

Candida tropicalis in the tropics: A rare fungal cause of perinephric abscess

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ABSTRACT

Perinephric and renal abscess are very rare entities with insidious presentation and pose a great diagnostic challenge, common etiology being bacterial. Only less than 30 cases of fungal etiology have been reported in literature. Herein, we report first case of fungal perinephric abscess caused by *Candida tropicalis* in a young diabetic female who presented with right flank pain and vomiting. Diagnosis made by CT imaging and culture of USG guided aspiration of perinephric abscess revealed growth of *Candida tropicalis*. *Candida tropicalis* perinephric abscess requires a very high index of suspicion for diagnosis. Associated high morbidity and mortality rates are likely due to misdiagnosis, therefore fungal perinephric and renal abscess must be kept as differential diagnosis in cases of fever with abdominal pain. Prompt diagnosis and early treatment are important for better outcome. Imaging and microbiological investigations are required for diagnosis, and drainage is indicated for successful therapy.

Keywords: Abscess, *Candida tropicalis*, fungal, perinephric

Introduction

Renal and perinephric abscess are one of the rare consequences of complicated urinary tract infection and present with non-specific symptoms. The common implicated pathogens are gram-negative enteric bacteria, gram-positive cocci and occasionally anaerobes and fungi, especially *Candida* species. Fungal etiology is a rare cause of perinephric and renal abscess.^[1,2] An extensive literature search revealed less than 30 cases of fungal renal and perinephric abscess reported till date and *Candida albicans* and *Candida glabrata* were commonly reported as etiological agents.^[3-5] To the best of our knowledge, only 3 cases of intrarenal micro-abscess have been reported in literature due to *Candida tropicalis*, however no case of perinephric abscess caused by it has been reported.^[6-8]

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Herein we report first case of a large fungal perinephric and small renal abscess in the world caused by *Candida tropicalis* in a young female.

Case History

A 22-year-old female, with history of diabetes mellitus for 2 years was admitted to our hospital with complaints of right flank pain, high grade fever, vomiting and decreased urine output for 1 week. She had no history of prolonged antibiotic treatment, previous surgery, catheterization, prior hospitalization or tuberculosis in the past. On presentation, her blood pressure was 70/40 millimeters of mercury, heart rate was 120 beats per minute, respiratory rate-24 per minute, temperature of 39°C and was anuric. On physical examination, right flank tenderness was noted. Hematological investigation revealed a total leucocyte count (TLC) of 30,000, with 83% neutrophils, platelet count of 3 lakhs and hemoglobin of 7.2 g/dl. Serum creatinine was 6.6 mg/dl and blood glucose level was 300 mg/dl on

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admission. Urine routine and microscopic examination revealed 15–20 pus cells/hpf and glucosuria (100 mg/dl). She was started on intravenous fluids, nor-adrenaline infusion for inotropic support, intravenous meropenem in modified renal dose, paracetamol and insulin infusion.

Ultrasound abdomen revealed a grossly enlarged right kidney with irregular outline and perinephric fat stranding, multiple hypoechoic areas suggestive of renal abscesses and a perinephric collection of size 5.3 × 3 cm. As serum creatinine was persistently elevated, a non-contrast Computerized Tomography (CT) scan of the kidneys was done which revealed bilateral fat stranding, right perinephric abscess and multiple areas of small renal abscess. [Figure 1] Subsequently, ultrasound-guided aspiration of the perinephric abscess was attempted and it yielded about 65 cc of pus. Patient slowly developed a urine output of 600–800 ml/day. Patient underwent bilateral double J stent placement on day 2 of admission. A 10 Fr pigtail was also inserted in the persistent perinephric collection. However, she still continued to have spikes of fever despite being on intravenous antibiotics and antipyretics.

The perinephric pus was sent for microbiological investigations. Gram staining was performed from direct specimen which showed gram positive budding yeast cells [Figure 2a]. The specimen was inoculated on Sabouraud's dextrose agar slants, incubated at 37°C for 24 h which showed creamy pasty growth [Figure 2b]. Germ tube test was done using *Candida albicans* ATCC 90028 as control and demonstrated negative results for germ tube production. Corn meal agar and HiCrome Candida Differential Agar were inoculated for further identification [Figure 2c and d]. Probable identification of *Candida tropicalis* was made which was then confirmed by MALDI-TOF MS (Bruker Daltonics, Bremen, Germany) with a Confidence Interval (CI) score of 1.8 by direct formic acid extraction and same identification by VITEK-MS (Biomérieux, Craponne, France). Antifungal susceptibility testing for the

isolate was done by VITEK2 system. However, her urine and blood culture were sterile. Our isolate was sensitive to fluconazole, amphotericin, and echinocandins. Patient was started on intravenous fluconazole. Fever spikes decreased subsequently and the TLC became normal (9300/μL), urine output gradually improved to 2.5 L/day over a period of 5 days and her serum creatinine became normal within 1 week of hospitalization. Intravenous fluconazole was continued for 1 week followed by 3 weeks of oral fluconazole therapy. Double J stents were removed after 10 days. Patient was followed up with Ultrasound (KUB) to look for residual collection. Repeat ultrasound on follow-up revealed complete resolution of perinephric collection after 2 weeks, hence pigtail catheter was removed. She was discharged after 2 weeks of hospitalization in stable condition. At 2 weeks of follow-up, patient has normal serum creatinine and is doing well.

Discussion

Over the last three decades, *Candida* species has emerged as an important cause of health care associated and opportunistic infections. Although most infections are attributed to *Candida albicans*, the shift towards non-*albicans* *Candida* (NAC) species is evident in recent years.^[9,10]

In India, *Candida tropicalis* is the most common cause of health care associated candidemia. The increased isolation of *Candida tropicalis* from various clinical types of candidiasis is of concern because of its ability to develop rapid resistance to fluconazole. It is second most virulent fungal species after *Candida albicans* and surpasses it in producing biofilm.^[11]

Candida tropicalis related renal abscesses are rare and were previously reported in severely immunocompromised hosts, especially patients with acute leukemia after chemotherapy.^[6,7] Other risk factors associated with fungal renal and perinephric

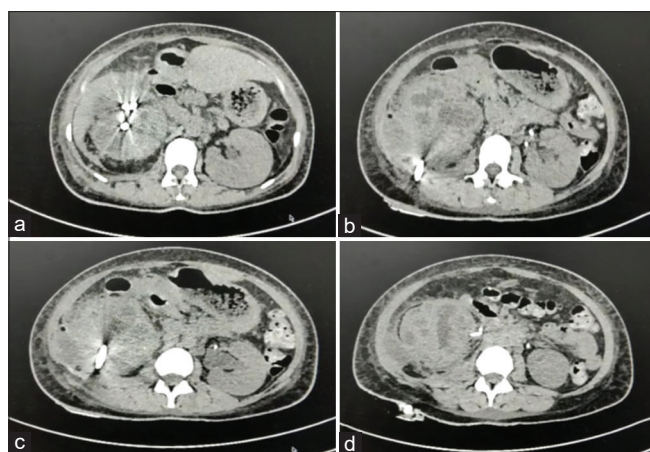


Figure 1: (a-c) Sequential axial non-contrast computerized tomography(CT) images showing bilateral fat stranding, right perinephric abscess and multiple areas of small renal abscess, with pig tail in the right kidney; 1d: Bilateral Double-J stent in situ

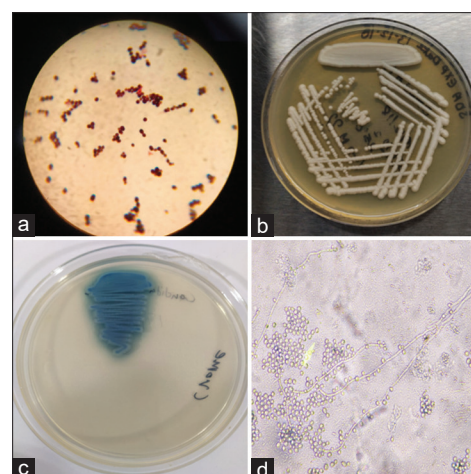


Figure 2: (a) Gram-positive budding yeast cells on Grams staining, (b) Creamy, pasty colonies on Sabouraud's dextrose agar, (c) Metallic blue raised colonies on HiCrome™ Candida Differential Agar, (d) *Candida tropicalis* (Blastoconidia anywhere along pseudohyphae) on Corn Meal agar

abscess are uncontrolled diabetes mellitus, malignancy, prolonged antibiotic use, abnormal urological anatomy, and previous urological interventions. The pathogenesis involves a hematogenous dissemination from a distant focus or an ascending infection of the urinary tract.^[12]

Fungal perinephric abscess is a very rare occurrence, reported only in few case reports and 2 case series in literature. In a study by Shu T, et al., only 1 out of 70 patients of perinephric abscess was reported to be of fungal etiology.^[13] *Candida albicans* and *Candida glabrata* are the implicated species in fungal renal and perinephric abscess.^[5-8]

Li et al. and Duque et al. reported 1 case each, of intra renal abscess with *Candida tropicalis* as possible etiology in patients with AML.^[6,7] Chandra et al. reported a case of *Candida tropicalis* intrarenal abscess in a type II diabetic patient.^[8] Our patient had large perinephric abscess as well as intrarenal abscess, caused by *Candida tropicalis*, making it a unique and first case to be reported.

Ultrasound and cross-sectional imaging are cornerstones in diagnosing the presence of perinephric abscess. CT scan, if feasible, is the investigation of choice.^[3] Since fungal infection in these cases are rare, a pus culture from abscess is required to establish the presence of bacterial or fungal species and to initiate a targeted therapy.

Effective management of fungal abscesses requires prompt diagnosis and combined medical and surgical interventions. Patients often present only with history of fever, abdominal pain, anorexia and sometimes with symptoms of urinary tract infection. So, general practitioners at primary care level must be vigilant to keep fungal etiology as differential. Lie et al. and Duque et al. reported prolonged antifungal treatment (fluconazole and amphotericin respectively) for treatment of *Candida tropicalis* renal micro-abscess.^[7,8] However, Chandra et al. reported aspiration and antifungal treatment with amphotericin.^[8] Our patient underwent pigtail drainage of perinephric abscess and antifungal treatment with fluconazole for 4 weeks. Although there is increasing evidence of azole resistance in *Candida tropicalis*, prolonged therapy with fluconazole has been shown to be effective in *Candida tropicalis* infection.

Conclusion

Candida tropicalis causing perinephric abscess is a very rare entity. It requires a high index of suspicion for expeditious diagnosis of fungal perinephric abscess. Cross sectional imaging and microbiological examination are important to establish fungal etiology. Prompt combined medical treatment and drainage of pus is mainstay for successful management of these patients.

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 patient understands that her name 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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Key Messages: Fungal perinephric abscess though rare but must be kept as a differential diagnosis in patients with fever and abdomen pain for better clinical outcome. This case report highlights that in patients with diabetes and renal stone disease, while treating Urinary tract infections (UTI), primary care physicians must look for fungal etiology also to prevent complicated UTI's.

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Conflicts of interest

There are no conflicts of interest.

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