Case report

OPEN ACCESS

When sarcoidosis hits down: a case of prostatic sarcoidosis

Antonio Moretti[1,2,*], Giulia Bruzzi[1,2,*], Dario Andrisani[1,2], Filippo Gozzi[1,2], Matteo Costantini[3], Roberto Tonelli[1,2], Enrico Clini[1,2,§], Stefania Cerri[1,2,§]

[1]Respiratory Diseases Unit and Centre for Rare Lung Diseases, University Hospital of Modena (Italy); [2]Laboratory of Experimental Pneumology, Department of Surgical and Medical Sciences of Mother and Child, University of Modena and Reggio Emilia (Italy); [3]Pathology Unit, University Hospital of Modena (Italy); [*]These authors share first authorship; [§]These authors share senior authorship

ABSTRACT

A 69-year-old North African male with established diagnosis of sarcoidosis underwent a stereotactic prostate biopsy with fusion technique. At the histological analysis, non-necrotizing micro-granulomas were highlighted in 2 samples, while the immunohistochemical staining resulted negative for CK903/p63/racemase. To the best of our knowledge, only 16 cases of prostatic sarcoidosis have been reported in literature. With this case report we describe an incidental diagnosis of prostatic involvement of sarcoidotic disease and briefly review and discuss the available literature on the topic.

Key words: Sarcoidosis, Prostate, Urogenital involvement of sarcoidosis

Introduction

Sarcoidosis is a systemic granulomatous disease that primarily affects the lungs and the lymphatic system [1]. It commonly affects young and middle-aged adults and frequently presents with bilateral hilar lymphadenopathy, pulmonary infiltration, and ocular and skin lesions. The liver, spleen, lymph nodes, salivary glands, heart, nervous system, muscles, bones, and more rarely other organs, may also be involved [1]. In general, the diagnosis is established when clinic-radiological findings are supported by histological evidence of noncaseating epithelioid cell granulomas [1]. The latest international guidelines on treatment of sarcoidosis recommend treating patients either for risk of death and/or permanent disability (danger), or to improve quality of life. However, they do not provide specific indications about the management of urological involvement [2]. Related to the urological system, manifestations of sarcoidosis include nephrolithiasis and nephrocalcinosis, inflammatory infiltration of the tubular interstitium leading to granulomatous interstitial nephritis, sarcoid infiltration of the kidneys resembling renal lymphoma, rare direct bladder, epididymis and testis involvement [3].

Correspondence: Roberto Tonelli, MD, PhD - Respiratory Diseases Unit and Center for Rare Lung Disease - Department of Surgical and Medical Sciences, University Hospital of Modena, Via del Pozzo, 71 - 41125 Modena (Italy). PhD Course Clinical and Experimental Medicine (CEM), University of Modena & Reggio Emilia, Via Università 4 - 41121 Modena (Italy) - E-mail: roberto.tonelli@me.com

Contributions: AM and GB have substantially contributed to the conception and the writing of the present manuscript, therefore they should both be considered as first authors. DA, FG and RT reviewed the literature and collected the data regarding the case. MC produced the figures and edited the section on pathology. EC and SC reviewed and edited the manuscript.

Consent to participate and for publication: The involved subject gave informed consent to participate and patient anonymity has been constantly preserved.

Conflict of interest: All authors declare no conflicts of interest.

Funding: None.

Acknowledgments: None

Although quite rare, sarcoid infiltration in the reproductive tract has been described in autopsies by non-necrotizing micro-granulomas in genitourinary organs in 5% of cases [3].

Little evidence is available about the symptoms, the diagnostic and prognostic features of sarcoid prostate involvement in patients affected by sarcoidosis. With the present case report we aimed to expand the knowledge about this rare clinical occurrence.

Case presentation

A 69-years-old African male with a past medical history of type 2-diabetes, arterial hypertension, chronic kidney failure and retinal maculopathy, was diagnosed with sarcoidosis in 2013 after the incidental finding of hilar lymphadenopathy at chest radiography. Hilar and mediastinal lymph nodes enlargement was confirmed at computed tomography (CT) scan, that showed also pulmonary involvement consisting of bilaterally diffused subpleural and peribronchovascular nodules. Thereafter, the patient underwent bronchoscopy with endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) that lead to the confirmed diagnosis of sarcoidosis. At the time of diagnosis, sarcoid involvement of eyes, skin and heart was excluded. A systemic steroid treatment was initially started in consideration of the diffuse bilateral lung micronodules and lymphadenopathy, being discontinued 1 year later because of poor compliance. After few months, a CT scan showed worsening of nodular subpleural interstitial lung disease, and therefore steroid treatment with methylprednisolone was started again. At a follow up visit in 2015 steroid therapy was stopped because of normal pulmonary function tests and poor treatment compliance.

In July 2020, the patient was admitted to our Respiratory Intensive Care Unit at the University Hospital of Modena (Italy) due to acute respiratory failure following the worsening of sarcoidosis pulmonary involvement, complicated by sepsis.

The patient underwent a full-body CT scan which identified a prostatic inhomogeneous nodule mass and multiple hyperdense spinal lesions. Prostate-specific Antigen (PSA) level was in normal range. A magnetic resonance (MR) of the lower abdomen was performed confirming the presence of a capsulated nodule in the middle prostatic lobe. MR images revealed a heterogeneous signal intensity with good contrast enhancement, colliquating areas within the nodule with haemorrhagic content and small multiple focal lesions of the pelvis bones (Figure 1). A full-body bone scintigraphy was then performed showing inhomogeneous tracer accumulation at the level of dorsal vertebrae, inconsistent with malignant origin.

Pulmonary function tests highlighted a mild non-reversible airflow obstruction. The patient was discharged and was prescribed a 6-month systemic steroid treatment together with inhaled corticosteroids/long acting β_2 agonist, which lead to a complete resolution of sporadic wheezing and dyspnoea. PSA level remained normal during the following 12 months. In December 2021, a stereotactic prostate biopsy with fusion technique was performed; the histological analysis of the 10 collected samples showed gland hyperplasia, lobular atrophy, and a non-specific chronic inflammation. At hematoxylin and eosin staining two non-necrotizing micro-granulomas were highlighted, and the immunohistochemical staining was negative for CK903/p63/racemase (Figures 2 and 3). As a collateral finding, a lithiasic intra-luminal formation was described. Giving the histology, diagnosis of prostatic sarcoidosis was made. Therefore, urologic follow up with PSA measurement after 4 and 8 months was recommended, while the ongoing therapy was left unchanged, due to the absence of symptoms potentially related to sarcoidosis. PSA was within its normal values also 18 months after the biopsy.

Discussion and conclusions

With this case report we described a biopsy-proven prostate involvement of sarcoidosis in a >65-year African male. Only other few cases and autoptic series are reported in literature.

A review by K. Kodama and colleagues reported that among 60 males with sarcoid involvement of reproductive organs, the epididymis was hit in 73%

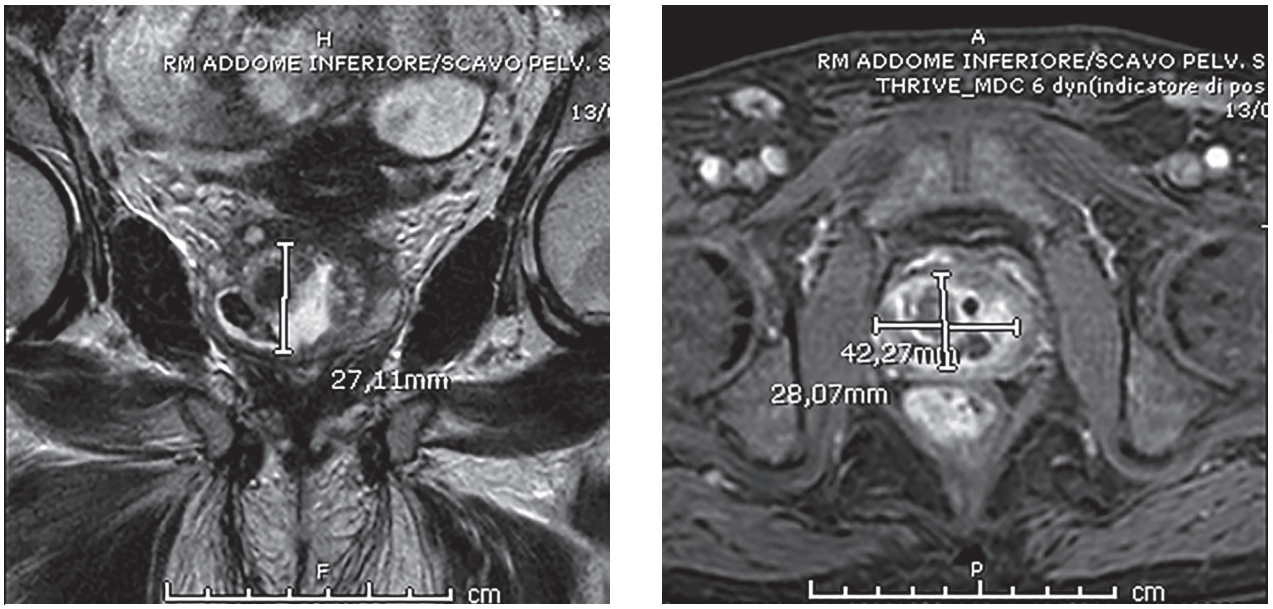

Figure 1. MRI of inferior abdomen and pelvic cavity: nodulation to the middle prostatic lobe, with heterogeneous signal intensity characterized by colliquate areas and areas with haemorrhagic content, having transverse diameters of about 4.2 x 2.8 cm and longitudinal extension of about 2.7 cm. The nodulation appears capsulated, without significant restriction to the evaluation of diffusion but with fair contrast enhancement predominantly peripheral and paramedian left. The peripheral glandular part appears poorly represented from the right side, that is compressed by the described nodulation. The left peripheral glandular part is more represented, with low-intensity focal length in T2 sequences weighed about 3 mm showing restriction of signals to the evaluation of diffusion and discrete contrast enhancement (PIRADS=4).

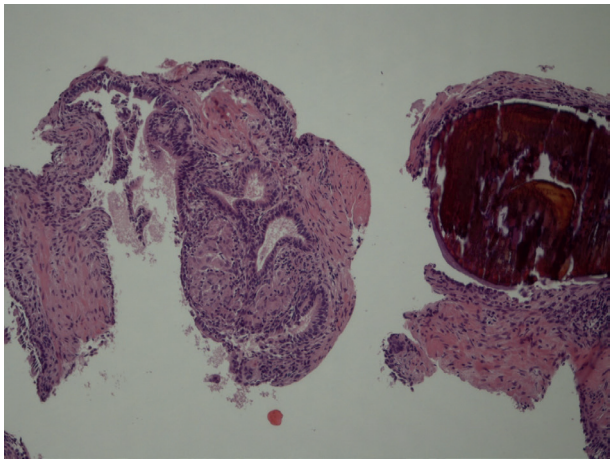

Figure 2. Hematoxylin and eosin stain, 10x magnification: needle biopsy of prostatic tissue with intraluminal calcification, alongside a non-necrotizing microgranuloma next to a normal prostatic gland structure.

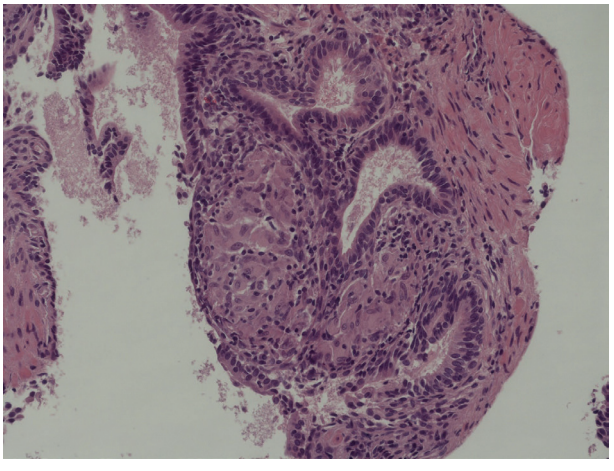

Figure 3. Hematoxylin eosin stain, 20x magnification: same slide with greater magnification on the microgranuloma.

of cases, the testis in 47%, and the spermatic cord and prostate in 3% [4]. As regards sarcoid prostatic involvement, according to the cases reported in literature the average age at diagnosis is 58 years, prevalence is higher in African ethnicity and the peripheral prostatic regions are mostly affected at histology [5].

Three out of the 16 (18.8%) men with histologically confirmed sarcoidosis described in literature suffered from related symptoms, 4 were asymptomatic, while no detailed information at this regard were available for the remaining [6–9].

Little scientific evidence is available as regards the implications of prostatic sarcoidosis on fertility and on risk of local infection. In the case report by A. Osanami and colleagues the patient presented with symptoms similar to prostatitis (urinary retention and fever) and a rapid decline of the renal function. Tests were conducted to exclude other possible autoimmune diseases until a kidney and prostate biopsy confirmed sarcoid infiltration of the prostate and tubulointerstitial nephritis. The patient recovered completely following systemic steroid therapy, thus suggesting the necessity of a prompt and accurate diagnosis of this rare occurrence in order to avoid undesired collateral implications [9].

Moreover, diagnostic imaging seems helpful in diagnosing prostatic involvement of sarcoidosis as described by a mild uptake of prostate at the 18-fluorodeoxyglucose positron emission tomography (18-F FDG PET) [9]. In our case, MR played a key role in the differential diagnosis of prostatic nodularity, suggesting the suspicion of a granulomatous disease. Nonetheless, almost all the reported cases required organ biopsy sampling to confirm diagnosis.

It is also worth mentioning that sarcoid infiltrates of the bone tissue may act as a confounding factor during the staging of prostatic cancer [10]. In such particular cases invasive procedures might be crucial to prove diagnosis.

The histological and imaging findings in our case confirmed the prostatic peripheral areas as the most frequently involved. However, the micro-granulomas found in our sample were localized within the parenchyma, distinguishing the present case from most of the reported ones [5]. Interestingly, the values of PSA remained within normal levels during the 12 months follow up between RM and biopsy, at difference with other reported cases, thus suggesting that PSA may not be a reliable diagnostic marker in the suspicion of prostatic sarcoidosis [5–8]. Such hypothesis is strengthened by the fact that our patient was not affected nor by IPB neither by prostate cancer, two common causes of PSA elevation that might therefore interfere with sarcoidosis as regards the PSA levels. Generally, serum PSA levels vary according to patient age and race. Any process that disrupts the normal architecture, especially the basal cell layer of the prostate, allows diffusion of PSA from prostatic ductal system into the microvasculature. Therefore, elevated serum PSA concentration is seen with acute prostatitis, chronic prostatitis including granulomatous prostatitis-like sarcoidosis, infarcts, hyperplasia, and transiently following biopsy as well as with prostatic adenocarcinoma [7]. Therefore, we can hypothesize that when sarcoid involvement of prostate occurs, PSA levels may be within the normal range in the early stages of local disease and then increase with its progression.

Moreover, our patient has never developed lower urinary tract symptoms (LUTS) before undergoing the prostate biopsy, similarly to the majority of the cases reported in literature. This may be consistent with the normal PSA level in the same period.

As further support to our hypothesis, it should be noticed that the case described by S.K. Mulpuru and colleagues presented elevated PSA levels together with symptoms, possibly meaning a more advanced local involvement [7]; other cases reported with elevated PSA levels had concomitant prostate cancer [6]. Unfortunately, very few reported cases mentioned information on PSA level.

In conclusion, prostate sarcoidosis remains a very rare condition. However, when patients already diagnosed with sarcoidosis complain about LUTS and/or are found with imaging evidence of prostatic enlargement and/or nodular abnormalities, or increased uptake at 18-F FDG PET, sarcoid prostatic infiltration should be considered, regardless of the PSA level. With this clinical scenario, and especially in case of patients of African ethnicity, prostate biopsy may be indicated.

Abbreviations:

CT: Computed tomography
EBUS-TBNA: Endobronchial ultrasound-guided transbronchial needle aspiration
PSA: Prostate-specific antigen
MR: Magnetic resonance
18-F FDG PET: 18-fluorodeoxyglucose positron emission tomography
LUTS: Lower urinary tract symptoms

References

1. Crouser ED, Maier LA, Wilson KC, Bonham CA, Morgenthau, AS, Patterson, KC, et al. Diagnosis and Detection of Sarcoidosis. An Official American Thoracic Society Clinical Practice Guideline. Am J Resp Crit Care 2020;201:e26–51. doi: 10.1164/rccm.202002-0251ST
2. Baughman RP, Valeyre D, Korsten P, Wuyts WA, Wells A, et al. ERS clinical practice guidelines on treatment of sarcoidosis. Eur Respir J 2021;58:2004079. doi:10.1183/13993003.04079-2020
3. La Rochelle JC, Coogan CL. Urological Manifestations of Sarcoidosis. J Urol 2012;187:18–24. doi: 10.1016/j.juro.2011.09.057
4. Kodama K, Hasegawa T, Egawa M, Tomosugi N, Mukai A, Namiki M. Bilateral epididymal sarcoidosis presenting without radiographic evidence of intrathoracic lesion: Review of sarcoidosis involving the male reproductive tract. Int J Urol 2004;11:345–8. doi: 10.1111/j.1442-2042.2004.00783.x
5. Block NL, Kava BR. Genitourinary sarcoidosis: An essential review for the practicing clinician. Indian J Urol 2017;33:6–12. doi: 10.4103/0970-1591.195724
6. Furusato B, Koff S, McLeod DG, Sesterhenn IA. Sarcoidosis of the prostate. J Clin Pathol 2007;60:325–6. doi: 10.1136/jcp.2006.039222
7. Mulpuru SK, Gujja K, Pai VM, Chen CYY, Levey RL. A rare and unusual cause of PSA (prostate-specific antigen) elevation: sarcoidosis of the prostate. Am J Med Sci 2008;335:246–8. doi: 10.1097/MAJ.0b013e31811eba71
8. Maurice MJ, Zhu H. Sarcoidosis of the prostate. J Urol 2013;190:711–2. doi: 10.1016/j.juro.2013.05.017
9. Osanami A, Yamashita T, Sakurada S, Kyoda Y, Shindo T, et al. Systemic sarcoidosis presenting as a rare combination of interstitial nephritis with necrotizing vasculitis and urinary retention due to prostate involvement: a case report. BMC Nephrol 2023;24:370. doi: 10.1186/s12882-023-03430-9
10. McCormick ME, Pewitt EB. Careful consideration of sarcoidosis in diagnosis and staging of prostate cancer: A case report. Urol Case Rep 2022;45:102255. doi: 10.1016/j.eucr.2022.102255

Received for publication: 25 December 2023 - Accepted for publication: 11 March 2024

Licensee Mattioli 1885, Italy
Multidisciplinary Respiratory Medicine 2024; 19: 956
doi: 10.5826/mrm.2024.956