Small lymphocytic lymphoma of the prostate mimicking a PIRADS 5 lesion that resolved after systemic treatment

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ABSTRACT

Prostatic PIRADS 4 and 5 lesions on multiparametric MRI typically represent adenocarcinoma with small lymphocytic lymphoma being a rare pathological finding. We report a case of small lymphocytic lymphoma masquerading as PIRADS 4 and 5 lesions with associated lymphadenopathy in a 69-year-old male on active surveillance for low-risk prostate cancer that was subsequently confirmed on targeted and systematic prostate biopsy. Following treatment of lymphoma with ibrutinib, there was complete resolution of the PIRADS lesions on follow-up mpMRI.

Introduction

Chronic lymphocytic leukemia (CLL) and small lymphocytic lymphoma (SLL) are mature B cell neoplasms with similar disease processes; CLL is found in blood and bone marrow, while SLL typically occurs in lymph nodes or spleen. SLL has a relatively indolent course, with many patients being asymptomatic or presenting with painless cervical lymphadenopathy. While CLL/SLL is the most common leukemia in adults in the United States, SLL originating from the prostate is rare. 1

With the recent incorporation of multiparametric magnetic resonance imaging (mpMRI) in the work-up of elevated PSA and surveillance for adenocarcinoma of the prostate, there have been no reports of how SLL presents on imaging.

To our knowledge, we present the first reported case of prostatic SLL initially found as a PIRADS 5 lesion and we describe treatment with immunotherapy and complete resolution.

Case presentation

A 69-year-old Caucasian male was referred for active surveillance of low risk, Gleason Grade Group (GGG) 1 prostate cancer initially diagnosed 8 years ago. He reported a previous MRI of the prostate that was “normal”. 

"At the time of presentation, he was asymptomatic – PSA was 2.8ng/mL and digital rectal exam was consistent with T1c disease. He subsequently underwent a repeat mpMRI which demonstrated a concerning 2.6 × 1.9 cm midline PIRADS 5 lesion in the anterior transitional zone with suspicion for extracapsular extension (Fig. 1), bone signal abnormality due to leukemic infiltration, as well as a PIRADS 4 lesion in the right posteromedial peripheral zone (not shown). The estimated prostate size was 42ml and there was also presence of bilateral pelvic and inguinal lymphadenopathy measuring up to 2.1cm (Fig. 2).

He underwent MRI/ultrasound fusion prostate biopsy that included the standard 12-core systematic biopsy plus 3 targeted cores of both PIRADS lesions. Pathology revealed persistent GGG1 prostate cancer in 2 cores at the left base of the systematic biopsy and diffuse SLL in all cores. Histology demonstrated moderate lymphoid aggregate consisting of monotonous small and mature lymphocytes without large cells. Immunohistochemical stains showed lymphocytes positive for CD45, CD19, CD20, CD9a, CD5, and CD23 (Fig. 3). CD3 highlighted scattered T-lymphocytes. Ki-67 showed a proliferative index <10% and PCK highlighted epithelial components (not shown).

Abbreviations: mpMRI, multiparametric magnetic resonance imaging; PIRADS, prostate imaging reporting and data system; PSA, prostate specific antigen; GGG, Gleason grade group; CLL, chronic lymphocytic leukemia; SLL, small lymphocytic lymphoma.

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Patient was referred to medical oncology for management of lymphoma. His white blood cell count reached 320,000 cells/mm$^3$ and he started experiencing bothersome cervical lymphadenopathy. CT scan revealed enlarged lymph nodes throughout the body including cervical and retroperitoneal. He subsequently underwent immunotherapy with ibrutinib. Repeat CT scan after treatment demonstrated reduction of retroperitoneal and cervical lymph nodes and reduction of WBC count to 32,000 cells/mm$^3$. Follow-up mpMRI at 1 year for prostate cancer surveillance demonstrated complete resolution of the previously noted PIRADS 4 and 5 lesions (Fig. 1) as well as resolution of pelvic lymphadenopathy (Fig. 2). He is asymptomatic and remains on active surveillance for his prostate cancer.

**Discussion**

Both primary and secondary lymphomas of the prostate are rare findings. The incidence of primary lymphoma of the prostate is very rare and has been reported to occur in only 0.2–1.2% of cases. Secondary prostatic lymphoma, such as this case, is much more common. Patients typically present with lower urinary tract symptoms and less commonly with back pain and hematuria. Systemic symptoms such as fever, night sweats, and weight loss, are rare.

Due to the indolent course, lymphoma of the prostate is often discovered during workup for prostatic adenocarcinoma and/or benign prostatic hyperplasia. Histologically, low-grade prostatic lymphoma appears as patchy lymphoid infiltration of the glands, which may be confused for inflammation from chronic prostatitis. It may also be confused with reactive lymphoid hyperplasia in the presence of pelvic

![Fig. 1. Multiparametric MRI prostate before treatment with ibrutinib (A = T2W, B = DWI). Post-treatment (C = T2W, D = DWI) demonstrates resolution of PIRADS 5 lesions (red arrow) and inguinal lymph nodes (white arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)](image)

![Fig. 2. T2W axial MRI pre-post-treatment with ibrutinib demonstrating resolution of a large left pelvic lymph node (white arrow).](image)
lymph node involvement. Immunohistochemistry and molecular studies confirm the diagnosis, with the presence of CD20+ lymphocytes, with co-expression of CD5, CD43, and/or CD23. However, there should be a relatively higher index of suspicion of SLL of the prostate if the symptoms are concurrent in patients with elevated white blood cell counts or a past history of lymphoma.

Lymphoma of the prostate discovered at the time of prostatectomy is associated with expected long-term survival that is similar to prostate cancer. Overall, prostatic lymphoma may often remain asymptomatic for months or years. Patients can be managed with active surveillance or treated locally to relieve obstructive symptoms. Treatment often does not initiate until the development of systemic symptoms. Treatment options include chemotherapy, radiotherapy, immunotherapy, and stem cell therapy. For those who present with intermediate and high grade prostatic lymphoma, the prognosis is much worse and they are generally treated with chemoradiotherapy.

Due to the rarity of lymphoma of the prostate and the fact that most reported cases are non-contemporary in the era, there have been no dedicated reports to our knowledge on how it appears on mpMRI that is now often used for the work-up of elevated PSA or the evaluation of prostatic adenocarcinoma. Furthermore, there have been no reported cases of resolution of PIRADS lesions following systemic therapy for SLL. We thus, report the first case of SLL appearing as PIRADS 4–5 lesions that were concerning for high-risk prostate cancer. More interestingly, the lesion resolved on subsequent imaging which also has never been previously reported.

Conclusion

To our knowledge, this is the first case of SLL appearing as a PIRADS

Fig. 3. (A) H and E staining of prostatic biopsy showing diffuse moderate lymphoid aggregate consisting of monotonous small and mature lymphocytes. Immunohistochemistry staining positive (B) CD 5 and (C) CD 19, confirming the diagnosis of prostatic lymphoma.