Int J Clin Exp Pathol 2018;11(8):4153-4157
www.ijcep.com /ISSN:1936-2625/IJCEP0073257

Case Report

No significant risk of secondary prostatic cancer in a patient with prostatic malakoplakia after a four-year follow-up

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Received January 22, 2018; Accepted April 10, 2018; Epub August 1, 2018; Published August 15, 2018

Abstract: Malakoplakia is a rare granulomatous inflammatory condition, which is usually mistaken as malignant because prostatic malakoplakia can cause the formation of a prostatic mass and thickening of the bladder wall. The diagnosis of malakoplakia requires a histopathologic examination and is strongly supported by the presence of Michaelis-Gutmann bodies. It has been reported that malakoplakia of the prostate (prostatic malakoplakia) may be accompanied by a tumor. We report a case of malakoplakia which was initially diagnosed as prostate carcinoma but revised based on a perineal biopsy. We did not find prostate carcinoma with a 4 year follow-up.

Keywords: Malakoplakia, prostate-specific antigen, prostatic malignancy, follow-up

Introduction

Malakoplakia is a rare granulomatous inflammatory condition, which may involve all organs/systems of the body. The urogenital tract is most frequently involved, followed by the liver, central nervous system, thyroid, lungs and gastrointestinal tract [1-5]. The pathogenesis of malakoplakia is not fully understood. Malakoplakia may be caused by chronic infection or immunodeficiency. The diagnosis of malakoplakia requires a histopathologic examination, which is strongly supported by the presence of Michaelis-Gutmann (M-G) bodies [6, 7]. Prostatic malakoplakia is usually mistaken for malignancy because prostatic malakoplakia can cause the formation of a prostatic mass and a thickening of the bladder wall [8]. It has been reported that malakoplakia of the prostate may be accompanied by a tumor [9, 10]. Here we report a case of malakoplakia which was initially diagnosed as prostate carcinoma but revised based on a perineal biopsy. The patient was followed for 4 years.

Case report

A 43-year-old man presented to our hospital for evaluation of fevers for > 2 days in October 2013. The patient had hypertension. The laboratory tests revealed a high inflammatory index, with a leukocyte count of 14×10^9/L, a platelet count of 2.1 μg/mL, and a C-reactive protein (CRP) level of 150 ng/mL. Blood and urine cultures were negative.

The patient's temperature returned to normal after the administration of meropenem. We further found that the prostate-specific antigen (PSA) level was as high as 148 ng/mL. Pelvic ultrasonography revealed prostatic hypertrophy and a mass (**Figure 1**).

A urologist diagnosed the patient with prostate cancer and recommended surgery; however, we believed there was a co-existing bacterial infection because the fever symptom resolved, and the elevated inflammatory markers returned to normal after the antibiotic treatment (**Figure 2**). The PSA level decreased to 48 ng/mL after 6 days of antibiotics. Therefore, the patient was treated with meropenem for 1 month, and then discharged from the hospital. The patient had a recurrent fever 3 days after discharge. During the second hospital stay, a prostate magnetic resonance image (MRI) revealed a prostate tumor. After

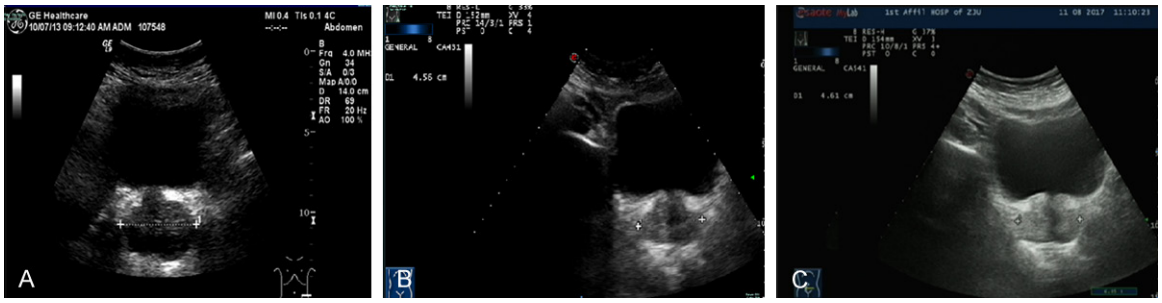

Figure 1. Prostate ultrasonography after a four-year follow-up. A: Prostate ultrasonography at the time of admission: prostate ultrasonography reveals prostatic hypertrophy and mass; B: Prostate ultrasonography after 1 year of follow-up: prostatic hypertrophy; C: Prostate ultrasonography after 4 years of follow-up: prostatic hypertrophy.

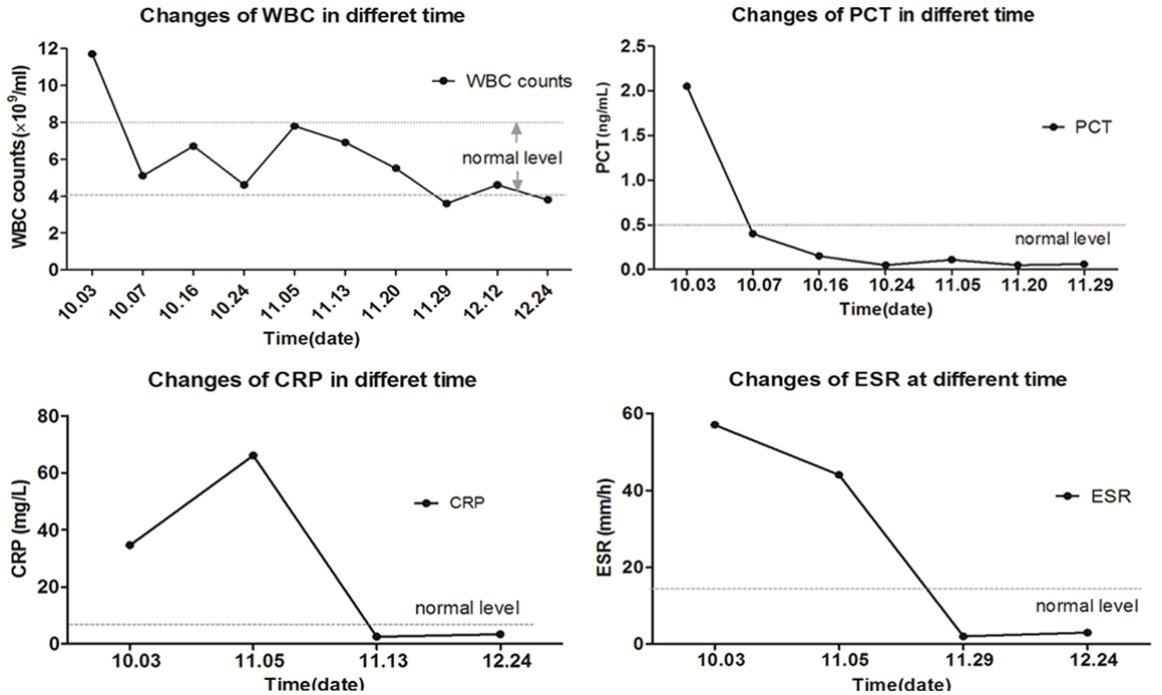

Figure 2. Longitudinal levels of inflammatory parameters after antibiotic treatment.

normalization of the patient's temperature for 7 days with antibiotic treatment, the patient underwent a perineum ultrasound-guided, 14 quadrant needle biopsy of the prostate.

The histopathologic examination found the presence of M-G bodies, which led to the diagnosis of malakoplakia (**Figure 3**). HE and special staining of PAS for M-G body were positive (**Figure 3A** and **3B**). Immunohistochemically, the staining of CD20 and CD68 for M-G bodies were positive (**Figure 3C** and **3D**), and negative for markers of CK and S-100 (**Figure 3E** and **3F**). Antibiotic treatment continued for an additional month. During treatment, the patient's temperature and PSA level returned to normal (**Figure 4**).

Four years later, we re-evaluated the patient, and he did not demonstrate any evidence of prostate tumor. The free to total ratio (f/t) PSA had returned to normal (**Figure 4**). Pelvic ultrasonography revealed prostatic hypertrophy (**Figure 1**).

This present study was approved by the Ethics Committee of the First Affiliated Hospital, School of Medicine of Zhejiang University. And all procedures were in accordance with the Helsinki Declaration. The patient provided writ-

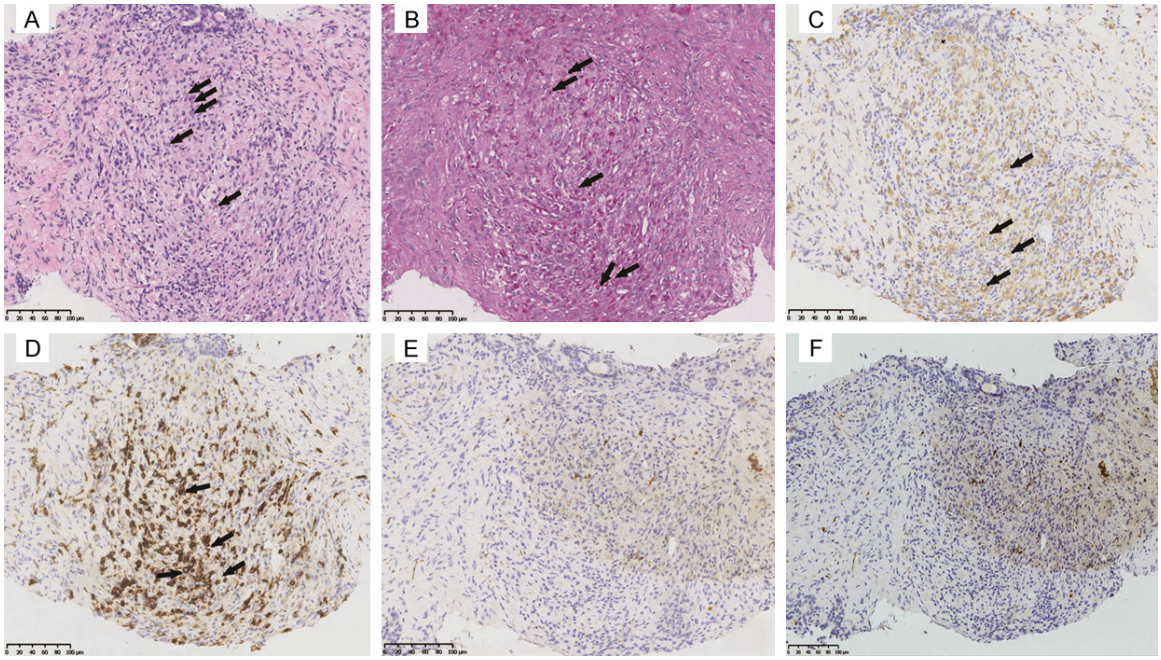

Figure 3. The histiocytes are scattered with M-G bodies, which exhibit a granular-to-finely vacuolated eosinophilic cytoplasm with small blue calcospherites. A: HE staining for M-G bodies (20×20). B: Special staining of PAS for M-G bodies (20×20). C: Immunohistochemical staining of CD20 for M-G bodies (20×20). D: Immunohistochemical staining of CD68 for M-G bodies (20×20). E: Immunohistochemical staining of CK for M-G bodies (20×20). F: Immunohistochemical staining of S-100 for M-G bodies (20×20).

ten informed consent for publication of his medical information and pictures.

Discussion

Malakoplakia is a rare, chronic, granulomatous disease, which may be secondary to an alteration in the bacterial phagocytic system. Malakoplakia was first described by Michaelis and Gutmann in 1902 [11]. Prostatic malakoplakia was described in 1959 [1]. Malakoplakia may co-exist with infections because 80%-90% of such patients are shown to be positive for Escherichia coli and Klebsiella pneumoniae by urine culture and some patients may have viral infections [7]. The definitive diagnosis of this disease requires a histopathologic examination. M-G bodies within von Hansemann macrophages are a hallmark of malakoplakia. The diagnosis of malakoplakia is sometimes difficult because the M-G bodies can go undetected. In such situations, extensive sectioning is helpful to identify classic M-G bodies. And extensive sectioning and immunohistochemical detection of the M-G bodies are required to diagnose this disease with positive staining of CD20 and CD68 [1, 11]. In our patient, the histopathologic examination found the presence of M-G bodies, and HE and special staining of PAS for M-G bodies were positive (**Figure 3A** and **3B**). Immunohistochemically, the staining of CD20 and CD68 for M-G bodies were positive (**Figure 3C** and **3D**), but negative for markers of CK and S-100 (**Figure 3E** and **3F**).

Treatment for malakoplakia depends on the extent of the disease and the anatomic site of involvement [2]. Malakoplakia may require combination antibiotic therapy for a prolonged duration, and combining this therapy with surgery is sometimes necessary [1]. The pathogens are susceptible to vancomycin, imipenem, erythromycin, rifampin, and ciprofloxacin, but may be resistant to penicillin G and ampicillin [2]. Gorgel et al. reported that the use of ceftazidime (2 g three times daily for 7 days) was curative [12]. In our case, the patient underwent > 1 month of treatment, but relapsed after the antibiotics were discontinued. Therefore, the duration of antibiotic therapy should be prolonged to > 1 month, which is in agreement with other reports [2, 7].

The PSA level is frequently increased in patients with prostatic malakoplakia; however, it rapidly decreases after effective antibiotic tre-

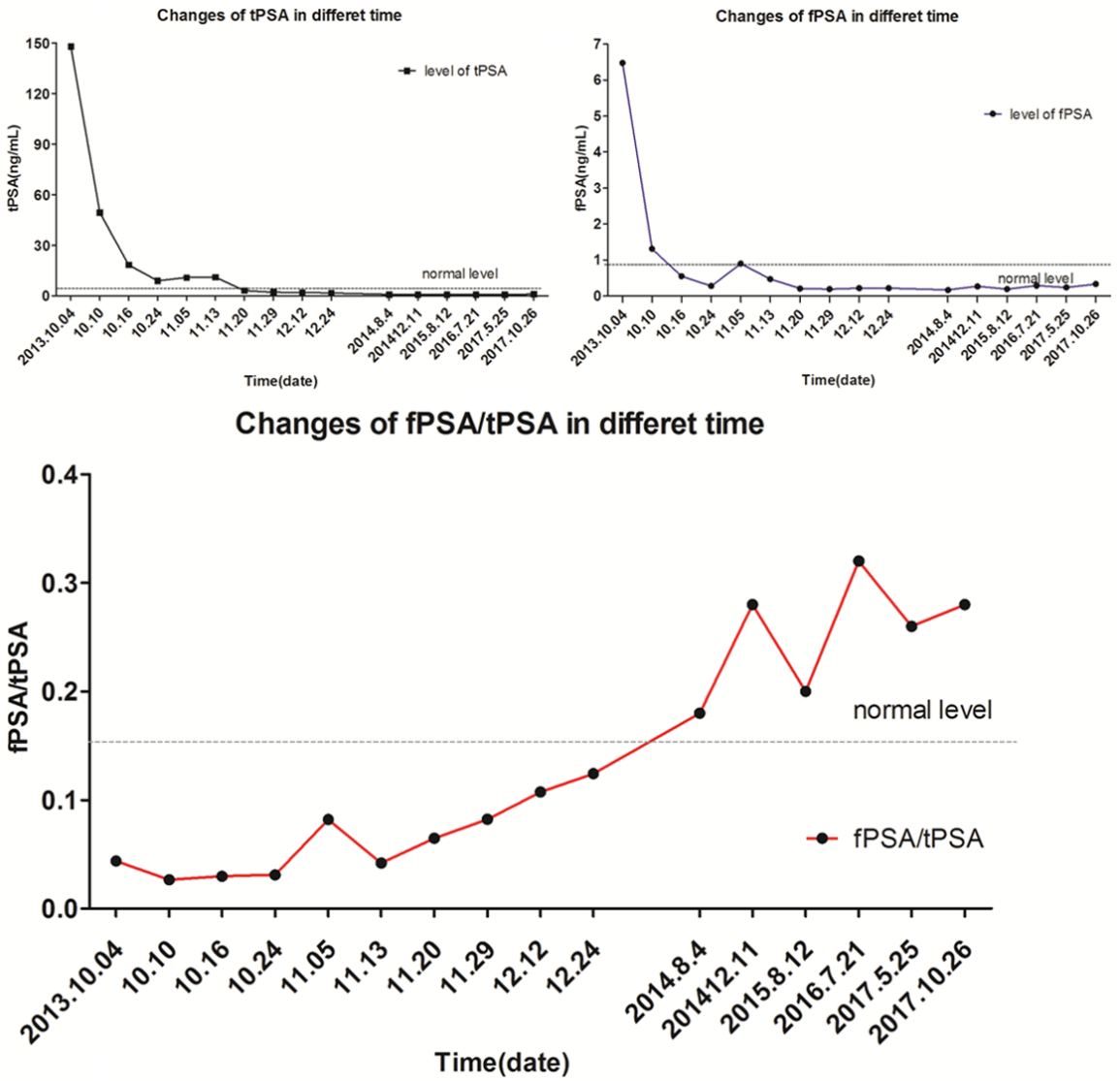

Figure 4. Longitudinal levels of of tPSA and fPSA, and the tPSA-to-fPSA ratio after antibiotic treatment.

atment. The low ratio of fPSA-to-tPSA (< 0.15) persists, even after resolution of the inflammation. It has been reported that a low ratio of fPSA-to-tPSA is associated with an increased risk of prostate cancer [13]. The case reported herein shows that malakoplakia of the prostate may co-exist with a tumor [9]. Based on our long-term follow-up, no occurrence of prostatic cancer was observed.

In conclusion, prostatic malakoplakia is a rare disease in clinical practice. Prostatic malakoplakia is easily misdiagnosed as prostate cancer. Malakoplakia should be suspected in patients with fevers and a prostate mass, especially when symptoms are improved by antibiotic therapy. Typical M-G bodies are strong evidence in support of a diagnosis of prostate malakoplakia. Prolonged antibiotic therapy is required for treatment of prostate malakoplakia. No significant risk of secondary prostatic cancer has been observed in the patient described herein to date.

Acknowledgements

This work was supported by grants from the National Natural Science Foundation of China (No.81500464 and 81670567).

Disclosure of conflict of interest

None.

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