Ureter metastatic castration-resistant prostate cancer: a case report

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Abstract

Background: In most cases, prostate cancer metastasizes to the lymph nodes, bone, and liver. In very rare cases, it metastasizes to the ureter. Due to the difficulty in making a preoperative diagnosis, ureteral metastasis from prostate cancer is typically diagnosed after nephroureterectomy.

Case presentation: A 77-year-old Asian Japanese man with right hydronephrosis and hydroureter was referred to our hospital to undergo further examination due to the suspicion of ureteral cancer. He had been diagnosed 2 years previously with prostate cancer with a Gleason score of 4+5=9. He received radiotherapy and androgen deprivation therapy. A nephroureterectomy was performed for suspected right ureteral cancer. On the basis of a histopathological examination, poorly differentiated adenocarcinoma was suspected, and the tumor cells were positive for prostate-specific antigen immunohistochemically.

Conclusions: We herein report a rare case of ureteral metastasis in castration resistant prostate cancer.

Keywords: Skene’s gland adenocarcinoma, Skene’s gland cancer, Female PSA

Background

In most cases, prostate cancer metastasizes to the lymph nodes, bone, and liver. In very rare cases, it metastasizes to the ureter [1]. Due to the difficulty in obtaining a preoperative diagnosis, ureteral metastasis from prostate cancer is typically diagnosed on the basis of examination of nephron specimens obtained at ureterectomy. We report an extremely rare case involving a patient with ureteral metastasis from prostate cancer.

Case presentation

A 77-year-old Asian Japanese man with suspected ureteral cancer was referred to our hospital to undergo further examination for right hydronephrosis and hydroureter in September 2016. He had undergone resection for cecal cancer and had been diagnosed with prostate cancer 2 years previously with a Gleason score of 4+5=9. He received radiotherapy and androgen deprivation therapy (ADT) for cT2N0M0 prostate cancer. The patient’s initial prostate-specific antigen (PSA) level was 14.66 ng/ml in 2014. Although the initial response was good, his PSA level increased to 0.417 ng/ml with continuous ADT (testosterone 0.30 ng/ml) from a nadir of 0.006 ng/ml in 2016. The results of a laboratory analysis were almost within normal limits, with the exception of a slightly elevated creatinine level (1.31 mg/dl) and a slightly decreased hemoglobin level (12.6 ng/dl). Urinalysis revealed no abnormalities, and urine cytology showed no atypical cells. Enhanced computed tomography showed right hydronephrosis and hydroureter from a lower ureteral mass with enhancement (Fig. 1). Retrograde pyelography showed complete obstruction of the right ureter (Fig. 2). Although the patient had castration-resistant prostate cancer (CRPC), the median overall survival was around 3 years at our institute, and the patient requested to undergo curative surgery for his ureteral tumor.

On the basis of these findings, we suspected right ureteral cancer and performed a nephroureterectomy in December 2016. The ureter showed strong adhesion to the peritoneum and was partially removed with the peritoneum. The resected specimen measured 16 cm × 2 cm.
in size, and the tumor was observed to have extended to
the surface of the resected tissue.

Histologically, the ureteral epithelium was normal. In
the intra- and extraureteral tissue, tumor cells that had
enlarged round nuclei with visible nucleoli were prolifer-
ated with a solid pattern. The tumor showed a little
glandular differentiation. Poorly differentiated adenocar-
cinoma was suspected. The result of immunohistochemical
staining for PSA was positive (Fig. 3). On the basis of
these findings, the patient was diagnosed with ureteral
metastasis from prostate cancer. The patient continues
to receive therapy for CRPC.

Discussion
Disibio et al. noted that prostate cancer was likely to
metastasize to the lymph nodes (26.2%), bone (19.7%),
lung (12.8%), and liver (7.8%) [1]. Ureteral metastasis
from prostate cancer is a very rare disease, with only
44 reported cases [2]. It is hypothesized that ureteral
metastasis is rare in patients with prostate cancer be-
cause the lymph stream is not connected around the
ureter [3]. Most patients with ureteral metastasis have
primary breast or gastric cancer, whereas some have
colon or cervical cancer [4, 5].

Metastatic ureteral tumors are difficult to differentiate
from ureteral urothelial carcinoma. Presman et al. re-
ported that metastatic ureteral tumors were diagnosed
because (1) tumor cells were confirmed in the lymph
nodes and vessels around the ureter, or (2) the same
cancer cells as the original cancer tissue were detected
in the ureteral wall without direct invasion [6]. Meta-
static ureteral tumors tend not to adhere to the mucosa,
owing to a poor lymphoid and visceral network [6]. For
these reasons, pain due to ureteral obstruction is the
chief complaint of patients with this type of tumor. In
most cases, the tumor is found in the submucosa, and
urine cytology is not useful in making the diagnosis.
Given recent developments with ureteroscopy, a uretero-
scopical biopsy might be useful. However, because of the
small sample size, the pathological diagnosis is some-
times difficult.

On one hand, it is hypothesized that the identifica-
tion of ureteral obstruction and hydronephrosis may
be used to make an early diagnosis. On the other
hand, patients with benign prostatic hyperplasia and
ureteral stones may also show these symptoms. In pa-
tients with prostate cancer, ureteral obstruction usu-
ally originates from direct invasion from an enlarged
tumor around the ureterovesicular junction [7]. In
most cases, direct invasion is observed in the bilateral
ureterovesicular junction. In our patient, the ureteral
obstruction was unilateral and was outside the ureter-
ovesicular junction. In such cases, a ureteroscopic bi-
opsy might be used to make a preoperative diagnosis.
However, this strategy is not superior to retrograde
pyelography. Fortunately, CRPC treatment does not
require favorable renal function, even when cytotoxic
treatments are used, including docetaxel and cabaza-
taxel, so radical nephroureterectomy is sometimes
performed.
Conclusions
We herein report a rare case of ureteral metastasis in castration resistant prostate cancer.

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Availability of data and materials
Due to ethical restrictions, the raw data underlying this paper are available only upon request submitted to the corresponding author.

Authors’ contributions
ST, JT, and SC conceived of and designed the experiments. ST, TK, and SC analyzed data. ST, TK, YH, TM, JT, YM, HU performed the experiments. ST, TK, and SC wrote the paper. All authors read and approved the final manuscript.

Ethics approval and consent to participate
The present study was approved by the Institutional review board of Yokohama City University Medical Center.

Consent for publication
Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing interests
The authors declare that they have no competing interests.

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Fig. 3 Pathological images. a Ureteral epithelium was intact. Solid metastatic nest in intra- and extraureteral wall (hematoxylin and eosin stain, original magnification ×12.5). b Tumor showed a little glandular differentiation (hematoxylin and eosin stain, original magnification ×400). c Tumor cells stained positive for prostate-specific antigen (original magnification ×200)

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