Case Report

Benign and Malignant Prostatic Urethral Polyps: Two Case Reports and Review of Literature

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Polypoid mass in the prostatic urethra is uncommon, yet the disease entities are so heterogeneous that the spectrum ranges from congenital malformations, benign polyps, to various malignancies. Prostatic urethral polyp (PUP) is a rare benign overgrowth of prostatic parenchyma protruding into prostatic urethra, and correspondingly, prostatic ductal carcinoma is a rare carcinoma originated from the primary duct of the prostate and occasionally presents as a polyp in the prostatic urethra. Due to the location of the polyps, varieties of symptoms, including dysuria, hematuria, urinary tract infections and obstruction leading to urinary retention, can be encountered and diagnostic confusion might be appreciated. Here we report two cases of polypoid mass located in the prostatic urethra: one case of benign PUP and another one of malignant prostatic ductal carcinoma protruding into prostatic urethra. The origins of both lesions were proven to be prostatic epithelium by using immunohistochemical identification of prostate-specific antigen (PSA). Further histological and immunohistochemical studies established the diagnoses of PUP and prostatic ductal carcinoma respectively. Their mimickers, including prostatic acinar adenocarcinoma, villous adenoma of urinary bladder, and papillary urothelial cell carcinoma, were also reviewed.
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INTRODUCTION

Polypoid mass in the prostatic urethra is uncommon but potentially represents a wide spectrum of different entities, ranging from congenital malformations, benign polyps, premalignant disorders to various malignancies. Among them prostatic urethral polyp (PUP) is a rare benign overgrowth of prostatic acinar tissue protruding into prostatic urethra. This entity has many synonyms over the years, including ectopic prostatic tissue in the urethra, benign polyp of prostatic-type epithelium, prostatic caruncle, adenomatous polyp of the prostatic urethra, prostatic urethral polyp, benign prostatic epithelial polyp and papillary adenoma of the prostatic urethra, etc.1 It can occur in patients with a wide age range from 13 to 70 years.1,2 On the other hand, another entity prostatic ductal carcinoma originates from the large duct of prostate and usually occurs in elderly patients.3 It may invade into prostatic urethra and manifest also as a polyp. Histologically, marked cytological atypia and numerous mitoses are seen in most of the prostatic ductal carcinoma cases, while in some cases cytological atypia can be minimal, causing diagnostic difficulty. In addition, other disease entities, such as prostatic acinar adenocarcinoma, papillary urothelial cell carcinoma villous adenoma of urinary bladder, etc., can also present as a polyp in the prostatic urethra, sharing with a variety of common symptoms, including dysuria, hematuria, hemospermia and obstruction leading to urinary retention. All these lesional polyps sometimes show similar histologic features that make morphologic diagnosis beyond reach, yet a definite diagnosis, especially differentiating malignancy from benigncy, is critical for patient care.

In this report, we describe the clinicopathologic and immunohistochemical features of two cases of prostatic urethral polypoid mass, one benign PUP in an 80 years old Caucasian male and one malignant prostatic ductal carcinoma in a 73 years old black male. Their mimics, especially those malignant in nature, are also discussed to raise awareness about these unusual "polyps".

CASE REPORT

Case one: The patient was an 80-year-old Caucasian male presented with hematuria and abnormal micturition for 6 months. Cystoscopy was performed and revealed papillary growth in the prostatic urethra. The lesion was completely resected transurethrally. A light purple-tan papillary tissue (0.9 x 0.7 x 0.3 cm) was sent for pathology. The tissue was submitted entirely for microscopic examination.

Light microscopy: The polypoid soft tissue contained papillary structures with fibrovascular cores (**Figure 1A**). The epithelial lining was tall columnar cells with bland oval nuclei and abundant foamy cytoplasm (**Figure 1C**). There

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was no appreciable atypia. Mitotic activity was not seen. The histologic findings were consistent with a benign polyp.

Immunohistochemistry: The epithelial columnar cells showed intense, diffuse positivity for prostate-specific antigen (PSA) supporting prostatic origin (**Figure 1C**). Immunostain with Prostate Intraepithelial Neoplasia 4 (PIN4) (CK5, CK14, P63 and P504S) demonstrated that the basal cells were intact and P504S was negative (**Figure 1D**). This was consistent with benign prostatic urethral polyp (PUP). The epithelial cells were also patchy positive for CK7 (**Figure 1E**), and negative for CK20 (**Figure 1F**). Of note, The prostatic epithelial cells usually are negative for both CK7 and CK20. However, our lesion is patchy positive for CK7 for some unknown reasons.

The final diagnosis of benign prostatic urethral polyp was made based on the histopathologic findings and immunohistochemistry phenotype. The patient was recovered completely after the procedure and his symptoms disappeared.

Case two: The patient was a 73-year-old black male presented with hematuria and urination obstruction. Cystoscopy revealed a papillary polyp in the junction between urinary bladder and prostate. Biopsy was performed.

Light microscopy: The polypoid soft tissue showed papillary structures with fibrovascular cores (**Figure 2A**). The lining epithelial cells were tall, pseudostratified, and with enlarged nuclei and marked atypia. Mitoses were frequently seen (**Figure 2B**). The histologic features suggested that this was a malignant lesion.

Immunohistochemistry: The epithelial cells were positive for PSA indicating prostatic origin (**Figure 2C**). Diffuse positivity for P504S in the lining epithelial cells (**Figure 2D**) and loss of majority of the basal cells demonstrated by patchy staining with CK5/6 (**Figure 2E**) and p63 (**Figure 2F**) supported the diagnosis of prostate carcinoma. Together with histological findings, a diagnosis of prostatic ductal carcinoma was established. Of note, although prostatic ductal carcinoma can retain some basal cells, spreading of tumor cells to innocent ducts can present similar immunostaining findings. The patient received radical prostatectomy and followed with adjunct therapy.

DISCUSSION

We have described one benign and one malignant polypoid mass located in the prostatic urethra, with both patients presenting with very similar clinical symptoms. The benign prostatic urethral polyp shows tall columnar cell lining with low N/C ratio and no atypia. Immunostaining reveals a benign prostatic acinar gland phenotype. In contrast, the prostatic ductal carcinoma shows tall, pseudostratified atypical epithelial cells with high N/C ratio, marked atypia and frequent mitotic figures. Immunostaining reveals positivity for PSA, P504S and loss of most of the basal cells. Besides the two entities we described in this report, many mimickers from benign to malignant, which is listed in **Table 1**, may create confusion and dilemma. Therefore, better understanding of these "polyps" is extremely crucial to avoid misdiagnosis.

Table 1. The morphologic and immunohistochemical features of different prostatic urethral polyps.

	Origin	Key morphological features	Immunostaining
PUP	Prostate	Fibrovascular cores lined with tall columnar cells. No atypia.	(+): PSA and PAP basal layer (P63+ basal cells): intact (-): P504S (-): CK7 and CK 20
Prostatic acinar adenocarcinoma	Prostate	Small and crowded glands. Loss of basal cells. Marked atypia with prominent nucleoli. Fibrous stroma, desmoplasia.	(+): PSA and PAP (+): P504S basal layer: lost
Prostatic ductal adenocarcinoma	Prostate	Tall pseudostratified epithelium. Marked atypia. Fibrovascular cores, desmoplasia.	(+): PSA and PAP (+): P504S basal layer: retaining of some basal cells
Papillary urothelial cell carcinoma	Bladder	Urothelial cells with variable morphology. Marked atypia. Fibrovascular cores.	(-): PSA and PAP (+): CK20, CK7, P63, uroplakin, calmodulin
Villous adenoma of urinary bladder	Bladder	Pseudostratified epithelium with atypia. Fibrovascular cores.	(-): PSA and CK7 (+): CK20, CEA (-): beta-catenin (nuclear), thrombomodulin

Note: PAP: prostatic acid phosphatase; P504S: alpha-Methylacyl-CoA Racemase; CK: cytokeratin.

Benign polypoid mass in the prostate urethra is uncommon. Randall first described and classified these lesions in 1913.[4] Nesbit confirmed for the first time that the lining epithelium of benign prostatic urethral polyp was prostatic origin by staining the cells with azo dye techniques.[5] PUP is thought to be formed by ectopic prostatic tissue located in the prostate urethra,[5-7] but is more likely of hyperplastic–metaplastic in nature. PUP is usually single but can be diffuse. They are usually papillary or polypoid, although sessile or villous form has been reported also. Malignant transformation of PUP is very rare, with only one reported case of prostatic ductal carcinoma arising from a villous polyp.[8] PUP is usually treated with transurethral resection and fulguration. Recurrence of these lesions after local resection is unusual.[6] Prostatic ductal carcinoma accounts for less than 1% of prostatic malignancies. The lesion is usually located at periurethral area, presenting as an exophytic papillary lesion in the prostatic urethra and resulting in obstructive symptoms

and hematuria. There is a great deal of overlap between prostatic duct carcinomas and PUP clinically and endoscopically. Histologically, prostatic duct carcinoma shows papillary or cribriform pattern with slit-like lumina/ discrete glands that are lined by tall, pseudostratified epithelium with abundant amphophilic cytoplasm (**Figure 2A, 2B**). Indeed this entity was dubbed "prostatic endometrioid carcinoma" for many years due to its similarity to the latter. Comparing to prostatic adenocarcinoma, prostatic ductal carcinoma might still have some disarrayed basal cells. Comparing to PUP, prostatic ductal carcinoma usually shows markedly increased P504S staining (**Figure 2D**).

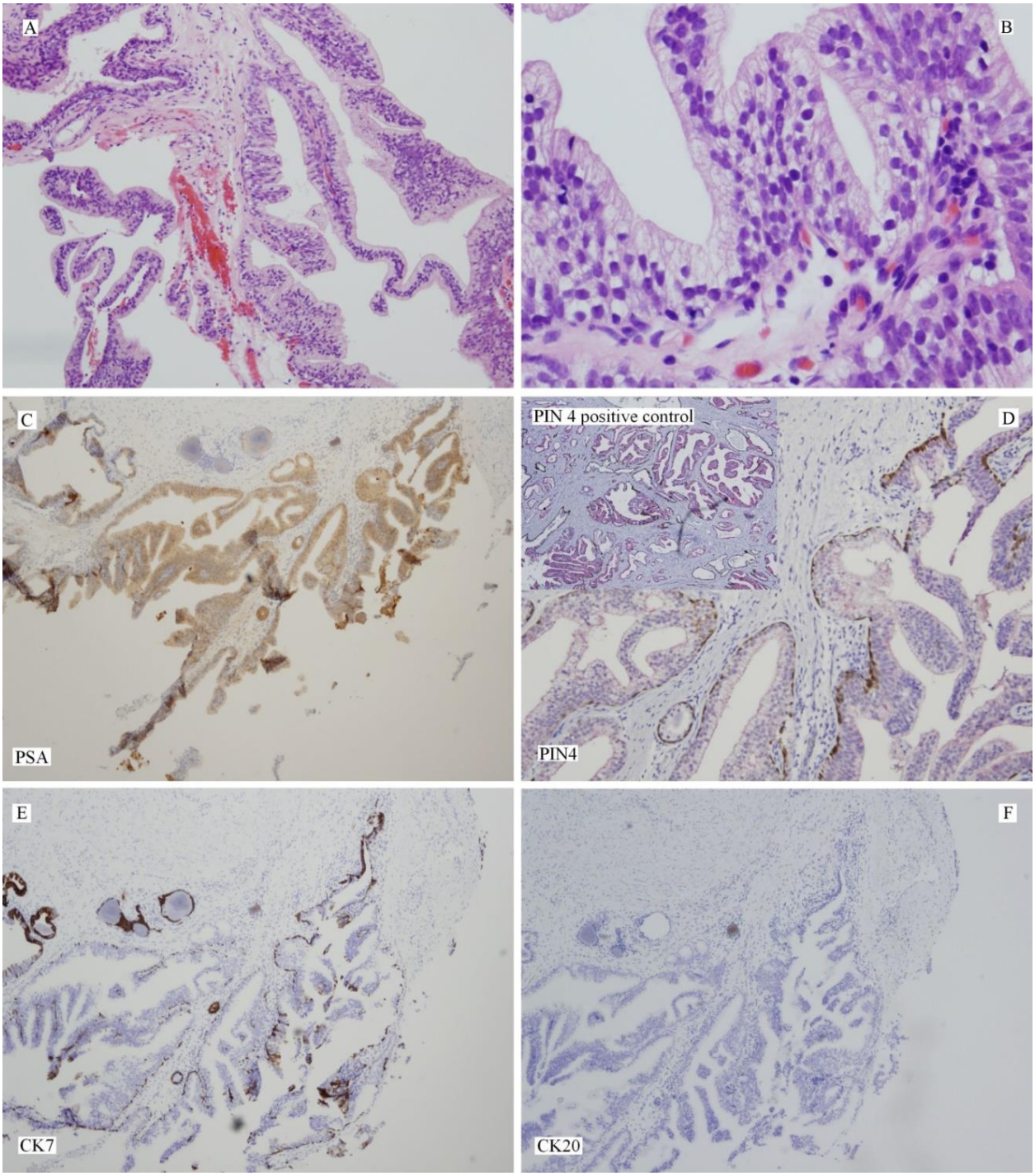

Figure 1. The morphology and immunophenotype of prostatic urethral polyp. 1A (10x) and 1B (20x): H & E sections of the PUP. 1C: The lining epithelial cells are positive for PSA, confirming their prostatic origin. 1D: PIN4 staining shows the basal cells are present, Racemase is negative. 1E: Immunostain for CK7 shows the epithelial cells are patchy positive for CK7. 1F: Immunostain for CK20 shows the epithelial cells are negative for CK20.

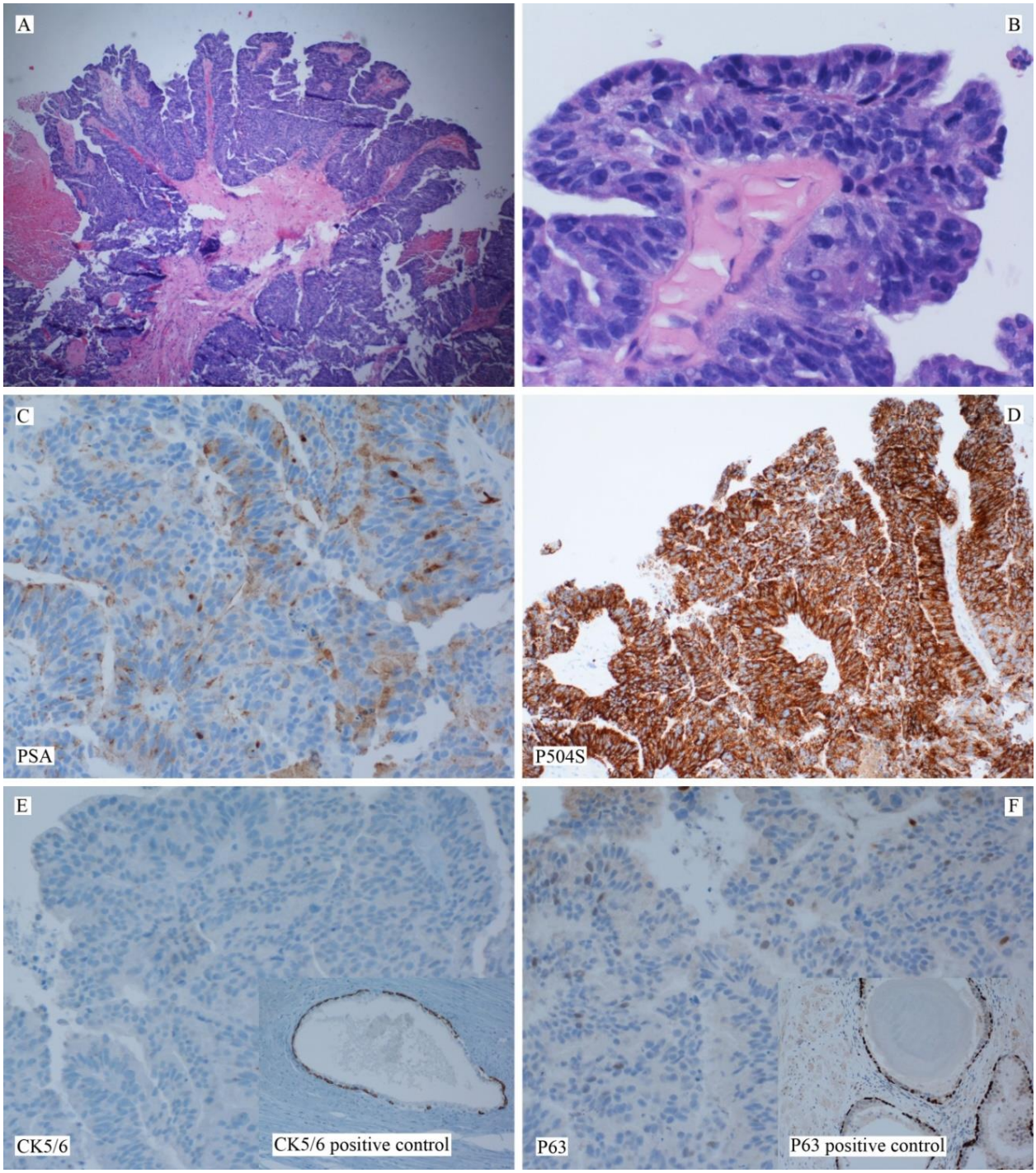

Figure 2. The morphology and immunophenotype of prostatic ductal carcinoma protruding into prostatic urethra. **A** (10x) and **B** (20x): H & E sections of the prostatic ductal carcinoma. **C:** The atypical epithelial cells are positive for PSA, confirming their prostatic origin. **D:** The atypical epithelial cells are positive for P504S (Racemase),confirming their malignant nature. **E** and **F**: The atypical epithelial cells are negative for **CK5/6 (E)** and **P63 (F)**, confirming their not deriving from urothelium of the urinary bladder.

Prostatic acinar adenocarcinoma is the second commonest cancer and second commonest cause of cancer death of men in US. Most of the prostatic adenocarcinomas arise from the peripheral zone. Local invasion commonly occurs in seminal vesicles and bladder base, from where protruding into prostatic urethra occurs occasionally. Clinically patients present with increased PSA, Histologically the tumor present as glandular, cribriform or diffuse infiltration (on which the Gleason score system is based) with nuclear enlargement, hyperchromasia, and prominent nucleoli.

Immunohistochemical features are characterized by strong positive staining for PSA and P504S and loss of basal cells.[9] Villous adenoma of the urinary tract is a rare bladder tumor similar to its colonic counterpart and occasionally presents as a polyp at prostatic urethra. This tumor shows identical

immunohistochemical profile to that of colonic villous adenoma, with positivity for CK 20, CEA and negativity to CK7. However, nuclear beta-catenin staining is usually negative, comparing to some positivity for colonic adenoma. Immunohistochemistry study can differentiate this tumor from PUP and ductal carcinoma.

Papillary urothelial carcinoma is a papillary neoplasm in the bladder but sometimes can present mainly in prostatic urethra. Histologically, the tumor is lined with urothelial cells with marked architectural and cytologic atypia. Urothelial cell carcinoma should be negative for PSA, positive for CK20, uroplakin, calmodulin and P63.

Overall, PUP is a rare benign papillary lesion in the prostatic urethra. Prostatic ductal carcinoma is a rare malignancy that may protrude into the prostatic urethra. Clinical and endoscopic findings of these two lesions, and other mimickers, are very similar. Better recognition of these lesions is crucial to avoid misdiagnosis. Immunohistochemical analysis may be necessary to reach a definite diagnosis in some difficult cases.

CONFLICT OF INTEREST
None.

REFERENCES

1. Tan MO, Kordan Y, Deniz N, et al. Papillary adenoma of the prostatic urethra: report of two cases. International journal of urology : official journal of the Japanese Urological Association.2003;10:459-462.
2. Zeid M, Gaeta JF, Asirwatham JE, et al. Papillary adenoma of the prostatic urethra. The Prostate.1986;9:9-14.
3. Brinker DA, Potter SR, Epstein JI. Ductal adenocarcinoma of the prostate diagnosed on needle biopsy: correlation with clinical and radical prostatectomy findings and progression. The American journal of surgical pathology.1999;23:1471-1479.
4. Randall A. POLYPS OF THE MALE URETHRA. Annals of surgery.1914;60:325-335.
5. Nesbit RM. The genesis of benign polyps in the prostatic urethra. The Journal of urology.1962;87:416-418.
6. Butterick JD, Schnitzer B, Abell MR. Ectopic prostatic tissue in urethra: a clinocopathological entity and a significant cause of hematuria. The Journal of urology.1971;105:97-104.
7. Eglen DE, Pontius EE. Benign prostatic epithelial polyp of the urethra. The Journal of urology.1984;131:120-122.
8. Walker AN, Mills SE, Fechner RE, et al. 'Endometrial' adenocarcinoma of the prostatic urethra arising in a villous polyp. A light microscopic and immunoperoxidase study. Archives of pathology & laboratory medicine.1982;106:624-627.
9. Jiang Z, Chen H, Li L, et al. P504S: a new molecular marker for the detection of prostate carcinoma. The American journal of surgical pathology.2001;25:1397-1404.

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