CASE REPORT

Ureteral metastasis from prostate cancer

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SUMMARY

A 59-year-old man had an elevated prostate-specific antigen (PSA) concentration (439 ng/mL) in December 2008. We diagnosed prostatic adenocarcinoma by prostate needle biopsy. CT and MRI showed a prostatic tumour with bone and lymph node metastases. Combined androgen blockade therapy reduced the PSA level temporarily. After the PSA level gradually started to increase again and reached 27.27 ng/mL in October 2010, the patient was diagnosed with castration-resistant prostate cancer and treated with docetaxel chemotherapy. Radiological examination detected left hydronephrosis and a tumour in the left lower ureter in March 2011. Retrograde pyelography and urine cytology of class 3 from the left ureter indicated that the ureteral mass was a urothelial carcinoma. A left nephroureterectomy was performed. After the operation, the pathological examination showed a metastatic prostate carcinoma, accompanied by a decrease in the serum PSA level from 59.56 to 45.33 ng/mL.

BACKGROUND

The ureter is only rarely an organ of cancer metastasis regardless of the primary cancer lesion. Several cases in the literature have reported ureteral metastasis of various carcinomas.^{1 2} However, cases that describe ureteral metastasis from prostate cancer are extremely rare. We experienced a case of ureteral metastasis of prostate cancer presenting hydronephrosis that we suspected was urothelial carcinoma. We present a case report and literature review of ureteral metastasis of prostate cancer.

CASE PRESENTATION

A 59-year-old man visited our hospital in December 2008 for examination of his serum prostate specific antigen (PSA) level. He did not have any subjective symptoms related to prostate cancer. Laboratory data showed that the PSA concentration was 439 ng/mL and a stony hard mass in the prostate was suspected of being prostate cancer by digital rectal examination. A prostate needle biopsy was performed and pathological examination revealed a Gleason score 4+5 adenocarcinoma. A body MRI showed a prostatic tumour invading the right pelvic wall. CT and bone scintigraphy showed multiple metastases to the pelvic lymph nodes and spines. On the basis of the results, the patient underwent combined androgen blockade therapy with bicalutamide and leuprolerin. His serum PSA level decreased to 4.93 ng/mL, but gradually increased thereafter. When the PSA level reached 27.27 ng/mL in October 2010, we started docetaxel chemotherapy.

INVESTIGATIONS

In March 2011, a CT was performed to evaluate the patient's condition and the cancer progression. The results indicated a left hydronephrosis and hydroureter due to a left ureteral mass formation (figure 1) without retroperitoneal lymphadenopathy. A retrograde pyelography examination was performed to evaluate the left ureteral mass. A urine cytology examination of the left ureter resulted in a class III classification.

DIFFERENTIAL DIAGNOSIS

- ▶ Urothelial carcinoma
- ▶ Metastatic tumour
- ▶ Lymphadenopathy

TREATMENT

We suspected that the mass in the left ureter was a urothelial carcinoma. A laparoscopic-assisted left nephroureterectomy was performed.

OUTCOME AND FOLLOW-UP

Pathological examination revealed a metastatic adenocarcinoma lesion from the prostate (figure 2). After the operation, the serum PSA level declined from 59.56 to 45.33 ng/mL because of a reduction in the mass of the prostate cancer. The patient has been undergoing docetaxel chemotherapy continuously up to the present day.

DISCUSSION

Advanced prostate carcinoma could cause obstruction of a ureter. It is often due to direct invasion of a prostatic tumour or compression by lymphadenopathy. We suspected urothelial carcinoma, and performed nephroureterectomy. Pathological examination showed metastatic prostate cancer. The case did not have direct invasion to the ureter or compression by lymphadenopathy.

The most common metastatic site of prostate cancer is the bone. The lungs, liver and brain are other comparatively common metastatic sites. Ureteral metastasis of prostate cancer is extremely rare. There are only a few reports describing ureteral metastasis from prostate cancer.^{3 4}

It was reported that ureteral metastases originated mostly from breast cancer and gastric cancer,¹ while cases from colon, cervix, rectum and prostate cancers also have a relatively high frequency. Ureteral metastases are often reported bilaterally.^{1 2} These reports suggested that most ureteral metastatic tumours may be made by cancerous dissemination. Cases of bilateral ureteral metastases from prostate cancer were also reported in the 1980s⁵ (table 1). To the best of our knowledge, the measurement of PSA concentration was still not

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Figure 1 CT images of the abdomen. CT showed left hydronephrosis (A) and a mass in the left lower ureter (B).

Figure 2 Pathology of the left ureter. The left tumour was diagnosed as metastasis from prostate cancer with H&E staining (A) and immunohistochemistry with antiprostata-specific antigen antibody (B).

Table 1 Published reports of ureteral metastasis from prostate cancer

Author	Age	Laterality	Location of ureteral involvement	Other sites of metastases	Diagnosis
Campbell <i>et al</i> ⁵	71	Bilateral	Multiple	Bones	Retrograde pyelography
	64			None	
	74			None	
	65			Bones	
	66			None	
	60			None	
Maeda and Yoshida ⁶	86	Right	Upper	Bones	Nephroureterectomy
Jung <i>et al</i> ³	64		Multiple	None	Nephroureterectomy
Schneider <i>et al</i> ⁴	74	Left	Lower	Bones	Ureteroscopy
This case (2014)	59		Lower	Bones and lymph nodes	Nephroureterectomy

common in the 1980s, so the prostate cancer was already advanced. There are no reports after the 1990s that describe bilateral ureteral metastasis from prostate cancer.^{3 4 6} Our case also had unilateral metastasis to the ureter and the tumour was located beneath the mucosa, so the ureteral metastasis was thought to be haematogenous.

The most commonly reported symptom of ureteral metastasis is flank pain (15–50%)⁷ due to ureteral obstruction. Haematuria is not frequently found. This may be because most ureteral tumours from other carcinoma sites are made by metastases beneath the mucosa or invade from tissues surrounding the ureter. In our case, the patient had no subjective symptoms. Screening of the urinary tract by ultrasonography or CT may be needed for patients with prostatic cancer presenting with urinary obstruction symptoms.

Learning points

- ▶ The ureter is only rarely an organ of cancer metastasis regardless of the primary cancer lesion.
- ▶ The most commonly reported symptom of ureteral metastasis is flank pain.
- ▶ Screening of the urinary tract by ultrasonography or CT may be needed for patients with prostatic cancer presenting with urinary obstruction symptoms.

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Competing interests None.

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