



An unusual association between renal tuberculosis and urothelial carcinoma of the upper urinary tract; a case report

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ABSTRACT

The occurrence of urothelial carcinoma and tuberculosis in the same kidney is exceptional. To our knowledge, a few cases have been reported in the literature. Herein, we report a case of an unusual association between renal tuberculosis and urothelial carcinoma of the upper urinary tract in a 61-year-old patient and discuss the diagnosis and treatment difficulties.

1. Introduction

Upper urinary tract carcinoma is a rare entity, accounting for 5–10% of urothelial carcinomas.¹ The occurrence of urothelial carcinoma and tuberculosis in the same kidney is exceptional.² To our knowledge, a few cases have been reported in the literature. Herein, we report a case of an unusual association between renal tuberculosis and urothelial carcinoma of the upper urinary tract in a 61-year-old patient and discuss the diagnosis and treatment difficulties.

2. Case report

A 61-year-old patient, with no history of pulmonary tuberculosis, has been followed for non-invasive bladder cancer. Transurethral resection of bladder tumor has been realized followed by regular endoscopic follow-up, without BCG adjuvant therapy. After 2 years of follow-up, he developed hematuria without fever, cough, or any symptom evoking tuberculosis and physical examination was normal. Blood examination showed acute renal failure. Computed tomography revealed a bladder tumor with sheathing of the two ureteral orifices bilateral hydronephrosis, iliac, and left lumbar stenosis ureteral tissue formation taking the contrast, without other distant secondary localizations (Fig. 1). The diagnosis of a locally advanced bladder tumor associated with a Left ureteral tumor was retained.

After nephrostomy in this right renal pelvis and normalization of renal function, a cystectomy with left nephroureterectomy and right cutaneous ureterostomy has been performed. The patient had an

uneventful recovery and was discharged on the seventh postoperative day. Histology of the specimen found a ureteral localization of a urothelial carcinoma infiltrating the muscular (pT2) with many epithelioid, giant cellular granulomatosis, and caseous necrosis (Figs. 2 and 3). Prostate, seminal vesicles, and ureteral recoup were intact. Based on the histological findings, we sent the nephrectomy specimen for bacteriological analysis. Tuberculosis-polymerase chain reaction (TB-PCR) testing confirmed the diagnosis of TB disease by confirming the presence of the Mycobacterium tuberculosis complex. The diagnosis of renal tuberculosis was retained. The urinary culture of tuberculosis was negative. The decision of the Tumor Board Meeting was to start an anti-tuberculosis treatment and a radiologic follow-up for urothelial cancer given the localized nature of the tumors and the completed character of the excision surgery. Bacteriological controls (direct examination and culture of Koch's bacillus) were negative after six months of anti-tuberculosis treatment. After six months of clinical and radiological check-ups, there were no functional complaints or signs of recurrence.

3. Discussion

Urogenital tuberculosis represents the third extrapulmonary localization after lymph nodes and bone. It often affects the young subject (20–50 years) with a male predominance (sex ratio 2/1).² Urogenital involvement is often associated with disseminated tuberculosis infection. Active lung involvement is found in almost 40% of patients with urogenital tuberculosis, and extrapulmonary disseminated involvement in 18% of immunocompetent patients.^{2,3} The association of UT and UC

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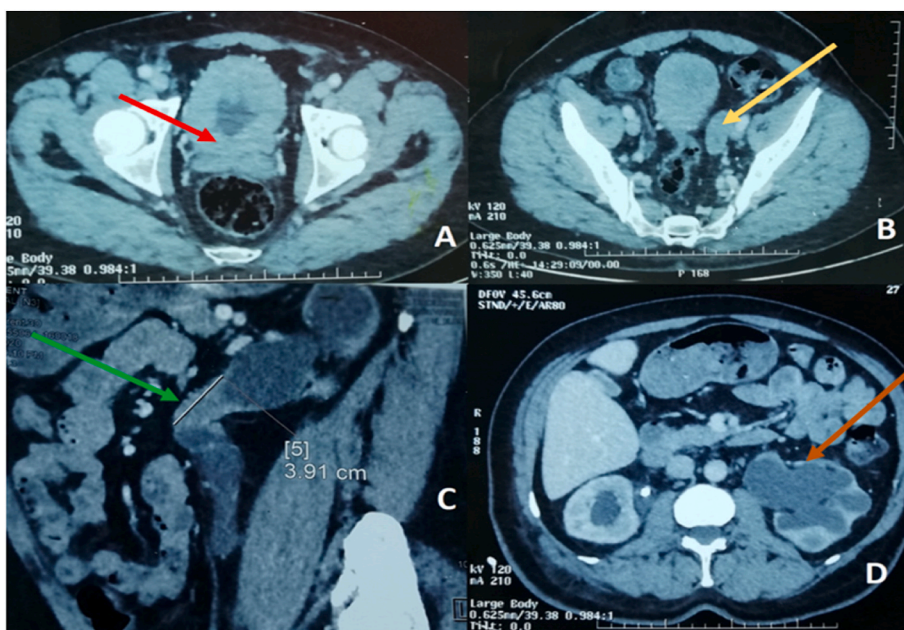


Fig. 1. Computed tomography images showing a pan-parietal bladder tumor with sheathing of the two ureteral orifices (red arrow, panel A). Left Iliac (yellow arrow) and lumbar (green arrow) stenosing ureteral tissue formation (panels B and C) evoking an upper urinary tract tumor with bilateral hydronephrosis and laminated left renal parenchyma (brown arrow, panel D). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

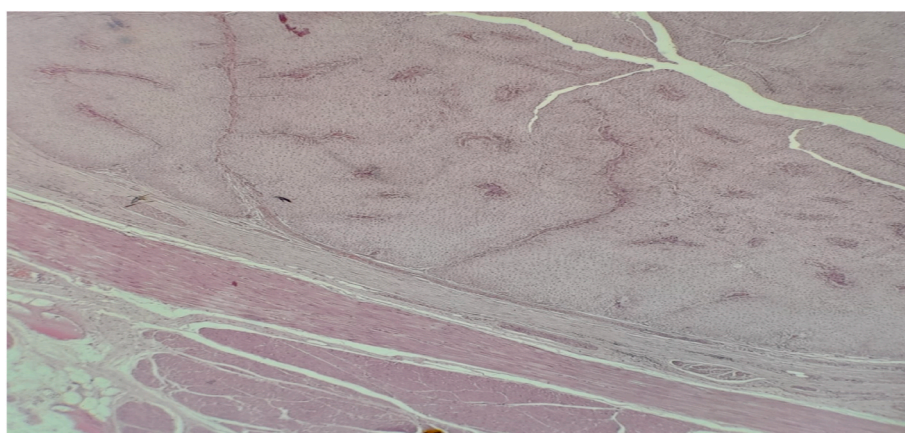


Fig. 2. Magnification at 10x with hematoxylin and eosin (H&E) showing pT2 Invasive urothelial carcinoma invading the muscularis propria with tumor cells permeating the muscularis propria wall (blue arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

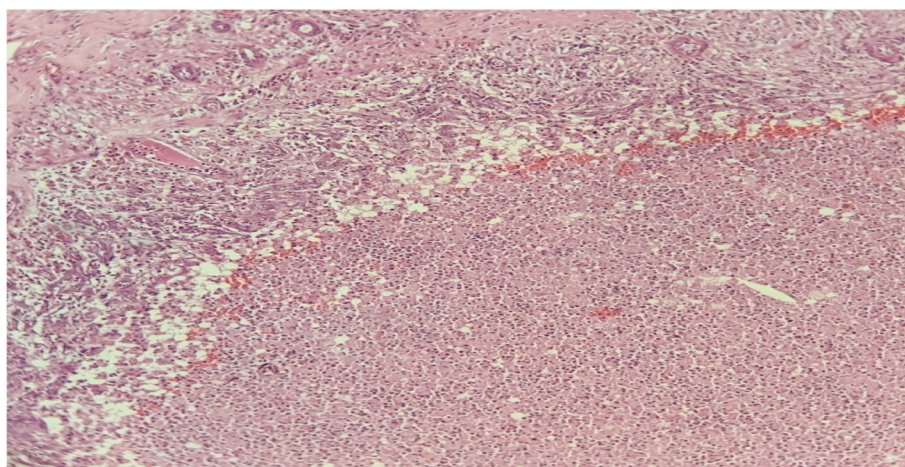


Fig. 3. Magnification at 40x with hematoxylin and eosin (H&E) showing extensive caseous necrosis with granulomas composed of epithelioid cells and Langhans giant cells into the ureteral wall.

is a rare entity with only two cases published in the literature, the first in 1994 by Feeney and the second in 2014 by Chin^{3,4}. To our knowledge, our patient is the third case to be described in the literature. Some authors suggest that tuberculosis is associated with an increased long-term risk of cancer, possibly related to chronic inflammation and shared risk factors, including immunosuppression and smoking.⁴ Y-C Lien has found in a retrospective study published in 2013 that urogenital tuberculosis was considered a risk factor for the occurrence of urothelial carcinoma ($p < 0.0001$).⁵ From an etiopathogenic point of view, tuberculosis is characterized by the presence of chronic granulomatous, ulcerative and giant cellular inflammation destroying the renal parenchyma and stenosing the urinary ducts. Clinical symptomatology is non-specific, thus delaying diagnosis and therapeutic management.

The positive diagnosis of urogenital TB is usually made by microbiological examination.² The bacteriological analysis allows the isolation of the causative organism from urine or biopsy material on conventional solid media.³ Recently, nucleic acid amplification techniques, such as PCR, have been widely studied for the detection of *M. tuberculosis* and other mycobacteria.³ In our patient, the diagnosis was suspected on histological findings and was confirmed by tuberculosis-polymerase chain reaction (TB-PCR) testing.

Diagnostic delay in urogenital tuberculosis is at the origin of the perpetuation of urothelial inflammation which can promote malignant degeneration especially since there are other risk factors such as smoking or exposure to urothelial carcinogens such as aromatic amines.^{4,5} In addition, tuberculosis finds as a preferred host patient with progressive neoplasia due to reduced immune defenses in this population.^{3,4} This case illustrates that, although concomitance of renal tuberculosis and urothelial tumors is exceptional, the likelihood of such

concomitance should be kept in mind, especially in patients from regions where tuberculosis is endemic.

4. Conclusion

Clinical and radiological manifestations of tuberculosis are heterogeneous, and differential diagnoses can include both benign and malignant diseases. The concomitant presence of urinary tuberculosis and urothelial carcinoma is extremely rare. The diagnosis of TBC must be suspected in front of any evocative radiological image, especially since it is an endemic geographical area.

Declaration of competing interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

References

1. Roupret M, Zigeuner R, Palou J, et al. European guidelines on upper urinary tract urothelial carcinomas: 2013 update. *Eur Urol.* 2013;63:1059–1071.
2. Feeney D, Quesada ET, Sirbasku DM, et al. Transitional cell carcinoma in a tuberculous kidney: case report and review of the literature. *J Urol.* 1994;151(4): 989–991.
3. Chin SN, Foster T, Char G, Garrison A. Concomitant urothelial cancer and renal tuberculosis. *Case Rep Urol.* 2014;2014, 625153.
4. Kaplan MH, Armstrong D, Rosen P. Tuberculosis complicating neoplastic disease: a review of 201 cases. *Cancer.* 1974;33(3):850–858.
5. Lien YC, Wang JY, Lee MC, 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):2933–2940.