

CASE REPORT

Open Access



Simultaneous prostatic and right seminal vesicle abscesses: a case report

Nader Gharbia^{1*}, Yassine Ouanes¹, Kays Chaker¹, Jihed Karmous¹, Moez Rahoui¹, Mokhtar Bibi¹ and Yassine Nouira¹

Abstract

Background Synchronous abscesses of the prostate and seminal vesicles represent a rare but clinically significant form of purulent retention. They pose diagnostic and therapeutic challenges and are associated with considerable morbidity and a high risk of sepsis.

Case presentation We present the case of a 60-year-old Caucasian man with a history of insulin-dependent diabetes mellitus, who had a voluminous prostatic abscess associated with a right seminal vesicle abscess due to compression of the right ejaculatory duct, and who presented to our department with sepsis. He had clinical and radiological confirmation with computed tomography scan and magnetic resonance imaging. The patient underwent percutaneous drainage of the prostatic abscess resulting in the subsidence of the seminal vesicle abscess. The treatment also consisted on prolonged antibiotic therapy. The clinical evolution was favorable.

Conclusion We conclude that prostatic abscesses can lead to synchronous seminal vesicle abscesses due to ejaculatory duct compression. Percutaneous drainage of the prostatic abscess by transrectal ultrasound-guided drainage, combined with prolonged antibiotic therapy, can effectively treat both abscesses.

Keywords Abscess, Prostate, Seminal vesicle, Sepsis, Case report

Background

Synchronous prostatic abscess (PA) and seminal vesicle abscess (SVA) represent a rare yet clinically significant manifestation of genitourinary pathology. They are characterized by the accumulation of purulent material within the prostate gland and adjacent seminal vesicles, therefore posing an immediate threat due to the high risk of sepsis [1].

Although less frequently encountered than isolated prostatic abscesses, the simultaneous presence of abscesses in both the prostate and seminal vesicles, caused by compression of the ejaculatory ducts,

complicates both clinical presentations and management [2].

To our knowledge, this represents the first reported case in the literature of synchronous prostate and seminal vesicle abscesses resulting from ejaculatory duct compression. Understanding the etiology, clinical features, diagnostic modalities, and treatment strategies is crucial for timely recognition and effective management of this complex synchronous purulent retention.

Case presentation

A 60-year-old Caucasian male with a known history of unbalanced insulin-dependent diabetes mellitus evolving for 8 years presented to our department. He had no known urological history, no dental issues, and no significant family or psychosocial history. He was a non-smoker and reported no alcohol consumption. He was retired from a clerical job and lived in an urban environment.

*Correspondence:

Nader Gharbia
nadergharbia@hotmail.fr

¹ Department of Urology, La Rabta Hospital, University of Tunis El Manar, Tunis, Tunisia



He had no history of environmental exposure to toxins or any other medical conditions besides diabetes. His chief complaint was a fever persisting for 10 days along with lower urinary tract symptoms including dysuria and pollakiuria as well as perineal pain. The patient had been receiving insulin therapy for diabetes management, though specific dosages were not documented. Prior to admission, he completed a course of oral ciprofloxacin 500 mg twice daily for 7 days, prescribed by his primary care physician for suspected urinary tract infection, but reported no improvement. An analysis of midstream urine samples revealed a wild-type *Escherichia coli*, sensitive to fluoroquinolones.

Upon physical examination, the patient appeared lethargic and showed signs of dehydration. Neurologically, he was alert but mildly disoriented, with a Glasgow Coma Scale (GCS) of 13/15. His vital signs included a temperature of 38.9 °C (102 °F), blood pressure of 90/70 mmHg, heart rate of 110 beats per minute, and a respiratory rate of 24 cycles per minute. Oxygen saturation was 98% on room air. The cardiovascular exam revealed a regular but rapid pulse, while auscultation of the lungs was clear with no crackles or wheezes. There were no focal neurological deficits or cranial nerve abnormalities.

The patient presented with sepsis with a Quick Sepsis-Related Organ Failure Assessment (qSOFA) score [3] of 3/3 (systolic blood pressure < 100 mmHg, respiratory rate > 20/minute, GCS ≤ 14).

Palpation of the abdomen revealed isolated tenderness of the hypogastric and perineal region but there was no bladder globe. The digital rectal palpation found a painful fluctuation with tenderness towards the prostate.

Laboratory findings indicated an inflammatory syndrome with a C-reactive protein (CRP) level of 258 mg/L. The complete blood count revealed leukocytosis, with white blood cell count of 19,410 cells/ μ L, predominantly neutrophils (86%). The patient also had thrombocytopenia with a platelet count of 71,000/ μ L. Renal function tests showed acute kidney injury with a serum creatinine level of 320 μ mol/L, and blood urea nitrogen was elevated at 15 mmol/L. Liver function tests were within normal limits. Urinalysis showed pyuria but no hematuria, and urine culture revealed a wild-type *Escherichia coli* sensitive to fluoroquinolones; it was negative for fungi or anaerobes.

An emergency abdominal computed tomography (CT) scan (Fig. 1) showed an enlarged prostate with heterogeneous density, with two collections measuring 9.8 mm and 36 mm. The larger collection was associated to a collection of the right seminal vesicle, requiring further characterization by pelvic magnetic resonance imaging (MRI).

On pelvic MRI (Fig. 2), we found a voluminous multi-loculated collection of 70 mm × 60 mm × 43 mm involving almost the entire peripheral zone, extending to the right seminal vesicle. The collection exhibited heterogeneous high signal on T2-weighted images, low signal on T1-weighted images, high signal on diffusion-weighted imaging with apparent diffusion coefficient (ADC) restriction, and peripheral enhancement after gadolinium injection. Additionally, a second collection measuring 11 mm was noted in the left anterior peripheral zone of the prostate.

The imaging findings confirmed the presence of a synchronous PA and right SVA.

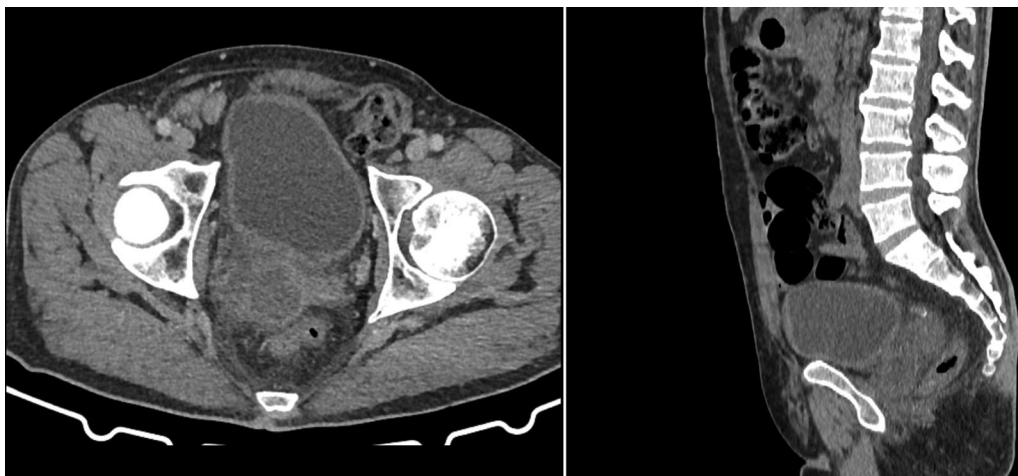


Fig. 1 CT scan of the pelvis showing enlarged heterogeneous prostate with two collections associated to right seminal vesicle collection

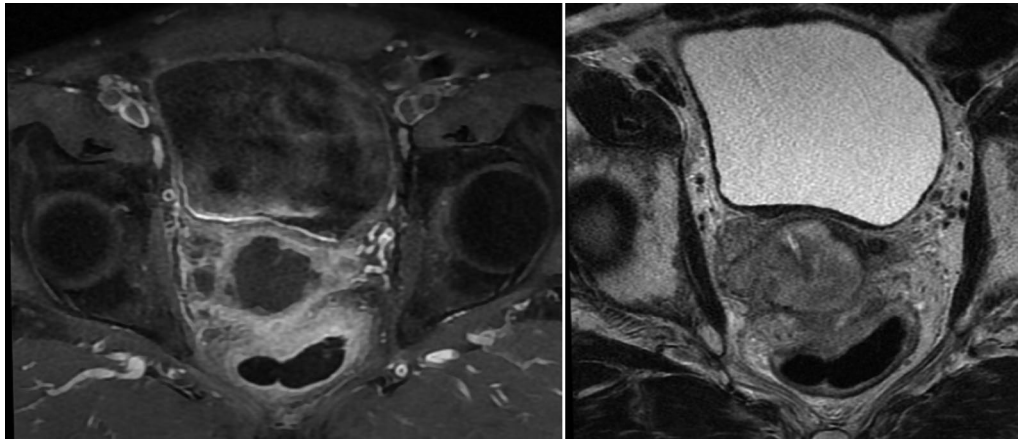


Fig. 2 MRI of the pelvis revealing extensive peripheral zone collection in the right prostate lobe synchronous with right seminal vesicle collection

The right SVA was caused by the compression of the right ejaculatory duct, resulting in purulent retention.

Upon admission, the patient was immediately started on intravenous broad-spectrum antibiotics, specifically third-generation cephalosporin (ceftriaxone 2 g/day), along with a percutaneous drainage of the PA based on a transrectal ultrasound (TRUS) guided approach. The technique consisted on the insertion of a thin needle under real-time ultrasound guidance into the abscess cavity within the right lobe of the prostate. Once the needle is correctly positioned, the content of the abscess was gently aspirated, destined for microbiological culture. During the procedure, real-time ultrasound imaging showed that the reduction in PA size allowed the subsidence of SVA.

The aspirate samples were collected using a sterile technique with a fine needle under real-time transrectal ultrasound guidance. Samples were immediately transported in appropriate media to the microbiology lab for culture. Standard protocols were followed for both aerobic and anaerobic cultures, and susceptibility testing was performed on any potential isolates. However, no growth was observed from the samples. Both cultures, as well as Gram stains of the aspirate, were negative for any bacterial growth. On the other hand, blood cultures for both aerobic and anaerobic bacteria were obtained upon admission, and results returned negative after 48 hours of incubation. Gram staining of the abscess aspirate showed no bacterial organisms.

There were no immediate complications and the patient's condition improved positively. After culture results were negative, the antibiotic regimen was shifted to oral trimethoprim-sulfamethoxazole 160/800 mg twice daily for 4 weeks, following discharge. The patient remained hospitalized for 5 days

and received intravenous fluids along with ceftriaxone therapy.

The patient was followed up for 6 months post-discharge. During this period, he reported a complete resolution of symptoms. Pelvic ultrasound performed at 3 months showed no recurrence of the prostatic or seminal vesicle abscesses. The patient remained free from any urinary or systemic infections, and renal function had returned to baseline by the 6-month follow-up.

Discussion

This case presents the unusual coexistence of PA and SVA in a patient with uncontrolled diabetes mellitus, a combination rarely documented in the literature. What makes this case particularly unique is the synchronous presentation of PA and SVA, the latter occurring as a result of compression of the right ejaculatory duct. To our knowledge, there are few cases describing such an association and even fewer detailing a successful resolution through percutaneous drainage of the PA, which led to the subsidence of the SVA. Additionally, the case is notable for the negative culture results despite clinical signs of severe infection, emphasizing the importance of imaging in the diagnosis and management of these complex cases. PA and SVA are rare but serious conditions that can occur independently or concurrently. However, their association presents unique diagnostic and management challenges. In this case study, our approach involved a thorough diagnostic workup including clinical and imaging modalities such as pelvic CT and MRI of the pelvis to accurately visualize and characterize the abscesses. The treatment strategy encompassed percutaneous drainage of the PA by transrectal ultrasound-guided drainage allowing the subsidence of SVA, along with prolonged antibiotic therapy. Through this comprehensive

approach, we aimed to highlight effective management strategies and outcomes in dealing with these complex genitourinary infections.

The etiology of PA associated with SVA can be similar to that of isolated PA, arising from bacterial infections, which can occur secondary to synchronous hematogenous dissemination during bacteremia or retrograde transmission through contaminated urine or iatrogenic sources. The proximity of the prostate and seminal vesicles facilitates the spread of infection between these structures, leading to concurrent abscess formation [1].

Untreated or poorly treated acute or chronic prostatitis will progress to prostatic abscess. In our case, the SVA occurred due to compression of the right ejaculatory duct, resulting in purulent retention.

Bacterial pathogens implicated in these infections commonly include *Escherichia coli*, *Klebsiella pneumoniae*, and *Proteus mirabilis* [1]. In their 5-year study, Göğüş *et al.* [4] found out that 33% of patients that developed genitourinary abscesses had a medical history of diabetes mellitus.

PA and SVA often manifest with symptoms resembling those of acute prostatitis, including dysuria, urinary frequency, perineal pain, fever, acute urinary retention, and hematuria. However, these symptoms are nonspecific. The hallmark finding for PA is tenderness on digital rectal examination, observed in 48–100% of cases [5].

Imaging serves a critical role in diagnostic processes. Transrectal ultrasound (TRUS) is a valuable tool offering diagnostic and therapeutic benefits for guiding drainage procedures. It can reveal disorganization within the prostatic or seminal vesicle architecture, manifesting as hypoechoic areas indicative of abscess collections, typically concentrated in transitional and central regions. However, this method can be discomforting, particularly for large-sized abscesses, and its sensitivity in detecting early-stage lesions is limited, necessitating supplementary cross-sectional imaging [6].

CT excels in delineating the topography and extent of abscess collections, displaying well-defined, oval, hypodense formations with regular contrast-enhanced walls that tend to converge. In cases of complex collections, where distinction from other differential diagnosis proves challenging, MRI and, potentially, histological biopsies are indispensable [2]. They typically present as hypointense on T1-weighted and hyperintense on T2-weighted images, with restricted diffusion on diffusion-weighted imaging (DWI) and low ADC values. Differential diagnosis includes rare cystic tumors of the prostate, such as cystadenoma and cystadenocarcinoma, along with cystic tumors of the seminal vesicles [7].

Antibiotic therapy and drainage of abscess represent the cornerstones of treatment. Empiric antibiotic

regimens should be guided by local antimicrobial resistance patterns, targeting mainly Gram-negative organisms. The antibiotic adjustment could be through urine cultures and Gram stain results showing evidence to suspect another etiology such as Gram-positive bacteria or rare causes such as fungal organisms. The duration of antibiotic therapy typically ranges from 4 to 6 weeks, with oral or parenteral administration depending on the severity of the infection [8].

As for drainage, several methods have been proposed; TRUS-guided aspiration is a minimally invasive procedure that is known for its safety and efficacy. In the largest series in literature, Collado *et al.* reported a success rate of 83% in 24 patients treated by TRUS-guided drainage with no major complications. Success was defined as complete resolution of abscess on subsequent US and complete resolution of abscess after second TRUS-guided aspiration, respectively. The reasons for failure were abscess size > 3 cm, anechoic appearance and ultrasonographically heterogeneous. Transurethral drainage was used following failure of TRUS-guided aspiration and was successful [5]. We also cite the transperineal approach involving TRUS guidance to direct a needle through the perineum and into the prostatic abscess. This technique is typically performed under general anesthesia.

In cases of recurrent abscess or incomplete evacuation, transurethral resection emerges as a more appropriate method, ensuring better drainage of the abscess cavity with early recovery of the patient [9].

In exceptional circumstances, patients with extraprostatic involvement may necessitate open surgical drainage. This involves transperineal incision and drainage, particularly if the abscess has breached the levator ani muscle [10].

Conclusion

Accurate diagnosis of PA and SVA can be made through imaging techniques such as CT scan and MRI, which are crucial in guiding effective treatment strategies. The use of noninvasive TRUS-guided percutaneous drainage has proven to be both effective and safe, particularly in managing complex cases involving both PA and SVA.

The sequential approach of initially draining the PA, which aids in decompression of the ejaculatory ducts, and thus, drainage of SVA, can be a crucial step in resolving these infections.

In case of persistence of the SVA, its drainage can then be discussed based on the patient's clinical progression.

Abbreviations

PA	Prostatic abscess
SV	Seminal vesicle
CT	Computed tomography

MRI Magnetic resonance imaging
ADC Apparent diffusion coefficient
TRUS Transrectal ultrasound-guided approach
DWI Diffusion-weighted imaging

Acknowledgements

Authors wish to thank all the teams of the Urology department of the La RABTA University Hospital for their efforts.

Author contributions

Study concept was provided by NG, YO, and JK. Writing the paper was performed by NG, KC, and MR. Data interpretation was carried out by YO, MB, and YN.

Funding

No funding was received.

Availability of data and materials

The datasets are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The institution (La RABTA University Hospital) exempts the case report from ethical approval.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing interests

The authors declare that there is no conflict of interests.

Received: 23 June 2024 Accepted: 14 October 2024

Published online: 08 November 2024

References

1. Lahfidi A, Traore WM, Hajar A, Abdellaoui M, El Fenni J, Saouab R. Extensive prostatic abscess drained by CT-guided percutaneous approach: case report. *Radiol Case Rep.* 2022;17(8):2723–7.
2. Ren J, Huang X, Wang H, Liu H, Ren F, Zhang Z, et al. Prostatic abscess and seminal vesicle abscess: MRI findings and quantitative analysis of apparent diffusion coefficient values. *Radiol Infect Dis.* 2015;2(1):27–32.
3. Singer M, Deutschman CS, Seymour CW. The third international consensus definitions for sepsis and septic shock (sepsis-3). *JAMA.* 2016;315(8):801–10.
4. Göğüş C, Ozden E, Karaboğa R, Yağci C. The value of transrectal ultrasound guided needle aspiration in treatment of prostatic abscess. *Eur J Radiol.* 2004;52(1):94–8.
5. Collado A, Palou J, García-Penit J, Salvador J, De la Torre P, Vicente J. Ultrasound-guided needle aspiration in prostatic abscess. *Urology.* 1999;53(3):548–52.
6. Chou CP, Chiou SH, Levenson RB, Huang JS, Yang TL, Yu CC, et al. Differentiation between pelvic abscesses and pelvic tumors with diffusion-weighted MR imaging: a preliminary study. *Clin Imaging.* 2012;36(5):532–8.
7. Singh P, Yadav MK, Singh SK, Lal A, Khandelwal N. Case series: diffusion weighted MRI appearance in prostatic abscess. *Indian J Radiol Imaging.* 2011;21(1):46–8.
8. EAU Guidelines. Edn. presented at the EAU Annual Congress Milan, Italy 2023. ISBN 978-94-92671-19-6
9. Ludwig M, Schroeder-Printzen I, Schiefer HG, Weidner W. Diagnosis and therapeutic management of 18 patients with prostatic abscess. *Urology.* 1999;53:340–5.

10. Granados EA, Riley G, Salvador J, Vincente J. Prostatic abscess: diagnosis and treatment. *J Urol.* 1992;148:80–2.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.