

## Intaureteral Recurrence of Renal Cell Carcinoma Following Nephrectomy: A Case Report<sup>1</sup>

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The recurrence of renal cell carcinoma (RCC) in the remnant urothelium is rare, and in this paper we report a case in which the condition recurred in the remnant ureter five years after radical nephrectomy. The recurrent mass was seen on retrograde ureterograms as polypoid filling defect, and on CT images as soft tissue mass-like density. In view of the radiologic and pathologic findings, we believe that in this case, the mechanism of intraureteral recurrence was direct implantation.

**Index words :** Ureter neoplasms  
Ureter, CT

Although urothelial tumors of the upper urinary tract are known to recur in the remnant ureter or lower urinary tract, it is unusual for RCC to recur in the remnant urothelium (1, 2). To the best of our knowledge, only a few cases of intraureteral recurrence of RCC have so far been reported, and most have occurred within two months to eight years of nephrectomy (2).

We describe a case of renal cell carcinoma recurring in the remnant ureter five years after nephrectomy. Retrograde ureterography showed the recurrent mass as polypoid filling defect, and CT imaging revealed soft tissue mass-like density.

The radiologic and pathologic findings in this case suggest that the mechanism of intraureteral recurrence was direct implantation.

### Case Report

A 75-year-old man with a 6-month history of painless gross hematuria was admitted to our hospital. Five years earlier he had undergone left radical nephrectomy due to renal cell carcinoma, and had been symptom-free for four years, at which time gross hematuria redeveloped. Postcontrast pelvic CT revealed round soft-tissue density with homogenous enhancement in the course of the left remnant ureter (Fig. 1A), but at that time this abnormality was neglected by radiologists.

One month before admission, the hematuria worsened, and urine cytology on admission showed some atypical urothelial cells, suggesting malignancy. Left retrograde ureterography revealed one (or two) filling defects with polypoid growth in the distal remnant ureter and local ureteral dilatation, and contrast material trapped within the interstice was noted in the larger defect (Fig. 1B). Intravenous urography indicated that the right pelvocalyceal system, ureter and bladder were normal, while abdominal ultrasonography incidentally revealed circumferential wall thickening of the sigmoid colon. Further study confirmed that the lesion was located in this region.

Left ureterectomy and low anterior resection of the

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colon were performed, and a 1 × 1 cm-sized intraluminal polypoid mass with a papillary surface was found in the remnant ureter (Fig. 1C). Histologic examination revealed the presence of metastatic renal cell carcinoma, which was confined to the ureteral mucosa, and after pathologic examination, adenocarcinoma of the sigmoid colon was also confirmed.

## Discussion

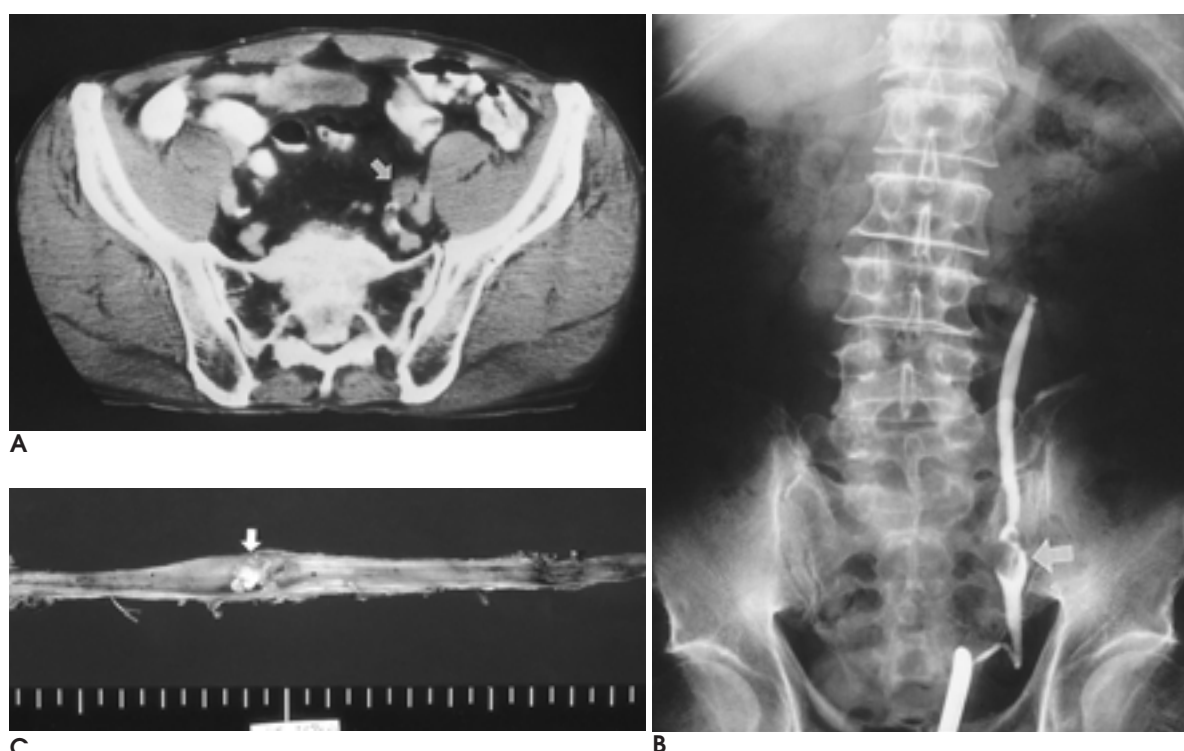
The ureter is a rare metastatic site of malignancy. Common primary tumors that metastasize there are carcinoma of the breast, gastrointestinal tract, pancreas, bladder, kidney, prostate and cervix (1).

Three types of ureteral involvement are known: infiltration of the periureteral soft tissues, transmural involvement of the ureteral wall, and submucosal or mucosal lesions (3). Radiographically, involvement of the ureteral adventitia or muscularis by hematogenous or lymphatic spread in the first two types may appear as single or multifocal stenosis with ureteral wall thickening,

and periureteral streaky density and retroperitoneal soft tissue density are sometimes present. Submucosal or mucosal lesions are seen as one or more intraluminal filling defects, with or without local ureteral dilatation, as in our case (4).

Common metastatic sites of renal cell carcinoma include the lung, which is the most frequent site, and the liver, bone, adrenal gland, opposite kidney and brain. Metastasis to unusual sites such as the stomach, duodenum, gall bladder, pancreas, and testis may also occur (4), however, and metastasis to the ureter, which is commonly involved in urothelial tumors such as transitional cell carcinoma has been reported but is very rare (2, 5). Remnant ureteral metastases of RCC following nephrectomy have been described in case reports, and the onset of recurrence varies from two months to eight years after diagnosis of the primary tumor (2).

In the present case, remnant ureteral recurrence was detected by retrograde ureterography as polypoid filling defect five years after nephrectomy. As pathologic examination proved that the recurrent mass was confined



**Fig. 1.** A 75-year-old man with recurrent renal cell carcinoma in the remnant ureter.

**A.** Postcontrast pelvic CT reveals round soft tissue density with homogenous enhancement (arrow) in the course of left remnant ureter.

**B.** Left retrograde ureterogram shows one (or two) filling defects with polypoid growth (arrow) and local ureteral dilatation. Contrast material trapped within the interstice is noted in the larger filling defect.

**C.** Ureterectomy specimen shows a polypoid mass with papillary surface (arrow) in the remnant ureter. This mass was confined to the ureteral mucosa on dissection.

to the mucosa, we believe that the mechanism of intraureteral recurrence of RCC was direct implantation through the urine. To account for remnant ureteral metastasis, several mechanisms have been suggested, and these include hematogenous, lymphatic spread and direct mucosal or submucosal implantation (2, 5). The first of these is regarded as especially plausible, since in most cases the left kidney is affected and a retrograde venous tumor embolus is more likely to occur on the left side via the gonadal vein (5). In the case reported by Raasch and Voight, however, urogenous implantation was thought to be more probable, because, as in our case, metastatic lesions were found to be polypoid, with no ureteral wall invasion, and were confined to the ureteral mucosa (5). Urogenous implantation is more likely to occur in tumors invading the renal pelvis or calices.

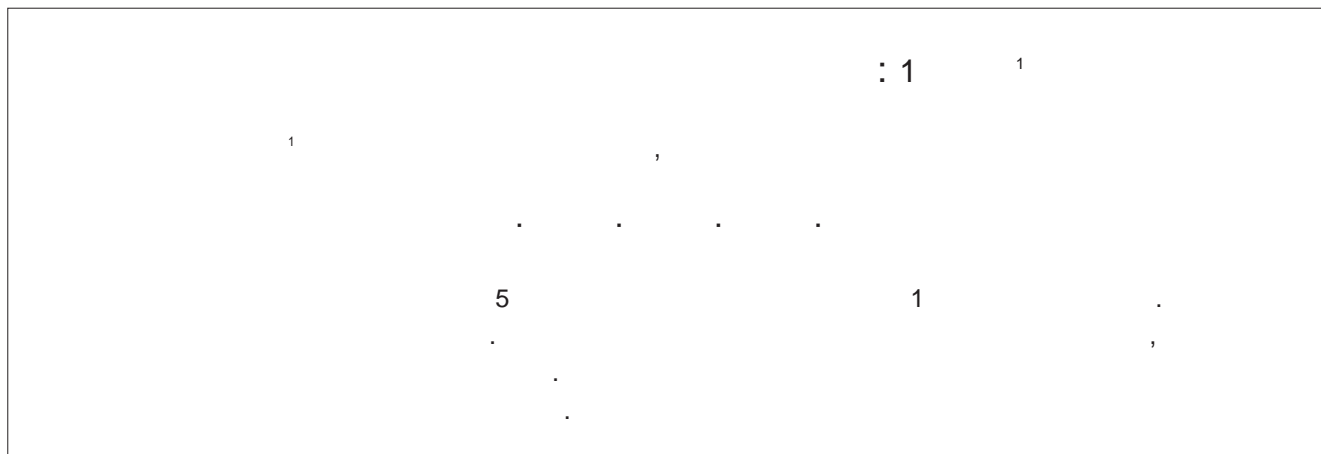
According to the literature, if malignant cells have been found in the urine before nephrectomy, or if the tumor is found during surgery to have invaded the collecting system, the likelihood of implantation metastases increases (5). In such cases, total nephroureterectomy is therefore recommended. Some authors have suggested that minor trauma caused by surgical manipula-

tion and retrograde pyelography increases the chances of implantation metastases (6).

We have described a case of metastatic renal cell carcinoma in the remnant ureter which is most likely due to urogenous implantation. After nephrectomy, adequate follow-up of the remaining ureter is necessary, especially if the primary tumor had invaded the collecting system.

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