Radiolucent Ureteral Stones or Ureteral Cancer?: A Case Report

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We report a case of ureteral cancer, an uncommon disease entity, which presented as a radiolucent ureteral stone, a common problem for urologists. This 72-year-old female suffered from acute left renal pain with gross hematuria. Intravenous pyelography suggested a radiolucent stone in the left-side distal ureter with obstructive uropathy. After failure of shock-wave lithotripsy, abdominal computed tomographic (CT) scanning showed that the left-side ureteral obstruction persisted with no ureteral stone. Diagnostic ureteroscopy identified a papillary tumor in the left distal ureter, but the biopsy was negative for malignancy. The patient underwent a left total nephroureterectomy with removal of the bladder cuff. The pathology was compatible with a locally advanced ureteral transitional cell carcinoma. She had a smooth postoperative recovery with adjuvant chemotherapy. We concluded that the possibility of an underlying ureteral tumor must be kept in mind when dealing with a possible radiolucent stone. **(JTUA 20:137-9, 2009)**

Key words: ureteral cancer, radiolucent stone, hematuria, shoock-wave lithotripsy, chemotherapy.

INTRODUCTION

A radiolucent filling defect associated with hematuria, either gross or microscopic, is common in urological practice. It is most commonly caused by a radiolucent ureteral stone, especially when accompanied by flank pain. However, sometimes it can be caused by ureteral cancer, an uncommon disease entity that usually presents with painless hematuria.[1] When a diagnosis is in doubt, computed tomography (CT) scanning is the best tool for differentiation of the 2 problems. Under current National Health Insurance policy for shock-wave lithotripsy (SWL) in Taiwan, urologists tend to treat a possible radiolucent ureteral stone empirically with SWL without a complete work-up. Such a practice may work most of the time, but sometimes it may lead to inappropriate management for undiagnosed ureteral cancer. We report such a case to remind our collegues of this possibility, although it is uncommon.

CASE REPORT

A 72-year-old female patient suffered an acute episode of left groin pain and left renal colic with gross hematuria on the day before she visited our clinic. She had a past history of hypertension and a grossly normal appearance on the physical examination. The biochemical data were within normal limits, but the complete blood count showed mild anemia. Pyuria and hematuria were noted in the urinalysis. Renal ultrasonography and intravenous pyelography (IVP) were suggestive of a radiolucent stone impacted in the left-side distal ureter with obstructive uropathy (Fig. 1). She received 1 session of SWL under contrast guidance. However, the patient continued to suffer from gross hematuria and left renal pain 2 weeks after SWL. A subsequent abdominal CT scan showed that the left-side ureteral obstruction persisted, but with no ureteral stone. With diagnostic ureteroscopy, we identified a papillary tumor located at 7 cm proximal to the left ureterovesical junction. The ureteral biopsy was negative for malignancy. Because the possibility of ureteral cancer could not be excluded, the patient underwent a left total nephroureterectomy with removal of the bladder cuff. The postoperative pathology showed a high-grade papillary urothelial carcinoma that had invaded the subepithelial tissue with focal lymphovascular invasion (stage I, T1N0M0) (Fig. 2). She had a smooth postoperative recovery. She was later given adjuvant chemotherapy with Gemmis (gemcitabine HCl) and cisplatin. The patient was doing well at 11 months of follow-up, with no signs of bladder tumors, contralateral ureteral cancer, or distant metastasis.

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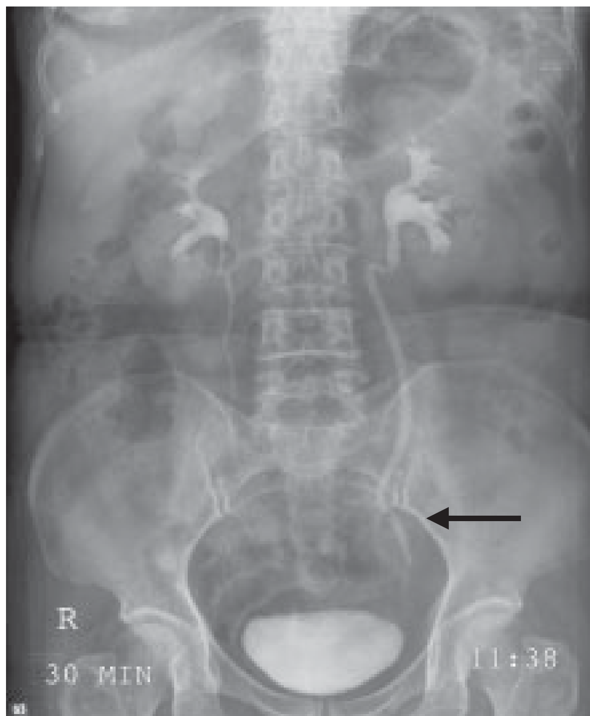

Fig. 1. A radiolucent filling defect (arrow) in the left distal ureter, suggesting a radiolucent stone (by intrevenous pyelography).

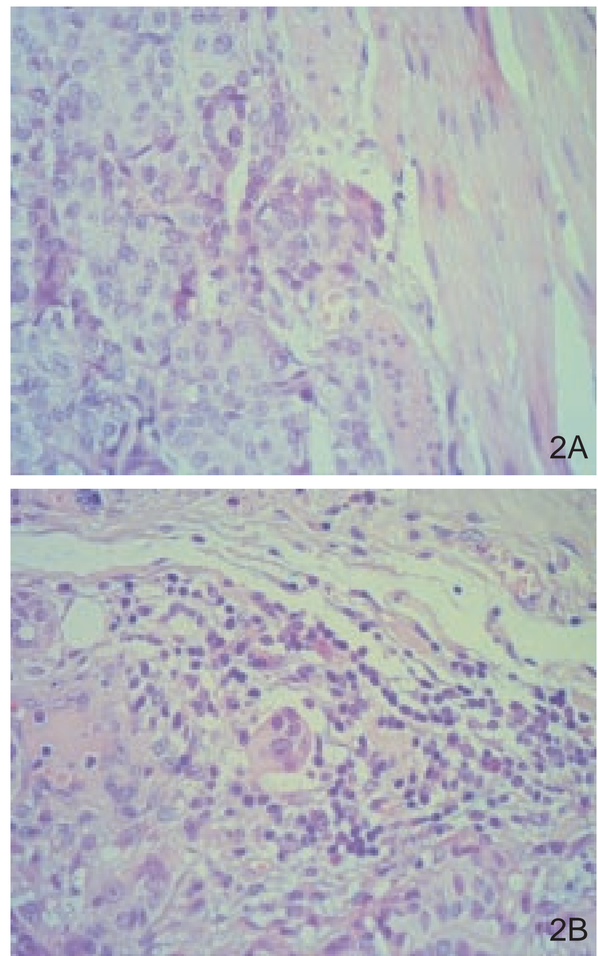

Fig. 2. Pathological findings showing a high-grade papillary urothelial carcinoma that had invaded the subepithelial tissue (2A) with focal lymphovascular invasion (2B) (H&E stain, 400×).

DISCUSSION

Upper urinary tract cancer is an uncommon disease entity, accounting for about 5% of all urolithial tumors. Upper tract cancers rarely present before the age of 40 years, and the mean age at presentation is 65 years. They are twice as likely to occur in men than in women.1 The most common (56%~98%) presenting symptom of ureteral cancer is hematuria, either gross or microscopic. Sometimes (around 30%) ureteral cancer can present with dull flank pain, which is thought to be secondary to a gradual onset of obstruction and hydronephrotic distension.[2] In contrast, the most common clinical presentations of a radiolucent ureteral stone (usually uric acid stones), a much more common disease, include acute onset of renal pain, gross hematuria, and obstructive uropathy. Both diseases may present as a radiolucent filling defect by IVP or retrograde pyelography. Other than stones and cancer, the differential diagnosis of a radiolucent filling defect in the upper urinary tract includes a blood clot, overlying bowel gas, external compression, sloughed papilla, and fungus balls. CT scanning is considered to be the best tool for differentiating these conditions. Stones can be easily ruled out by confirmation of calcification by CT scanning. Transitional cell cancers have an average density of 46 Hounsfield units (HU) and a range of 10~70 HU, while radiolucent uric acid stones have an average of 100 HU (range, 80~250 HU).[3] However, CT scanning does expose the patient to higher doses of radiation.

Probably due to incidental obstruction by a small stone or blood clot, this patient presented with a clinical picture compatible with a radiolucent ureteral stone, including acute renal colic pain, gross hematuria, and hydronephrosis. Under the current National Health Insurance policy in Taiwan, such a patient is more likely to be treated empirically with SWL without going through a more-detailed study to exclude the possibility of ureteral cancer. The SWL for this patient might have been avoided if CT scanning had been performed before treatment.

For radiolucent non-calcified lesions, additional

evaluation by retrograde urography or ureteroscopy may be required, with or without a biopsy and urine cytology.[4] Although pyelovenous and pyelolymphatic migration was reported with ureteroscopy, this phenomenon appears to be uncommon and should not preclude its use.[5] Thus, ureteroscopy should probably be reserved for situations in which the diagnosis remains in question after conventional radiographic studies, as what occurred in our patient, and for those patients in whom the treatment plan may be modified on the basis of ureteroscopic findings. The risks, although not high, of tumor seeding, extravasation, and dissemination should preclude ureteroscopy when it is unnecessary.[6] It must be kept in mind that the small size of ureteroscopic biopsy specimens may result in a false negative result, which occurred in this patient. In some cases of upper tract tumors, antegrade urography and uroscopy may be useful for diagnosis and treatment. However, tumor cell implantation in the retroperitoneum and along the nephrostomy tube track was reported after these procedures.[7]

Although ureteral cancer is an uncommon disease entity, the incidence is relatively high among elderly women in Taiwan.[8,9] We concluded that the possibility of an underlying ureteral cancer, although uncommon, must be kept in mind when dealing with a radiolucent lesion in the ureter.

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