

Solitary Synchronous Metastatic Gastric Cancer Arising from T1b Renal Cell Carcinoma: A Case Report and Systematic Review

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Metastasis to the stomach from renal cell carcinoma (RCC) is extremely rare. Usually, gastric metastasis seems to be a late event in patients with RCC and is accompanied by disseminated tumor spread to other organs. Solitary synchronous gastric metastasis from small, localized RCC has rarely been reported. We report a case of 79-year-old man with synchronous gastric metastasis presenting with a single erosive lesion from pT1 RCC. The patient underwent radical nephrectomy and endoscopic resection for metastatic gastric cancer. The resected specimen showed an ill-defined tumor, approximately 0.6 cm long, with a clear resection margin. The morphologic features of the tumor cells were consistent with those of metastatic RCC of the clear cell type. At 6 months's follow-up, the patient did not show local recurrence or additional metastasis on upper endoscopy and computed tomography scan. (*Gut Liver* 2012;6:388-394)

Key Words: Stomach neoplasms; Carcinoma; Renal cell; Neoplasm metastasis

INTRODUCTION

Renal cell carcinoma (RCC) has a propensity to metastasize along the hematogenous route. About 20% to 25% of patients with RCC have distant metastases at presentation,¹ and another 50% develop distant metastases or local recurrence after nephrectomy.² Metastasis can occur at any time, and the most frequent sites include the lungs, bones, liver, and brain. However, RCCs can also metastasize to unusual sites, including the pancreas, thyroid, adrenal gland, skeletal muscle, and skin.³ Clinical courses vary among patients with RCC who initially present with metastatic disease or who develop tumor dissemination

during follow-up.

RCC metastases to the stomach, including solitary synchronous gastric metastases from small, localized RCCs, are extremely rare.⁴ We here describe a patient with a solitary synchronous metastatic gastric cancer originating from a small RCC who was treated with endoscopic resection. We also review the clinical characteristics of, therapeutic modalities for, and clinical outcomes of, patients with this disease.

CASE REPORT

A 79-year-old man presented with abdominal pain. He had previously undergone surgery for a duodenal ulcer as well as an open cholecystectomy. He had smoked for 30 years. On physical examination, we did not detect abdominal tenderness or a mass, and laboratory tests revealed no abnormal findings. Upper endoscopy showed an erosive lesion, approximately 0.6 cm in length, in the anterior wall of the midbody (Fig. 1). A biopsy of the lesion showed tumor cells, consistent with metastatic RCC of the clear cell type. Computed tomography (CT) showed a mass, approximately 5 cm long, in the right kidney, but there was no evidence of lymph node enlargement or metastatic lesions in the abdomen (Fig. 2A). Positron emission tomography showed an isometabolic mass (maximum standardized uptake value [maxSUV], 2.7) in the right kidney (Fig. 2B and C), but no hypermetabolic lesions in other organs. The patient underwent radical nephrectomy. The resected specimen showed a well-defined lobulated mass, 5.2×3.8×3.5 cm in size, in the lower pole of the right kidney. The tumor cells had clear cytoplasm and round monotonous nuclei, both typical of clear cell carcinoma (Fig. 3). The tumor was confined to the renal parenchyma, and no lymphovascular or renal vein invasion was apparent. The

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RCC was staged as T1bN0M1.

The patient subsequently underwent endoscopic submucosal dissection of the metastatic gastric lesion (Fig. 4). Microscopic examination of the resected specimen showed an ill-defined tumor, about 0.6 cm long, with clear resection margins, a finding consistent with metastatic RCC (Fig. 5). Upper endoscopy and a CT scan performed 6 months later showed no evidence of local recurrence or additional metastasis.

DISCUSSION

Although metastatic gastric cancers are uncommon, those ob-

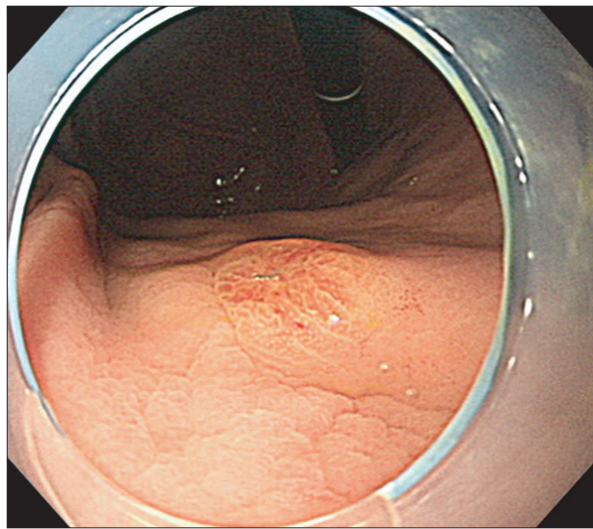


Fig. 1. Upper endoscopy showing an erosive lesion approximately 0.6 cm long in the anterior wall of the gastric mid-body.

served are frequently metastases of lung cancer, breast cancer, and malignant melanoma.⁵⁻⁸ The clinical symptoms most commonly requiring endoscopy of patients with gastric metastasis include anemia, gastrointestinal bleeding, dyspepsia, and epigastric pain. Metastases are most common in the gastric body, and are more likely to be single rather than multiple. Grossly, such lesions can resemble submucosal tumors, with or without central depressions, or primary gastric cancers.⁸ The outcome of patients with metastatic gastric cancer is generally poor, because concomitant metastases to other organs are common.⁵

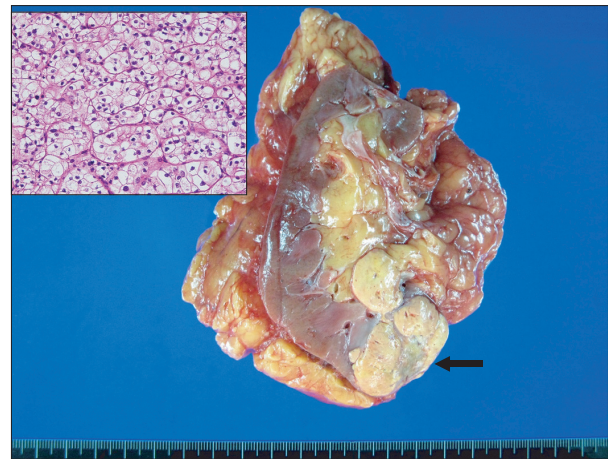


Fig. 3. Pathology findings for the tumor of the right kidney. The tumor was 5.2×3.8×3.5 cm in size, located in the lower pole (arrow), and confined to the renal parenchyma. Thus, lymphovascular invasion and tumor emboli in the renal vein were absent in the tumor. The Fuhrman nuclear grade was 2/4. Inset: The tumor cells had clear cytoplasm and round nuclei, typical of renal cell carcinoma of the clear cell type (H&E stain, ×400).

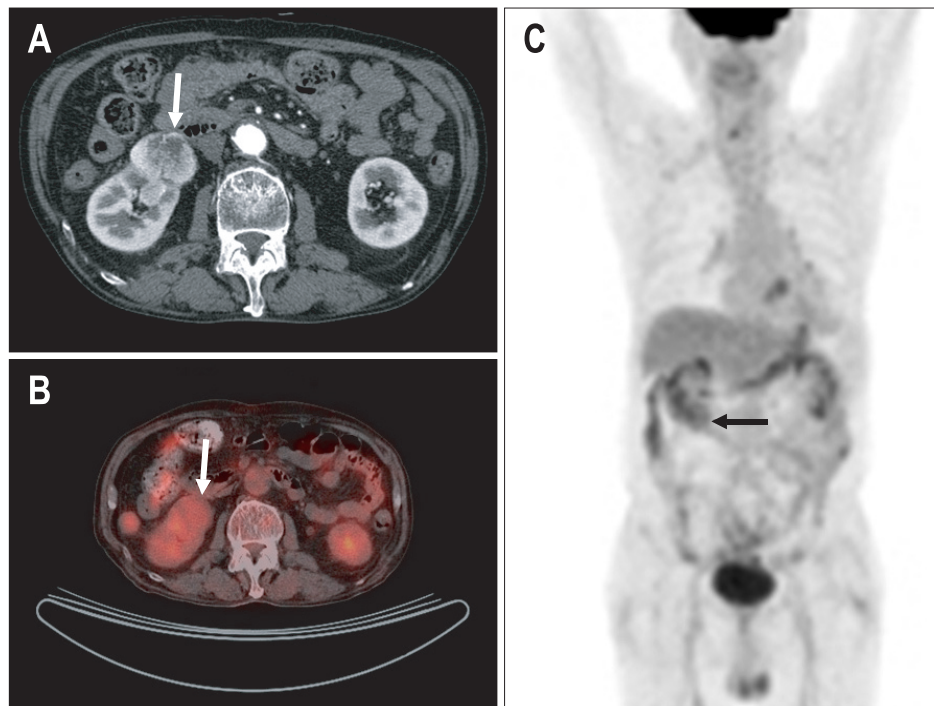


Fig. 2. (A) Computed tomography showing a hypervascular mass (arrow) approximately 5 cm long and bilobular in shape in the right kidney. (B, C) Positron emission tomography showing an isometabolic mass (arrow, maxSUV 2.7) in the right kidney. maxSUV, maximum standardized uptake value.

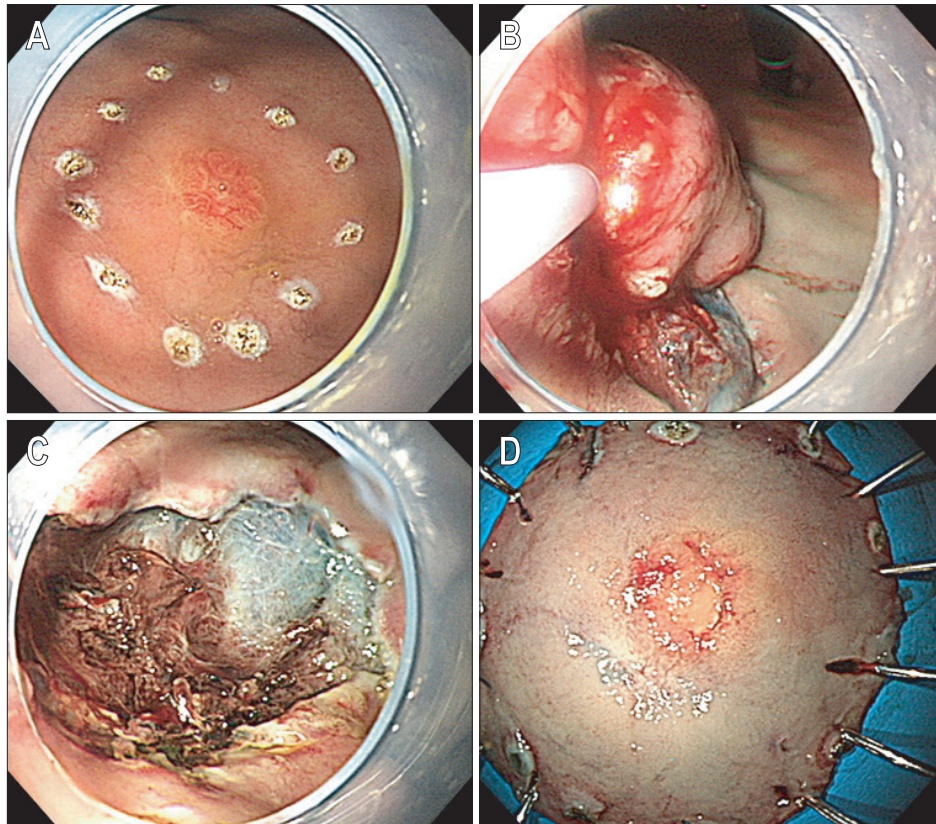


Fig. 4. Endoscopic resection of the metastatic lesion of the stomach. (A) Marking associated with soft coagulation. (B) Snaring after pre-cutting with a needle knife and partial submucosal dissection with an IT-knife after the injection of a saline-epinephrine solution into the submucosa. (C) Ulcer after endoscopic resection. (D) Grossly resected specimen.

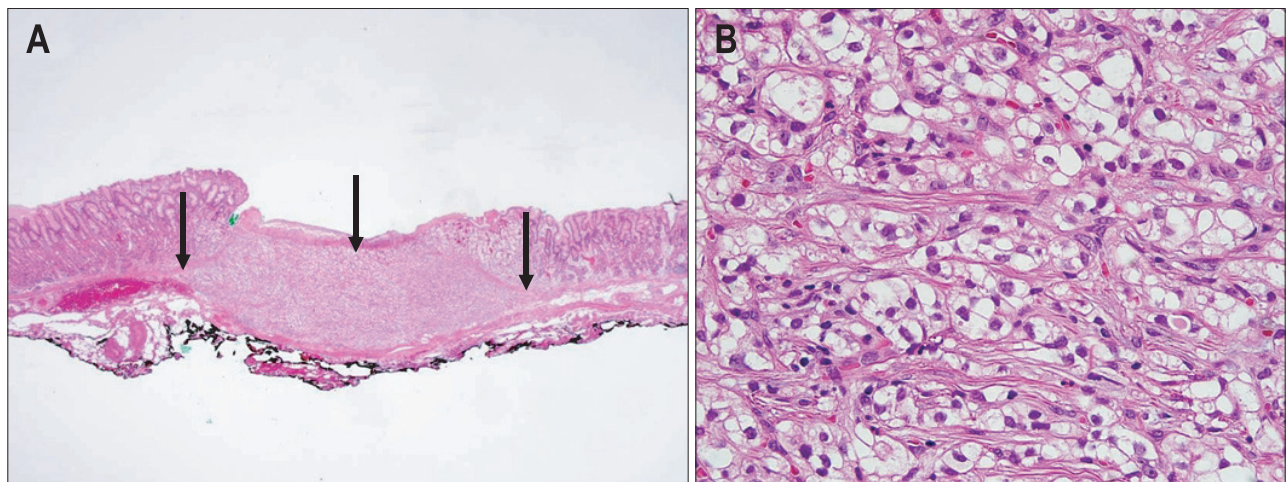


Fig. 5. Microscopic features of the resected specimen showing the characteristics of a metastatic gastric tumor arising from renal cell carcinoma (RCC). (A) The poorly defined tumor, approximately 0.6 cm long, was located in the submucosa, extended to the lamina propria (arrow), and did not involve the deep resection margins (H&E stain, $\times 40$). (B) The morphologic features of the tumor cells were consistent with the features of metastatic RCC of the clear cell type (H&E stain, $\times 400$).

Metastasis to the stomach from RCC is extremely rare,⁸ although we identified as many as 36 such patients (including the patient described here, but excluding those identified on autopsy) by systematic review of articles in English using a computerized search of the PubMed database (Table 1).^{1,9-37}

We found that gastric metastases from RCC were more common in males than in females (26 males vs 9 females). Median age at presentation was 67 years (range, 48 to 84 years). Among

the most frequent clinical symptoms were upper gastrointestinal bleeding, anemia, and epigastric pain. Some patients were asymptomatic or had nonspecific symptoms. The most frequent location of metastatic lesions was the gastric body, followed by the fundus and the antrum. A single polypoid lesion was more common than were multiple or ulcerated lesions. The size of such metastatic tumors varied from 0.5 to 8.0 cm. The average period from RCC surgery to the presentation of gastric metastasis

Table 1. Reported Patients with Gastric Metastasis Arising from RCC

Case	Age/ Gender	Symptoms	Location	Characteristics of metastatic lesions	Interval, yr	Treatment	Outcome	Histologic type	TNM stage	Additional metastasis
Sullivan <i>et al.</i> (1980) ⁹	69/M	Melena, anemia	Antrum	Single, polypoid	7	Antrectomy	-	Clear cell carcinoma	3b/0/0	None
Nakamura <i>et al.</i> (1984) ¹⁰	65/M	Melena	-	-	9	PG	Died 33 days after operation	Clear cell carcinoma	-	Ileum
Cosme <i>et al.</i> (1984) ¹¹	84/F	Melena	-	-	24	-	-	-	-	-
Bisesti <i>et al.</i> (1984) ¹²	64/M	Chest pain	-	-	14	STG	-	-	-	-
Ibáñez Olcoz <i>et al.</i> (1989) ¹³	60/F	Melena	Body	Two, polypoid, 5 cm	1.8	None	Died 4 wk after discharge	Clear cell carcinoma	3b/X/X	Lung, brain
Ibáñez Olcoz <i>et al.</i> (1989) ¹³	67/M	Melena	-	-	0.1	None	-	Clear cell carcinoma	-	-
Márquez <i>et al.</i> (1992) ¹⁴	70/M	Melena, UGI bleeding, anemia	Body	Single, ulcerated, 1.5 cm	0.1	None	Died 4 wk after diagnosis	Clear cell carcinoma	3a/X/X	Lung
Durous <i>et al.</i> (1992) ¹⁵	66/M	Anemia	Fundus	Three lesions	12	Interferon	Alive with disease	Clear cell carcinoma	1a/0/X	Lung, parotid
Otawa <i>et al.</i> (1992) ¹⁶	61/F	Hematemesis	-	-	0	TG	Died 3 mo after operation	-	-	None
Herrera Puerto <i>et al.</i> (1993) ¹⁷	63/M	Hematemesis, melena	Antrum	Single, ulcerated	0.1	None	Died 4 wk after nephrectomy	Clear cell carcinoma	3b/X/X	None
Boruchowicz <i>et al.</i> (1995) ¹⁸	48/M	Dysphagia	Fundus	Polypoid	1.3	CTx	Died at 4 mo	Clear cell carcinoma	-	Lung, liver, esophagus
Blake <i>et al.</i> (1995) ¹⁹	63/M	UGI bleeding	-	-	6	Palliative embolization	No complication at 5 mo	Clear cell carcinoma	-	Lung
Odori <i>et al.</i> (1998) ²⁰	59/M	-	Body	Single, ulcerated, 1.5 cm	4.4	TG with regional LND	No tumor recurrence at 17 mo	Clear cell carcinoma	2/0/0	None
Picchio <i>et al.</i> (2000) ²¹	64/F	Melena, anemia	Body	Single, polypoid, 1.5 cm	14	STG	No tumor recurrence at 6 mo	Clear cell carcinoma	2/0/0	None
Mascarenhas <i>et al.</i> (2001) ²²	66/M	Hematemesis, melena	Body	Single, ulcerated, 5 cm	4	PG	No tumor recurrence at 3 yr	Clear cell carcinoma	-	Lung, pleura
Kok Wee <i>et al.</i> (2004) ²³	60/M	Melena	Body	Two lesions	20	Endoscopic ablation	-	Clear cell carcinoma	-	-
Kobayashi <i>et al.</i> (2004) ²⁴	78/M	Anemia	-	0.5 cm	4	Gastrectomy	Died at 5 mo	Clear cell carcinoma	-	Liver
Suarez Fonseca <i>et al.</i> (2004) ¹	61/F	Melena, anemia, epigastric pain	Body	Single, polypoid, 6 cm	4	None	Alive with disease at 6 mo	Clear cell carcinoma	3b/0/0	Lung
Lamb <i>et al.</i> (2005) ²⁵	69/F	UGI bleeding, melena	Body	5 cm	3	Palliative embolization	Died at 23 mo	Clear cell carcinoma	-	Lung
Riviello <i>et al.</i> (2006) ²⁶	68/M	UGI bleeding, melena	Fundus	Single, polypoid, 5 cm	11	TG, CTx	Died at 2 yr	Clear cell carcinoma	-	Lung, liver, pancreas
Portanova <i>et al.</i> (2006) ²⁷	67/F	Melena, dyspnea	Body	Single, ulcerated, 3 cm	5	Gastrectomy	-	Clear cell carcinoma	3a/X/X	Pancreas

Table 1. Continued

Case	Age/ Gender	Symptoms	Location	Characteristics of metastatic lesions	Interval, yr	Treatment	Outcome	Histologic type	TNM stage	Additional metastasis
Saidi <i>et al.</i> (2007) ²⁸	-	Melena, anemia	Body	Single, polypoid, 1 cm	10	WR	No tumor recurrence at 18 mo	Clear cell carcinoma	-	None
Pezzoli <i>et al.</i> (2007) ²⁹	78/M	Anemia	Body	Three, polypoid, 2-3 cm	5	Endoscopic mucosal resection	Died 6 mo after surgery	Clear cell carcinoma	-	Multiple
Pollheimer <i>et al.</i> (2008) ³⁰	69/M	Epigastric pain, nausea, emesis	Body	Single, ulcerated, 7.5 cm	4.2	Tamoxifen	Died at 19 mo	Clear cell carcinoma	2/X/X	Lung, bone, adrenal
Pollheimer <i>et al.</i> (2008) ³⁰	77/M	None	Antrum	Single, ulcerated, 3 cm	6.3	Interferon	Died at 4 mo	Clear cell carcinoma	3a/X/X	Lung, bone
Pollheimer <i>et al.</i> (2008) ³⁰	83/F	Melena, anemia	Antrum	Multiple, 4.5 cm	1.7	Endoscopic ablation	Died at 5 mo	Clear cell carcinoma	3b/X/X	Lung, liver, pancreas
Pollheimer <i>et al.</i> (2008) ³⁰	65/F	UGI bleeding, melena, anemia	-	Two, 4 cm	13.1	Endoscopic ablation	Died at 3 mo	Clear cell carcinoma	3a/X/X	Lung, brain
Pollheimer <i>et al.</i> (2008) ³⁰	69/M	Anemia, epigastric pain	Body	Multiple, 5.4 cm	9.3	Endoscopic ablation, sunitinib	Alive with disease at 2 yr	Clear cell carcinoma	3a/X/X	Lung, bone
Ko <i>et al.</i> (2008) ³¹	71/M	Abdominal pain	Body	Multiple, polypoid	0	None	Alive with disease	-	-	Lung
Kibria <i>et al.</i> (2009) ³²	53/M	Melena, dizziness	Fundus	Single, polypoid, 1.5 cm	0	None	Died 2 mo af- ter diagnosis	Clear cell carcinoma	-	Lung, bone
Yamamoto <i>et al.</i> (2009) ³³	74/M	Melena	Body	Single, polypoid, 8 cm	5	WR	Died 4 wk after wedge resection	-	3b/0/0	Brain
Maeda <i>et al.</i> (2009) ³⁴	49/M	Nonspe- cific	Body	Single, polypoid, 2 cm	2	PG	Died 15 mo after opera- tion	Clear cell carcinoma	3a/0/1	-
Sugasawa <i>et al.</i> (2010) ³⁵	69/M	Melena	Fundus	Single, elevated lesion with ulcer	19	WR	No recurrence at 12 mo	Clear cell carcinoma	1/0/0	None
García- Campelo <i>et al.</i> (2010) ³⁶	75/M	Nonspe- cific	Fundus, body	Several, multilobu- lated and polyp- oid, 0.6-1.5 cm	3	Sunitinib	Complete response 6 mo after treatment	-	3/0/0	None
Eslick <i>et al.</i> (2010) ³⁷	65/M	Melena	Lower stomach	Single, polypoid lesion with oozing blood	9	Snare polyp- ectomy	Alive 7 yr af- ter diagnosis	Clear cell carcinoma	3a/X/X	None
The present case	79/M	Abdominal pain	Body	Single, 0.6 cm	0	Endoscopic submucosal dissection	No tumor recurrence at 6 mo	Clear cell carcinoma	1b/0/1	None

RCC, renal cell carcinoma; TNM, tumor, node, metastasis; UGI, upper gastrointestinal tract; PG, partial gastrectomy; STG, subtotal gastrectomy; TG, total gastrectomy; CTx, chemotherapy; LND, lymph node dissection; WR, wedge resection; -, not specified.

sis was approximately 6.5 years (range, 0 to 24 years). Twenty-one patients showed disseminated tumor spread to other organs, most frequently to the lungs. Ten patients had solitary gastric metastases. Two patients presented with metastatic gastric cancer arising from RCC before detection of a renal mass; one patient was diagnosed with advanced RCC with metastatic gastric cancer as well as lung and bone metastases,³² and the second patient, described here, had a single gastric metastasis arising

from a small RCC without evidence of additional metastases.

The optimal treatment for patients with gastric metastases arising from RCC remains unclear. Fourteen previously reported patients underwent surgical resection (total/partial gastrectomy or wedge resection); 3 (including the patient described here) received endoscopic resection/excision; 7 were treated with systemic therapy including interferon, tamoxifen, sunitinib malate, or chemotherapy; 6 received palliative embolization or endo-

scopic ablation for control of bleeding; whereas 7 received no specific therapy.

The clinical course in patients with RCC and metastasis to the stomach appears to be unpredictable. Generally, the outcome of patients with RCC and gastric metastases is poor.⁵ Some patients die within a few weeks, whereas six (including ours) showed no tumor recurrence at a median of 17 months (range, 6 to 36 months) after metastatectomy.^{20-22,28,35}

Of 10 patients with solitary gastric metastases, 6 underwent surgical metastatectomy, 2 underwent endoscopic resection (snare polypectomy and endoscopic submucosal dissection), 1 was treated with sunitinib malate, and 1 received no therapy. Five patients showed no evidence of tumor recurrence at a median of 12 months (range, 6 to 18 months) after metastatectomy, and one patient lived for 7 years after diagnosis. One patient showed a complete response 6 months after treatment with sunitinib malate.

Although the optimal treatment for patients with solitary gastric metastasis arising from RCC remains unclear, patients with potentially surgically resectable primary RCC and a solitary resectable metastatic cancer are candidates for nephrectomy and metastatectomy.³⁸ Patients in generally good condition showed prolonged survival after nephrectomy and complete resection of the metastatic lesion.^{4,38-40} Similarly, complete metastatectomy may offer survival benefits in patients with solitary gastric metastases arising from RCC.^{21,28} The optimal treatment modality in a patient with a small, solitary gastric metastasis confined to the mucosa and submucosa may be endoscopic resection.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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