Prostate primary intravascular large B-cell lymphoma: A case report

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ABSTRACT

Intravascular large B-cell lymphoma (IVLBCL) is an aggressive and disseminated disease with the presence of large lymphoma cells in the lumina of small vessels, especially capillaries. The lesion may involve several tissues or organs and various symptoms may occur in patients. Primary lymphoma of prostate is a rare condition that only accounts for 0.09% of all prostate neoplasms and 0.1% of all non-Hodgkin’s lymphoma (NHL). Prostate involvement of IVLBCL is extremely rare and was described in only a few case reports. In this study, we report a case of prostate IVLBCL in a 76-year-old male patient who was admitted with symptoms of severe lower urinary tract obstruction. IVLBCL was diagnosed based on histopathological and immunohistochemical examination of the precise tissue specimens though transurethral prostate resection. Awareness and accurate diagnosis are very important to guide the clinicals in formulation of diagnosis and treatment plan.

1. Introduction

Intravascular large B-cell lymphoma (IVLBCL) is an aggressive and disseminated disease with the presence of large lymphoma cells in the lumina of small vessels, especially capillaries. The lesion may involve several tissues or organs and various symptoms may occur in patients. Primary lymphoma of prostate is a rare condition that only accounts for 0.09% of all prostate neoplasms and 0.1% of all non-Hodgkin’s lymphoma (NHL). Prostate involvement of IVLBCL is extremely rare and was described in only a few case reports. In this study, we report a case of prostate IVLBCL in a 76-year-old male patient who was admitted with symptoms of severe lower urinary tract obstruction. IVLBCL was diagnosed based on histopathological and immunohistochemical examination of the precise tissue specimens though transurethral prostate resection. Awareness and accurate diagnosis are very important to guide the clinicals in formulation of diagnosis and treatment plan.

2. A case report

A 76-year-old Chinese man was admitted to the urology department for 5 years of progressive dysuria, aggravated by 1 month. Previously in good health, he has no past or family history of prostate cancer or any other malignant tumors. When comes to the physical examination, the central sulcus of the prostate disappears, the texture is tough and hard, and there are no obvious nodules and tenderness by digital anorectal examination, which indicated severe prostatic hyperplasia; then the remaining physical examination found no abnormalities, such as erythematous or nodular skin lesions, superficial lymphadenopathy, hepatosplenomegaly or systemic lymphoid lesions were found on the systemic examination. and so on. Laboratory test findings showed a normal count of erythrocytes and white blood cells. Prostate-specific antigen (PSA) was negative (2.136 ng/mL, normal 0–4 ng/mL), and lactate dehydrogenase (LDH) was slightly elevated (309 U/L, normal 109–245U/L).

Ultrasound detection indicated prostatic hyperplasia with a size of 6.3cm × 5.6cm × 5.9cm, and no obvious abnormal echo was detected. According to the physical examination and imaging study, a tentative diagnosis of prostatic hyperplasia was made. Transurethral resection of the prostate (TURP) was performed at the 5th day since admission.

Interestingly, there were new findings by histology detection: abundant hyperplastic atypical lymphoid cells were found in dilated small vessels of the interstitium (Fig. 1A), the tumor cells were large and had rough and deep-staining chromatin in irregular shaped nuclei, nuclear vacuoles and prominent nucleoli; high mitosis and fibrin thrombus were seen (Fig. 1B & C). CD34 and CD31 were positive expressed in endothelial cells (Fig. 1D), highlighting the intravascular nature of the neoplastic infiltration. Then, further immunohistochemistry results showed that the tumor cells were positive for indexes of CD20, CD19, CD5, MUM-1, C-myc and Bcl-2(Fig. 2A), but were negative for the indexes of CD3, CD30, CD10, bcl-6, Cyclin-D1 and EMA (Fig. 2B). C-myc was expressed in 40%–60% of the lymphoma cells and the Bcl-2 was expressed in 80% of them (Fig. 3A and B). The proliferative index
**Fig. 1.** Intravascular large B-cell lymphoma pathological features. A) The atypical lymphoid cells in dilated small vessels of the Interstitium, HE, 10×. B) The tumor cells are medium to large in size and have rough and deep-staining chromatin in irregular shaped nuclei, HE 40×. C) Fibrinous thrombus is seen in lumen, HE, 20×. D) CD31 expression in endothelial cells indicates the intravascular nature of neoplastic infiltrate 20×.

**Fig. 2.** Immunohistochemical staining to analyze the origins of intravascular large B-cell lymphoma prognostic indicators. A) The tumor cells filling the vessels are strongly positive for CD20, 20×. B) The tumor cells were negative for CD3, 20×.

**Fig. 3.** Immunohistochemical staining of intravascular large B-cell lymphoma prognostic indicators. A) C-myc expression (+, 40-60%), 20×. B) Bcl-2 expression (+, 80%), 20×. C) Ki67 staining shows a high proliferation index in neoplastic cells, 20×.
demonstrated by Ki-67 staining was about 90% (Fig. 3C). EBER showed negative result which was accord with the features of IVLBCL. In total, the final diagnosis was prostate primary IVLBCL, non-german center B cell (non-GCB), with double positive expression of Bcl-2 and C-myc.

Unfortunately, the patient refused to receive further treatment and was discharged at his request, and died from the disease 6 months after diagnosis.

3. Discussion

Most IVLBCL patients have no abnormal findings in peripheral blood and bone marrow puncture examination at the early stage of the disease, so early diagnosis is extremely difficult, and misdiagnosis is common.

IVLBCL generally does not form solid tumors, so imaging has no special manifestations. CT examination of lung lesions can be manifested as ground-glass interstitial lesions; MRI of craniocerebral lesions has the characteristics of long T1 and long T2 signals. Some researchers insisted that PET-CT is helpful for identifying potential lesions. There are no significant abnormalities on laboratory tests, and some patients are accompanied by a mild increase in LDH, normal PSA and f-PSA, which were consistent with the reported cases in this study.

In this study, the just male patient only had complaints indicating lower urinary tract symptoms, and then the routine ultrasound examination of the lower urinary tract were carried out and got the critical result of enlargement in prostatic dimensions, and finally the patient accept the logical p-TUR surgery treatment. In addition, he had an abnormally increased LDH serum level, which was consistent with the previous reports but lack of specificity. The diagnosis of prostate primary IVLBCL was established based on histopathological character and immunophenotype of the biopsy. The combination of cytomorphology and immunohistochemical staining is helpful for the diagnosis of IVLBCL.

IVLBCL needs to be differentiated from the following diseases: (1) Intravascular metastatic tumors: there is often a history of primary disease, the surface of the tumor thrombus is covered with intact vascular endothelium, or it adheres to the blood vessel wall, and the tumor cell-related markers are positive. (2) Intravascular NK/T cell lymphoma: 85–90% of intravascular lymphomas are B cell lymphomas, NK/T cell lymphomas are rare, and the results of immunological markers and TCR gene molecular rearrangement tests are helpful for the identification of the two diseases. (3) Vascular tumors: The proliferated blood vessels grow lobulated or anastomoses into labyrinth-like, without atypical lymphoid cells adhering or gathering in the vascular cavity. Currently, CHOP combined with Rituximab is commonly used for treatment, which can improve the complete response rate and prolong survival. Early diagnosis and treatment directly affect prognosis. PET-CT examination and biopsy are beneficial to early diagnosis when symptoms are not typical. Unfortunately, in this case of prostate primary IVLBCL, the patient refused treatment and died 6 months after diagnosis.

4. Conclusion

Prostate primary IV LBCL is extremely rare and is clinically difficult to be distinguish from benign prostatic hyperplasia as it presents with the similar obstructive urinary symptoms. Thus, the biopsy of the prostate by prostatectomy is very important in the diagnosis and removal of the original lesion of primary prostate lymphoma. Earlier diagnosis and appropriate treatment may improve the patient’s total survival time and life quality. Due to the rarity of the disease, there is no unified treatment standards, and chemotherapy is the preferred choice for treatment. Its pathogenesis and more effective treatment plan need to be further studied.

Statement of ethics

The patient has given his written informed consent to publish his case (including publication of images).

Authors contributions

Literature search and original draft of the manuscript were prepared by Lijuan Gu and Menghui Li. The clinical and pathological input were contributed by Guizhen Tong, Wei Wei, Yonghong Fan and Yongzhe Zhao respectively. All authors approved the final version of the manuscript and take responsibility for the statements in the article.

Declaration of competing interest

The authors declare no conflict of interests.

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