



(CASE REPORT)



RENAL CELL CARCINOMA WITH EXCLUSIVE SEMINAL VESICLE METASTASIS: A CASE REPORT

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ABSTRACT

Renal cell carcinoma (RCC) is known for its ability to metastasize to distant organs, often detected through advanced imaging techniques. Early and accurate identification of metastases is crucial for proper management. Imaging modalities, including ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI), are integral in assessing the extent and characteristics of RCC metastases. These techniques help differentiate primary tumors from metastatic lesions, guide biopsy, and monitor disease progression. Histopathology remains the gold standard for confirming metastatic diagnoses. This case demonstrates the essential role of imaging and histology in detecting and diagnosing rare metastatic sites in RCC, highlighting their combined value in clinical practice.

Keywords: Renal Cell Carcinoma, Seminal Vesicle Metastasis, Imaging Techniques.

1 INTRODUCTION

Renal cell carcinoma (RCC) is the most common malignant tumor of the kidney, accounting for approximately 90% of renal neoplasms in adults [1]. It has a high potential for distant metastasis, most frequently to the lungs, bones, liver, and brain [2]. However, metastases to the seminal vesicles are exceedingly rare, with only a handful of cases documented in the literature [3]. The pathways of dissemination to this uncommon site remain unclear, but hematogenous and lymphatic spread, as well as direct extension, have been proposed mechanisms [4]. Given its rarity, seminal vesicle metastasis from RCC can pose a diagnostic challenge, often being mistaken for primary prostatic or seminal vesicle malignancies [5].

2 CASE REPORT

We describe the case of a 64-year-old male patient with a known history of right renal cell carcinoma (RCC) diagnosed three years prior (figure 1), who presented with a recent onset of hemospermia and pelvic pain. The patient reported a week-long history of blood in the semen associated with moderate pelvic discomfort. On physical examination, no palpable abdominal masses or tenderness were noted, but there was localized discomfort upon deep pelvic palpation.

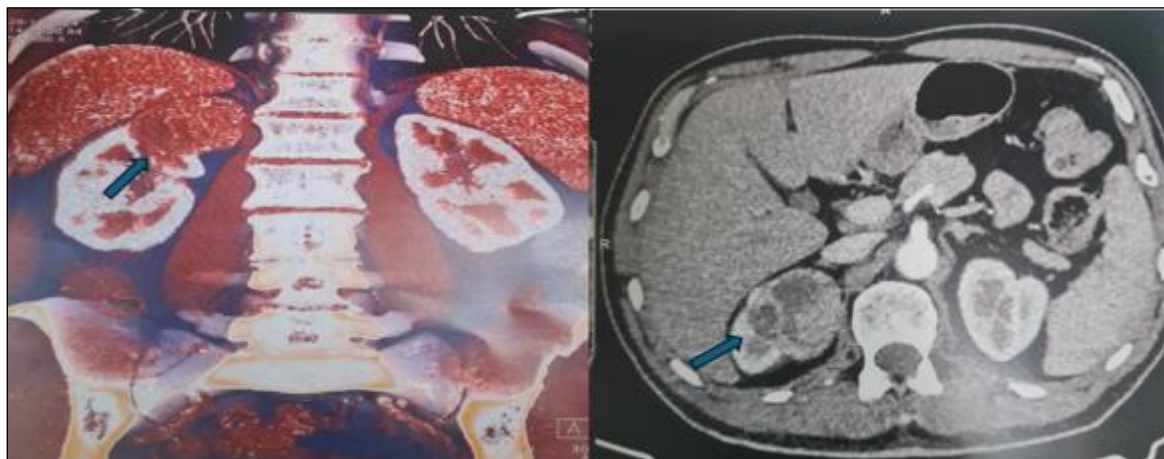


Figure 1: Renal mass in the right upper pole, consistent with renal cell carcinoma (RCC), as seen on contrast-enhanced CT. The lesion appears well-defined with irregular margins, suggesting a malignant etiology.

Initial imaging with pelvic ultrasound revealed a suspicious mass within the left seminal vesicle. The mass was cystic in nature, with well-defined hypoechoic contours, which were notably vascularized, showing intense color Doppler flow suggestive of an active lesion. The cystic formation appeared laterally located on the left side, prompting further investigation to assess its nature and potential connection to the known RCC. To determine the extent of the lesion and evaluate for potential metastatic spread, a contrast-enhanced computed tomography (CT) scan was performed. The scan revealed a well-defined, cystic formation localized to the left seminal vesicle, measuring 22 x 29 mm. The lesion's wall demonstrated significant enhancement after contrast administration, which is often indicative of malignancy. The mass appeared confined to the seminal vesicle, with no evidence of distant metastatic spread to other common RCC sites such as the lungs or liver (Figure 2).

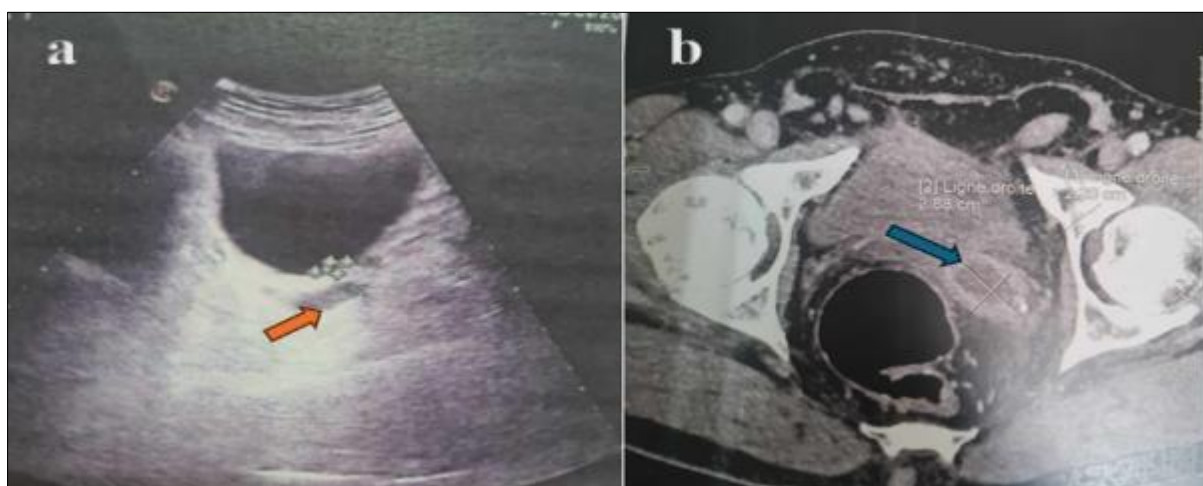


Figure 2: a: Axial ultrasound image showing the cystic lesion of the seminal vesicle; b: Axial CT scan showing the cystic lesion with a thickened wall and enhancement after contrast injection.

Subsequently, magnetic resonance imaging (MRI) was performed to further characterize the lesion. The MRI revealed a mass in the left seminal vesicle with a cystic component showing hyperintensity on T2-weighted images, suggesting fluid content. The lesion's wall appeared hypointense on T2-weighted sequences, indicating a dense fibrous component or malignant tissue. Diffusion-weighted imaging revealed restricted diffusion, which is typically seen in malignant lesions due to cellular crowding and high metabolic activity. After the administration of gadolinium contrast, the mass

showed progressive enhancement, further supporting the diagnosis of malignancy. The MRI findings were highly suggestive of a metastatic lesion from RCC (Figure 3).

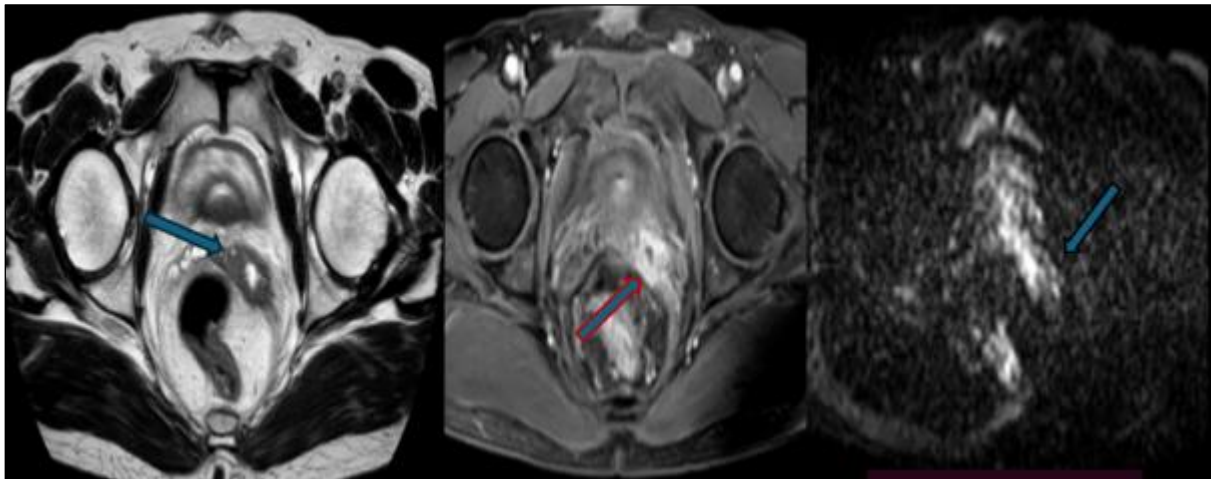


Figure 3: Axial MRI images showing the cystic lesion with hyperintense T2 signal and a hypointense T2 wall, demonstrating restricted diffusion and progressive enhancement after gadolinium injection.

Given the suspicion for metastatic involvement of the seminal vesicle, an ultrasound-guided transrectal biopsy was performed. Histopathological analysis confirmed the presence of RCC cells within the seminal vesicle, establishing the diagnosis of a metastatic deposit. The histological features were consistent with the known primary renal cell carcinoma, with clear cell morphology and a high nuclear grade, further confirming the metastatic nature of the lesion.

3 DISCUSSION

Renal cell carcinoma (RCC) is known for its unpredictable metastatic behavior, most commonly affecting the lungs, bones, liver, and brain [6]. However, unusual metastatic sites, such as the seminal vesicles, have been increasingly reported in the literature. In our case, a 64-year-old male with a history of right RCC presented with hemospermia and pelvic pain, leading to the detection of a lesion in the left seminal vesicle. Multimodal imaging was crucial for the evaluation: ultrasound first identified the cystic lesion, while contrast-enhanced CT and MRI provided further characterization of its morphology, vascularity, and tissue composition [7, 8]. The CT scan revealed a cystic formation with an enhancing wall, and the MRI demonstrated a cystic mass with a hyperintense T2 signal, restricted diffusion, and progressive post-contrast enhancement. These imaging findings raised the suspicion of a metastatic deposit, which was subsequently confirmed by an ultrasound-guided transrectal biopsy.

The integration of multiple imaging modalities not only improved lesion detection but also guided the biopsy and overall management strategy. Histopathological analysis correlated with the imaging findings, affirming the diagnosis of a metastatic RCC deposit in an uncommon location. This case underscores the importance of a systematic diagnostic approach in patients with RCC who present with atypical urogenital symptoms, ensuring that rare metastatic sites are not overlooked [6, 7, 8].

4 CONCLUSION

In conclusion, seminal vesicle metastasis from renal cell carcinoma (RCC) is a rare occurrence, often posing diagnostic challenges. This case highlights the importance of considering atypical metastatic sites when patients present with nonspecific symptoms like hemospermia and pelvic pain. A combination of imaging techniques, including ultrasound, CT, and MRI, along with histological confirmation, played a key role in diagnosing this unusual metastatic spread. Early detection and a thorough diagnostic approach are essential for improving patient management and outcomes in such rare presentations of RCC.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

The authors declare no potential conflicts of interest regarding the research, authorship, and/or publication of this article.

Statement of informed consent

Written informed consent was obtained from a legally authorized representative for anonymized patient information to be published in this article.

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