


CASE REPORT

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# Prostate ductal adenocarcinoma exhibiting a late recurrence in the anterior urethra 13 years post-total prostatectomy: a case report

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## Abstract

**Background** Prostate ductal adenocarcinoma, a rare histology observed in 0.4–0.8% of all prostate cancers, is treated similarly to acinar adenocarcinoma but tends to have a higher likelihood of metastasis, recurrence, and poorer prognosis.

**Case presentation** A 73-year-old Asian-Japanese male presented with gross hematuria, with investigations revealing a prostate ductal adenocarcinoma. Subsequent radical prostatectomy indicated a Gleason score of 8 with no lymph node metastasis. Despite initial prostate-specific antigen level reductions post-prostatectomy and salvage radiation therapy due to recurring elevated prostate-specific antigen levels, no recurrence was evident until 13 years later. A tumor in the anterior urethra was identified as metastasis of his prostate ductal adenocarcinoma.

**Conclusion** This report presents an uncommon case of prostate ductal adenocarcinoma exhibiting a late recurrence in the anterior urethra 13 years post-radical prostatectomy.

**Keywords** Prostate ductal adenocarcinoma, Urethral cancer, Urethral carcinoma

## Introduction

Prostate ductal adenocarcinoma is a rare histology found in 0.4–0.8% of all prostate cancers and is treated in the same way as acinar adenocarcinoma, but it is more likely

to metastasize and recur than acinar adenocarcinoma and also shows poorer prognosis [1]. There have been few reports of solitary recurrence in the anterior urethra rather than the anastomosis after radical prostatectomy.

We herein describe a rare case of prostate ductal adenocarcinoma that developed a late recurrence in the anterior urethra 13 years after radical prostatectomy.

## Case presentation

A 73-year-old Asian Japanese man was referred to our department for the further analysis of gross hematuria. He had no particular family history and complications. And he had no habit of smoking and drinking. Magnetic resonance imaging diffusion-weighted imaging (MRI–DWI) showed a high density in his prostate, and cystoscopy revealed a papillary tumor in his prostatic urethra (Fig. 1). His serum prostate-specific antigen (PSA) level

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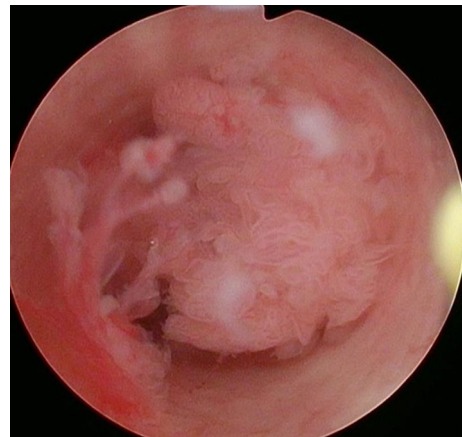


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was 15.9 ng/mL. Based on these findings, a prostate needle biopsy and transurethral resection were performed. At the time of admission, he had no particular physical and laboratory findings including CBC, renal function, liver function etc. The prostate needle biopsy showed no malignancy, and the resected tumor showed ductal prostate carcinoma without acinar adenocarcinoma. Subsequently, radical prostatectomy with lymph node resection was performed. The resected specimens showed a Gleason score of 4+4=8 adenocarcinoma without any findings of ductal cancer and no lymph node metastases. The PSA level decreased to <0.010 ng/mL 3 months after prostatectomy.

A total of 2 years after the prostatectomy, his serum PSA level gradually increased to 0.159 ng/mL, and early salvage radiation therapy was performed (64.8 Gy/36 fr). And no adjuvant hormonal treatment was performed. Three years after salvage radiation therapy, his serum PSA level increased again (0.07 ng/mL); however, both CT and cystoscopy showed no recurrence. Due to the long doubling time of his serum PSA level, both computed tomography (CT) and cystoscopy were performed without further treatment. Thirteen years after the initial prostatectomy procedure, cystoscopy revealed a papillary tumor in the anterior urethra (Fig. 2). His serum PSA level was 0.400 ng/mL, and urinary cytology revealed negative findings. Transurethral resection was performed to confirm the pathological findings. The resected specimens showed findings similar to those of his past prostatectomy specimens and positive findings on PSA staining. Based on these findings, the urethral papillary tumor was diagnosed as a metastasis of prostate ductal carcinoma (Fig. 3a, b).

After transurethral resection, the patient's serum PSA level decreased to <0.010 ng/mL (Fig. 4). At 6 months after transurethral resection, the patient was free of



**Fig. 2** Cytoscopic images of the anterior urethra

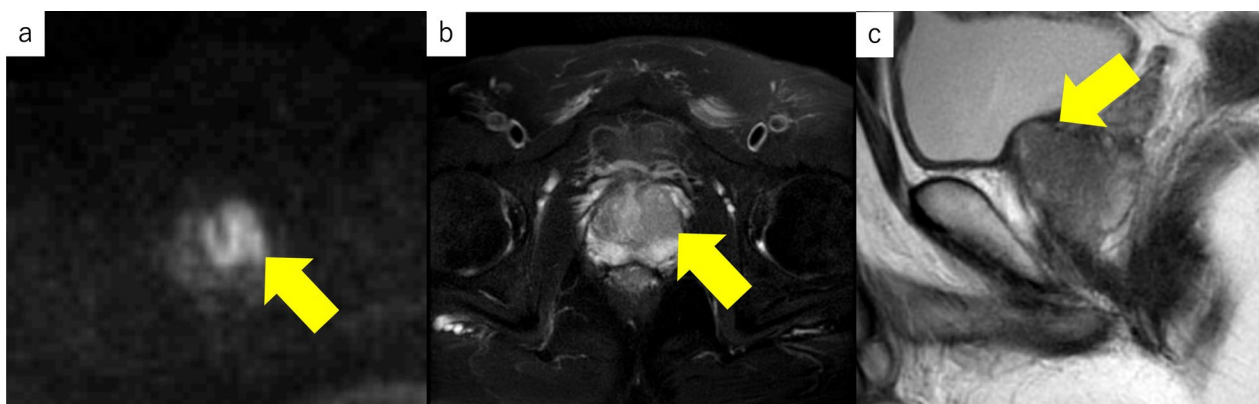
recurrence. Prostate-specific membrane antigen (PSMA) positron emission tomography (PET)-CT is not currently available in Japanese.

### Discussion

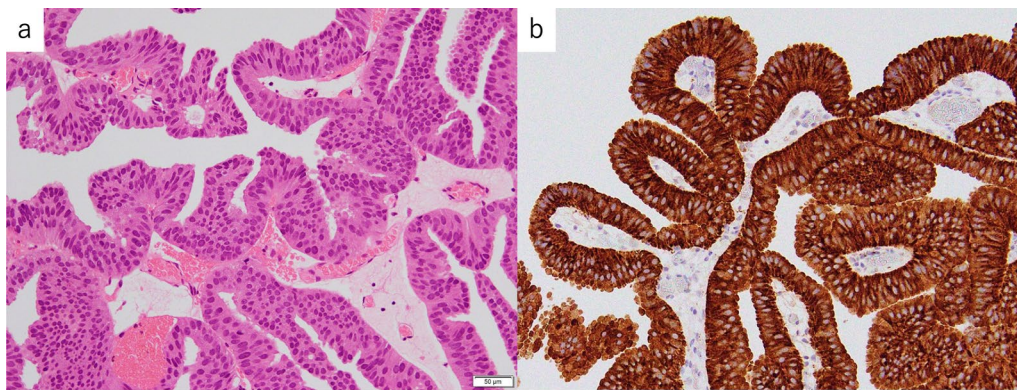
This case was initially diagnosed with prostate ductal adenocarcinoma, undergoing radical prostatectomy that revealed a Gleason score of 8 without lymph node metastasis. Despite early success in lowering PSA levels and salvage radiation for rising PSA, a metastatic tumor in the anterior urethra was identified 13 years later.

Prostate ductal carcinoma is a relatively rare histology, accounting for 0.2–0.8% of all prostate cancers [1]. Compared with adenocarcinoma, it is characterized by a higher rate of metastatic recurrence and worse prognosis [2], a higher rate of positive margins after prostatectomy [3], and a higher rate of genetic mutations [4].

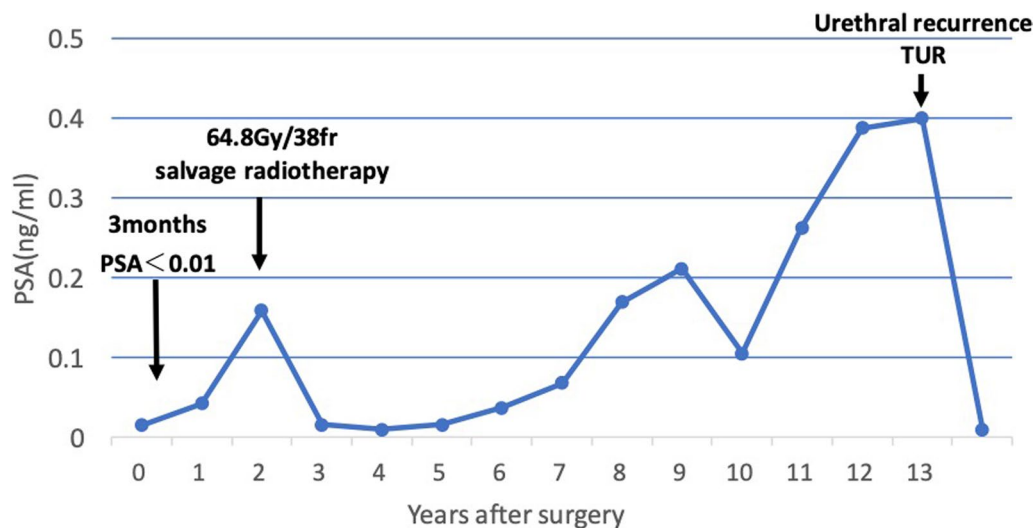
Urethral carcinoma is the most common malignancy that causes urethral tumors, with only a few reports of prostate cancer described [5]. Prostate ductal carcinoma



**Fig. 1** Magnetic resonance imaging showed prostate cancer by diffusion-weighted images (a axial) and T2-weighted images (b axial, c sagittal) The yellow arrows show the target tumor



**Fig. 3** **a** The main histological features of the tumor in the prostatic urethra, **b** positive immunohistochemical staining for PSA



**Fig. 4** The clinical course and PSA transition

often shows tubular, papillary, or cribriform structures that are histopathologically similar to those of urethral carcinoma, and PSA staining is useful for differentiating between the two [6]. In the present case, the possibility of urethral carcinoma could not be ruled out because of the presence of a papillary tumor; however, immunohistochemical staining was strongly positive for PSA, so a definitive diagnosis of prostate cancer was made.

Prostate cancer with solitary anterior urethral metastasis is rare, with only 19 reported cases. Among them, only three cases of solitary recurrence of radical prostatectomy to the urethra have been reported (Table 1) [7–9]. Two cases had positive margins at the time of prostatectomy, while one case reported by Merrett *et al.* recurred in the anterior urethra despite a negative margin. All patients had a history of transurethral resection.

This is the first case of late recurrence 13 years after surgery. Although the mechanism of urethral solitary recurrence of prostate cancer is still unknown, it has been proposed that prostate cancer tumors grow in the urethra after it has been damaged by catheterization [10]. In the present study, all patients had a history of transurethral resection; thus, a history of transurethral surgery might have been associated with recurrence in this case. Previous reports showed that urethral recurrence after radical prostatectomy without metastasis in other organs had a good prognosis [7, 9, 11–14]. Local recurrence after radical prostatectomy is most common at the vesicourethral anastomosis, and there is no established treatment for solitary urethral recurrence [15]. Although total urethral resection is considered a reliable treatment for urethral recurrence, it requires urinary diversion. Considering the patient's age of 86 at the time of recurrence, we evaluated that removing

**Table 1** Reported cases of urethral metastasis from prostate cancer after radical prostatectomy

Ref. no.	Author	Pathology	First therapy	Margin	Disease-free interval	Second therapy	follow-up (months)	Status at last follow-up	post TURP
[7]	Kasai	Acinar	RP	Positive	1 year	RT + CAB	50	Disease free	+
[8]	Kobayashi	Acinar	RP	Unknown	Unknown	TUR + chemo	Unknown	Unknown	+
[9]	Merrett	Ductal	Radical cysto-prostatectomy proximal penile urethrectomy	Negative	6 months	Penectomy	3	Disease free	+
	Our case	Ductal	RP + salvage radiotherapy	Negative	13 years	TUR	6	Disease free	+

RP Radical prostatectomy, RT radiation therapy, CAB combined androgen blockade, TURP transurethral resection of prostate

the urethra with urinary diversion in an elderly patient can pose challenges due to the risk of serious complications.

Generally, prostate ductal carcinoma is unlikely to induce increases in PSA levels [16]. In the present case, the PSA level decreased after resection of the anterior urethral tumor, but it was necessary to continue regular imaging follow-up using cystoscopy and CT in addition to serum PSA level monitoring.

## Conclusion

We encountered a rare case of prostate ductal carcinoma recurrence 13 years after the initial treatment.

## Acknowledgements

Not applicable.

## Author contributions

SH and TK drafted the manuscript. SH, TK, RT, SY, SF, AH, KO, NM, JK, TN, KS, DT, TT, JT, KM, and HU performed the experiments.

## Funding

None.

## Availability of data and materials

Not applicable.

## Declarations

## Ethics approval and consent to participate

Not applicable.

## 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 no conflicts of interest in association with the present study.

Received: 6 December 2023 Accepted: 12 July 2024

Published online: 17 August 2024

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