

Spectrum of tuberculosis in urology: Case series and review of the literature

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Abstract

Urologists are confronted with various forms of extrapulmonary tuberculosis (TB) having an atypical presentation. The disease presents late with complications and sequelae. Four cases of extrapulmonary TB who presented to the urology department are reported here. The cases reported are TB adrenalitis, tuberculous cystitis, renal TB, and TB prostatitis. The presentation of these cases shows GUTB as being a great imitator of other diseases. So there is a need for a very high index of suspicion for early diagnosis and to avoid misdiagnosis to prevent the devastating sequelae like organ damage. Furthermore, there is a need to develop better diagnostic tools for TB. Multidrug chemotherapy and judicious use of surgery form the mainstay of management.

Keywords: Genitourinary system, genitourinary tuberculosis, tuberculosis

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INTRODUCTION

Tuberculosis (TB) is the ninth leading cause of death worldwide.^[1] The lungs are primarily affected, but it can affect any organ. TB affecting mainly the kidneys, ureter, adrenal, prostate, testis, urinary bladder, and epididymis presents to an urologist. Genitourinary TB (GUTB) is considered as a great imitator of other diseases and has a subtle and varied presentation causing a delay in diagnosis and complications, such as infertility, renal failure, and disseminated disease.^[2] Therefore, it needs high index of suspicion for early diagnosis and prompt treatment. This case series shows a spectrum of four cases of TB which presented to the urology department.

CASE SERIES

Case 1

A 50-year-old male patient presented with insomnia,

loss of weight, and generalized weakness of the body. The patient was suffering from depression and had constipation. The patient was evaluated for the same and was found to have hyperkalemia and hyponatremia. Due to suspicion for malignancy, the patient underwent contrast-enhanced computed tomography (CECT) which revealed bilateral adrenal masses [Figure 1]. The patient was evaluated for metastases to the adrenal gland, lymphoma, TB, or functional adrenal tumors. All the tests done were unsuccessful in finding out the cause. Hence, the patient underwent computed tomography-guided biopsy of the lesion which revealed only necrosis. Hence, the patient was taken up for right adrenalectomy. The histopathology report came as TB of the adrenal gland [Figure 2]. Hence, the patient was started on antitubercular treatment (ATT) and steroids. The patient responded with a weight gain and became symptomatically better.

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Case 2

A 29-year-old female patient presented with dysuria and recurrent episodes of urinary tract infection (UTI). Ultrasound abdomen was normal, and urine culture showed significant growth of coliforms and hence based on sensitivity was given 10 days of ciprofloxacin. The patient again reported with dysuria and frequency. Urine culture was sterile twice. Urine showed pus cells and microscopic hematuria. Hence, the patient underwent cystoscopy which revealed a 0.5 cm × 0.5 cm nodular lesion in the right lateral wall surrounded by hyperemic areas. Biopsy was taken from the lesion. Histopathology report showed granulomatous lesion consistent with TB [Figure 3]. The patient was started on ATT. Four months later, the patient presented with hematuria and right flank pain. Ultrasound abdomen showed right mild hydroureteronephrosis. Hence, CECT was done which showed right renal cortical scarring and thinning with uneven caliectasis [Figure 4]. The right distal ureter had stricture which caused hydroureteronephrosis.



Figure 1: Case 1 – Contrast-enhanced computed tomography abdomen showing bilateral adrenal masses in patient with tuberculosis adrenalitis

It was managed with stenting which caused resolution of symptoms.

Case 3

A 22-year-old female patient presented with occasional left-sided loin pain of 4-year duration. The patient was evaluated, and the ultrasound abdomen showed multiple cysts in the left kidney. The patient had increasing frequency and severity of pain. Follow-up ultrasound abdomen done 6 months later showed a complex cyst in the left kidney. Hence, a CECT abdomen was done which showed nonenhancing kidney replaced by multiple cysts [Figure 5]. Hence, a diethylene triamine pentaacetic acid renogram was done which showed a <10% function for the left kidney. Hence, the diagnosis of a left multicystic dysplastic kidney was made, and the patient underwent left simple nephrectomy. Histopathology was a surprise and

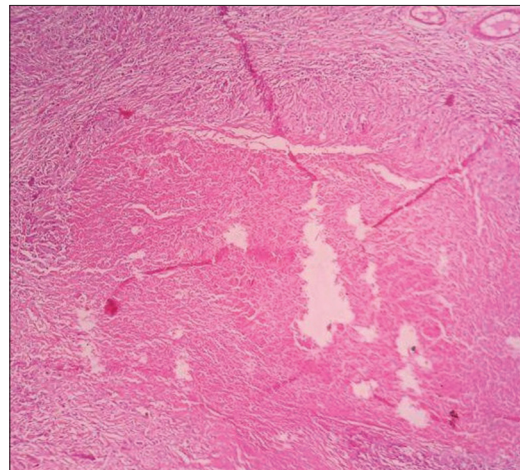


Figure 2: Case 1 – Microscopy of the adrenal gland showing caseation necrosis consistent with tuberculosis adrenalitis

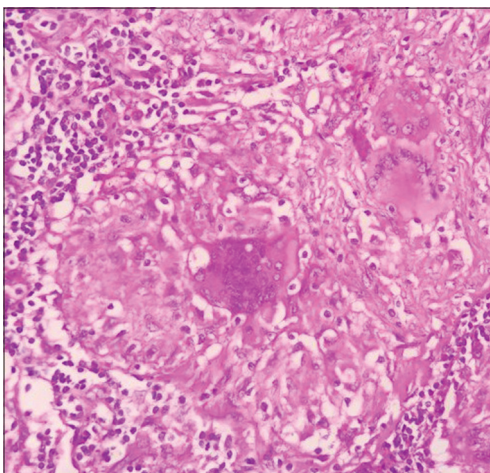


Figure 3: Case 2 – Microscopy of the lesion in urinary bladder showing caseating granuloma consistent with tuberculosis cystitis



Figure 4: Case 2 – Computed tomography urography showing the right renal cortical scarring and thinning with uneven caliectasis. The right distal ureter has stricture which causes hydroureteronephrosis

showed multiple granulomas consistent with renal TB. The patient was treated with ATT.

Case 4

A 50-year-old male patient presented with dysuria, frequency, urgency, and poor stream of urine. There was no hematuria, lithuria, or pyuria. Ultrasound abdomen revealed a 50 g prostate with intravesical protrusion of the median lobe of the prostate for 1 cm. Serum prostate-specific antigen was 2.0, and cystoscopy was done which showed only prostatic enlargement. The patient was put on medical therapy but did not have any significant improvement after 6 months. The irritative symptoms were bothersome. Hence, transurethral resection of the prostate was done. The histopathology report came as granulomatous prostatitis, suggestive of tuberculous prostatitis [Figure 6]. ATT was started, and the patient became symptom-free.

DISCUSSION

TB is the ninth leading cause of death worldwide and also the leading cause of death from a single infectious agent. Around 10.4 million people fell ill with TB in 2016 of which 90% were adults, 65% were male, and 10% were people living with HIV. More than half of the cases worldwide were from five countries: India, Indonesia, China, Philippines, and Pakistan.^[2] GUTB is defined as infectious inflammation of urogenital system organs in any combination, caused by *Mycobacterium tuberculosis* or *Mycobacterium bovis*.^[3] GUTB is the second most common type of extrapulmonary TB. In most of the cases, it is due to reactivation of old dormant tuberculi. In GUTB, the most common site is kidney. TB is basically a droplet infection, and GUTB is by bloodstream spread. It can also

spread during sexual contact.^[4] It has long latent periods of around 15 years, so it is uncommon in children and commonly affects 30–50 years of age group with more incidence in men.^[5,6]

GUTB often has an atypical presentation and has no specific signs. This leads to often late presentation of the disease as in our four cases. In fact, the most common cause of delayed diagnosis is the absence of typical clinical features. TB also hides behind the mask of other diseases and presents later with a surprise. It needs a very high index of suspicion for diagnosis. The complaints are usually localized to the site affected. The most common complaint is loin pain. Other common complaints are flank pain, dysuria, frequency, hematuria, renal or ureteric colic, scrotal pain, scrotal swelling, infertility, and ulceration or fistula in the genital area.^[2,5-8]

The most important clue for early diagnosis is the ineffectiveness of standard antibacterial therapy for UTI as in our Case 2. The prevalence of TB in patients showing poor results to antibiotic therapy for UTI is 25.8%.^[9] The most commonly involved endocrine gland in TB is the adrenal gland. It leads to adrenocortical insufficiency – Addison's disease like in our first case. It is the most common infectious cause for adrenal insufficiency. TB adrenalitis accounts for only <2% adrenal incidentalomas. It is most commonly due to poorly treated GUTB. Signs of adrenal insufficiency take much longer to appear and usually manifests when 90% of the gland is affected.^[10,11]

The diagnosis must be as early as possible to avoid organ damage and complications, such as renal failure, infertility, and disseminated disease. The classical finding



Figure 5: Case 3 – Contrast-enhanced computed tomography abdomen showing the left bulky kidney replaced by multiple nonenhancing cysts

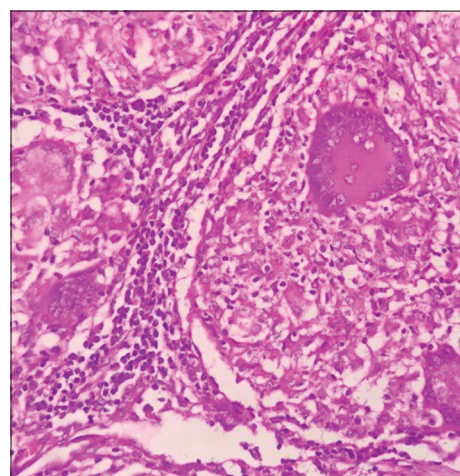


Figure 6: Case 4 – Microscopy of the prostate showing caseating granuloma consistent with tuberculous prostatitis

in urine microscopy is sterile pyuria. Other findings in urine examination are leukocyturia, hematuria, and acidic urine. The gold standard for diagnosis of GUTB is isolation and culture of *Mycobacterium* from urine sample. It has poor sensitivity due to sporadic shedding of the organism in low concentrations. Hence, a minimum of three early morning samples is necessary for diagnosis. Early diagnosis is obtained by the recent nucleic acid amplification tests. These are polymerase chain reaction-based tests and have very high sensitivity and specificity of >90% in various studies. Supportive evidence is obtained by a positive Mantoux test or an elevated erythrocyte sedimentation rate.^[5,12,13]

Imaging findings often clinch the diagnosis. However, when the classical changes occur, the disease would have progressed to a stage of organ destruction. Ultrasound, X-ray, excretory urography, CECT, magnetic resonance imaging, and isotope studies all are used based on the case. The earliest urographic abnormality in renal TB is a moth-eaten appearance of the calyx. Other common classical findings are multiple strictures, localized hydrocalycosis, cavitory lesions, low-capacity thimble bladder, pipe-stem ureter, calcifications, and calculi.^[8,14-16]

Cystoscopy and ureterorenoscopy provide valuable information and give opportunity for the biopsy. The classical microscopic finding is caseating granuloma and necrosis. Histopathology gives a conclusive evidence, and sometimes, the diagnosis is obtained only by histopathology of resected specimen.^[15,17]

The first line of management of GUTB like all other forms of TB is antituberculosis chemotherapy with multiple drugs. The optimum duration of treatment is yet to be defined, but the trend is toward shorter course of 6 months. Antibiotics induce fibrosis and may aggravate stricture formation. The role of corticosteroids is controversial, except for TB adrenalitis causing Addison's disease.^[13,15,18]

Operative management is required mainly to manage complications or sequelae of GUTB. Both endoscopic and open procedures may be required on a case-to-case basis. Reconstructive surgeries are on the rise with the advent of newer technologies and the use of bowel segments in the urinary tract. Hence, multidrug chemotherapy with the judicious use of surgery and strict follow-up form the main crux in the effective management of the GUTB.^[13,15,19]

CONCLUSION

The urologist is confronted with various forms of extrapulmonary TB having atypical presentation. All the

four cases presented late and had to undergo surgery for definitive diagnosis. TB being a great imitator needs a very high index of suspicion in probable cases for early diagnosis to avoid devastating sequelae due to the disease. Furthermore, there is a need to develop better diagnostic tools for TB. Multidrug chemotherapy and judicious use of surgery are the mainstay of management.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Available from: http://www.who.int/tb/publications/global_report/gtbr2017_annex1.pdf?ua=1. [Last accessed on 2018 Sep 02].
2. Kulchavenya E, Kholobin D. Diseases masking and delaying the diagnosis of urogenital tuberculosis. *Ther Adv Urol* 2015;7:331-8.
3. Kulchavenya E. Urogenital tuberculosis: Definition and classification. *Ther Adv Infect Dis* 2014;2:117-22.
4. Zajackowski T. Genitourinary tuberculosis: Historical and basic science review: Past and present. *Cent European J Urol* 2012;65:182-7.
5. Krishnamoorthy S, Palaniyandi V, Kumaresan N, Govindaraju S, Rajasekaran J, Murugappan I, *et al.* Aspects of evolving genito urinary tuberculosis-a profile of genito urinary tuberculosis (GUTB) in 110 patients. *J Clin Diagn Res* 2017;11:PC01-5.
6. Kapoor R, Ansari MS, Mandhani A, Gulia A. Clinical presentation and diagnostic approach in cases of genitourinary tuberculosis. *Indian J Urol* 2008;24:401-5.
7. Kulchavenya E, Zhukova I, Kholobin D. Spectrum of urogenital tuberculosis. *J Infect Chemother* 2013;19:880-3.
8. Merchant S, Bharati A, Merchant N. Tuberculosis of the genitourinary system-urinary tract tuberculosis: Renal tuberculosis-Part I. *Indian J Radiol Imaging* 2013;23:46-63.
9. Kulchavenya E, Cherednichenko A. Urogenital tuberculosis, the cause of ineffective antibacterial therapy for urinary tract infections. *Ther Adv Urol* 2018;10:95-101.
10. Kelestimir F. The endocrinology of adrenal tuberculosis: The effects of tuberculosis on the hypothalamo-pituitary-adrenal axis and adrenocortical function. *J Endocrinol Invest* 2004;27:380-6.
11. Bouknani N, Bentaleb D, Belgadir H, Amriss O, Moussali N, Elbenna N. Tuberculose surrénalienne bilatérale: à propos d'un cas Bilateral adrenal tuberculosis: about a case. *Pan Afr Med J* 2018;29:212. French. doi: 10.11604/pamj.2018.29.212.15459. PMID: 30100966; PMC6080958.
12. Kulchavenya E. Best practice in the diagnosis and management of urogenital tuberculosis. *Ther Adv Urol* 2013;5:143-51.
13. Yadav S, Singh P, Hemal A, Kumar R. Genital tuberculosis: Current status of diagnosis and management. *Transl Androl Urol*

- 2017;6:222-33.
14. Figueiredo AA, Lucon AM, Srougi M. Urogenital Tuberculosis. *Microbiol Spectr* 2017;5. doi: 10.1128/microbiolspec.TNMI7-0015-2016. Review. PubMed PMID: 28087922.
 15. Fillion A, Koutlidis N, Froissart A, Fantin B. Investigation and management of genito-urinary tuberculosis. *Rev Med Interne* 2014;35:808-14.
 16. Engin G, Acunaş B, Acunaş G, Tunaci M. Imaging of extrapulmonary tuberculosis. *Radiographics* 2000;20:471-88.
 17. Das P, Ahuja A, Gupta SD. Incidence, etiopathogenesis and pathological aspects of genitourinary tuberculosis in India: A journey revisited. *Indian J Urol* 2008;24:356-61.
 18. Abbara A, Davidson RN. Etiology and management of genitourinary tuberculosis. *Nat Rev Urol* 2011;8:678-88.
 19. Bansal P, Bansal N. The surgical management of urogenital tuberculosis our experience and long-term follow-up. *Urol Ann* 2015;7:49-52.