CASE REPORT

MRI findings of prostate stromal tumour of uncertain malignant potential: a case report

¹V F MUGLIA, MD, PhD, ²G SABER, MD, ²G MAGGIONI JR, MD and ²A J C MONTEIRO, MD

¹Ribeirao Preto School of Medicine, University of Sao Paulo, Ribeirao Preto, Sao Paulo, Brazil, and ²Benemerit Society Against Cancer, SOBECCAN, Ribeirao Preto, Sao Paulo, Brazil

ABSTRACT. Prostatic stromal tumours are rare neoplasias that include benign, malignant and borderline lesions. Stromal tumour of uncertain malignant potential (STUMP) has been recently described and only a few reports exist in the literature. As a rare and distinct neoplasia, to date, there is no description of MRI findings of prostate STUMP. In this article, we describe the clinical and MRI features with histopathological correlation of a patient with prostate STUMP.

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Prostatic stromal tumours are rare neoplasias that include benign, malignant and borderline lesions [1]. Stromal tumour of uncertain malignant potential (STUMP) has recently been described [2] and only a few reports exist in the literature [3–7]. Histological subtypes have also been described, but they are not associated with specific clinical behaviour or the risk of having an associated sarcoma. STUMP usually presents between the sixth and the seventh decades of life, but has been reported in younger patients. It can originate in either peripheral or transitional zones, can involve the entire gland and have a high recurrence rate. The major clinical symptoms are related to lower urinary tract obstruction, but haematuria may occur [2, 7]. As a newly recognised distinct neoplasia and because of its rarity, to date there is no description of the MRI findings of prostate STUMP. In this article, we describe the clinical and MRI features with histopathological correlation of a patient with prostate STUMP.

Case Report

A 52-year-old male presented with urinary symptoms, which were described as progressive urinary retention that was not associated with pelvic pain or fever. The digital rectal examination (DRE) showed an enlarged and firm prostate without perceptible nodules. Routine ultrasound confirmed a large volume prostate with a heterogeneous central gland. The prostate-specific antigen (PSA) value was 7.5 ng dl⁻¹ (normal range <4.0 ng dl⁻¹) and acid phosphatase was 7.9 UI l⁻¹ (normal range: 2.2–11 UI l⁻¹). A transrectal ultrasound (TRUS)-guided biopsy was indicated and performed at another facility. Following

the biopsy results, an MRI was requested for better lesion characterisation and local staging.

Imaging findings

The TRUS was performed in another facility using transabdominal and endorectal approaches. The prostate was reported as enlarged and well defined. It measured 7.4 × 6.3 × 6.5 cm and had an estimated volume of 157 cm³. The prostate was heterogeneous in the central zone where cystic areas with thin septae were seen in the right anterior gland; the largest lesion was 3.5 cm.

MRI of the prostate was performed on 1.5 T scanner 10 weeks after prostate biopsy using pelvic phased array and a 5-channel endorectal coil, simultaneously. The MR protocol included T₂ weighted images in three orthogonal planes, axial T₁ weighted pre-contrast and dynamic images (on axial plane) after intravenous contrast administration at 30, 60, 120 and 180 s. There was a large, expansive, well-defined lesion arising from the posterior aspect of the prostate, compressing and dislocating the peripheral zone and central gland. Apart from the apex, it was not possible to identify the surgical capsule. The volume of the lesion was estimated at 110 cm³. The urethra was anteriorly compressed and dislocated. Cranially, the lesion extended until the seminal vesicles, but without signs of invasion (Figure 1a,b). The lesion had homogeneous low-signal on T₁ weighted image, but it was diffusely heterogeneous on T₂ weighted images. Areas with high-signal interspaced by low-signal bands, corresponding to cystic areas described at sonography, were seen again on MRI (Figure 1c). Following the administration of intravenous contrast medium, the lesion had diffuse but low enhancement with the exception of cystic components in which the enhancement was restricted to the walls and septae (Figure 1d). There were no enlarged lymph nodes in the pelvis and the pelvic bones were unremarkable.

Address correspondence to: Dr Valdair Muglia, Imaging Medical Physics Center, Hospital Clinicas Ribeirao Preto, Second Floor, Campus Monte Alegre, Avenue Bandeirantes 3900, Sao Paulo 14048900, Brazil. E-mail: fmuglia@fmrp.usp.br

Figure 1. (a) Axial and (b) coronal T_2 weighted images showing enlarged prostate with cystic areas (asterisks); the solid components are scarce (arrow in (a)) and the peripheral zone (PZ) and central gland (CZ) and displaced anteriorly. (c) Sagittal T_2 weighted image, the urethra is seen compressed and dislocated anteriorly (arrow); (d) Axial post-contrast T_1 weighted image showing enhancement of septae and areas of homogeneous enhancement on solid areas (*).

Patient outcome

The patient underwent a suprapubic radical prostatectomy 1 month after MRI. At surgery and pathology, there was no evidence of a tumour extending beyond the prostate. The diagnosis of STUMP was confirmed after specimen analysis. The patient was followed up for 18 months and showed no evidence of clinical or local recurrence; however, he died from an intestinal occlusion and its complications.

Discussion

STUMPs are rare proliferative lesions of prostate gland derived from the specialised stroma. These lesions were only designated under this term in 1998, when Gaudin et al [2] reported a series of 22 cases with specific histological and immunohistochemical features that were distinct from prostate sarcomas. The term “uncertain malignant potential” was employed to describe the diversity of biological behaviour. Some tumours caused

Figure 2. Histological sections (haematoxylin and eosin staining, $\times 200$) showing a (a) diffuse fusocellular pattern and (b) foci of atypia (black arrows).

Table 1. Main clinical and histological features of prostate stromal tumour of uncertain malignant potential. Comparison with present case

Parameter	Literature ^a	Present case
Age (years)	27–83 (mean, 58)	52
Presentation	DRE LUTS Haematuria Rectal dysfunction PSA elevation	LUTS
Histological pattern	Degenerative atypia Hypercellular Myxoid Phyllodes-type	Degenerative atypia
Size (cm)	0.7–18.0	7.4
MRI findings	-	Cystic areas interspaced by septae and solid components. Discrete enhancement on solid areas and septae.

^a Largest series in literature [7]. DRE, digital rectal examination; LUTS, lower urinary tract syndrome; PSA, prostate-specific antigen.

only minor local morbidity, while others had an aggressive course, with a high rate of local recurrence and/or systemic metastases [5–6]. To date, the definition is still controversial regarding the pathological features and outcome of STUMP [5–7].

The diagnosis of prostate 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 owing to an adenocarcinoma. Histologically, Herawi and Epstein [5] defined four subtypes of STUMP: degenerative atypia, hypercellular, mixed and phyllodes type.

Occasionally, it may be difficult to differentiate sarcoma from STUMP, especially when based only on histology [5, 7–8]. There are reports of STUMP tumours that appeared histologically benign; however, based on surgical specimen features, a sarcoma was diagnosed. STUMPs can also be misdiagnosed as benign prostate hyperplasia (BPH), but in contrast to this benign condition, 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 (Figure 2a, b) and there was no evidence of malignant component after surgical resection. Table 1 summarises the main clinical and histological features of STUMP that have been described in the literature.

The MRI features described here are quite different from adenocarcinoma, which is the commonest malignant lesion of the prostate and whose features include low signal intensity on T_2 weighted images [9]. But, the MRI features of this STUMP are similar to other prostate lesions. Cystadenoma may have a very similar appearance on MRI, *e.g.* a large mass composed of cystic areas. Mucinous adenocarcinoma is an uncommon variant of prostate adenocarcinoma that shows high signal intensity on T_2 weighted images; however, it is almost always a solid lesion [10]. The prostate sarcomas, leiomyosarcoma, and rhabdomyosarcoma, are

usually solid lesions with heterogeneous signal intensity on T_2 weighted imaging. When large they may show cystic areas of variable sizes 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 a 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, in this case cystic spaces were unusually large for a typical BPH.

There is no consensus on the most appropriate treatment for STUMPs, again because of its rarity. However, when deciding if a STUMP lesion should have a more invasive procedure with definitive resection, some factors should be considered, including the patient's age and treatment choices, whether the lesion is palpable or not at DRE, extension of the lesion on tissue sampling and presence and extension of the lesion on imaging studies [9]. A more aggressive approach is reserved for younger patients and those with extensive lesions of imaging studies.

Conclusion

Imaging may be useful to improve characterisation of incidentally discovered (*e.g.* on transurethral resection of prostate) or biopsy-proven STUMPs, which helps to distinguish between a localised proliferation and a more troublesome mass-forming disease and provides useful information for surgical planning.

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