



# Prostate Leiomyosarcoma: A Rare Misleading Tumor

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## CASE REPORT

73 year-old patient present with lower urinary tract symptoms (LUTS) and a low serum prostate specific antigen (PSA) diagnosed with a prostate leiomyosarcoma following a TURP. Afterwards, he was submitted to radical prostatectomy. A multimodal approach with radiotherapy was considered although death occurred less than three months after surgery.

## DISCUSSION

Prostate leiomyosarcoma is a rare aggressive tumour with misleading clinical features which may delay the diagnosis. The rarity of prostate sarcomas makes it very difficult to have prospective studies and appropriate clinical research. Therefore, it is of the utmost importance to report its occurrence in order to improve our knowledge of its natural history. There are no guidelines concerning an optimal treatment. When feasible, surgery is the mainstay of treatment. Notwithstanding, recently published data favour multimodal therapies for the treatment of prostatic sarcomas, particularly for locally advanced disease. *UROLOGY* 130: 13–16, 2019. © 2019 Elsevier Inc.

## CASE REPORT

A 73-year-old male patient presented with a history of moderate LUTS, namely frequency, nocturia, and weak urinary stream. He had no history of previous surgery, or any medical conditions of notice, and he is a nonsmoker, nonalcoholic. He has been diagnosed with benign prostate hyperplasia (BPH) 10 years before, for which he was then being treated with dutasteride and tamsulosin. Because of having slightly elevated prostate specific antigen (PSA), which had been stable at 6 ng/mL over the past years, the patient had also undergone two 12-core transrectal ultrasound-guided (TRUS) biopsies. On digital rectal examination, the prostate was nontender, symmetrically enlarged, without abnormalities in consistency or any palpable nodules. Serum PSA was 6.45 ng/mL. The prostate volume was estimated at 90 cc by TRUS, without suspicious lesions reported. The patient's prostate multiparametric magnetic resonance imaging (mpMRI) documented an enlarged prostate (103 cc), symmetric, with a pattern of "organized chaos" in the central prostate (Fig. 1). Meanwhile, the patient presented acutely with hematuria and urinary retention. A contrast-enhanced computed tomography (CT) ruled out upper urothelial tumors as the cause of hematuria. On rigid urethroscopy, no bladder lesions

were found. Thus, a transurethral prostatic resection was performed. Histology revealed poorly differentiated cells with marked atypical features and increased mitotic activity, negative for CK20, CK7, and PSA expression. Regarding immunohistochemical tests, actin and vimentin showed positivity and protein S100 was negative (Fig. 2). The diagnosis of a prostate leiomyosarcoma was suggested. Metastatic work-up did not reveal any evidence of metastasis. The patient underwent to a radical prostatectomy.

Histopathologic examination of the specimen showed a high-grade prostate leiomyosarcoma with extraprostatic extension, angio and neuro invasion, invasion of the seminal vesicles, and positive surgical margins (Fig. 3). Immunohistochemical studies showed positivity for vimentin, actin, and desmin.

In a multidisciplinary setting, radiotherapy was offered as adjuvant treatment, which the patient was unable to start as a result of significant deterioration of his performance status, with hematuria and pelvic pain leading to hospital admission. Given the poor clinical condition, best supportive care was offered. Death occurred less than 3 months after radical surgery.

## DISCUSSION BY CATARINA GAMEIRO, M.D

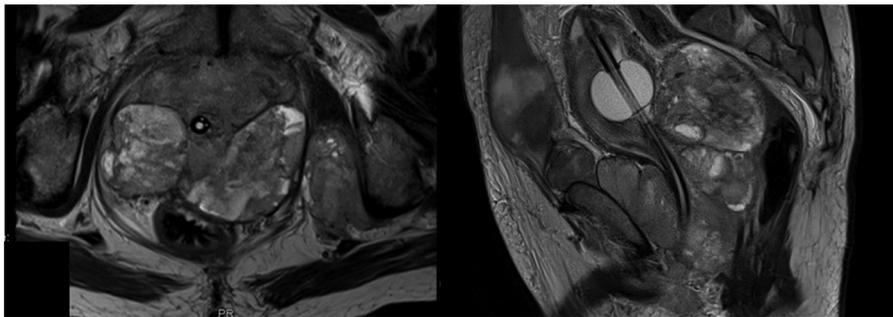
Leiomyosarcoma is an extremely rare primary malignant neoplasm of prostatic smooth muscle with less than 200 cases reported.<sup>1</sup> Its etiology remains uncertain although previous pelvic radiotherapy (RT) may be related to some cases.<sup>4</sup> Men aged between 41 and 78 years (mean age of 61 years) are the most affected group. Most frequently

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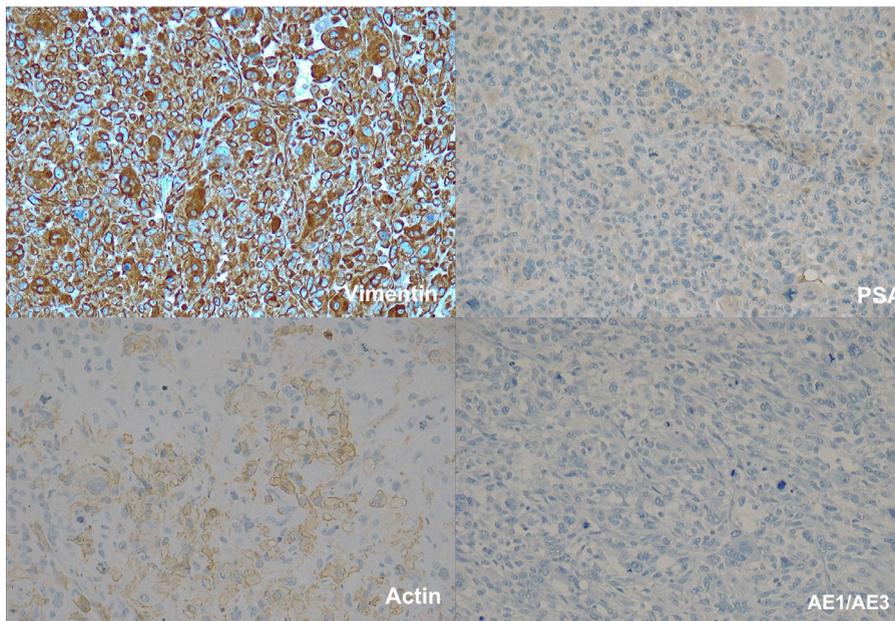
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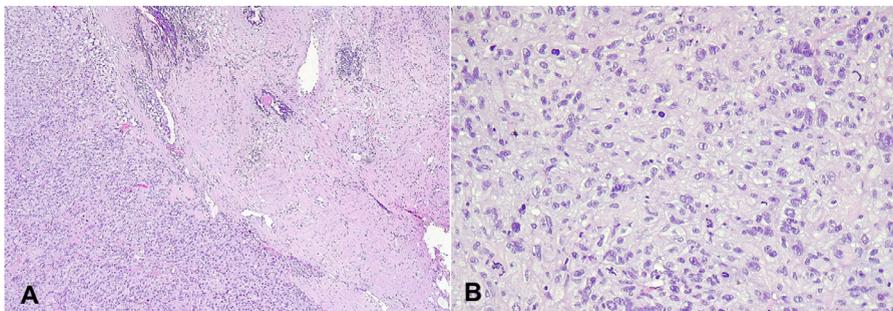
**Figure 1.** MRI showing a pattern of “organized chaos” in the central prostate.



**Figure 2.** Immunohistochemical studies showing positivity for vimentin and actin. The tumor specimen was negative for AE1/AE3 and PSA expression. (Color version available online.)

patients present with signs and symptoms of urinary obstruction, such as frequency, weak stream and inability to void, often misdiagnosed as BPH. Additional associated symptoms include hematuria, pelvic or perineal pain, and weight loss.<sup>5</sup> The lack of typical symptoms often results in

more advanced disease at the time of diagnosis.<sup>6</sup> About one-third of patients present with metastatic disease, usually in the lung or liver.<sup>7</sup> Digital rectal examination may reveal an enlarged prostate with benign features, a raise in consistency or even a hard tumor extending to other



**Figure 3.** A fascicular neoplasm is seen infiltrating the surrounding prostatic parenchyma (A), composed of highly pleomorphic cells with eosinophilic cytoplasm and frequent mitotic activity, including atypical mitotic figures (B). (Color version available online.)

pelvic structures. Serum PSA can be normal or slightly raised, since the tumor has a nonepithelial origin, making PSA neither helpful in diagnosing nor in monitoring treatment. Ultrasounds can reveal enlargement of the prostate and a thickened bladder wall with trabeculation and sacculation. Heterogeneous hypoechoic lesions with invasion of the capsule or extension to the adjacent structures may be documented in TRUS.<sup>1</sup> Lesions usually range between 2 and 31 cm, tend to be infiltrative, with focal areas of hemorrhage, necrosis and/or cystic degeneration.<sup>8,9</sup> Andreou et al, based on a retrospective analysis of imaging findings in 13 patients with different types of prostate sarcoma, attempted to identify imagiological features useful for distinguishing sarcomas from prostate adenocarcinomas. In the majority of cases, the tumor occupied the entire gland, distorting the zonal anatomy. MRI was the modality of choice to evaluate local disease due to its high soft tissue contrast resolution. T1-weighted images revealed homogeneous hypointense masses while T2-weighted sequences showed heterogeneous masses with areas of intermediate and high signal. A pseudocapsule between the tumor and the adjacent compressed tissues may be present. On the contrary, adenocarcinomas are usually multifocal, confined to the prostate at the time of diagnosis, and exhibit low T1 and T2 signal intensity.<sup>2</sup> The diagnosis is obtained by TRUS-biopsy and often by transurethral prostatic resection, as in our patient's case. The vast majority of leiomyosarcomas are high-grade lesions with increased mitotic activity. Histologic features are fundamental in distinguishing this subtype of sarcoma. Leiomyosarcomas lack normal glands, as opposed to stromal sarcomas, or sarcomatoid carcinomas which often contain mixed malignant prostatic glands.<sup>8,9</sup> Regarding immunohistochemical profile of the tumor, most of the cases expressed vimentin, actin, progesterone receptor and CD34. S-100 and CD 117 are negative in all tumors. Cytogenetic analysis showed rearrangements involving chromosomes 2, 3, 9, 11, and 19.<sup>8,9</sup> As opposed to other prostate sarcomas, in which the first site of distant metastasis are lymph nodes, in prostatic leiomyosarcoma nodal involvement is uncommon, occurring in only 10% of the cases. Lung, liver, and bone are common sites of distant metastasis. Bone lesions tend to be osteolytic differing from the typical osteoblastic pattern of bone metastasis seen in prostate adenocarcinomas.<sup>2</sup> As recommended for other prostate neoplasms, CT and bone scans are usually performed on initial evaluation.<sup>6</sup> Owing to its rarity, there is a paucity of evidence regarding the optimal treatment for such cases. The treatment approach for these patients is based on retrospective analysis of limited numbers of cases, defined by institutional preference or by analogy with the recommendations for soft tissue sarcomas.<sup>3</sup> Prostate sarcomas have an aggressive clinical course and poor prognosis. For the past few years, surgery has been the mainstay of treatment, consisting in radical prostatectomy, cystoprostatectomy, or pelvic exenteration.<sup>6</sup> Notwithstanding, recently published data favor multimodal therapies for the treatment of prostatic sarcomas,

particularly for locally advanced disease. In a study by Bari et al, 24 of 31 cT3-4 patients received surgery plus RT and a significant improvement in 5-year local control (LC) (68% vs 33%,  $P = .004$ ) and overall survival (OS) (65% vs 31%,  $P < .001$ ) over surgery alone was demonstrated. RT did not seem beneficial in cT1-2 patients in terms of OS or LC. Globally, chemotherapy, given to 18 out of 57 patients, improved 5-year OS ( $P = .8$ ) and LC ( $P = .1$ ).<sup>3</sup> On a previous study, Sexton et al retrospectively staged patient tumors according to the American Joint Committee on Cancer (AJCC) and found that stage III tumors (>10 cm) benefit from multimodality treatment, regarding mean survival (85 vs 39 months). However, they failed to demonstrate differences in survival related to histologic subtype, grade, and size.<sup>6</sup> Standard use of chemotherapy is still controversial. The advantage of systemic therapy along with radiotherapy might be tumor downsizing, thus allowing for a complete resection, which constitutes the only chance of achieving cure in this setting.<sup>10</sup> The most consistent prognostic variables found in the published data are the presence of metastatic disease at the time of diagnosis and positive surgical margins, resulting in poorer outcomes.<sup>6,10-12</sup> Prostate sarcomas have high rates of local recurrence as well as distant metastasis, highlighting the aggressiveness of the tumor. Long-term surveillance is essential. There are some reports on successful salvage surgery on local recurrences.<sup>6</sup>

In our patient's case, the presence of confounding clinical features, a history of BPH and elevated PSA with a previous negative TRUS biopsy, deferred the diagnosis. After diagnostic workup excluded metastatic disease, radical surgery was promptly offered; positive surgical margins were documented, with locally advanced disease disabling the possibility of cure. Although radiotherapy was offered, the patient's poor clinical status precluded adjuvant treatment.

Due to the rarity of this entity, there are insufficient data regarding the clinical presentation, diagnoses, and treatment approach. Therefore, it is of the utmost importance to report its occurrence in order to improve our knowledge of its natural history.

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