

Original Article

Prostatic stromal tumor of uncertain malignant potential (STUMP) after transurethral resection of prostate (TURP): a case report and mini-literature review

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Abstract: Prostatic stromal tumors are rare neoplasias that include benign, malignant and borderline lesions. Stromal tumor of uncertain malignant potential (STUMP) has been recently described and only a few reports exist in the literature. This article describes the clinical and medical imaging features of this rare and distinct neoplasia, with histopathological correlation in a patient with prostatic STUMP.

Keywords: Prostate, neoplasms, therapy

Introduction

Prostatic stromal tumor of uncertain malignant potential (STUMP) is a rare and distinctive proliferative lesion characterized by an expansion of the specialized prostatic stroma, with fewer than 100 cases reported worldwide. These lesions were only designated under this term, after Gaudin et al. reported “a series of 22 cases with specific histological and immunohistochemical features that were distinct from prostate sarcomas.” in 1998. The term “uncertain malignant potential” was employed to describe the diversity of biological behavior. The clinical significance and management of STUMP is uncertain because of its rarity and the lack of long-term follow-up [1]. Here we report the case of a patient with prostatic STUMP-treated by transurethral resection of prostate (TURP) together with a mini-review of literature.

Materials and methods

Case report

A 64-year-old Chinese male was first admitted to our department in October 2010, with a

remarkable medical history. He presented with urinary frequency, odynuria, and progressive dysuria; although his urine flow was fine, he complained of weakness and nocturia. His medical history revealed hypertension dating back to 10 years. No hematuria and hematospermia were reported in 2006. No history of diabetes was seen.

Subsequent findings from color Doppler sonography revealed a local mass at right renal pelvis, and an enlarged prostate sized 4.4×4.0×4.3 cm, with normal form, uniform echo, and residual urine volume of 240 ml. Initial chest x-ray revealed small multiple nodules in both lung fields.

Chest and renal computed tomography (CT) revealed right renal neoplasm. Lung CT scan indicated a double upper pulmonary lobe, and nodules. Pneumology consultation revealed pulmonary nodules suggestive of venereal disease, requiring regular follow-up. Holter monitoring suggested frequent VPB (Ventricular Premature Beats), and first degree AV nodal block.

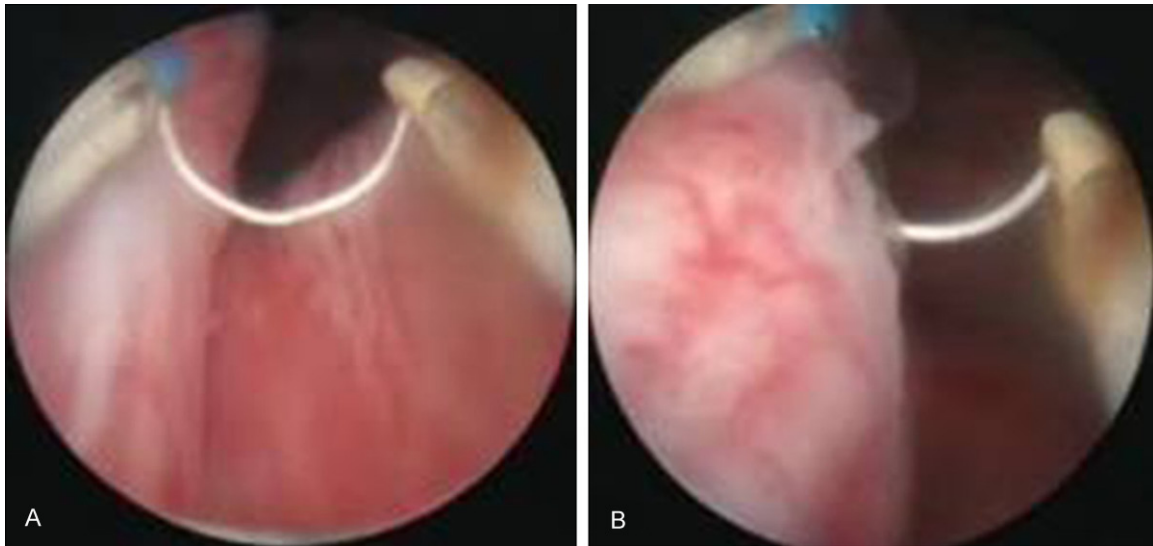


Figure 1. The prostate observed via transurethral resection (TUR).

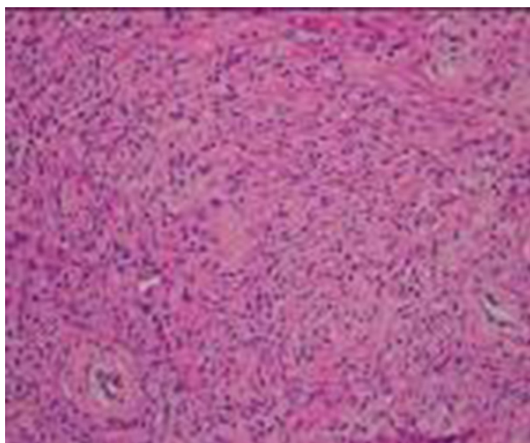


Figure 2. Pathology of the prostate (10×40).

Initial laboratory findings were unremarkable: serum prostate specific antigen (PSA), 0.97 ng/mL (normal, < 4.0 ng/mL). Digital rectal examination (DRE) then revealed slightly bulky, non-tender and benign prostatomegaly. The patient diagnosis included: BPH (Benign Prostate Hyperplasia) and renal cancer. After indwelling catheter and treatment with Finasteride tablets (5 mg po qd x1) and Cardura (4 mg po qd x1), corrected the general condition, right kidney radical resection was done. The pathology results showed right kidney clear cell carcinoma, and the syndrome of BPH was resolved.

The patient reported one year later in October 2011, with persistent symptoms of dysuria, uri-

nary retention, and presented with suprapubic discomfort, and urinary frequency. A follow-up color Doppler sonography revealed an enlarged prostate, with normal form, uniform echo, and sized 4.4×4.0×4.6 cm. The prostatic middle lobe protruded into the bladder. The residual urine volume was 107 ml. No abnormalities in pancreas, liver, spleen, and the left kidney were detected, while a repeat Chest CT demonstrated unremarkable changes compared with the previous CT reports.

Laboratory findings were unremarkable: serum prostate specific antigen (PSA), 0.86 ng/mL (normal, < 4.0 ng/mL); and BCr (blood creatine) 153 μmol/l.

Nephrology consultation advised improvement in the kidney blood flow and regular check-up. Urine cell analysis results revealed white cell count of 28.3/HPF and red blood cells count of 285.9/HPF. Urine culture for bacteria was positive.

Results

Escherichia coli

Digital rectal examination (DRE) then revealed a smooth prostate surface, convex and typically elastic, with non-tender and benign enlargement, while the anal sphincter was tense. Patient was diagnosed with BPH and UTI (urinary tract infection). After correction for general

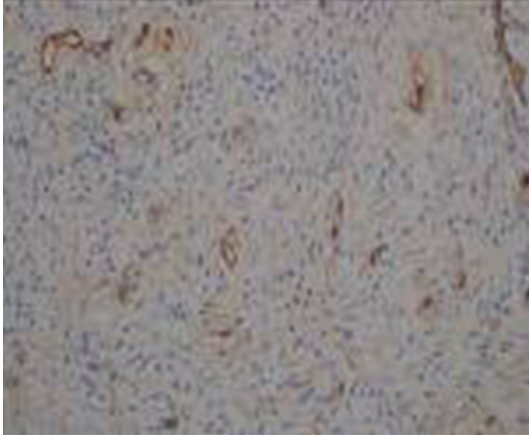


Figure 3. Immunohistochemistry of CD34 (10×40).

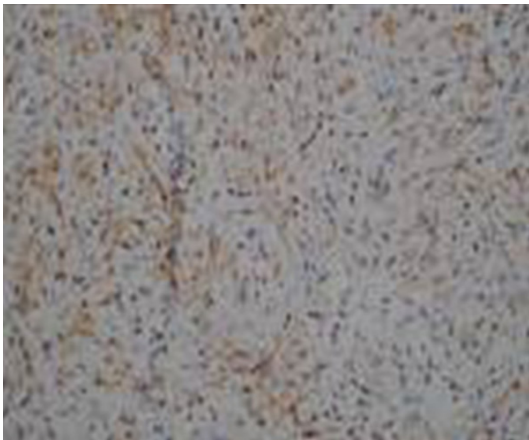


Figure 4. Immunohistochemistry of Desmin (10×40).

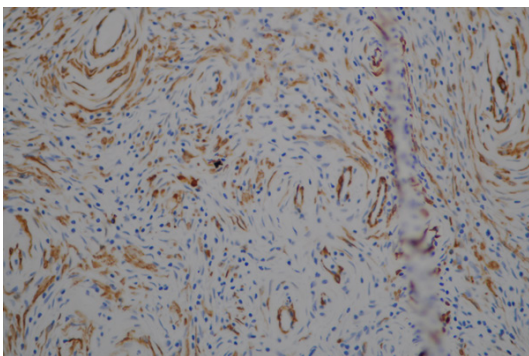


Figure 5. Immunohistochemistry of SMA (10×40).

condition and UTI, TUR-P was prescribed for the patient based on the diagnosis of BPH. Cystoscopy revealed a large polypoid mass arising from the verumontanum and extending proximally beyond the bladder neck and into

the bladder, with the right lobe of the prostate significantly extending into the posterior urethra. The prostate tissue was white and spongy (**Figure 1**). Four months after uneventful TURP, the patient was free from recurrent urinary symptoms.

We observed histologic proliferation of the prostatic stroma without significant cellular atypia and with normal appearing glandular elements. The diagnosis was prostatic stromal proliferation of uncertain malignant potential. The stromal examination showed proliferation of elongated and spindle-shaped cells without cytologic atypia or increased mitotic activity. Immunostaining of desmin (smooth muscle marker) and SMA was positive, confirming the diagnosis. Stromal cells also displayed immunoreactivity for vimentin but moderate reactivity for actin. Luminal epithelial cells showed intense immunoreactivity for prostate-specific antigen. Interestingly, the patient was negative for CD34 (mesenchymal marker). Due to the absence of necrosis and cellular atypia, this tumor was classified as low-grade “indolent” tumor (**Figures 2-5**).

Discussion

Prostatic stromal tumor of uncertain malignant potential, which is sometimes characterized by other names including cystadenoma, leiomyoma, cystosarcoma phyllodes, cystic epithelial stromal tumor and mullerian adenosarcoma-like tumor, is a rare proliferative lesion with fewer than 100 cases reported. Classically, this patient is similar to the other presentations happened at the sixth and seventh decade of life. The most common clinical manifestations are urinary retention, followed by hematuria or hematospermia as most prostatic stromal tumors develop in the posterior portion of the gland, where they adhere to adjacent organs or occur as retrovesical masses and infiltrating the entire prostate [2]. Our patient presented with the classical triad of symptoms including: urine retention, hematuria and hematospermia.

Abnormal digital rectal examination and a palpable rectal mass were noted. The MRI features were different from adenocarcinoma, which is the commonest malignant lesion of the prostate characterized by low signal intensity on T2 weighted images [3]. Mucinous ade-

nocarcinoma is an uncommon variant of prostate adenocarcinoma that shows high signal intensity on T2 weighted images; however, it is almost always a solid lesion [4]. The prostate sarcomas, leiomyosarcoma and rhabdomyosarcoma are usually solid lesions with heterogeneous signal intensity on T2 weighted imaging. When enlarged, they may show cystic areas of variable size that often represent areas of necrosis, instead of true cystic components. Large sarcomas tend to disseminate to adjacent organs including seminal vesicles, bladder and rectum. In this case, the extension of the lesion, close to the seminal vesicles and anterior rectal wall, makes the distinction from sarcoma very difficult, based on imaging findings alone. Cystic areas may be found in BPH, making this condition a potential differential diagnosis of STUMP. However, we regret not doing MRI examination for this case.

The diagnosis of prostatic STUMP is usually made by core biopsy. However, it can be derived from a transurethral resection of prostate or even from specimens of radical prostatectomy for adenocarcinoma. Histology is based on the extent of stromal cellularity, presence of mitotic figures, necrosis, and stromal overgrowth. Four histological patterns of prostatic STUMP were identified [5]: ①. Hypercellular stroma with scattered cytological atypia associated with benign glands; ②. Hypercellular stroma with minimal cytological atypia associated with benign glands; ③. Hypercellular stroma with or without cytological atypia associated with benign glands in a "leaf-like" growth pattern that resemble phyllodes tumours; ④. Hypercellular stroma without cytological atypia and without glands.

Occasionally, it may be difficult to differentiate sarcoma from STUMP, especially based on histology alone. Reports of STUMP tumors that appear histologically benign are available. However, based on surgical specimens, a sarcoma was diagnosed. STUMPs can also be misdiagnosed as benign prostate hyperplasia (BPH) [6], as this case illustrates. In contrast, STUMPs can have local morbidity and malignant potential. They can either grow and adhere to adjacent organs (mainly the rectum) or promote widespread disseminated disease. In the case reported in this article, a degenerative subtype was found without any evidence of malignancy after surgical resection. The main

clinical and histological features of STUMP summarized from the literature are LUTS (lower urinary tract syndrome), elevated PSA, and abnormal DRE. Initial Treatments include TURP, RP (radical prostatectomy), RT (radiotherapy), and CT (chemotherapy).

Generally, PSS (Prostate Stromal Sarcoma) shows greater cellularity, mitoses, necrosis, and stromal overgrowth than prostatic STUMP. The immunohistochemical profile of both prostatic STUMP and PSS demonstrate positive reactivity for CD34 [7], which may aid in distinguishing them from other prostatic mesenchymal neoplasms such as rhabdomyosarcoma or leiomyosarcoma. Both STUMP and PSS involve hormonally responsive prostatic mesenchymal cells as they characteristically express progesterone receptors (PR) and to a lesser extent, oestrogen receptors (ER). PSS is generally negative for HHF-35, smooth muscle actin and desmin, in contrast to prostatic STUMP, and this may also serve as a method of differentiation between these neoplasms. Previous studies showed that prostatic STUMPs typically express progesterone receptors/CD34, and focally may or may not express express desmin. Although CD34 was considered as a useful marker of prostatic STUMP and PSS, there are reports, which demonstrated prostatic STUMP with negative immunohistochemical staining for CD34, similar to the findings in our patient.

The histologic grade of prostatic sarcoma is predictive of patient outcome, in terms of local recurrence and distant metastasis, unlike the natural history of STUMP. Despite aggressive local resection or radical surgery, 46% of patients with prostatic STUMP will show local recurrence. Five percent of patients may progress to PSS. Although distant metastasis was not observed in prostatic STUMP, 25% of patients with PSS develop distant metastasis, most commonly in the lungs and bones. Some authors recommended that the use of the term STUMP be discouraged because of its benign course and rare recurrence [8]. Others reported that these tumors usually recurred and frequently showed the emergence of metastatic disease, and insisted on complete resection at the initial diagnosis.

Prostatic stromal proliferation of uncertain malignant potential frequently recurs despite

aggressive local resection or radical surgery. Furthermore, progression from this lesion to frankly malignant prostatic stromal sarcoma has been reported. While the urologist and pathologist must be aware of this rare entity called STUMP, only further research into prostatic stromal interactions will establish the etiology and provide more definitive treatments in the absence of consensus on the most appropriate intervention. However, the patient's age and treatment options, palpability of the lesions during DRE, and extension of the lesion on tissue sampling and imaging studies are some of the factors that warrant a more invasive procedure. A more aggressive approach is reserved for younger patients and those with extensive lesions on imaging studies.

Phyllodes tumor of the prostate is a rare neoplasm, composed of epithelium-lined cysts and channels embedded in a variably cellular stroma. The pathogenetic relationship of the epithelium and stroma is unknown and whether each is a clonal neoplastic element is uncertain. McCarthy et al. studied the clonality of phyllodes tumors from six patients who underwent either enucleation or transurethral resection as their initial treatment. Polymerase chain reaction was used to amplify genomic DNA. In each tumor, stroma and epithelium were analyzed separately. Gel electrophoresis with autoradiography was used to detect loss of heterozygosity. All tumors showed allelic loss in one or more loci of both the epithelial and stromal components [9]. The pattern of allelic loss is significantly different in both stroma and epithelium statistically. The data demonstrate that both epithelial and stromal components of phyllodes tumor of the prostate are clonal, supporting the hypothesis that both elements are neoplastic. While both epithelium and stroma are clonal proliferations, they appear to have different clonal origins. Michael Nagar et al. systematically described the epithelial proliferation suggesting epithelial-mesenchymal crosstalk within STUMPs, as described in benign prostate and prostatic carcinogenesis. In unusual cases of STUMP, the epithelial proliferation may predominate to the extent that it can mask the diagnosis of STUMP [10].

To date, the definition is still controversial regarding the pathological features and outcome of STUMP. Imaging may be useful to

improve characterization of incidentally discovered (eg, on transurethral resection of prostate) or biopsy-proven STUMPs, to distinguish between localized proliferation and severe mass-forming disease, and provides useful information for surgical planning. This case shows that prostatic STUMP treated by TUR-P is associated with tolerable oncologic and functional outcomes until the final follow-up. The clinical significance of this case study may be known from further long-term follow-up.

Disclosure of conflict of interest

None.

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