Renal cell carcinoma (RCC) is a fairly uncommon malignancy, comprising only 3% of malignancies in adults [1]. Symptoms related to gastrointestinal involvement of this tumor rarely present, although up to 4% of patients with RCC have small-bowel metastases. Direct colonic invasion by RCC is extremely rare due to the retroperitoneal location of the kidneys and mesocolon. A thorough search of the English medical literature revealed only three reported cases of RCC with direct invasion into the colon [2–4]. Here, we present another case with a brief literature review.

A 53-year-old man presented with intermittent hematochezia and left flank pain. A computed tomographic (CT) scan of the abdomen revealed a 7-cm, left renal mass extending into the descending colon, with suspected fistulous communication (Fig. 1). Colonoscopy revealed significant luminal narrowing in the proximal descending colon with multiple, friable mass lesions (Fig. 2 and Video 1). Biopsy specimens showed a poorly differentiated carcinoma, lacking both glandular and squamous features. Immunohistochemical analysis revealed tumor cells with marked reactivity for cytokeratin AE1/AE3 and vimentin stains. Scattered S100-positive cells were interspersed among the tumor cells.

Endoscopic view of the renal cell carcinoma invading the descending colon.
The patient underwent a left radical nephrectomy and partial colectomy with left-sided transverse colostomy. The surgical specimen contained a mass (11.2 × 10.5 × 5.5 cm) arising in the renal parenchyma, penetrating the renal capsule, and invading the adherent colon (Fig. 3). Histopathologic evaluation revealed a stage pT4 RCC, conventional (clear cell) type renal cell carcinoma with high nuclear grade and extensive sarcomatoid differentiation (85%), and multifocal tumor necrosis (Fig. 4). The surgical resection margins were free of tumor and no lymph node metastasis was identified.

Clear cell carcinoma is the most common (80–90%) subtype of RCC [5]. However, only 5% of clear cell RCCs exhibit sarcomatoid differentiation, indicating a higher grade and worse prognosis. Of the four reported cases, including this one, three showed sarcomatoid differentiation (Table 1).

**Table 1**  Summary review of published case reports of renal cell carcinoma (RCC) with direct colonic invasion.

<table>
<thead>
<tr>
<th>Case report</th>
<th>Tumor size</th>
<th>Tumor location</th>
<th>Tumor histopathology</th>
<th>Tumor immunohistochemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paine et al. (current case)</td>
<td>11.2 × 10.5 × 5.5 cm (by pathology)</td>
<td>Left renal mass extending into the descending colon</td>
<td>High grade stage pT4 clear cell RCC with extensive sarcomatoid differentiation and multifocal tumor necrosis</td>
<td>Strongly positive for cytokeratin AE1/AE3 and vimentin; S100-positive cells were scattered among the tumor cells</td>
</tr>
<tr>
<td>Perez et al., 1998 [2]</td>
<td>Not reported</td>
<td>Left upper pole renal mass, invading sigmoid colon</td>
<td>Carcinoma with clear cell and sarcomatoid features</td>
<td>Not reported</td>
</tr>
<tr>
<td>Ohmura et al., 2000 [3] (Case 2)</td>
<td>7.0 × 6.0 × 3.5 cm (by pathology)</td>
<td>Right renal mass, invading the ascending colon and psoas muscle</td>
<td>Clear cell RCC with partial ulceration, invading the colonic submucosa</td>
<td>Ki-67 labeling index 20.4</td>
</tr>
<tr>
<td>Pompa and Carethers, 2002 [4]</td>
<td>11.0 × 8.0 × 6.5 cm (by CT)</td>
<td>Left lower quadrant mass, involving left kidney and descending colon, with extension into spleen and left adrenal gland</td>
<td>90% spindle-shaped, poorly differentiated sarcomatoid cells</td>
<td>Not reported</td>
</tr>
</tbody>
</table>

**Fig. 4** Microscopic specimen showing conventional (clear cell) type renal cell carcinoma with high nuclear grade and extensive sarcomatoid differentiation (hematoxylin and eosin, ×40 magnification).

The patient showed sarcomatoid differentiation (Table 1).

**Endoscopy_UCTN_Code_CCL_1AD_2AB**

**Competing interests:** None

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