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Renal fungal bezoar owing to *Geotrichum candidum*

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ABSTRACT

Geotrichum candidum is yeast like fungi that cause infections in immunocompromised patients. We report a case of renal fungal ball with *Geotrichum candidum* in a 27 yr. old women post-partum. This case to our knowledge is the first case of renal fungal bezoar due to *Geotrichum candidum* reported in India.

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1. Introduction

Geotrichum candidum is common yeast like fungus with world-wide distribution. The pathogenicity of this fungus in humans has not been clearly defined [1]. *Geotrichum candidum* infection has been reported in renal transplant recipients [2].

Oral infections of *Geotrichum candidum* are clinically similar to candidiasis and commonly associated with diabetes mellitus and HIV infection [1,3]. Cases of dissemination and fungemia are reported in patients with chronic and acute myeloid leukemia [4–10].

We report a case of 27 yr. old women post-partum with isolated renal calculi and renal fungal bezoar attributed to *Geotrichum candidum* and to illustrate the diagnostic dilemmas.

2. Case

27 yr. old women presented with history of left flank pain and intermittent fever since 15 days. She gave history of full term normal delivery 3 months ago. There was no hematuria, oliguria, dysuria and lower urinary tract symptoms. She was evaluated elsewhere with contrast enhanced computerized tomography (CT) scan which revealed contracted left kidney with 2 calculi in

the lower and middle calyx of 8–9 mm each with intrapelvic mass and multiple air pockets in the renal pelvis (Fig. 1).

The retrograde uretrogram (RGU) done also revealed renal fungal ball (Fig. 2).

She had undergone cystoscopy and left DJ stenting elsewhere but continued to have fever and flank pain when she was presented to us. After routine investigation, patient was started on 3rd generation cephalosporin and she underwent left percutaneous nephrolithotripsy (PCNL) which revealed brownish gray material with 2 calculi. Portion of the specimen was sent to the pathology laboratory for histopathological examination.

Gross specimen consists of multiple irregular gray brown tissue bits, largest measuring 0.5 cm × 0.5 cm and cut portion showed gray brown areas. Section showed fungal ball containing aggregates of macerated, distorted fungal hyphae with some showing acute angle branching surrounded by cell debris and neutrophils.

Both urine and biopsy material sent to mycology laboratory for culture investigation were inoculated on Sabourauds dextrose agar (Hi-media Laboratories Ltd., Mumbai) and incubated at 37 °C and 28 °C which grew a rapidly growing fungus with flat, white to creamy having a smooth texture later becoming hairy consistent with *Geotrichum candidum* (Fig. 3).

Identification was based on the morphological characters and the biochemical test profiles. *Geotrichum candidum* was morphologically identified by the presence of true hyphae, hyaline smooth, one-celled, subglobose to cylindrical, slimy arthroconidia and the lack of blastoconidia. The arthroconidia vary in size and germinate at one end giving a 'hockey stick appearance' (Fig. 4).

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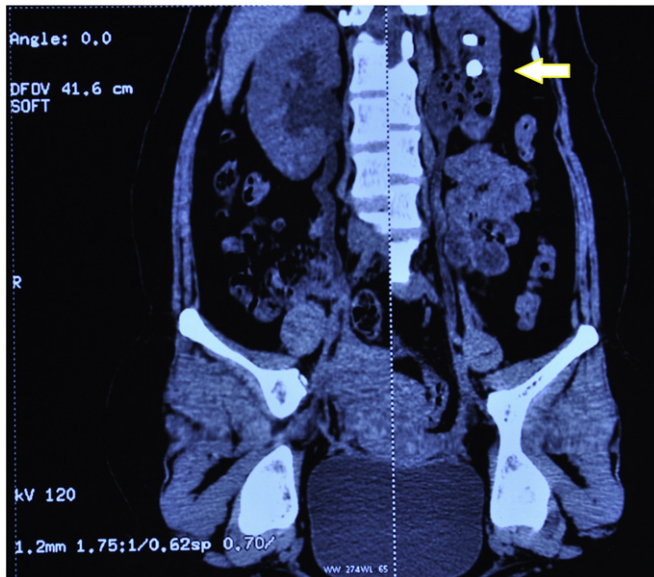


Fig. 1. CT scan image showing the renal fungal ball with two calculi.

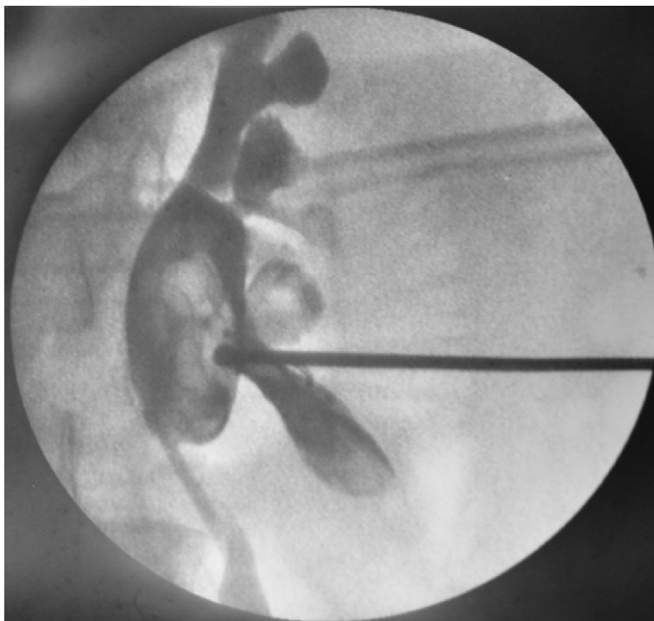


Fig. 2. Retrograde uretrogram showing renal fungal ball.



Fig. 3. Colony macroscopy of *Geotrichum candidum* on Sabourauds dextrose agar after 5 days of incubation at 28 °C.

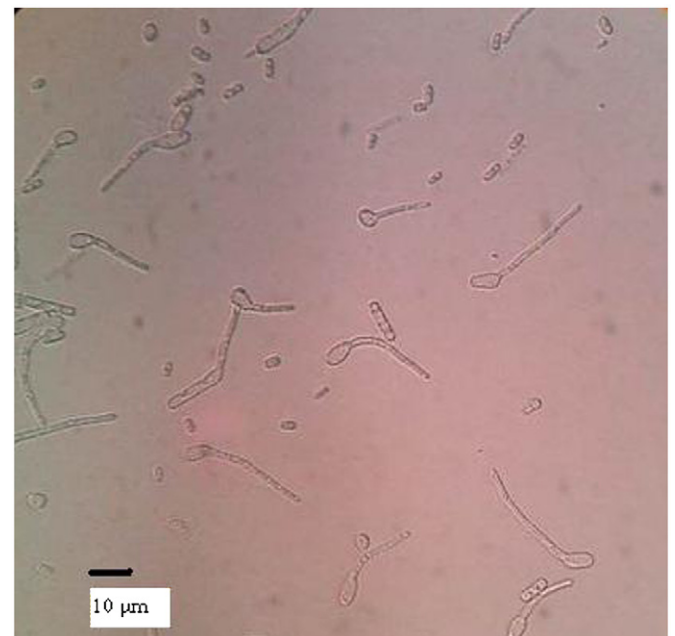


Fig. 4. Wet mount preparation showing germinating arthrospores with a 'hockey stick appearance'—40 ×.

Biochemical identification was carried out in the mycology laboratory, Kasturba Medical College, Manipal using both conventional and API 20C yeast identification system (Biomerieux Inc.). It was further differentiated from *Trichosporon* by the absence of urea utilization and inability to assimilate carbohydrate; maltose, sucrose, lactose, cellobiose, inositol raffinose and trehalose. Glucose, galactose and xylose were assimilated.

Antifungal susceptibility testing for the isolate was performed according to the Clinical and Laboratory Standards Institute (CLSI) document M38-A2. The MIC₉₀ (minimum inhibitory concentration) for amphotericin, fluconazole, itraconazole and voriconazole were found to be 0.125 μg/mL, 16 μg/mL, 4 μg/mL and 0.25 μg/mL respectively.

Patient continued to have fever in the post-operative period and responded only after starting intravenous itraconazole 200 mg bd for 2 days followed by oral itraconazole 200 mg bd and continued for 6 weeks. During the follow up, a repeat CT done

showed complete clearance of the fungal material from the left kidney.

3. Discussion

The saprophytic colonization of a preformed cavity by conglomerate of fungal mycelia without invasion of adjacent tissue is termed as fungal ball or fungal bezoar [11]. Renal colic can be caused by passage of fungal ball that obstruct the collecting system. Genitourinary tract is rarely a site of primary fungal infection with exception of *Candida* species, however it may be involved as a result or part of systemic infection. Candidal

infection can cause pyelonephritis, abscess, papillary necrosis and obstruction with fever and flank pain [12,13].

Genitourinary fungal infections are usually encountered as a part of disseminated disease in immunocompromised host (AIDS, corticosteroids, malignancy, neutropenia) [4–10].

Fungal balls also called and fungal bezoars or accretions are known to cause ureteral and uretero-pelvic junction obstruction. Diagnosis is established by identification the of fungi in urine and imaging studies using (Computerized tomography, ultra sonography, intravenous urography) that document obstructive uropathy and soft tissue density with in renal collecting system [13]. Morello et al. have successfully managed the removal of bilateral renal pelvis mycotic bezoars using a mechanical thrombectomy device followed by antifungal renal pelvis irrigation [14]. Percutaneous nephrostomy, tract dilation and fluoroscopically guided extraction of renal fungal ball under epidural anesthesia is described by Doemeny et al. [15].

The outcome of *Geotrichum* infections depend on the degree of tissue invasion by the organism and the immune status of the host [16]. Sheehy et al. suggested that *Geotrichum* lack virulence and ability to colonize renal tubules based on the rarity of disseminated disease, lack of tissue invasion and their rapid clearance in most of the case reported [10].

Although rare, *Geotrichum candidum* is potential pathogen in immune compromised hosts. Its incidence may be under reported since it can be misdiagnosed histopathologically as *Candida*, *Aspergillus* or *Trichosporon*. This possibility of misinterpretation highlights the importance of obtaining repeated fungal cultures in addition to histopathological examination. Our patient was successfully managed by antifungal therapy and endourological debulking. We hereby reiterate the pathogenic potential of *Geotrichum candidum* and report its role in causing renal fungal ball.

Conflict of interest

There are none.

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