CASE REPORT

Case Report: Xanthogranulomatous prostatitis, a difficult differential diagnosis of prostate adenocarcinoma [version 1; peer review: 2 approved with reservations]

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Abstract

Background: Xanthogranulomatous prostatitis is a rare benign inflammatory process of the prostate. Clinical, biochemical and imaging similarities make xanthogranulomatous prostatitis a difficult differential diagnosis of prostatic adenocarcinoma.

Case presentation: We report the case of a 62 year-old diabetic patient, with 3 months of lower urinary tract symptoms. On digital rectal examination, the prostate was hard and nodular. Initial prostate-specific antigen (PSA) was 43.97 ng/mL, with urine analysis and transabdominal ultrasonography not showing any alterations. A multiparametric magnetic resonance imaging (mpMRI) of the prostate was performed and showed two foci that were classified as PI-RADS 4 lesions. A transrectal ultrasound guided prostate biopsy was then realized. After an initial suspicion of prostatic adenocarcinoma, on clinical, biochemical and radiological grounds, histopathological examination revealed a suppurated xanthogranulomatous prostatitis, with no evidence of malignancy.

Conclusions: Xanthogranulomatous prostatitis is an uncommon benign inflammatory condition of the prostate that can clinically, biochemically and even radiologically simulate prostatic adenocarcinoma. We advise that if an older male with low urinary tract symptoms and a hard nodular prostate on digital rectal examination presents, the first diagnosis that one should think of is prostate adenocarcinoma, especially if PSA is high. However, only histopathological examination can differentiate with certitude between these two pathologies and is therefore essential for the diagnosis of xanthogranulomatous prostatitis.

Keywords

Xanthogranulomatous, Prostatitis, Adenocarcinoma

Open Peer Review

Approval Status

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Any reports and responses or comments on the article can be found at the end of the article.

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Author roles: **El Moussaoui R:** Conceptualization, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **El Moussaoui A:** Investigation, Resources, Supervision, Validation; **Dakir M:** Supervision, Validation; **Benkirane A:** Investigation, Resources

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Introduction

A variety of benign conditions of the prostate can clinically mimic prostatic adenocarcinoma, thus raising a diagnostic problem. Xanthogranulomatous prostatitis, a rare form of non-specific granulomatous prostatitis, is considered among those pathologies that can clinically, biochemically and even radiologically behave as a prostate carcinoma^{1,2}. Symmers was the first author to mention this disease in 1950³, while Miekoś *et al.* produced the first case report in Poland in 1986^{4,5}. Very few similar cases have since then been described in the literature.

We report an additional case of a patient with initial clinical suspicion of prostatic carcinoma, but whose histopathological report revealed a xanthogranulomatous prostatitis.

Case report

The patient is a 62 year old diabetic male, with no particular medical history, whose main symptoms started 3 months ago with urinary incontinence, increased urinary frequency and urgency, alongside haematuria. The patient also had micturition burning, which came with a recent onset of fever. Digital rectal examination (DRE) was indolent and revealed an asymmetric and enlarged prostate, with a hard fixed nodule on the right lobe. The patient's general physical examination was normal, and revealed no alterations of the penis, the testicles or the epididymis. A prostate-specific antigen (PSA) test was performed

and showed an increase in serum PSA level that reached 43.97 ng/ml (normal level <4 ng/ml). Urine analysis were within normal limits with no growth in urine culture. A transabdominal ultrasonography showed a normal upper renal tract and a normal bladder wall, with a post-micturition residual volume of 48.21 ml. Transrectal ultrasound (TRUS) was not performed, as it was too painful for the patient to sustain. From the clinical, radiological and biochemical data, a locally advanced prostate carcinoma was suspected. A multiparametric magnetic resonance imaging (mpMRI) of the prostate was then performed. The MRI showed an enlarged prostate, with an estimated weight of 51 grams. Two foci were found (Figure 1), which were classified as PI-RADS 4 lesions, thus requiring histological examination. There was no infiltration of the peri-prostatic fat.

A TRUS guided prostate biopsy was then performed. A systematic 12-core prostate biopsy was realized, alongside three more core samples on zones that were found suspicious on the MRI images. Histological examination of the 15 needle biopsy core samples showed glandular atrophy, fibrosis, and an accumulation of inflammatory cells including polymorphs with eosinophils and neutrophils, with prostatic abscess, as well as the presence of foamy macrophages (lipid-laden histiocytes), also known as xanthoma cells (Figure 2). Tissue cultures and immunohistochemistry tests were not performed.

Figure 1. MRI showing two foci. (a) The first focus, of 18 mm, was located in the central zone of the prostate, in the right posterolateral region (blue arrow), with a low signal intensity on T2-weighted images. **(b)** The other focus was a 22 mm nodule located in the transitional zone of the prostate (blue arrow). Both were classified as PI-RADS 4 lesions.

Figure 2. Microscopic views of the needle biopsy samples. (a) Prostatic parenchyma with abscess and a polymorph inflammatory infiltrate of neutrophils. **(b)** Xanthomatous infiltrate with foamy histiocytes, with no evidence of malignancy.

The histopathological examination concluded a suppurated xanthogranulomatous prostatitis, with no evidence of malignancy.

Conservative treatment was chosen, and the patient was given Ciprofloxacin for 4 weeks (500mg, twice a day). After three months, a PSA test was performed, and showed a significant decrease in PSA that reached 7.27 ng/ml (compared to the initial 43.97 ng/ml). A transabdominal ultrasonography showed a decrease in prostate volume, with an estimated prostate weight of 31 grams (versus 51 grams previously). A close follow-up will be needed for this case, with a clinical and biochemical check-up every trimester, until PSA levels are within normal limits (<4 ng/ml).

Discussion

Benign conditions that mimic prostate carcinoma have been divided into six groups⁵, among them, inflammatory diseases. Granulomatous prostatitis is an unusual prostatic entity that was first described by Tanner and McDonald in 1943⁶ and classified in 1984 by Epstein and Hutchin⁷ into five groups, based on aetiology and histopathology: idiopathic (non-specific), infectious (specific), malakoplakia, iatrogenic, and cases associated with systematic diseases and allergy^{3,7,8}. Infectious agents that have been encountered in specific granulomatous prostatitis are *Mycobacterium tuberculosis*, *Treponema pallidum*, as well as some fungi and viruses^{3,8}. Specific granulomatous prostatitis may also be due to intravesical Bacillus Calmette-Guerin (BCG) therapy for bladder cancer⁸. Xanthogranulomatous prostatitis is an uncommon form of non-specific granulomatous prostatitis. The aetiology of xanthogranulomatous prostatitis is still unclear; it has been often associated with hyperlipidemia (in our case, the patient had no history of hyperlipidemia) or recurrent urinary tract infection⁸, although some authors have considered that it might be caused by an autoimmune disease with a HLA-DR15-linked T-cell response against proteins in prostatic secretions^{4,9,10}. Bostwick and Chang brought the theory of ductal obstruction, speculating that blockage of prostate ducts and stasis of secretions cause cellular debris, bacterial toxins, prostatic secretions, sperm, and semen to escape into the stroma through the destroyed epithelium, eliciting a localized inflammatory response^{4,9,10}.

Xanthogranulomatous inflammation occurs very rarely in the prostate. It is vastly known in the kidneys and gallbladder, and has been described in other anatomic sites, such as the mandible, retro peritoneum, third ventricle, choroid plexus, orbit, vagina, lung, stomach, pericardium, and ovary¹⁰. Less than 20 cases have been reported in the literature since its first description^{4,9} with a similar case of suppurated xanthogranulomatous prostatitis recently discovered also in Morocco⁹.

Histologically, the typical lesion in granulomatous prostatitis is a large inflammatory nodular infiltrate of epithelioid histiocytes, plasma cells, lymphocytes and sometimes polymorphs with eosinophils^{5,9,11}. The specific and distinctive feature of xanthogranulomatous prostatitis is the presence of foamy macrophages (lipid-laden histiocytes), also known as xanthoma cells^{5,9,11}. Immunohistochemistry tests reveal T-lymphocytes in close association with damaged epithelium while B-lymphocytes occur in a more peripheral location or form

follicular structures^{9,11}. The presence of xanthoma cells may cause diagnostic confusion with high-grade prostatic carcinoma^{3,9,12}, especially with the hypernephroid pattern of prostate carcinoma (Gleason 4B)³, as well as clear cell carcinoma¹². A panel of immunohistochemistry tests, such as cytokeratin, PSA, prostatic acid phosphatase (PAP), leukocyte common antigen (LCA) and CD68 can be useful in differentiating between these two conditions, by showing results more consistent with an inflammatory process^{3,9,11}. Those tests were not performed in our case, as the foamy macrophages were judged sufficient for the histopathological diagnosis of this condition.

In our case, even though all the signs were pointing towards prostate adenocarcinoma, we decided not to rush the diagnosis. Multi-parametric MRI was very helpful, as it allowed us to locate the suspicious foci. We decided then to perform a 15-core needle biopsy, rather than the systematic 12-core biopsy that is usually performed for prostate carcinoma, to increase our chances of finding pathological cells.

Xanthogranulomatous prostatitis causes serious confusion with prostate carcinoma when it comes to diagnosis. It occurs usually in elderly men, usually in the sixth decade^{3,8}. In most cases, xanthogranulomatous prostatitis is diagnosed incidentally on TURP chips or needle biopsy^{3,8,9}. Clinically, the symptoms are either those of urinary obstruction, with low urinary tract symptoms, or severe low urinary tract infection symptoms. Two recent studies have shown that the most encountered symptoms were increased urinary frequency and urgency, sometimes with dysuria, micturition burns, haematuria and urinary incontinence^{3,8}. Few episodes of fever and chills have been reported⁸. On DRE, it is difficult to distinguish from prostate carcinoma, as the prostate feels hard and nodular^{3,8}. In some cases, DRE finds an asymmetry or an enlargement of the prostate. In addition, xanthogranulomatous prostatitis may cause a transient increase in serum PSA level, which decreases with a resolution of the inflammation^{4,9,11}. In some cases, PSA serum levels reach 150 ng/ml¹¹. In our case, PSA decreased from 43.97 ng/ml to 7.27 ng/ml in the space of 3 months. Furthermore, no imaging (TRUS, MRI) can differentiate between xanthogranulomatous prostatitis and prostate adenocarcinoma, given the radiological similarities, and the absence of a specific feature of xanthogranulomatous prostatitis^{1,2}. In a recent study, it has been shown that 63.6% of patients with PI-RADS (V2) 4 lesions who underwent transrectal biopsy were diagnosed with prostate cancer¹³. Hence, the only way to differentiate between these two conditions is histopathological examination.

Xanthogranulomatous prostatitis can occur in a normal gland, nodular hyperplastic gland or carcinomatous prostate. It is mostly located in the peripheral or transitional zone^{3,8}. In some cases, xanthogranulomatous prostatitis can co-exist with prostate carcinoma^{3,8,11}.

Unlike prostatic adenocarcinoma, conservative management is the rule for xanthogranulomatous prostatitis^{8,9}. Inflammation is often self-limiting and resolves slowly over time. Surgical management may be considered if there is failure of conservative treatment, and might be needed in case of severe

low urinary tract symptoms or due to occurrence of complications that may require radical prostatectomy^{4,9,10}. However, surgical treatment of xanthogranulomatous prostatitis can lead to complications like vesical neck contraction, and might require repeated resections¹².

Long-term follow-up is needed for patients with xanthogranulomatous prostatitis, as they require a regular clinical and biochemical check-up. MRI in xanthogranulomatous prostatitis follow-up is not required, but it might be necessary if DRE remains suspicious, or if there is no decrease in PSA serum levels. In addition, benign prostatic hyperplasia and prostatic adenocarcinoma can still occur in patients who previously dealt with xanthogranulomatous prostatitis^{3,8,11}, thus making long-term follow-up inevitable.

Conclusion

Xanthogranulomatous prostatitis is an uncommon inflammatory pathology that can mimic prostatic carcinoma both

clinically and/or biochemically. Furthermore, no radiological features can help differentiate between these two conditions. Precise histopathological examination is essential for the final diagnosis of xanthogranulomatous prostatitis.

Given clinical, biochemical and imaging similarities with prostatic carcinoma, as well as the rare nature of this condition, patients with xanthogranulomatous prostatitis raise a major diagnostic issue. Conservative treatment is the rule, with long-term follow-up needed, especially in patients with persisting elevated serum PSA values.

Consent

Written informed consent was obtained from the patient for the publication of this case report and accompanying images.

Data availability

All data underlying the results are available as part of the article and no additional source data are required.

References

1. Kitzing YX, Prando A, Varol C, *et al.*: **Benign Conditions That Mimic Prostate Carcinoma: MR Imaging Features with Histopathologic Correlation.** *Radiographics*. 2016; **36**(1): 162–75.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
2. Lee SM, Joshi J, Wolfe K, *et al.*: **Radiologic presentation of chronic granulomatous prostatitis mimicking locally advanced prostate adenocarcinoma.** *Radiol Case Rep*. 2016; **11**(2): 78–82.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
3. Shukla P, Gulwani HV, Kaur S: **Granulomatous prostatitis: clinical and histomorphologic survey of the disease in a tertiary care hospital.** *Prostate Int*. 2017; **5**(1): 29–34.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
4. Miekoś E, Włodarczyk W, Szram S: **Xanthogranulomatous prostatitis.** *Int Urol Nephrol*. 1986; **18**(4): 433–437.
[PubMed Abstract](#) | [Publisher Full Text](#)
5. Noyola A, Gil JF, Lujano H, *et al.*: **Xanthogranulomatous Prostatitis, a Rare Prostatic Entity.** *Urol Case Rep*. 2017; **10**: 4–5.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
6. Tanner FH, McDonald JR: **Granulomatous prostatitis: a histologic study of a group of granulomatous lesions collected from prostate glands.** *Archives of Pathology and Laboratory Medicine*. 1943; **36**: 358–370.
7. Epstein JI, Hutchins GM: **Granulomatous prostatitis: distinction among allergic, nonspecific, and post-transurethral resection lesions.** *Hum Pathol*. 1984; **15**(9): 818–825.
[PubMed Abstract](#) | [Publisher Full Text](#)
8. Kumbhar R, Dravid N, Nikumbh D, *et al.*: **Clinicopathological Overview of Granulomatous Prostatitis: An Appraisal.** *J Clin Diagn Res*. 2016; **10**(1): EC20–EC23.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
9. Jabbour Y, Lamchahab H, Harrison S, *et al.*: **Prostatic Abscess on Xanthogranulomatous Prostatitis: Uncommon Complication of an Uncommon Disease.** *Case Rep Urol*. 2018; **2018**: 5417903.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
10. Xing L, Liu Z, Deng G, *et al.*: **Xanthogranulomatous prostatitis with prostatic fistula: a case report and review of the literature.** *Res Rep Urol*. 2016; **8**: 165–168.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
11. Rafique M, Yaqoob N: **Xanthogranulomatous prostatitis: a mimic of carcinoma of prostate.** *World J Surg Oncol*. 2006; **4**.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
12. Punia R, Amanjit, Mohan H, *et al.*: **Granulomatous Prostatitis – an infrequent diagnosis.** *Indian J Urol*. 2002; **19**(1): 16–19.
[Reference Source](#)
13. D'Agostino D, Mineo Bianchi F, Romagnoli D, *et al.*: **Comparison between "In-bore" MRI guided prostate biopsy and standard ultrasound guided biopsy in the patient with suspicious prostate cancer: Preliminary results.** *Arch Ital Urol Androl*. 2019; **91**(2).
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Nausheen Yaqoob

Consultant and Head of Section of Histopathology, The Indus Hospital, Karachi, Pakistan

1. High Power magnification pictures of xanthogranulomatous areas are required.
2. References are very old. References should be refreshed with recent references within last 5 years. (Reference no 4,6,7).
3. Are you sure only 20 cases are reported to date?
4. Other antibodies like PSAP, NKX3.1 or AMACR were performed?

Is the background of the case's history and progression described in sufficient detail?

Yes

Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?

Partly

Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?

Yes

Is the case presented with sufficient detail to be useful for other practitioners?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Histopathology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 04 February 2020

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Paari Murugan

Department of Laboratory Medicine and Pathology, University of Minnesota, Minneapolis, MN, USA

A fairly well written report with useful, if not novel information. This case is also interesting because the PSA was quite high at over 40 ng/ml. It is imperative to carefully evaluate these cases for prostatic adenocarcinoma. This not only includes the "hypernephroid" pattern (a term that is no longer used) of Gleason grade 4 carcinoma that may mimic xanthomatous inflammation but also typical coexisting adenocarcinoma that may be hard to identify due to large amounts of inflammation and parenchymal distortion. The discussion can also include the fact that multinucleated giant cells are often seen in this condition.

Please perform the corrections recommended below:

- The images should say axial and coronal in Figure 1. Also, please check if the blue arrow in Figure 1b is in the right place.
- The word polymorph can be deleted from Figure 2.
- The pathology image quality should be improved.
- In the discussion, the author name Cheng is spelt wrong and is not referenced.
- It is unclear what the authors refer to as Gleason 4B. This is not used in current practice.
- Clear cell carcinoma should be changed to clear cell renal carcinoma.

Is the background of the case's history and progression described in sufficient detail?

Yes

Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?

Yes

Is sufficient discussion included of the importance of the findings and their relevance to

future understanding of disease processes, diagnosis or treatment?

Yes

Is the case presented with sufficient detail to be useful for other practitioners?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Genitourinary Pathology.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

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