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Case Report

Concurrent renal tubulocystic carcinoma with gastrointestinal stromal tumor: a case report

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Abstract: Reported herein is a coexistence of renal cell carcinoma in a gastrointestinal stromal tumor (GIST) patient. A 77-year-old male suffered from renal tubulocystic carcinoma in the left kidney and spindle cell gastrointestinal stromal tumors. Immunohistochemically, the renal cancer cells showed expression of Vimentin, Ckpan, CK18, CK19, CD10, P504S and Pax-8, focal positive of CK7, 34βE12, Ksp-cad and EMA, but negative for CK20, CA9, CD117, P63, CD15 and Villin. The gastric tumor indicated expression of CD117, CD34, DOG-1 and Nestin, while negative for CKpan, EMA, SMA, Caldesmon and S-100 and Ki67 index was less than 1%. About 14%~43% of GISTs were observed to develop additional primary malignancies preoperatively or postoperatively. To our knowledge, this is the first case of coexistence of tubular cystic carcinoma and GIST.

Keywords: Gastrointestinal stromal tumor (GIST), renal tubulocystic carcinoma, immunohistochemistry

Introduction

Gastrointestinal Stromal Tumor (GIST) is the most common mesenchymal tumors of the digestive tract, most commonly occurs in the stomach followed by small intestine [1]. About 14%~43% of GISTs were discovered to develop additional primary malignancies preoperatively or postoperatively [2-5], commonly digestive tract cancer, prostate cancer, lymphoma and breast cancer [6, 7]. However, coexistence of renal cell carcinoma is extremely infrequent in GIST patients. Among the types of concurrent renal cell carcinoma with GIST, papillary renal cell carcinoma are found most common [8-10], followed by clear cell carcinoma [11]. We herein report a case of coexistence of tubular cystic carcinoma and GISTs in a 77-year-old male, a rare concurrent tumor for better understand.

Case presentation

A 77-year-old male was admitted to our hospital with space-occupying lesions in the left kidney and stomach in his routine physical examination. The lesion in left kidney was firstly found 48 months ago without any symptoms, and no treatment was given. The swelling in the stomach was found under the gastric fundus submucosal nodule. The patient had suffered from abdominal discomfort for about three months, such as distension, belching and poor appetite without significant incentives, and the symptom is often aggravated after eating cold food. Nothing remarkable was found in additional investigations. Laboratory results were all ranked in normal limits, including routine blood chemistry, complete blood count, kidney and liver function tests, and urine analysis.

Electronic endoscopic ultrasonography examination was performed for the tumor in the stomach. The swelling was under the gastric fundus submucosa with well-defined boundary and light vascularity, which was considered as benign tumor. Gastric submucosal mass decollement was performed, which confirmed the submucosal swelling was located in gastric fundus vault with smooth surface, and measured about 1.5 cm× 1.5 cm (**Figure 1A**).

Computerized tomography (CT) of the left kidney revealed a low-density elliptic shadow in the upper portion of left kidney with clear

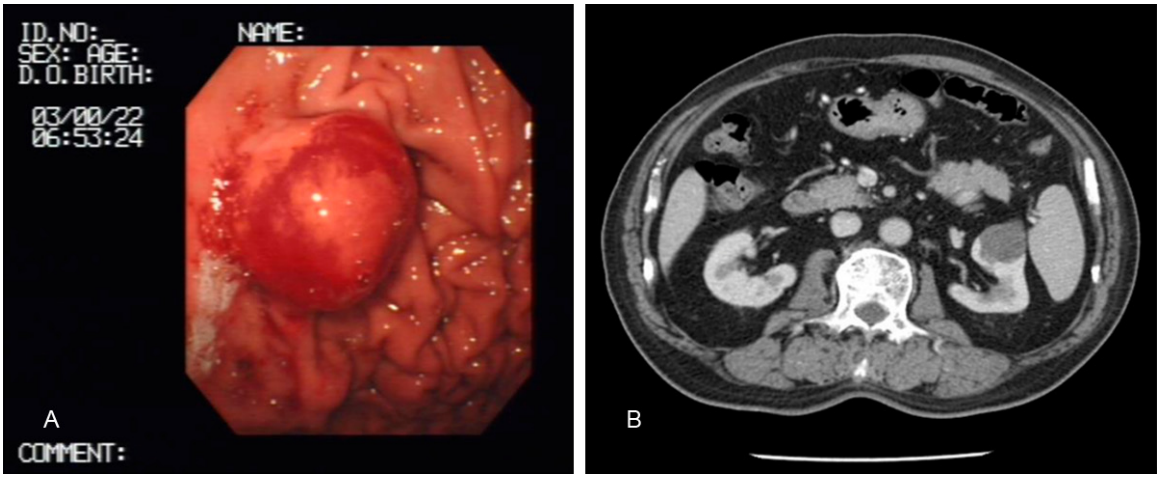

Figure 1. Macroscopic and computed tomography findings of the tumors in stomach and left kidney. A. Image form gastroscopy examination revealed a giant mass (1.5×1.5 cm). B. Computed tomography scanned image revealed a gray nodular tumor in upper pole of the left renal which was outstanding to the surface of the kidney.

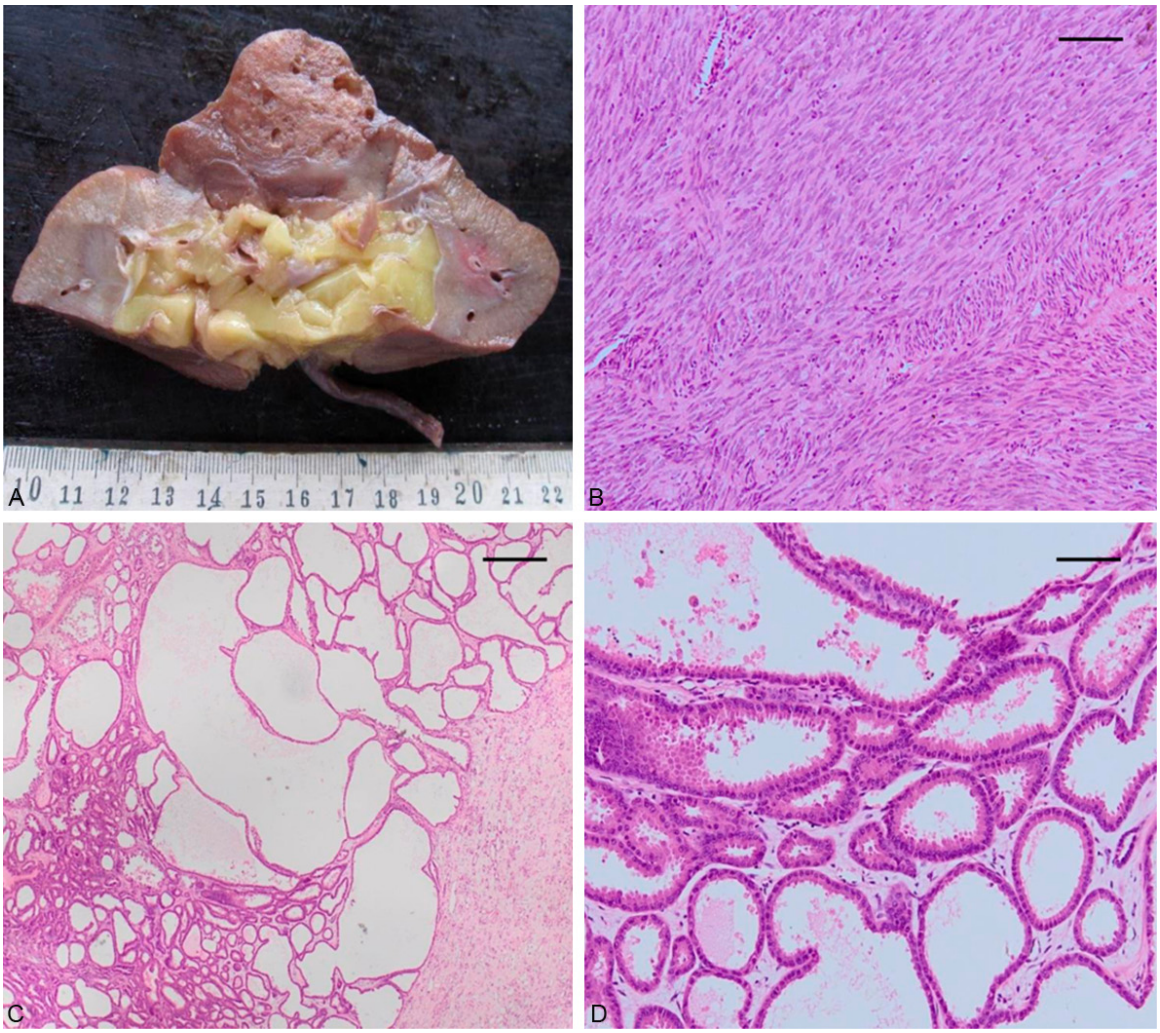

Figure 2. Grossly observation and HE staining of tumors: A. Gross examination of the renal tumor showed that tumor with clear boundary and honeycomb-like small cyst cavity. B. Histopathological examination revealing that tumor

cells were arranged in spindle, beam and weave architecture with mild atypia, but without necrosis. C. Histopathological examination revealing that renal tumor tissue was consisted of intensive tubular structures and different size of cysts lined with single cubic or squamous epithelium. D. Renal tumor cell cytoplasmic eosinophilia, nuclear were round, nucleolus were obvious. Bar=50 μm.

Table 1. Immunohistochemistry results of gastric and renal tumors

	Strongly positive	Focal positive	Negative
Gastric tumor	CD117, CD34, DOG-1, Nestin	-	CKpan, EMA, SMA, Caldesmon, S-100
Renal tumor	Vimentin, CKpan, CK18, CK19, CD10, P504S, Pax8	CK7, 34βE12, Ksp-cad, EMA	CK20, CA9, CD117, P63, CD15, Villin

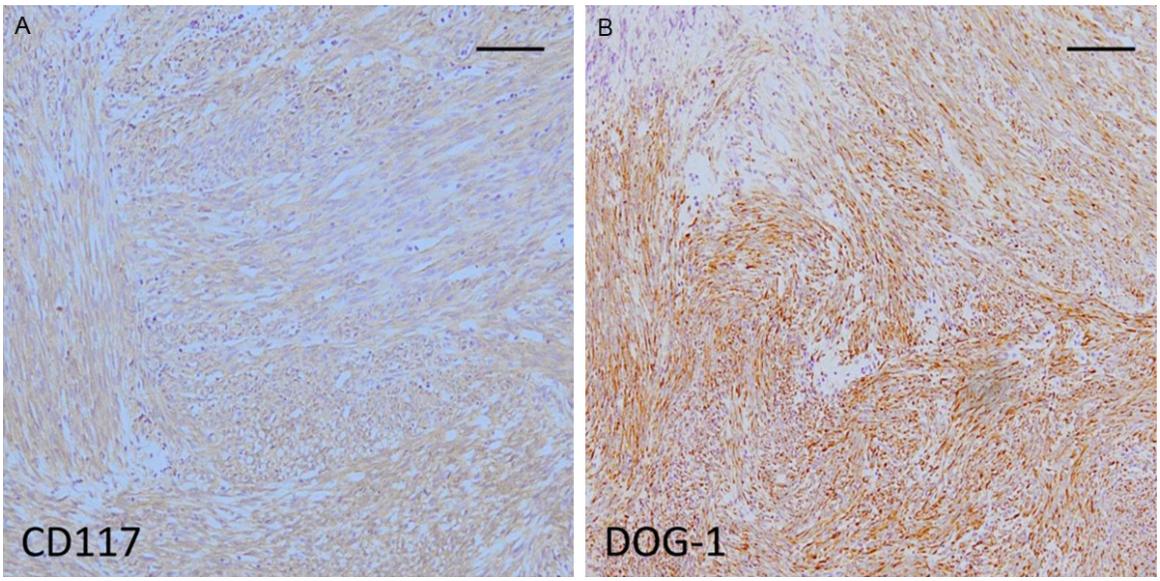

Figure 3. Immunohistochemical staining of the GIST. Immunohistochemical staining of strong positive for CD117 (A) and DOG-1 (B). Bar=50 μm.

boundary, which was measured about 3.1×2.3 cm, enhanced CT showed a mild enhanced lesion (**Figure 1B**). Bilateral renal pelvis and calyces showed no obvious expansion and hydrops. No obvious swelling lymph nodes were found in retroperitoneum. MRI showed an irregular abnormal signal image in the upper pole of the left kidney with spaces inside. The lesion had a clear boundary, part of which was prominent outside the renal capsule measuring 3.4 cm × 3.1 cm × 3.4 cm. Enhanced image showed a mild enhancement during the delay period. Clinical presumptive diagnosis was primary renal carcinoma. Subsequently the patient received radical resection of left kidney.

Pathologic findings

Grossly, the resected specimen (1.5 cm × 1.0 cm × 1.0 cm) of the gastric neoplasm was received. The specimen was of slightly smooth surface, bisected to reveal a boundary-clear but unencapsulated tumor in white to gray-yellow color. Another resected specimen was the kidney attached to perinephric fat measuring 11.5×5.5×5.5 cm. A gray nodular tumor was observed in the upper pole of the renal which was superficial of the renal surface. A circumscribed and pliable tumor (1.2 cm × 1 cm) was found in the tough bisected section, which is in gray-yellow color. The tumor with clear boundary was measured about 2.8×2.3 cm. The solid lesion was scattered with small utricle cavities, and parts of which were honeycomb-like. No capsule was found, but the tumor cells were not infiltrated into renal pelvis (**Figure 2A**).

Microscopically, the gastric tumor tissue located in the submucosa. Tumor cells were arranged in spindle, beam and weave architecture with mild atypia. The mitoses were less than 2/50HPF without necrosis (**Figure 2B**).

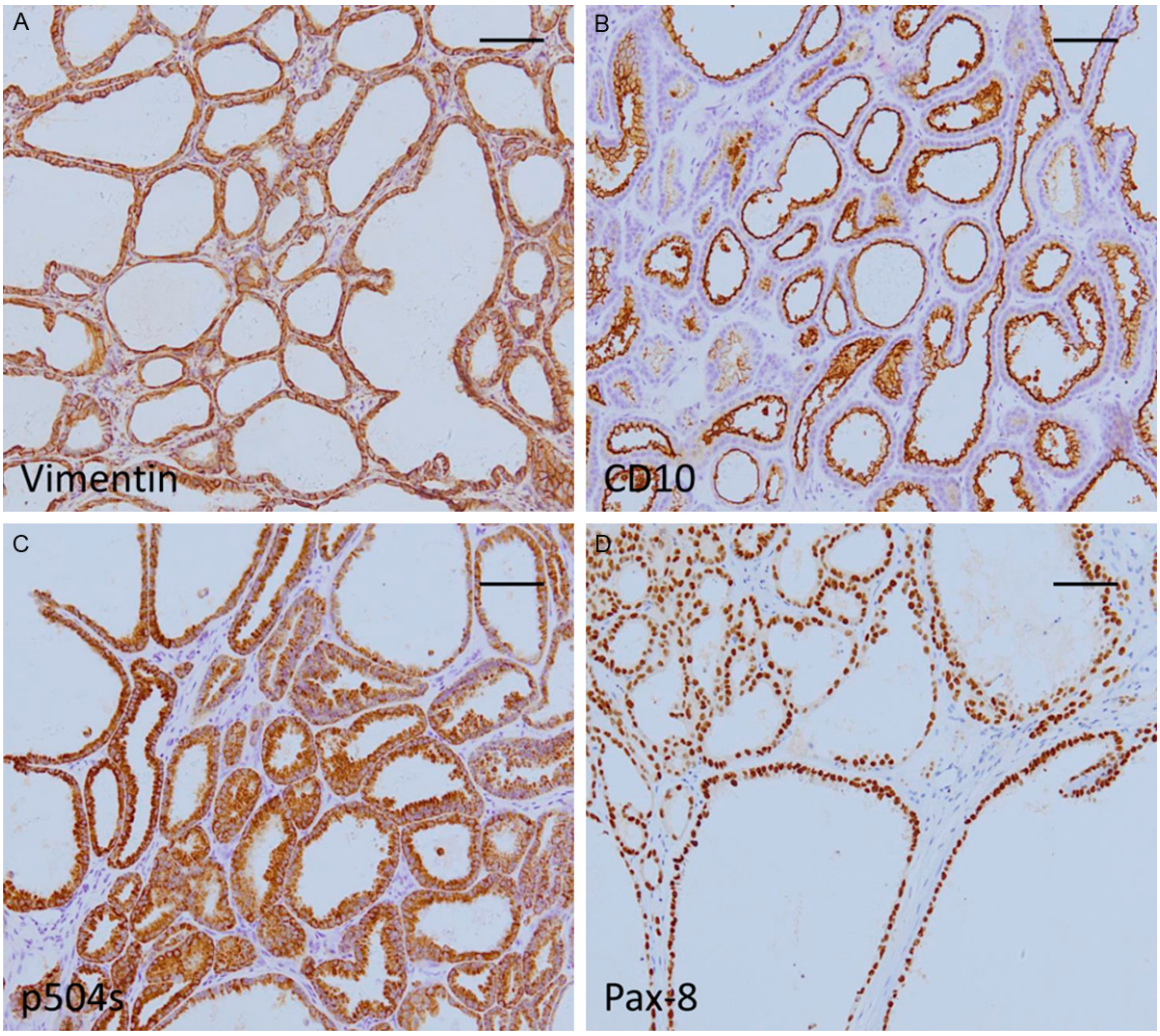

Figure 4. Immunohistochemical staining of the renal tubular cystic carcinoma. Positive staining of Vimentin (A), CD10 (B), P504S (C) and Pax8 (D). Bar=50 μm.

The renal tumor tissue was consisted of intensive tubular structures and different size of cysts lined with single cubic or squamous epithelium (**Figure 2C**). The hyperplastic epithelium cells formed slender papillae or multilayer structure. Tumor cells were not capsulized and invaded surrounding tissues. The cytoplasm of the tumor cells were eosinophilia, part of which was studs-like with round nucleus and dispersed chromatin. Small nucleoli could be found. Fuhrman nuclear grading was 3 with rare mitosis (**Figure 2D**). A few tumor cells had clear cytoplasm. The stroma of loose connective tissue was scarce. No hemorrhage and necrosis were observed.

Immunohistochemically (**Table 1**), the gastric tumor cells indicated diffuse, strongly positive expression of CD117 (**Figure 3A**), CD34, DOG-1 (**Figure 3B**) and Nestin, while negative for CKpan, EMA, SMA, Caldesmon and S-100. And Ki67 index was less than 1%.

Renal tumor cells showed diffuse, strongly positive expression of vimentin (**Figure 4A**), CKpan, CK18, CK19, CD10 (**Figure 4B**), P504S (**Figure 4C**), pax8 (**Figure 4D**), focal positive expression of CK7, 34βE12, Ksp-cad and EMA, whereas negative for CK20, CA9, CD117, P63, CD15 and Villin.

Based on the histological appearances and immunohistochemical results, a final diagnosis of coexistence of tubular cystic carcinoma in left kidney and spindle cell gastrointestinal stromal tumors in gastric fundus was con-

firmed. No other treatment was performed after surgical operations since then. The patient is still alive and without evidence of local recurrence or distant metastasis for 60 months after the operation.

Discussion

To our knowledge, this is the first case of concurrent TCC and GIST. No treatment was administrated after the renal lesion detected, which developed GIST in stomach four years later. This case proved tubular cystic carcinoma is a low-grade malignant tumor with slow progression, which provided evidence that GIST was followed by renal TCC.

TCC is a rare renal cell carcinoma, which was first described by Farrow et al in 1994 [12]. Due to its unique clinic pathological characteristics, TCC was recognized as a novel subtype of renal cell carcinoma in 2012 by the International Society of Urological Pathology (ISUP) consensus conference on renal neoplasia [13], which was incorporated into the WHO classification (2016 edition). The tumor cells were immunohistochemically positive for Vimentin, CK18, Pax-8, CD10 and P504S, and focally positive for CK7. In addition, similar biological characteristics were observed between TCC and papillary renal cell carcinoma, as well as obtained chromosome 7, 17 and chromosome Y deletion [14]. Therefore researchers speculate a certain correlation between RCC and papillary renal cell carcinoma.

About 60% of GIST occurred in the stomach. Significant histological differences were observed in the tumor cells, including spindle cells and epithelioid cells. Different cell types were shown in a tumor. The spindle cells often are often arranged in cross bundles, vortex or palisade. The epithelioid cells are arranged in diffuse, nest structure [15]. The immunohistochemical feature of GIST is positive for CD117 in about 95% of the patients. Most GIST tissues expressed DOG-1 (96%) and CD34 (70%) [16]. It is still unclear of the pathogenesis of concurrent GIST and other malignant tumors. Coexistent renal cell carcinoma in GIST patient tends to be occurred after the diagnosis of GIST. Gene mutation in the 11th exon of KIT was observed in GIST tumors [3]. Hechtman et al reported that both GIST and RCC were sensitive to tyrosine kinase receptor inhibitors treatment, such as Chougny et al [4], which suggested they should have a same genetic mutation. It was reported previously that a case of synchronous renal clear cell carcinoma and GIST in stomach with portal vein thrombus [11]. The portal vein thrombus disappeared completely after two cycles of sunitinib treatment. There was also some correlation between papillary renal cell carcinoma and GIST. Both of them are familial tumors which are associated with proto-oncogenes mutation, such as c-MET and c-KIT, which further support a certain relationship between them.

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Disclosure of conflict of interest

None.

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