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Genitourinary Tuberculosis with Co-existing Transitional Cell Carcinoma of the Urinary Bladder: Imaging findings and Diagnostic Challenges

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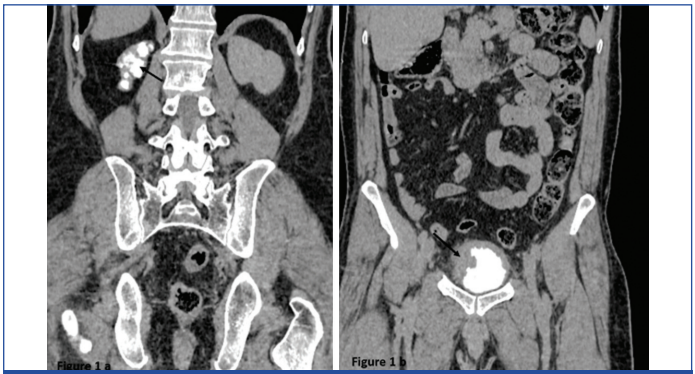
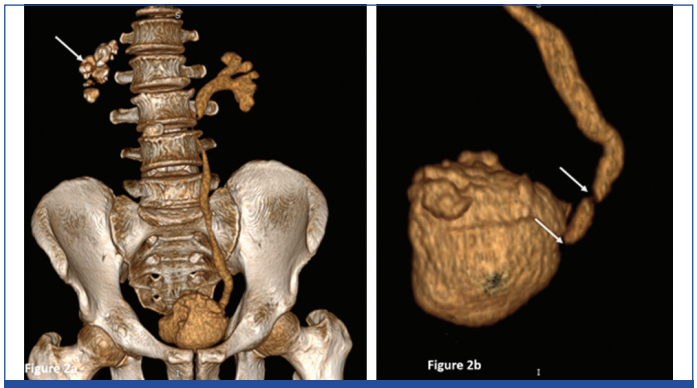
A 56-year-old male presented with gross haematuria, increased frequency of micturition, dysuria for two months and passage of clots in urine for one week. There was no history of fever, nausea, vomiting, or weight loss. The patient had been evaluated at an outside hospital for haematuria six months earlier, during which Genitourinary Tuberculosis (GUTB) was suspected. Consequently, empirical Anti-Tuberculosis Therapy (ATT) was initiated and continued for six months. The patient had a 30-year history of smoking. He did not have a known history of hypertension. No other relevant medical or surgical history could be elicited. Urine analysis revealed reddish-brown discolouration with a turbid appearance. Microscopic examination demonstrated numerous red blood cells and occasional urothelial epithelial cells, with no significant presence of white blood cells, casts, or crystals.

Plain and Contrast-Enhanced Computed Tomography (CECT) abdomen showed an atrophic and calcified right kidney [Table/Fig-1a,2a]. The bladder showed diffuse and irregular wall thickening with a polypoid lesion along its right lateral wall [Table/Fig-1b] and multiple left ureteric strictures [Table/Fig-2b]. Radiological diagnosis of GUTB sequelae was made, as the patient exhibited imaging signs of a shrunken kidney, reduced bladder volume (thimble bladder) and multiple left ureteric strictures. These imaging signs were characteristic of GUTB. Given the associated polypoid soft tissue in the right lateral wall of the urinary bladder [Table/Fig-1b], transitional cell carcinoma of the urinary bladder was suspected. The patient underwent Transurethral Resection of Bladder Tumour (TURBT) and histopathology confirmed muscle-invasive high-grade urothelial carcinoma. The patient was referred to a higher cancer centre for further management with chemotherapy. GUTB is the third most common form of extrapulmonary tuberculosis, constituting approximately 3-5% of all tuberculosis cases [1]. It typically leads to granulomatous inflammation, caseating necrosis and eventual fibrosis of the renal and lower urinary tract structures, resulting in anatomical distortion such as ureteral strictures and bladder wall thickening [2].



[Table/Fig-1]: a) Coronal non contrast CT abdomen showing a small-sized right kidney with multiple large, rounded calcific foci within the right kidney suggestive of Putty kidney (black arrow); b) Coronal CT urogram image showing reduced urinary bladder volume with asymmetric wall thickening and polypoidal projection along right lateral wall of the urinary bladder (black arrow).



[Table/Fig-2]: a) Coronal volume rendered image {Volume Rendering Technique (VRT) image} of CT urogram shows a putty kidney on the right side (white arrow); b) Coronal volume rendered image (VRT image) shows multiple ureteric strictures involving the left lower ureter (white arrows).

Chronic inflammation caused by *Mycobacterium tuberculosis* may predispose the urothelium to dysplastic changes through prolonged epithelial injury, oxidative stress and impaired immune surveillance [3]. Furthermore, *M. tuberculosis* may create a local immunosuppressive microenvironment that facilitates malignant transformation [4,5]. In a study conducted in Taiwan by Lien YC et al., 1.2% of urinary tuberculosis cases had an association with urothelial carcinoma, but there was no association with renal cell carcinoma [4].

In the present case, a 56-year-old male with a long history of smoking presented with persistent lower urinary tract symptoms and haematuria, initially misattributed to tuberculosis. Empirical ATT was administered without histological confirmation, leading to a delay in cancer diagnosis. Xiang Y et al., reported a case of renal tuberculosis combined with bladder cancer in a 57-year-old man who presented with haematuria and signs of urinary tract irritation [3]. Tsai YC et al., reported a patient with fever, persistent haematuria and pyuria who had both GUTB and urothelial carcinoma of the urinary bladder [2].

Treatment strategies for coexisting renal TB and Muscle-Invasive Bladder Cancer (MIBC) require a multidisciplinary approach. Simultaneous nephrectomy and radical cystectomy may be considered in selected patients, but carry increased perioperative risk due to anaemia, malnutrition and infection-related morbidity [3]. An alternative approach includes staged management: initial TB nephrectomy, followed by neoadjuvant chemotherapy to reduce tumour burden and finally radical cystectomy [2]. In resource-constrained settings, concurrent ATT and chemotherapy may be initiated, with surgery deferred until patient stabilisation [5].

The present case highlights the importance of not anchoring solely on a single diagnosis, particularly in high TB-burden areas where symptoms like haematuria may be misleadingly attributed to infection. Cystoscopic biopsy remains the gold standard for confirming bladder pathology and should not be delayed when malignancy is suspected [6]. This underscores the need for vigilant cancer screening in patients with chronic or recurrent GUTB, especially in TB-endemic regions.

REFERENCES

[1] Mantica G, Ambrosini F, Riccardi N, Vecchio E, Rigatti L, De Rose AF, et al. Genitourinary tuberculosis: A comprehensive review of a neglected manifestation in low-endemic countries. Antibiotics (Basel). 2021;10(11):1399.

[2] Tsai YC, Li CC, Chen BT, Wang CY. Coexistence of urinary tuberculosis and urothelial carcinoma: A case report. World J Clin Cases. 2023;11(16):3921-28.

[3] Xiang Y, Wen Z, Yang M, Lyu H, Chen Z, Yuan D, et al. Case report: A rare case of renal tuberculosis combined with bladder cancer. Front Oncol. 2024;14:1423744. Doi: 10.3389/fonc.2024.14237443.

[4] Lien YC, Wang JY, Lee MC, Shu C-C, Chen H-Y, Hsieh C-H, et al. Urinary tuberculosis is associated with the development of urothelial carcinoma but not renal cell carcinoma: A nationwide cohort study in Taiwan. Br J Cancer. 2013;109(11):2933-40.

[5] Sundaram S, Singla S, Guleria S, et al. Approach to genitourinary tuberculosis with bladder cancer: Clinical management dilemmas. Int J Urol. 2019;26(3):317-21.

[6] Singh O, Gupta S, Ahlawat R, et al. Hematuria and the diagnostic delay of bladder cancer in TB-endemic regions: A call for early cystoscopy. Indian J Urol. 2021;37(2):144-49.

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