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Hemorrhagic Midline Cyst of the Seminal Tract Presenting with Recurrent Hematospermia: The Role of High-Resolution MRI

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ABSTRACT

Background
Hematospermia is a distressing symptom for patients, although it is most often related to benign or self-limiting conditions. When hematospermia becomes recurrent or persistent, cross-sectional imaging is indicated to exclude structural abnormalities, chronic inflammatory conditions, and neoplastic processes.
Case Presentation
We report the case of a 50-year-old man referred to the urology department for recurrent hematospermia. Physical examination, including digital rectal examination, and laboratory investigations were unremarkable. High-resolution pelvic magnetic resonance imaging (MRI) revealed benign prostatic hyperplasia associated with a well-defined midline cystic lesion located between the seminal vesicles. The lesion demonstrated characteristic MRI findings suggestive of intracystic hemorrhage, including spontaneous hyperintensity on T1-weighted imaging, a T2-weighted "shading" appearance, and thin smooth peripheral wall enhancement after gadolinium administration, without mural nodules.
Conclusion
A hemorrhagic midline cyst of the seminal tract is a rare but recognizable cause of recurrent hematospermia. This case highlights the essential role of MRI in characterizing midline pelvic cystic lesions, excluding malignant features, and providing accurate anatomical mapping to support conservative management.

KEYWORDS :

Hematospermia; Magnetic resonance imaging; Seminal tract cyst; Intracystic hemorrhage; Pelvic MRI

MAIN ARTICLE

INTRODUCTION

Hematospermia is a common clinical condition encountered in urological practice. Although it may cause significant anxiety and psychological distress, the underlying cause is frequently benign [1]. Initial clinical evaluation may often be inconclusive, resulting in diagnostic uncertainty. While persistent hematospermia previously required invasive investigations, high-resolution magnetic resonance imaging (MRI) has become an essential non-invasive tool for detailed evaluation of the prostate and seminal tract structures [2,3].

We report the case of a 50-year-old man investigated for recurrent hematospermia, in whom high-resolution MRI identified a hemorrhagic midline cyst of the seminal tract. The originality of this case lies in the atypical midline inter-vesicular location, the characteristic hemorrhagic MRI appearance, and the clinical presentation with recurrent symptoms.

CASE PRESENTATION

A 50-year-old man was referred to the urology outpatient clinic for evaluation of recurrent intermittent hematospermia, with a progressive increase in episode frequency over several months. Clinical examination, including digital rectal examination (DRE), revealed no abnormalities. Routine laboratory investigations, including prostate-specific antigen (PSA) measurement, were within normal limits.

A dedicated high-resolution pelvic MRI examination was performed. An extended field-of-view acquisition confirmed the absence of renal agenesis or other upper urinary tract abnormalities. The examination demonstrated benign prostatic hyperplasia without suspicious lesions in the peripheral zone.

The main finding was a well-defined midline cystic lesion measuring 8 × 9 mm, located between the seminal vesicles and closely related to the seminal tract. The lesion showed imaging characteristics of subacute hemorrhage:

- Spontaneous hyperintensity on unenhanced axial T1-weighted imaging, consistent with methemoglobin content (Figure 1).
- A characteristic T2-weighted shading appearance on axial and coronal sequences, suggesting hemorrhagic or highly proteinaceous content (Figures 2 and 3).
- Following gadolinium administration, fat-saturated T1-weighted imaging demonstrated thin smooth peripheral wall enhancement without enhancement of the cystic content or mural nodules, supporting a benign lesion (Figure 4).

DISCUSSION

Etiology and anatomical considerations

Recurrent hematospermia requires a systematic diagnostic approach to exclude structural abnormalities, chronic inflammatory conditions, and neoplastic processes [1,2]. Although most cases remain idiopathic or related to transient inflammatory changes, cystic lesions of the seminal tract represent a rare but clinically relevant cause [4].

Seminal tract cysts may be congenital or acquired. Congenital lesions are frequently associated with developmental abnormalities of the mesonephric (Wolffian) duct [5]. They may occur as part of complex urogenital malformations, including Zinner syndrome, characterized by a seminal vesicle cyst associated with ipsilateral renal agenesis or dysplasia [5,6]. Rarely, they may also be associated with vascular abnormalities such as vena cava malformations [7].

In our patient, the absence of renal abnormalities and the strictly midline inter-vesicular location represented an atypical presentation. Differential diagnoses of midline pelvic cystic lesions include Müllerian duct cysts, prostatic utricle cysts, and ejaculatory duct cysts. The absence of communication with the prostatic urethra on MRI made a prostatic utricle cyst or ejaculatory duct cyst unlikely. The lesion was therefore considered to originate from the seminal tract based on its close anatomical relationship with the seminal vesicles.

MRI findings and diagnostic implications

Intracystic hemorrhage is a recognized complication of seminal tract cysts and may increase intracystic pressure, explaining recurrent hematospermia [6]. MRI plays a central role in lesion characterization and differential diagnosis [3].

Blood degradation products, particularly methemoglobin, account for the spontaneous hyperintensity observed on unenhanced T1-weighted sequences in subacute hemorrhage. The presence of proteinaceous material and blood products may also cause T2 signal reduction, resulting in the characteristic T2 shading appearance [3,5].

Post-contrast fat-saturated T1-weighted sequences are essential to exclude enhancing solid components suggestive of neoplastic transformation. In our case, the thin and smooth peripheral enhancement of the cyst wall, without enhancement of the cystic content or mural nodules, supported the benign nature of the lesion [3].

Clinical relevance

High-resolution pelvic MRI provides detailed anatomical mapping and tissue characterization, allowing accurate diagnosis while potentially avoiding unnecessary invasive

procedures. In appropriately selected patients, recognition of benign hemorrhagic seminal tract cysts may support conservative management with clinical follow-up [1,4].

CONCLUSION

A hemorrhagic midline seminal tract cyst is a rare but recognizable cause of recurrent hematospermia. This case highlights the essential role of high-resolution pelvic MRI in identifying hemorrhagic content, defining anatomical relationships, excluding malignant features, and guiding appropriate conservative management.

FIGURES:

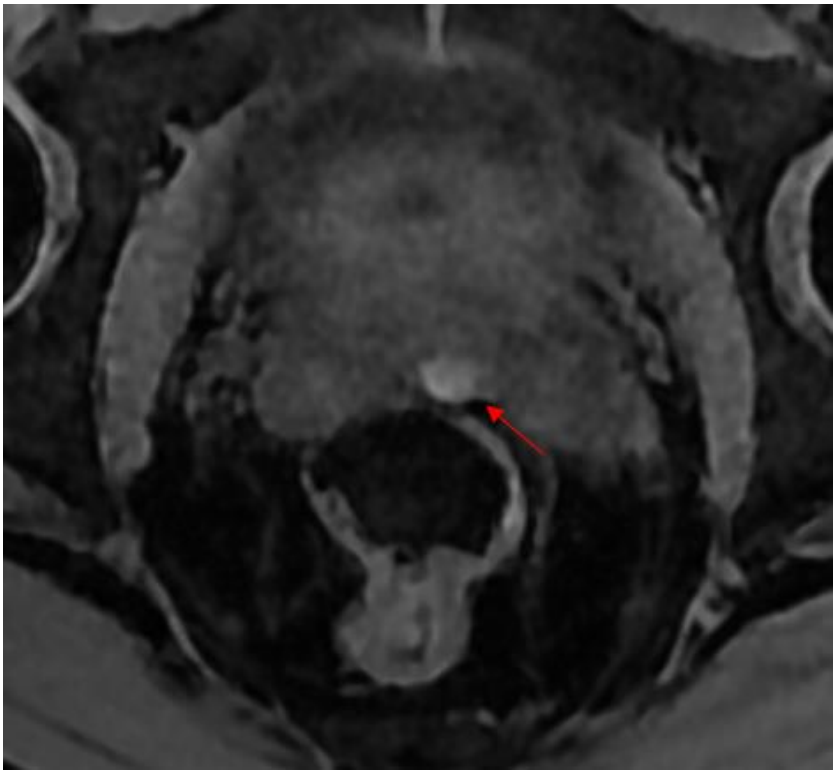

Figure 1. Axial unenhanced T1-weighted MRI demonstrating a well-defined midline cystic lesion located between the seminal vesicles (arrow), showing spontaneous hyperintense signal consistent with hemorrhagic/proteinaceous content

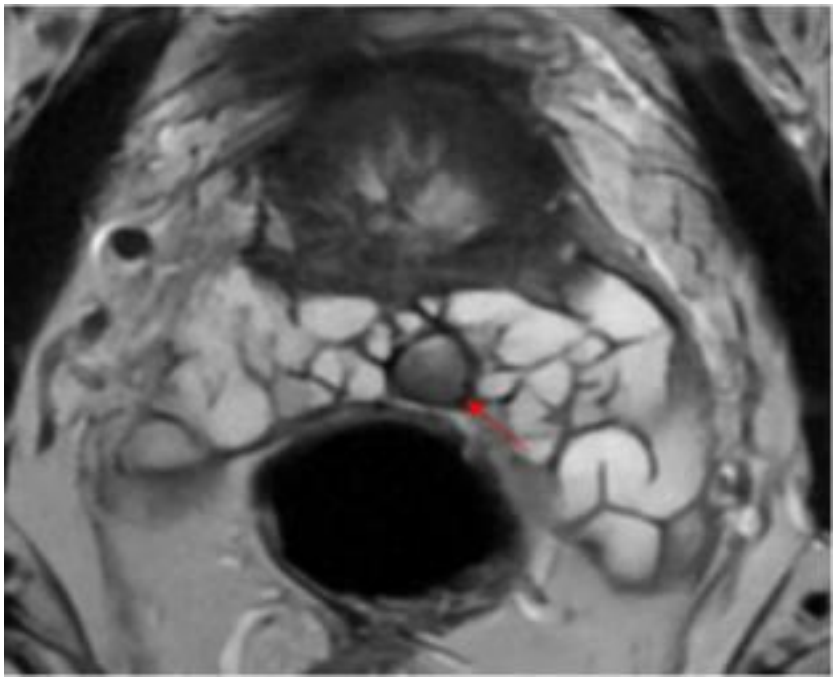

Figure 2. Axial T2-weighted MRI showing the cystic lesion (arrow) with marked T2 hypointense shading effect, supporting hemorrhagic content

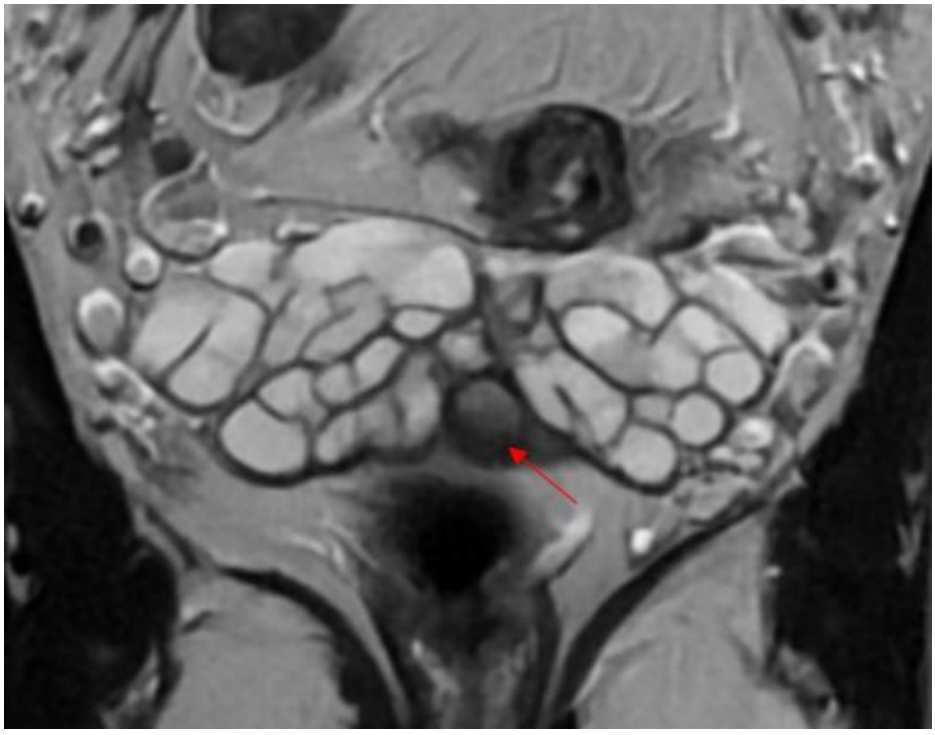

Figure 3. Coronal T2-weighted MRI demonstrating the anatomical relationship of the lesion (arrow), located between the bilateral seminal vesicles.

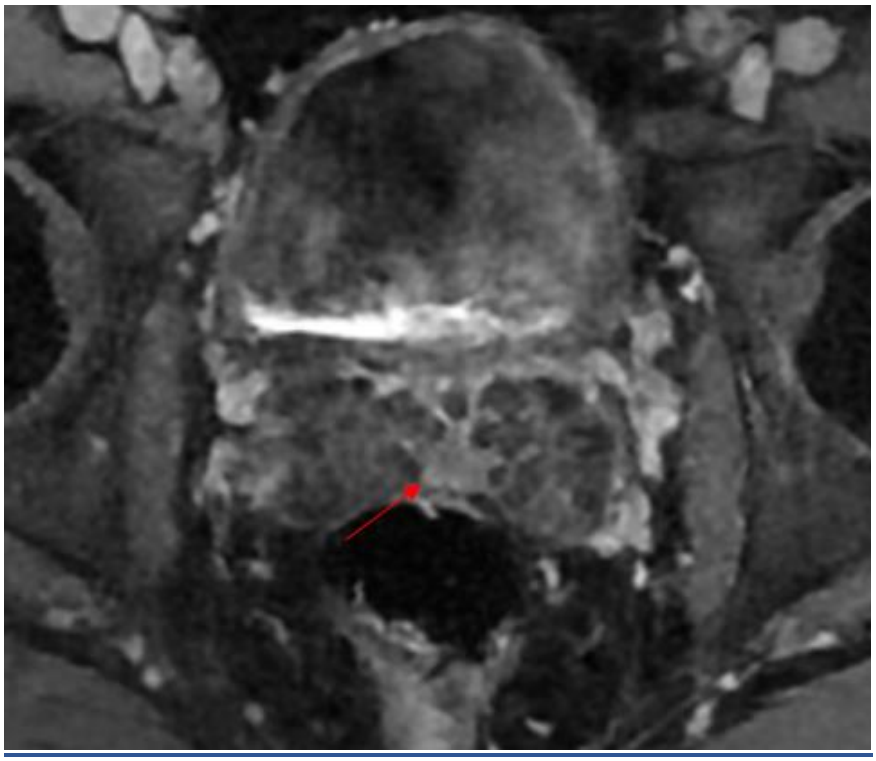

Figure 4. Post-gadolinium fat-saturated T1-weighted MRI demonstrating thin smooth rim enhancement of the cyst wall (arrow), without enhancement of the cystic content or mural nodules.

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Ethics approval and consent to participate
Ethical approval was waived for this case report according to institutional policy.
Consent for publication
Written informed consent was obtained from the patient for publication of this case report and accompanying images.
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Competing interests
The authors declare that they have no competing interests.
Authors' contributions
All authors contributed to the clinical evaluation, data collection, manuscript review, and approval of the final version of the manuscript.

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