Renal calculus complicated with squamous cell carcinoma of renal pelvis: Report of two cases

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Abstract

Longstanding renal calculus is a risk factor of squamous cell carcinoma (SCC) of the renal pelvis. It is highly aggressive and usually diagnosed at advanced stages with a poor prognosis. We present two cases of kidney stone complications with renal pelvic SCC. These two patients had a radical nephrectomy and the dissected tissues were renal pelvic SCC. Our cases further emphasize that renal pelvic SCC should be considered in patients with longstanding renal calculus. These cases contribute greatly to an early diagnosis and early treatment, both of which will significantly minimize the damage of, and markedly improve the prognosis of, renal pelvic SCC.

Introduction

Primary renal squamous cell carcinoma (SCC) affects less than 1% of all urinary tract neoplasms.[1] SCC occurs more often in the urethra and urinary bladder than in the renal pelvis in males. This cancer is highly aggressive and usually progresses at the first diagnosis, leading to a poor prognosis. We present two cases of kidney stones with SCC of the renal pelvis.

Case 1

A 55-year-old female was hospitalized because of dull pain at the bilateral lumbar regions, worse on the right side for 1 month. She underwent two ureterolithotomies on both sides to remove ureteral calculus 10 years before. A palpable lump was found on the right loin. The urine examination showed hematuria (occult blood 3+) and infection (white blood cell 2+). The blood urea and serum creatine were 8.15 mmol/L and 101 umol/L, respectively. The total glomerular filtration rate (GFR) was 77.22 mL/min with 25% on the right kidney and 75% on the left. The X-ray revealed multiple calculi in both kidneys. An ultrasound detected calculi in both renal hydronephrosis and a 3 × 3-cm mass in the right kidney with retroperitoneal lymph nodes enlargement. A computed tomography (CT) scan revealed a tumour in the right renal pelvis, as well as calculi in both renal hydronephrosis. This irregular mass was 3 × 3 cm in the renal pelvic region without renal and portal venous tumour thrombus (Fig. 1a). No distant metastasis was found on CT. The ureteroscopy showed that the right ureter was normal. The patient underwent a radical nephrectomy. The histopathology examination showed a well-differentiated SCC with a wide range of tissue necrosis. The cancer infiltrated the renal parenchyma, but not lymph nodes (Fig. 1b). This patient was therefore diagnosed with renal pelvic SCC at stage III (T3N0M0). The patient recovered from surgery without complication, but regretfully rejected chemotherapy. She died 1 year later from metastatic liver tumour.

Case 2

A 61-year-old male complained of bilateral flank pain, especially at the right side, which lasted for 3 months. He was diagnosed with bilateral kidney stones, but rejected any therapy 5 years before. The current urine test showed hematuria (occult blood 2+) and infection (white blood cell 2+). The urine culture was negative and the cancer cell was negative in the urine cytology. The blood urea and serum creatine were 12.15 mmol/L and 301μmol/L, respectively. The total GFR was 48.88 mL/min (the right kidney was 3.09 mL/min and the left was 45.79 mL/min). The X-ray and ultrasound revealed both renal hydronephrosis caused by calculi. The CT examination revealed bilateral renal hydronephrosis with stones and a 4 × 5-cm neoplasm in the right renal pelvis without renal and portal venous cancer embolus. The left hydronephrosis kidney was caused by the upper ureteral calculus (no enhanced scan because of his high serum creatine) (Fig. 2a). The CT screen did not reveal distant metastasis. The ureteroscopy showed no metastatic tumour in the right ureter. The patient received a right radical nephrectomy and left nephrostomy. The histopathology reported a well-differentiated SCC infiltrating the renal parenchyma and no

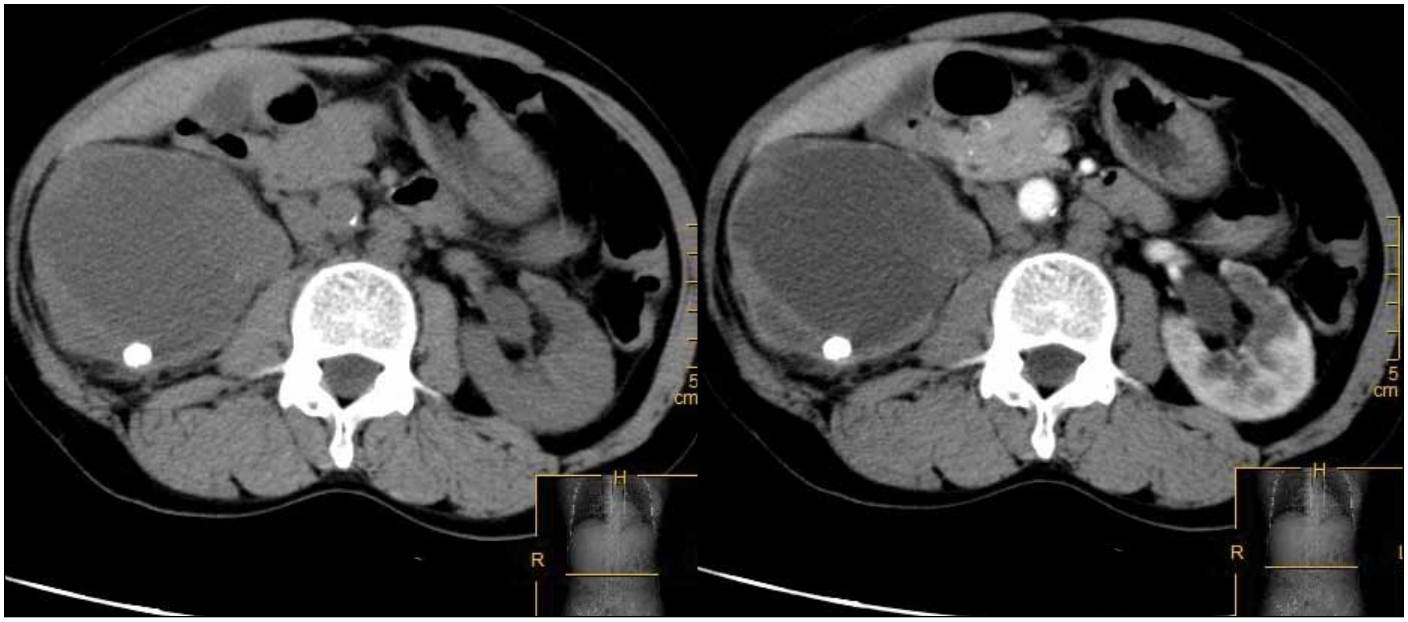

Fig. 1a. A computed tomography scan showing a 3 × 3-cm mass in the right renal pelvis.

lymph nodes metastasis (Fig. 2b). He was diagnosed with renal pelvic SCC at stage III (T3N0M0). During the course of his cisplatin-based chemotherapy, the patient died from a severe complication of a pulmonary infection.

Discussion

SCC of the renal pelvis is related to kidney stone or infection. Recently, a population-based study also addressed the association between urinary calculi and renal pelvis cancer.[2,3] The underlying mechanisms involve inflammation induced by calculus irragation and infection at the foci. Several tumour-supporting cytokines are possibly secreted during the inflammation.[4]

Clinically, both cases have flank pain and microscopic hematuria. Considering that the symptoms of SCC and renal stone are similar, the diagnosis heavily depends on ultrasound, intravenous urography (IVU), and CT. The urine cytology and histopathology with biopsy via endoscope will significantly improve the diagnosis. However, the tumour is easily missed from these results if renal pelvic SCC is not seriously considered. In our study, the neoplasm was not addressed by the ultrasound in the second case. A retrospec-

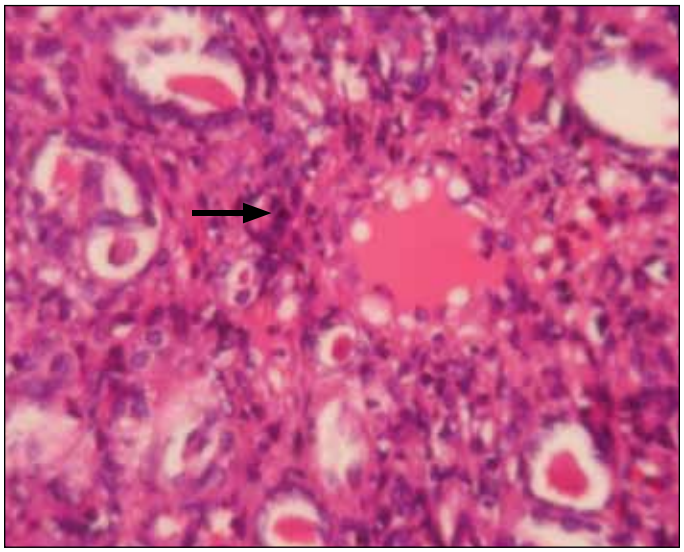

Fig. 1b. Microphotograph (magnification 40×) showing poorly differentiated squamous cell carcinoma (shown by an arrow).

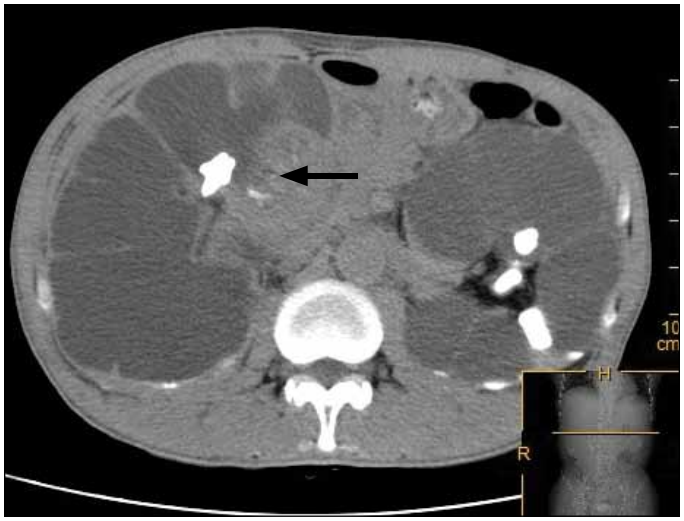

Fig. 2a. Non-enhanced computed tomography showing a mass in the right renal pelvis with calculus (shown by an arrow).

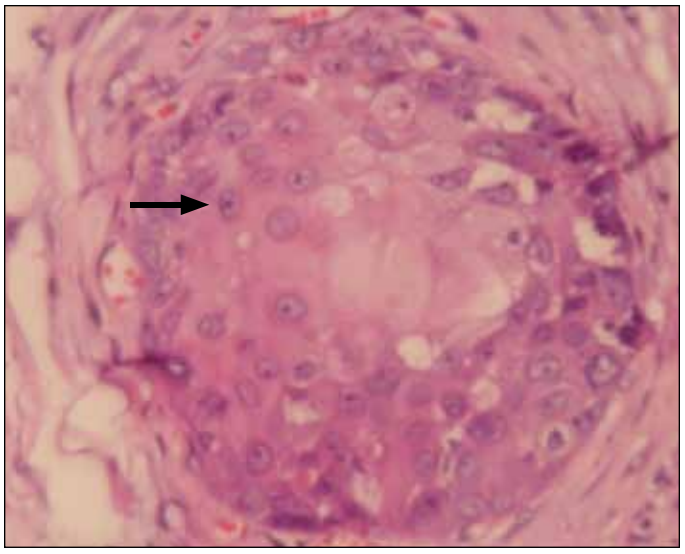

Fig. 2b. Microphotograph (magnification 40×) showing squamous cell carcinoma with keratin pearls (shown by an arrow).

tive review of radiological findings in renal SCC reveals that IVU is non-specific[5] and IVU may also cause infection in some worse cases. On the contrast, CT is non-invasive and can provide high-resolution image of regarding the anatomical extent of the tumour.[6] Therefore, we performed CT instead of IVU in these two cases. The diagnosis also depends on histopathology.

Many treatments have been tried in patients who suffer from renal SCC. The treatment approaches should be selected based on the age and general condition of the patient, the grading and staging of the cancer, as well as patient compliance. Among these choices, radical nephrectomy with total ureterectomy, including a bladder cuff around the ureteral orifice, are the main ways to treat renal SCC.[7] Some people suggest radical nephrectomy and only partial ureterectomy.[8] When distant metastasis occurs, surgery is not necessary. Radiotherapy, chemotherapy or immunotherapy could be adopted, but the effect is limited and no survival benefit has been demonstrated from these treatments.[9] Furthermore, the prognosis of renal SCC is so poor that the 5-year survival rate is no more than 10% and most patients die within 1 year of surgery.[10] Therefore, early diagnosis is necessary.

Conclusion

When complicated with kidney stones, renal SCCs are usually shaded by stones and underestimated in clinic. Careful inspection of CT images and histopathology examination remarkably help to diagnose and stage renal SCCs. Although there are treatments for renall SCCs, the overall prognosis is still poor.

Competing interests: The authors declare no competing financial or personal interests.

This paper has been peer-reviewed.

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