

Geotrichum candidum: A Rare Infection Agent in Urinary System: Case Report and Review of The Literature

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ABSTRACT

Geotrichum is a species of fungi that can be found in every environment in nature, in soil, in water and in air. As it can be found in plants and in cereals and milk products, it has also been shown to be found in normal human flora (mucus and faeces). *Geotrichum candidum*, mostly saprophytic, can cause clinical picture called *Geotrichosis*. Neoplasms, leukosis, HIV infection, diabetes mellitus, and kidney transplantation are generally the underlying diseases in such cases. In a case in which we detected *G.candidum* reproduction in urinary tract infection, we aimed to present the case with its clinic findings and to review the literature.

Key words: *Geotrichum candidum*, *Geotrichosis*, fungus, immunosuppressive host

INTRODUCTION

Fungi are creatures that humans shelter in their oral and intestinal mucus mostly as saprophyte [1]. They can be found in 30% of healthy people. The fungi of *Geotrichum* species are the members of *Endomycetaceae* family from *Saccharomycetales* class [2]. Although they are widely found in natural environments, *Geotrichum candidum* has been isolated in very rare cases as agents [2].

In a period of treatment in intensive care unit, an infection was thought to have developed in the urinary tract of one of our patients. *G.candidum* reproduced in urinary culture taken to test the infection agent. The methods followed in the course of the identification of this rarely-seen fungi infection and the clinical data of the patient have been retrospectively examined, being reported as case report.

Case report

An 74-year-old man who was treated in intensive care unit has fever up to 39°C, and suddenly developing severe pain at lumbar

region. The patient was being treated with lung and bronchial cancer diagnosis. There was no associated locally lymphadenopathy. These symptoms occurred on the 9th day of admission to the hospital.

Laboratory examinations included blood count, urinalysis, urine microscopic examination, C reactive protein (CRP), biochemical tests for identification of pathogenic bacteria and fungi. During this stage results of laboratory tests had been found as follows; white blood cell count 27.800/ μ L, erythrocyte sedimentation rate 78 mm/h, C reactive protein: 164.6 mg/L, AST:19 IU/L, ALT:12 IU/L, hepatitis markers were negative, Transient elevation of hepatic and renal biochemistry was probably due to immune-compromised situation. Abdominal radiography was also normal. Except for pO₂ and pH, arterial blood gases were within normal limits. Macroscopic appearance was blurred and green color of the urine. Erythrocyte, polymorphic nuclear leucocyte and hyphal elements have been showed in microscopic examination of the urine specimen. A large number of leukocyte clusters, erythrocyte and fungal hyphal elements were detected at urinalysis. Furthermore, use

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of Gram stain of urine specimen showed numerous septate hyphae without spores within material (Figure 1). Therefore, infection with fungal species was initially suspected.

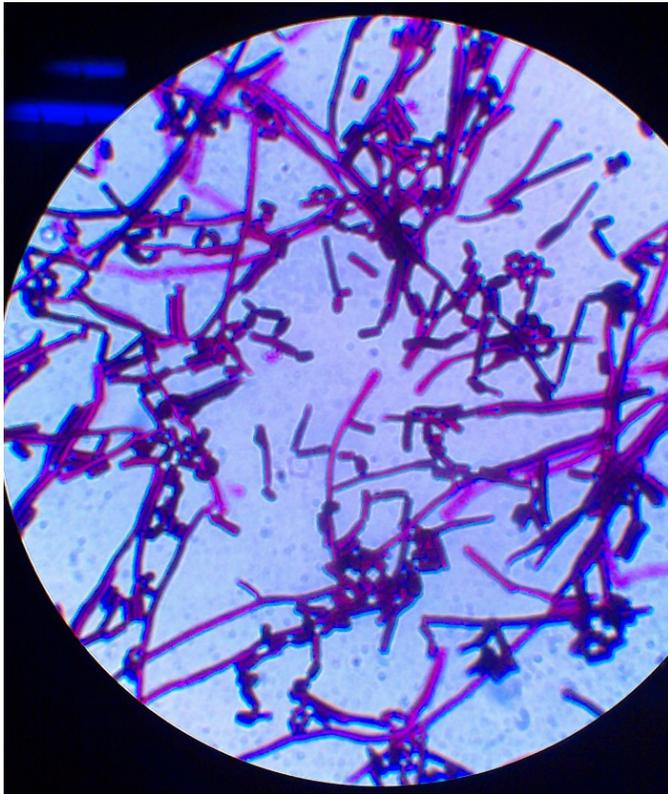


Figure 1. Gram stain of the patient's urine

Two urine specimens have been taken from the case at different days were cultured for including bacteria and fungi. The samples were inoculated onto blood agar (RTA Labs, Turkey), Eosin Methylene Blue (EMB) Agar (RTA Labs, Turkey) and Sabouraud's dextrose agar (SDA) (RTA Labs, Turkey) plates and incubated at 37°C aerobically, and one Sabouraud's dextrose agar plate incubated aerobically at 25°C. After 24 h of incubation, culture at 37°C yielded in pure growth on blood agar, SDA and EMB agar. Colony appearance is cream color, moist, and yeast-like (Figure 2). At 25°C, growth on SDA slowly over a period of three days. Microscopically the colonies were seen to be composed of hyphal elements that segmented into rectangular arthroconidia, quite variable in size. Based on the colonial and microscopic characteristics, the lack of carbohydrate fermentation and urease activity and the carbohydrate assimilation tests performed by API 20C AUX (BioMe'rieux, France), the isolate was identified as *Geotrichum candidum*. Repeated cultures from the patient were positive for *Escherichia coli* and *G.candidum*, so that persistence of the fungi was attributed to the pulmonary cancer of the patient.

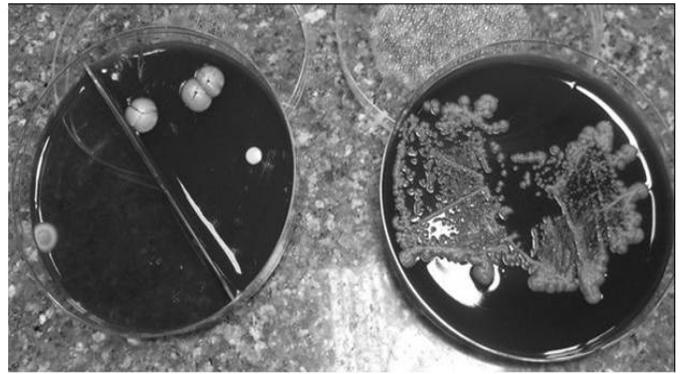


Figure 2. Colony appearance of the microorganism

Treatment with voriconazole 400 mg/day was preferred. There have been negative changes in laboratory results in this patient with pulmonary cancer due to the fungal urine infection by *G.candidum*. However, two days later, the general condition worsened and the patient was lost.

DISCUSSION

Geotrichum candidum is a fungi species rarely isolated as infection agent in human body [2-4]. There are very few number of cases reported in this field [5-10]. In searching the infection agent especially in immune failure cases and in old age group, it is a very rare agent that can come to mind. Colonial morphology and microscopic evaluation are the most useful and basic identification methods for identification of *G.candidum* [1].

Kassamali et al. reported disseminated *G.candidum* infection in a 47-year-old female case with acute leukemia [11]. On the 17th day following chemotherapy, the blood and urine cultures had been positive for fungi. Three days after, nodular skin lesions have been developed. According to biopsy results of the skin lesion showed irregularly septated hyphae. The histopathological appearance consistent with *G.candidum* was also confirmed by culture test in this study [11]. This case had died on day 26 of chemotherapy after a total dose of 90 mg of amphotericin B. Kassamali et al revealed that a disseminated fungal infection. with histopathological findings after autopsy [11].

Prakash et al. also reported the agent as *G.candidum* in a case regarding renal fungal bezoar in a female patient, 27 ages, in postpartum period [12]. The patient had left flank pain and intermittent fever for 15 days. Hematuria, oliguria, dysuria and lower urinary tract symptoms had no complaints. Renal fungal bezoar had been revealed with computerized tomography scan which contracted left kidney with 2 calculi in the lower and middle calyx. Fungal bezoar was removed by percutaneous nephrolithotripsy method for surgical treatment. And then, intravenous itraconazole 200 mg bd was started for medical treatment. Complete clearance had occurred 6 weeks later in this case.

Traumatic joint infections due to local tissue invasion have also been reported [13]. Sfakianakis et al. reported invasive cutaneous infection in a case with DM [14]. An ulcerative lesion developed in the distal phalanx region of an 80-year-old male patient after trauma. When a biopsy was taken from the lesion, a large number of septic hyphae without spores were seen in necrotic material. The diagnosis of geotrichosis caused by *G.candidum* was based on histopathology and cultures from biopsy material in this case.

G.candidum infection has been disseminated in a 56-year-old woman patient with relapsed acute myelogenous leukemia following allogeneic stem cell transplantation [7]. The patient was using prednisone daily because of chronic graft-versus-host disease. Prednisone effected renal function worsly. In this process, *G.candidum* infection developed and spread. The isolate was susceptible to voriconazole, amphotericin B, and micafungin in vitro in this study [7].

G.candidum is usually sensitive to systemic antifungal agents [3]. However, serious infections occur and treatment response becomes difficult in immunosuppressive cases [4].

In our study, it was aimed to define *G.candidum* that we determined in urine cultures repeated in our case in intensive care unit who received chemotherapy, had immune failure, and was in old age group and to research the place of this infection in literature.

In conclusion, for immunosuppressive patients, fungal agents should be kept in mind to cause opportunistic infection in performing microbiological tests, and from this viewpoint care should be taken in direct microscopic studies and in assessment of culture plaques.

Conflict of Interests: The authors declare that they have no conflict of interest.

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