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Case report

# Granulomatous prostatitis: mimicking locally advanced prostate adenocarcinoma

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**Abstract.** We report the case of a 63-year-old male who came to the urology clinic with an increasing value of the prostate specific antigen and an asymmetrical enlargement at the digital rectal examination. The man was subjected to an MRI of the prostate following which a convincing radiological diagnosis of prostate cancer was made. The patient was assigned a provisional stage of disease T3a N0. In order to confirm this diagnosis, a prostate biopsy was performed but the histological analysis reported non-specific granulomatous prostatitis (GP). It is an uncommon condition that both clinically and radiologically on TRUS and MRI usually mimics prostate cancer (PCa), representing a diagnostic challenge due to its non-specific symptoms and aspecific radiological findings. In this case report we discuss the magnetic resonance imaging features of this rare clinical condition in order to help radiologists in the timely diagnosis for a correct diagnostic framing. (www.actabiomedica.it)

**Key words:** granulomatous prostatitis, adenocarcinoma, prostate, prostate cancer, MRI

## Introduction

Prostatitis can be divided into several groups: acute and chronic bacterial prostatitis, chronic abacterial prostatitis and granulomatous prostatitis. Granulomatous prostatitis (GP) can be classified as nonspecific, infectious and indeterminate, accounting for 78%, 18% and 4% of cases respectively (1). It is an infrequent condition with a TRUS and MRI appearance indistinguishable from that of prostate cancer (2).

Multiparameter magnetic resonance imaging (mpMRI) in the diagnostic pathway of prostate cancer (PCa) has a well-established early role in the recently updated European Association of Urology (UAE) guidelines presented at the EAU Annual Congress Milan 2023 and recommendations from the American Urological Association (3,4).

## Case presentation

A 63-year-old male presented to the urology clinic with an increasing value of the prostate specific antigen (PSA), which was 6.15 ng/mL at the time of the visit. He had no history of intravescical Bacillus Calmette-Guérin (BCG) therapy.

Digital rectal examination revealed an asymmetrical prostate enlargement with a prominent right prostatic lobe characterized by an increased consistency.

Therefore it was decided to put the man on a prostate MRI. MRI images were obtained with 1.5 Tesla MRI using an endorectal integrated pelvic (eight-channel) phased-array coil (MR Innerva; Medrad, Pittsburgh, Pa).

The MRI protocol included T2-weighted (T2-w) images in 3 planes, diffusion weighted images (DWI)

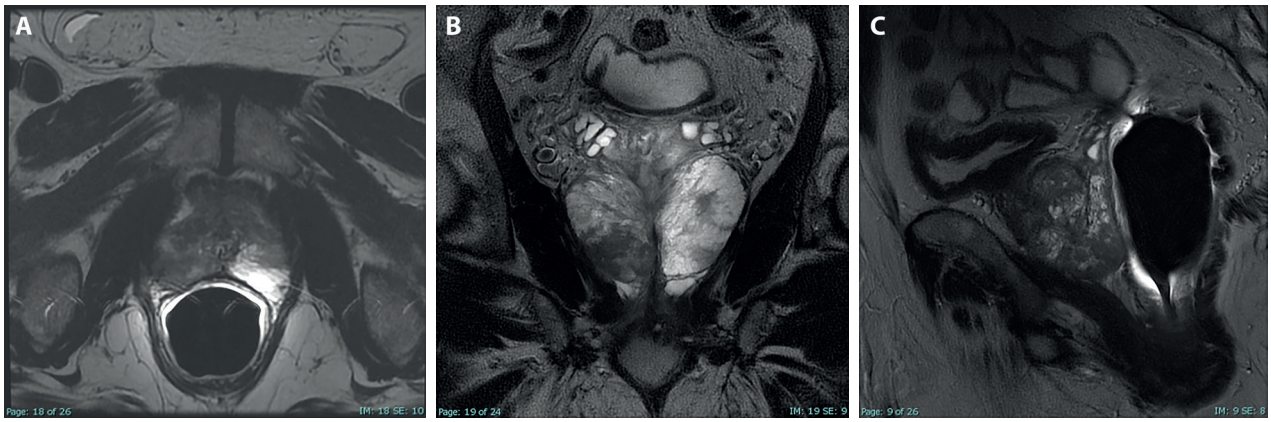


**Figure 1.** Axial Coronal (A and B) and sagittal (C) T2-weighted MRI images show a lesion in the right postero-lateral peripheral area in the mid-apical area that causes an evident swelling of the overlying capsular margin with focal interruption of the capsular signal.

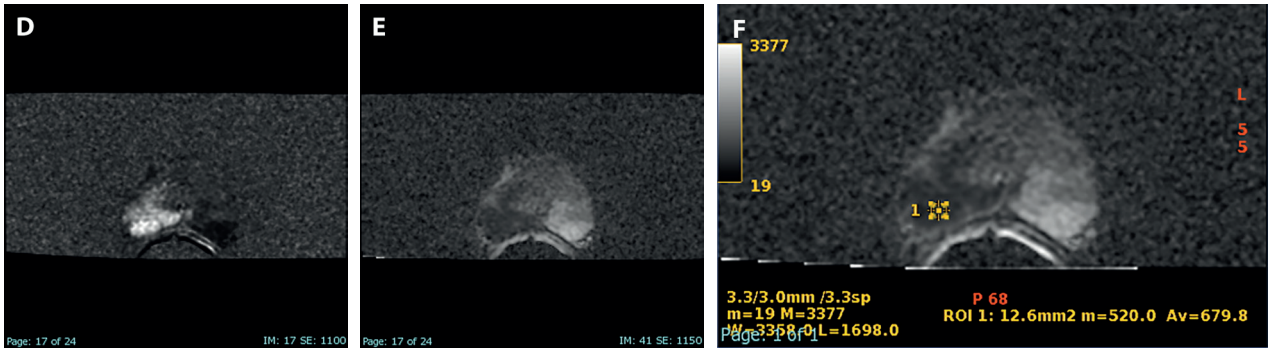


**Figure 2.** Axial diffusion-weighted images (DWI) (D) and apparent diffusion coefficient (ADC) (E) images. The lesion shows signal restriction in DWI sequences with hypointensity on the ADC map. ADC map (F) showing a very low ADC value (10–6 mm2/s) for the ROI located in the right postero-lateral portion indicating a marked limitation of water diffusion.

and Dynamic Contrast Enhanced (DCE) images in the axial plane.

All acquisitions (T2-w, DWI and DCE) were displayed on a workstation screen (iCAD Inc., Nashua, NH, USA) with automatic synchronization of the magnification and position of the slice.

The T2-w axial sequence showed an area of low signal intensity involving the peripheral area in the right postero-lateral mid-apical area and focal interruption of the capsular signal. These findings allowed a Prostate Imaging Reporting and Data System (PI-RADS) score v2.1 for T2WI of 5 to be calculated (Figure 1).

The DWI sequence with high b-values revealed a particularly hyperintense focus and corresponding low apparent diffusion coefficient (ADC) values. This resulted in a PI-RADS v2 DWI score of 5 (Figure 2).

Post-contrast DCE sequences revealed a type 3 washout curve and asymmetric, focal and early enhancement, rated as "positive" on PI-RADS v2.1 (Figure 3).

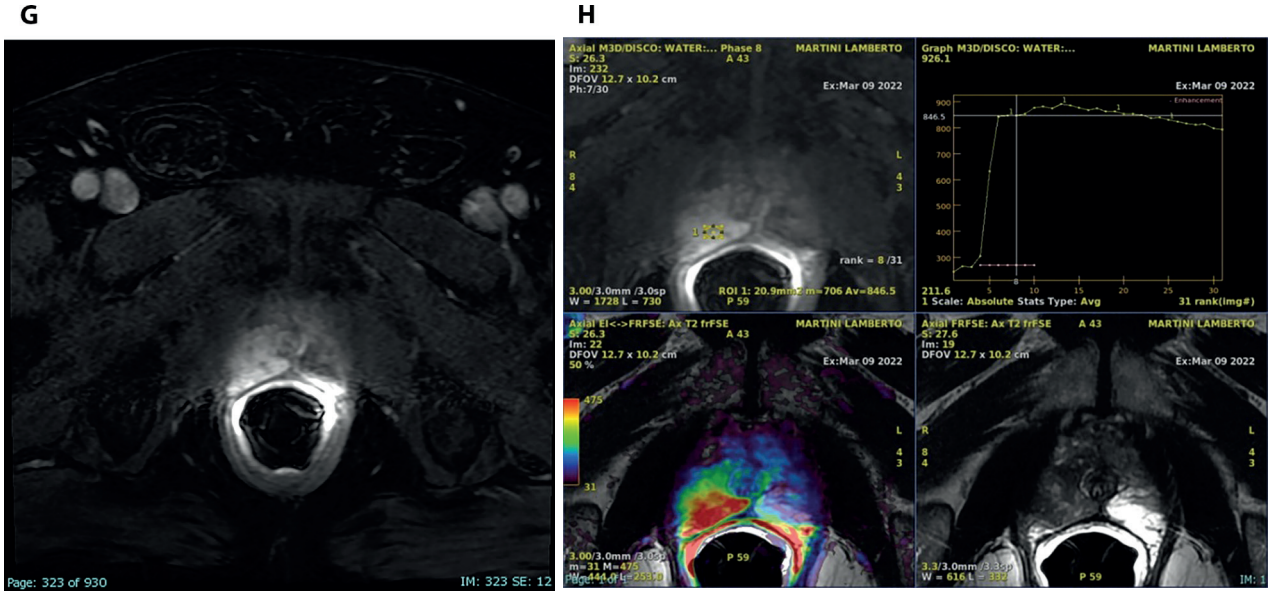


**Figure 3.** Axial Dynamic Contrast Enhanced (DCE) images (G) shows early and intense enhancement (bright signal) of the right portion of the lesion. The Enhanced Contrast Dynamic (DCE) color MRI map (H) shows intense lesion enhancement. Qualitative DCE MR imaging enhancement time curve generated from the right portion of the lesion appearing tissue ROI which was identified as a type 2 (plateau).

Evaluation of the capsular signal and periprostatic spaces showed capsular disruption and fat infiltration simulating T3a disease. A convincing radiological diagnosis of prostate cancer was made based on MR images and the patient was assigned a provisional stage of disease T3a N0.

A 12-core, systematic, industry-guided ultrasound-guided (trus) prostate biopsy was performed with additional cognitive targeting of suspicious lesions. Histological analysis reported non-specific granulomatous prostatitis (GP).

The patient was managed conservatively and discharged from urological care.

## Discussion

For biopsy-naïve men with suspicion of PCa, based on an elevated serum prostate-specific antigen level or an abnormal digital rectal exam, it is now recommended to undergo an mpMRI prior to the biopsy.

The incorporation of mpMRI into the diagnostic pathway of men with clinical suspicion of PCa has several advantages over a systematic transrectal ultrasound-guided biopsy (TRUSGB) approach. (5)

MRI can rule out clinically significant PCa and, therefore, will result in fewer unnecessary prostate biopsies.

Furthermore, mpMRI reduces overdiagnosis and overtreatment of low-grade cancer and allows for targeted biopsies of lesions assessed as “suspicious”, allowing for better risk stratification (6).

MRI features of granulomatous prostatitis can be divided into two types.

The first type, the most frequently reported, has a tumor-like appearance and cannot be distinguished from prostate cancer (PCa). Cell density, which causes diffusion restriction, is very high in granulomatous prostatitis and therefore low ADC values

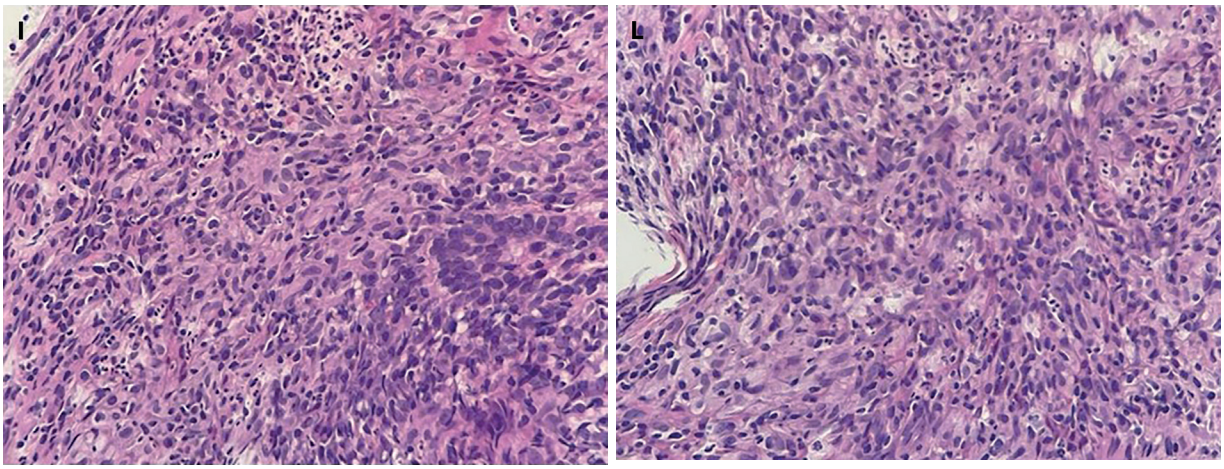


**Figure 4.** Granulomatous inflammation involving prostatic acini and diffusely occupying the interventing stroma (I). Spindled and epitheliod macrophages mixed with eosinophils, neutrophils and leukocites characterize the infiltrate (L).

within granulomatous foci might be expected. (7) In our study, the mean ADC value of the non-necrotic granulomatous focus (10-6 mm 2/s). DCE-MRI showed early and intense enhancement as in Pca in the peripheral area.

The second MRI pattern of granulomatous prostatitis is much rarer because it consists of a caseous abscess induced by a severe caseant necrotic process. The clinical expression of this complication is likely an extremely rare event, as very few tuberculous abscesses have been reported to date following intravescical BCG therapy (8).

In our case, magnetic resonance imaging showed a hypointense focal area of the peripheral area in the right posterolateral mid-apical area, with a marked decrease in the ADC value and an enhancement to the DCE.

Evaluation of the capsular signal and periprostatic spaces showed capsular disruption and fat infiltration simulating T3a disease.

The appearance of the MRI could not be differentiated from that of prostate cancer. (9)

Most granulomatous prostatitis lesions confirmed on targeted biopsies are assigned a PI-RADS score of 4 or 5.

Diagnosis of granulomatous prostatitis is difficult because it usually mimics PCa both clinically and radiologically and PI-RADS assessment must inevitably be used with scores of 4 or 5 (10); therefore, the diagnosis is possible only by performing a histopathological examination.

The diagnosis was confirmed by TRUS-guided biopsies. All the positive nuclei showed typical features of granulomatous prostatitis with epithelioid cells and infiltration of more or less dense multinucleated giant cells (Figure 4) (11).

The search for acid-alcoholic bacilli was not performed.

## Conclusion

Although is a rare condition, the granulomatous prostatitis represents a diagnostic challenge due to its non-specific symptoms and aspecific radiological findings. Therefore, clinicians must be aware of and recognize this image pattern in order to make an accurate diagnosis.

**Inform Consent:** Consent to participate and for publication. Written informed consent for publication was obtained from the patient.

**Conflict of Interest:** Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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