



Metastatic Ureteral Tumor from Adenocarcinoma of Colon

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Metastatic tumors of the ureter are rare. In most published cases the diagnosis was not made until postmortem examination or when gross metastases were present. A 69-year-old female was found to have colonic adenocarcinoma with liver metastases 17 months before she was admitted to our ward. After she underwent right hemicolectomy her liver metastases were well-controlled by adjuvant chemotherapy. Ureteral stricture over the upper third of the right ureter with hydroureteronephrosis was noted incidentally on abdominal computed tomography 9 months after the completion of postoperative chemotherapy. Metastatic evaluation including subsequent biopsies under ureteroscopy revealed urothelial hyperplasia with reactive atypia. Subsequently, segmental resection of the upper third of the right ureter was performed and histologic examination confirmed metastatic adenocarcinoma of the ureter from the colon. The patient is alive with disease and has been undergoing subsequent chemotherapy up to the present. The differential diagnosis of ureteral lesions causing stricture cannot be achieved by radiographic study only. Pathologic confirmation remains necessary for the diagnosis of malignancy, especially of metastatic nature. If a patient with ureteral stricture has a history of a primary neoplasm, a secondary ureteral tumor, although rare, must be maintained in the differential diagnosis.

Key words: metastatic ureteral tumor, colonic adenocarcinoma, computed tomography

INTRODUCTION

Metastatic tumor of the ureter is extremely rare; only about 410 cases have been reported to date in the world literature^{1,2}. In most published cases the diagnosis was not made until postmortem examination or when gross metastases were present³. This may be partly due to the asymptomatic nature of the majority of cases⁴. Nowadays, with readily available radiographic tools, there may be the incidental finding of an abnormality in the genitourinary tract such as thickened ureteral wall, ureteral stenosis, or hydroureteronephrosis^{5,6}, which raises the possibility of metastatic ureteral lesions. The most frequent primary tumors are neoplasms of the stomach, breast, urinary bladder, and prostate⁶. We report a rare case of metastatic ureteral cancer from adenocarcinoma of the colon 9 months

after the patient completed postoperative chemotherapy that produced a good response. Although the patient did not present with any significant genitourinary symptoms, abdominal computed tomography (CT) revealed ureteral stricture over the upper third of the right ureter with resultant moderate hydronephrosis. The subsequent evaluation which included pathologic examination confirmed the diagnosis of metastatic ureteral cancer.

CASE REPORT

A 69-year-old female was found to have colonic adenocarcinoma with liver metastases which caused her bowel habit to change with bloody stool. She underwent a right hemicolectomy and monosegmentectomy of segment 2 of the liver in May 2004 and then was treated with 5-fluorouracil weekly. Follow-up abdominal CT 3 months later showed a residual low-density nodule over segment 2 of the liver. Nine months later another abdominal CT did not show any low-density nodule over the liver. Positron emission tomography in February 2005 also did not show any evidence of residual malignancy. However, a newly developed high-density lesion over the upper third of the right ureter was noted incidentally on abdominal CT, which showed a right upper third ureteral stricture due to encroachment of a metastatic mass (Figure 1 Left, white

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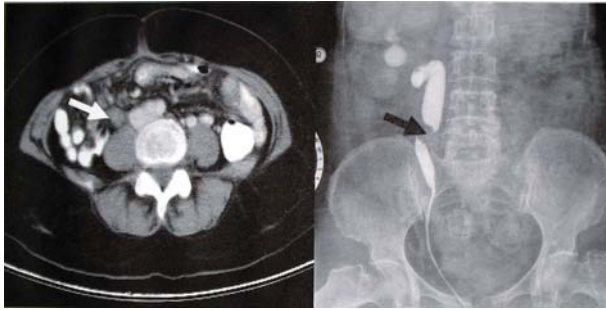


Fig. 1 Left: Right upper-third ureteral stricture due to encroachment of metastatic mass (white arrow) on abdominal CT; Right: Retrograde pyelography shows critical stenosis (black arrow) over the right upper-third ureter with hydronephrosis.

arrow) in October 2005. The mass caused ureteral stricture with resultant moderate hydronephrosis although the patient had no urological complaint or hematuria. Retrograde pyelography showed a critical stenosis over the upper third of the right ureter with hydronephrosis (Figure 1 Right, black arrow). Ureteral washing cytology and biopsies under ureteroscopy revealed urothelial hyperplasia with reactive atypia. An exploration was performed on November 14, 2005. A firm tumor causing ureteral stricture was noted around the upper third of the right ureter; it was also adhering to the adjacent colon and external iliac vessels. Segmental resection of the ureter and excision of the tumor were performed. Pathologic examination showed glandular structures as metastatic moderately differentiated adenocarcinoma of the ureter from the colon (Figure 2), which confirmed the nature of the tumor. The tumor cells invaded through muscular layer to the lamina propria of the ureter. The patient is still alive with disease and has been undergoing subsequent chemotherapy up to the present.

DISCUSSION

Although metastatic carcinoma of the ureter is rare, especially after the completion of chemotherapy that produced a good response, the antemortem recognition of such disease is even more uncommon⁷. The most common primary tumor sites may be kidney, stomach, prostate, breast, lung, and lymph nodes^{4,5,7,8}. Metastases from carcinoma of the colon are less frequently described⁹. The majority of cases are asymptomatic and are found incidentally at autopsy^{4,10}. Clinical symptoms such as low back

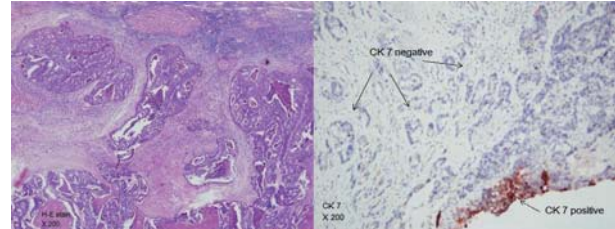


Fig. 2 Glandular structures as metastatic moderately differentiated adenocarcinoma of ureter from colon (Left: H-E stain X200; Right: CK7 positive for epithelium of ureter & CK7 negative for tumor cell).

pain and renal colic may be due to obstruction of the upper urinary tract, or there may be anuria when there is bilateral involvement⁶. However hematuria is infrequent since the mucosa of the urinary tract is rarely involved^{5,10}. Thus, urinary findings are not specific and do not predict the presence or absence of secondary involvement of the ureter by metastasis.

Three types of metastatic ureteral involvement have been described^{5,7,10}: (1) infiltration of the periureteral adventitial soft tissues with resultant compression of the ureteral wall; (2) transmural or a portion of the layers of the ureter with evidence of tumor cells in the muscular coat, perilymphatic components, or vascular components of the ureter; and (3) involvement of the local mucosa, with or without involvement of the muscularis of the ureter, and submucosal nodules. The resultant clinical manifestations of the first two types of metastatic ureteral involvement may be stricture formation or even obstruction of the ureter, as occurred in our case. The third type of metastatic ureteral involvement may be manifested by filling defects within the lumen seen radiographically. With regard to the anatomy of the ureter, the periureteral adventitia has longitudinally running well-developed blood vessels, whereas the muscularis and mucosa of the ureter are supplied by fewer smaller perpendicularly arranged vessels. This probably explains why hematogenous metastases more often occur in the periureteral adventitia with resultant compression of the ureter or stricture formation than in the muscularis or mucosal layer^{4,5,7,8}. Thus, the adventitial layer of the ureter is usually first involved and there is subsequent spread into the muscularis and lamina propria by direct extension or along vascular channels. Later, although rarely, attenuation or ulceration of the mucosa may occur⁹. Occlusion of the ureteral lumen generally occurs with metastatic ureteral tumors, which are caused by growth

and encroachment of the tumor nodules, sclerosing reaction to the tumor resulting in stricture formation, or even invagination of the upper ureteral segment into the lower portion⁸. The resultant hydroureteronephrosis can be easily detected on radiography.

In our case, abdominal CT revealed significant hydroureteronephrosis over the upper third of the right ureter. Retrograde pyelography revealed a critical stenosis over the upper third of the right ureter with hydronephrosis and hydroureter. However, some ureteral abnormalities such as inflammatory strictures or primary urothelial neoplasms may present with similar radiographic features. Pathologic confirmation remains necessary for the diagnosis of malignancy, especially of a metastatic nature. Unfortunately, it is difficult to obtain pathologic information in severely ill patients once they develop diffuse metastatic disease. In addition, the prognosis is poor for patients with ureteral metastasis; 75% of the patients die within 6 months after the onset of symptoms of ureteral blockage². This may emphasize the importance of early recognition of metastatic ureteral obstruction, especially in those patients without significant clinical symptoms or even after a good response to chemotherapy as occurred in our case. Early appropriate treatment and relief of ureteral obstruction may preserve renal function and increase the survival rate.

In conclusion, metastatic ureteral carcinoma must be kept in the differential diagnosis once there is any evidence in radiographic images that ureteral obstruction is present in a patient who has a history of malignant disease, regardless of the apparent clinical stage of the disease.

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