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## Case Report

# Ureteral metastasis from gastric cancer after two years of subtotal gastrectomy: A case report<sup>\*</sup>

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## ABSTRACT

True ureteral metastases from gastric cancer are extremely rare. Only a few cases of this condition have been reported. CT is the first-line imaging technique and may aid the diagnosis, even if the definitive diagnosis is histologic. We report a case of a 45-year-old female with a history of gastric cancer who underwent subtotal gastrectomy and presented 2 years later with ureteral metastasis and subsequently renal pelvis metastasis in absence of peritoneal involvement. A biopsy was required to rule out primary urothelial carcinoma and make a well-timed and proper diagnosis. We describe the pathologic and radiological features of this case, followed by a brief review of the literature included in the discussion.

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## Introduction

The incidence of ureteral metastasis in patients with gastric cancer is difficult to estimate due to the lack of studies. The few published studies are referred to Japanese experience, due to the high incidence of gastric cancer in the country (estimated at 27.5 per 100,000) [1].

Infiltration of the ureteral wall by neoplastic cells may occur in 3 different ways. According to the criteria of Pressman and Elrich, we can attribute the epithet of "true metastasis" only to malignant cells localized in "a portion of the

ureteral wall together with the absence of any neoplasm in adjacent tissues" [2]. In this case, the malignant cells achieve the ureteral wall through lymphatic, and/or blood vessels.

The second dissemination pattern, more common, is through peritoneal deposits or lymph node metastases or direct extension, and is usually found in advanced gastric cancer. The last dissemination pattern is very rare: neoplastic cells invade the periureteral region and cause a sclerotic reaction such as retroperitoneal fibrosis, which causes ureteral obstruction [3].

In this report, malignant cells affected the ureteral wall without the involvement of the superficial transitional cell

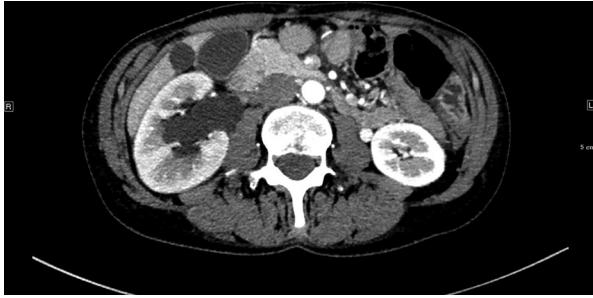
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**Fig. 1 – CT scan axial in corticomedullary phase: unilateral right hydronephrosis with a focal solid enhancing lesion in the pelvic ureteric junction.**



**Fig. 2 – CT scan axial in excretion phase: enhanced endoluminal lesion invading renal pelvis.**

layer, and in absence of any pathology in the periureteral and retroperitoneal space. For this criterion, we defined our case as “true ureteral metastasis” from gastric cancer.

Although cases of ureteral metastases from gastric cancer have been reported in the literature, to our knowledge, this is the first case in which metastases to the renal pelvis are due to dissemination from ureteral metastases from gastric cancer in the absence of peritoneal involvement.

### Case report

A non-smoker 45-years old female was diagnosed with gastric signet ring cell adenocarcinoma, in October 2019. The patient received subtotal gastrectomy with D2 lymphadenectomy, and adjuvant chemotherapy. After this therapeutic approach, the patient underwent follow-up. In June 2020, the patient was admitted to the Department of Radiology, due to the unilateral hydronephrosis incidentally detected during the patient’s follow-up. She claimed to remain asymptomatic and, therefore, clinically disease-free.

We performed a Contrast-enhanced computed tomography (CECT) of the thorax, abdomen, and pelvis. CECT showed right hydronephrosis without evidence of a ureteral stone, pulmonary metastases, and absence of disease in the area of anastomosis (Fig. 1).

Right retrograde pyelography disclosed an obstruction in the proximal third of the ureter, at 2 cm from the right ureteropelvic junction. Due to the stricture that did not allow the passage of a guidewire, a double J stent insertion failed. This finding suggested the possibility of a primary ureteral malignancy.

In order to ensure the kidney, a percutaneous nephrostomy (PCN) was deemed necessary.

After 4 months, follow-up CECT revealed a hyperattenuating mass adjacent to the nephrostomy tube, in absence of peritoneal deposits or lymph node metastases. This mass was strongly suggestive of renal metastasis of ureteral cancer (Fig.2).

In November 2020, complete obstruction of the renal pelvis due to an increase of endoluminal lesion resulted in a withdrawal of the catheter. Biopsy and replacement of the percutaneous nephrostomy catheter were needed.



**Fig. 3 – Uretero-pyelography: biopsy forceps provided specimen.**

Biopsy of renal pelvis lesion was performed through the nephrostomy access using biopsy forceps (Fig.3). Next, an 8 French percutaneous nephrostomy catheter was inserted as usual under fluoroscopic guidance.

Surprisingly, the histologic examination of the biopsy specimen showed that the sampled tissue resulted to be a sample of metastatic adenocarcinoma. The comparison between the biopsy specimen and a tumor specimen obtained from previous gastric cancer surgery showed a perfect match. Furthermore, malignant epithelial cells were not observed in the serosal layer of the ureteral wall in microscopic examination.

As a result, gastric cancer first spread to the ureter and subsequently, due to ureteral obstruction, seeded through the retrograde flow of urine, into the left renal pelvis.

Although the nephrectomy was performed and the patient was in a stable condition, about 3 months’ later patient’s condition gradually worsened due to peritoneal carcinomatosis, and subsequent bowel obstruction.

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## Discussion

In 1911, Schlagintweit first reported a gastric cancer case that spread to the ureter. Afterward, Japanese authors have identified other cases [4]. For example, Shimoyama et al. examined 27 cases of ureteral metastases related to gastric cancer. This study revealed a mean age of 52 years and a similar incidence on both genders. The most common symptom was flank pain (81% of patients) as a result of hydronephrosis. The 41% of patients had previously undergone gastrectomy for gastric cancer treatment.

There are several clinical presentations of ureteral metastasis, determined by urinary tract obstruction such as lumbar, flank, or abdominal pain, hematuria, and oliguria or anuria.

In conclusion, gastric cancer spreading to the ureteral wall, without any extension from adjacent tissues, is a very rare event.

Regardless of the primary site of the tumor, ureteral metastasis is often a sign of advanced disease, which worsens the prognosis [5]. CECT examination has improved the diagnosis of spontaneous ureteral metastasis, whereas in the past the diagnosis was made post-mortem [6].

The prognosis is generally poor, and most patients do not survive for more than 1 year after the onset of symptoms.

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## Conclusion

In oncology patients with hydronephrosis, especially patients with a history of subtotal gastrectomy for gastric cancer treatment, the possibility of ureteral metastases must always be considered as a cause of ureteral obstruction. The first line

imaging exam is CECT, but biopsy is required to rule out primary ureteral tumors.

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## Patient consent

We declare that the identifying characteristics are altered to protect anonymity and we provide assurances that such alterations do not distort scientific meaning.

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