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Renal cancer combined with prostate cancer with ureteral metastasis: A case report

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ABSTRACT

Ureteral metastasis of prostate cancer is extremely rare, with less than 50 cases at present. Kidney cancer with prostate cancer is also rare, and ureteral metastasis with prostate cancer is difficult to diagnose. Especially if there are no symptoms of hematuria, the ureteral mass should be clearly understood. Although there is no error in the diagnosis and treatment process in this case, there are still many points worth considering, such as whether unilateral nephroperectomy should be performed if there is no kidney cancerHere, we report a case of renal cancer complicated with prostate cancer and ureteral metastasis.

1. Introduction

Prostate cancer is the second most common male malignancy in the world and the fifth leading cause of cancer death in men. The metastatic pattern of prostate cancer is well known, and bone is the most common site of its metastasis, and about 50 cases of ureteral metastasis of prostate cancer have been reported in the current literature。In this case, the patient was found to have ureteral occupation, the nature of which was not clear, but implantation metastasis was considered. During the examination, the kidney was also found to have occupation, and lower ureteral metastasis of renal carcinoma was considered, and unilateral nephroureterectomy was performed; however, postoperative pathologic examination suggested that the lower ureteral mass was metastasis from prostate cancer. Here we report a case of renal cancer combined with prostate cancer with ureteral metastasis that was detected and resolved by MDT (Multi-disciplinary Treatment).

2. Case presentation

The patient was 72 years old and came to our hospital with "difficulty in urination for half a year and lower back pain on the right side for one month". He had frequent urination and urgency, but no hematuria and pain in urination. Physical examination: slight percussion pain in the right lumbar back, rectal examination reveals a hard prostate, no palpable enlarged nodules. In the course of the examination, abdominal enhancement CT found: right kidney mixed slightly dense mass, size about 5.7*6.6cm, consider renal Ca, right ureter pelvic segment obstruction and soft tissue shadow, enhancement scan obviously strengthened, planting metastasis may be, above the ureter and the right kidney hydrocele (Fig1) .The glomerular filtration rates of the left kidney, right kidney, and whole kidney were 40.4 mL/min, 9.4 mL/min, and 49.8 mL/min, respectively。Enhanced CT of the chest also suggests the presence of pulmonary nodules, and metastases cannot be excluded (Fig2). In order to understand the nature of the lower ureteral mass, three exfoliative cytology was also done, all of which did not reveal tumor cells, and prostate ultrasound suggested a size of about 3.4*4.2*3.6 cm, residual urine: 7 ml。Urine routine and culture suggested the presence of Klebsiella pneumoniae, PSA (prostate specific antigen) 31.97ng/ml. The patient's PSA was elevated, and MRI was not performed due to the presence of a metal stent in the patient's body. Considering that prostate cancer is an inert cancer and the patient also had right-sided lumbago, the decision was made to prioritize the treatment of the renal tumors and to follow up with a puncture biopsy.After preoperative preparations such as anti-infection, adjustment of cardiac and pulmonary function were given to the patient, the patient finally underwent laparoscopic right nephroureterectomy, in which the renal occupancy was found to be clear, and the ureteral occupancy was hard in texture, and the dissection was fish-shaped. Postoperative examination showed clear cell carcinoma in the kidney, ISUP/WHO grade: 3, cancer involvement in renal sinus fat and perinephric fat, cancer thrombosis in

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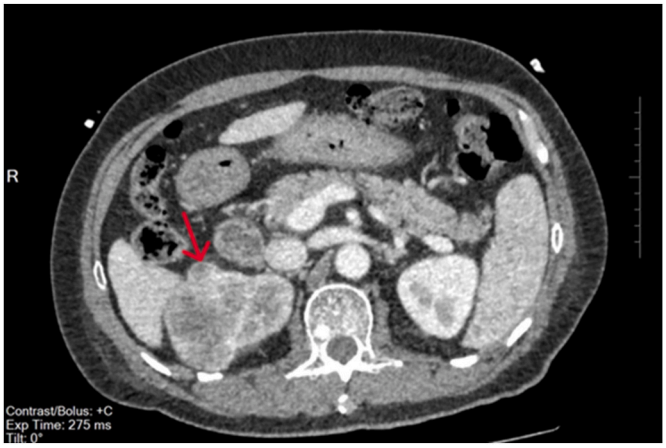

Fig. 1. Enhanced CT suggested renal occupying lesion.

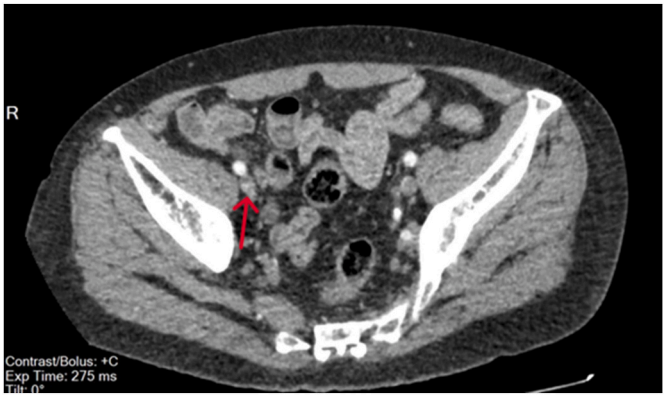

Fig. 2. Enhanced CT suggested lower ureteral occupation with significant enhancement.

the renal vein, no renal cancer cell involvement in the ureter, and infiltration of poorly differentiated adenocarcinoma in the wall of the lower part of the ureter up to the whole level, which is consistent with adenocarcinoma of the prostate. Gleason：5 + 4 = 9，WHO classification group 5, immunohistochemistry：MSH6（+），MSH2（+），PMS-2（+），PD-L1（CPS 0），Her-2（-），TTF-1（-），Ki-67（5 %），PSMA（+），GATA3（-），P53（-），P40（-），P63（-），PAX-8（-），AR（+），CDX-2（-），Mucin5Ac（-），MUC6（-），Villin（-），CK20（-），CK7（-），CKwide（+）（Fig3）。Postoperative recovery was fair, with no back pain and relief of dysuria, but it was considered that it might be due to improvement of urinary tract infection. Later, the patient refused to undergo prostate puncture, bone scan, PET-CT and lung puncture biopsy for his own reasons, so whether the lung nodule was a metastasis or a benign lesion and （Fig4）where the metastasis came from could not be traced back。But fortunately he followed up with improved genetic testing, in which: BRCA2, BRCA1 were both suggestive of heterozygous germline mutations（Table 1）Subsequent endocrine therapy (bicalutamide 50mg + levocarnitine 3.75mg *per* month regimen after two weeks + radiotherapy) was recommended for this patient's prostate cancer, and given that lung metastasis may also exist in renal cancer, the patient was still recommended to be treated with sunitinib 50mg (4/2 regimen), with olaparib as a back-up regimen after failure of ADT(androgen deprivation therapy). However, the patient was eventually treated with ADT only, and at more than 3 months of follow-up, the PSA dropped as low as 5.406 ng/ml, and the patient unfortunately eventually died of a lung infection.

Fig. 3. the lower part of the ureter (the mass is tough, fish-like, grayish-white, with adenocarcinoma infiltration throughout the ureter.

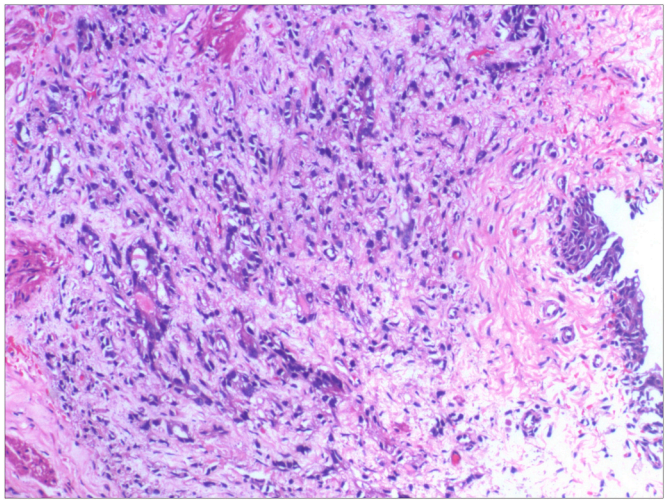

Fig. 4. Immunohistochemistry considers prostate cancer.

3. Discussion

The most common prostate cancer metastasis is bone metastasis, others include lymph nodes etc. Bone accounts for about (84.0 %), distant lymph nodes (10.6 %), liver (10.2 %), thorax (9.1 %), brain (3.1 %) and digestive system (2.7 %).[1] Tumors that metastasize to the ureter and renal pelvis are most common in breast, stomach, or colon cancers, and metastasis of prostate cancer is rare, with fewer than 50 cases reported.[2,3] Some studies have elaborated on the development of secondary tumors from the tunica vaginalis prior to invasion of the ureteral wall, which may be related to the ureteral lymphatic circulation, which, because of the staged nature of the circulation and the absence of continuous longitudinal lymphatic drainage directly from the prostatic area, is absent in the majority of patients with hematuria.[4,5] Cases of concurrent primary renal and prostate cancer are relatively rare, and partial/total nephrectomy and radical prostatectomy are chosen in most cases.[6] If there is only evidence of prostate cancer and ureteral occupation, three urine exfoliative cells, Fish test, urine methylation and other tests can help us to evaluate the condition, even when there is insufficient evidence of uroepithelial carcinoma, biopsy of ureteral mass can avoid over-treatment leading to unilateral nephrectomy and ureteral resection, and metastasis of prostate cancer to the ureter can be

Table 1
Genetic test results.

Genetic test results			
genomic variation	Mutation frequency/copy number/ suspected germline variation	The drug for this type of cancer has received approval from the FDA, NMPA and other regulatory agencies.	Other Cancer Drugs FDA/NMPA/Other Agency Approvals
BRCA2p.S2120*	Heterozygous germline mutation	Niraparib * (Highly Responsive, Grade A) Olaparib * (Highly Responsive, Grade A) Rucaparib* (Highly Responsive, Grade A) Talazoparib* (Highly Responsive, Grade A)	Fluoropyrimidine (Grade C, Sensitive), Pamiparib (Grade C, Sensitive), Olaparib in combination with Bevacizumab (Grade C, Sensitive)
BRCA1p. T884Nfs*19	Heterozygous germline mutation	Niraparib * (Highly Responsive, Grade A) Olaparib * (Highly Responsive, Grade A) Rucaparib* (Highly Responsive, Grade A) Talazoparib* (Highly Responsive, Grade A)	Fluoropyrimidine (Grade C, Sensitive), Pamiparib (Grade C, Sensitive), Olaparib in combination with Bevacizumab (Grade C, Sensitive)

taken as partial resection of the ureter and then end-to-end anastomosis can be done so as to preserve the function of the kidney.[7–9]

This case was discussed by the MDT team, and it was concluded that the lower ureteral mass was mostly a planted metastasis of renal cancer, and there was a lack of consideration for ureteral metastasis of prostate cancer, which is worth reflecting on, despite the fact that the whole treatment process went smoothly. The overall prevalence of BRCA2 mutations in patients with prostate cancer is low, approximately 1–2%. However, when this mutation is present, there is an 8.6-fold increased risk of prostate cancer in men ≤65 years of age, even in patients with small, localized disease, which portends a worse prognosis compared to non-carriers.[10] For localized and regional prostate cancer, the 5-year survival rate is more than 99 %, and the combined survival rate for SEER(surveillance, epidemiology,and end results program) is 97 %, but in recent years, at the time of diagnosis, 12 % of prostate cancer cases have already spread to localized lymph nodes and 5 % have distant metastases. Distant spread portends a poor prognosis, with a 5-year relative survival rate of only 29.8 %.[11]

When patients presenting with distant metastases of prostate malignancy, ADT + radiotherapy will be used in most cases, but when a ureteral mass is present at the same time, a clear diagnosis is extremely important, and partial resection followed by anastomosis can be considered to protect renal function, along with systemic comprehensive treatment, as a way to improve the patient's quality of life and survival cycle.

Fig.A.B Enhanced CT suggested renal occupying lesion and lower ureteral occupation with significant enhancement.

FigC.D Mass and immunohistochemical findings in the lower part of the ureter (the mass is tough, fish-like, grayish-white, with adenocarcinoma infiltration throughout the ureter).

Conflicts

All authors have no conflict of interest.

CRediT authorship contribution statement

Bo Chen: Writing – original draft, Formal analysis, Data curation, Conceptualization. **Haifeng Wang:** Writing – review & editing, Methodology. **Haole Xu:** Formal analysis, Data curation. **Hongjin Shi:** Formal analysis, Data curation, Conceptualization. **Yigang zuo:** Writing – review & editing. **Junhao Chen:** Formal analysis, Conceptualization. **Wei Feng:** Data curation. **Zhaojiao Li:** Formal analysis.

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