCC. Careful image interpretation enabled an accurate diagnosis of the gastric metastasis of RCC. In addition to surgery, endoscopic treatment is another possible treatment for pedunculated gastric metastasis.

Ethical approval

All procedures performed in this study involving human participants were performed in accordance with the ethical

standards of the institutional and national research committees and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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