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Case Report

Microbiology Section

Pulmonary Infection by *Blastoschizomyces capitatus* in An old Tuberculosis Patient

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ABSTRACT

Blastoschizomyces capitatus is an arthrospore filamentous fungus. Lung infection by *Blastoschizomyces* can develop as an opportunistic infection in patients with underlying conditions especially when there is immunosuppression including neutropenia. However, it can occur in non-neutropenic patients with solid organ transplant and patients whose local pulmonary defenses are altered by chronic underlying lung pathology. We report here a case of pulmonary infection by *B. capitatus* in an old tuberculosis patient.

Keywords: Fluconazole, Immunocompetence, Sputum

CASE REPORT

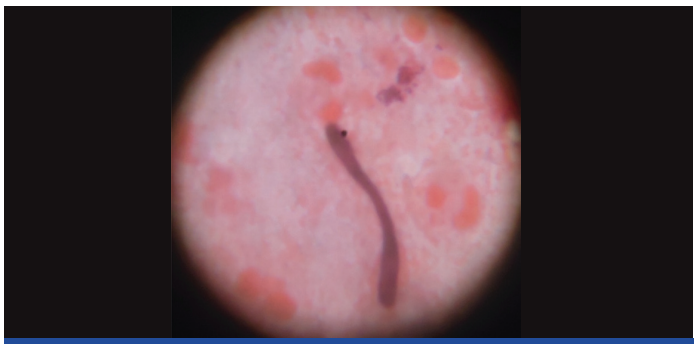
A 75-year-old male presented to the Emergency Department of Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh on with fever, breathlessness, epitaxis and malaise. On chest auscultation, bilateral rhonchi and crepitation in intrascapular region were found.

Lab investigations showed Hb 16 gm%, TLC 9900/mm^3 with DLC $P_{76}L_{21}M_{02}E_{01}B_{00}$ and Platelets 2.53lakhs/µl ESR was 35mm in 1st hour FBS=146mg/dl. HIV and HBsAg were both non reactive. Liver and renal function tests were within normal limits. X-ray chest showed patchy consolidation in middle and lower zones. ECG revealed AV block. Sputum sample was send to the Microbiology Department for gram stain, acid fast staining, KOH mount and culture.

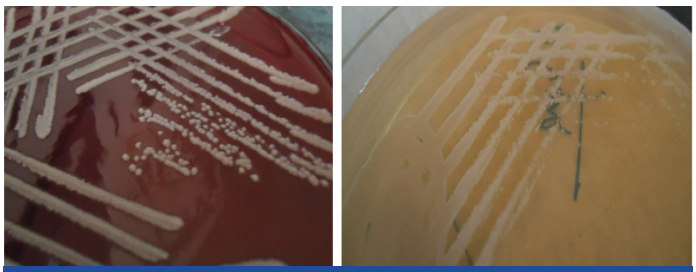
Numerous fungal hyphae with arthrospores were seen on gram staining of the sputum sample [Table/Fig-1]. Direct KOH examination also showed fungal hyphae. No acid fast structures were seen. Culture on blood agar and SDA agar showed pure growth of white to cream colored, yeast like, smooth to wrinkled colonies [Table/Fig-2]. His three repeat samples were examined which also revealed similar findings.

On lactophenol cotton blue preparation and gram staining, true hyphae, pseudohyphae and annelloconidia resembling arthroconidia were seen microscopically [Table/Fig-3]. On further Dalmau plating on Cornmeal Tween 80 agar clusters of annelloconidia at the tips of the annelids were seen [Table/Fig-4]. Further on subculture, growth was obtained at 45ºC. The isolated fungus was unable to utilize urea. Glucose and galactose were assimilated. On the basis of direct examination, culture and various biochemical tests, fungus was finally identified as *Blastoschizomyces capitatus*. A further confirmation of the same was done by the VITEK-2 (bioMèrieux VITEK) system. Antifungal susceptibility was also done by VITEK-2 system, the fungus was found to be sensitive to most antifungal agents.

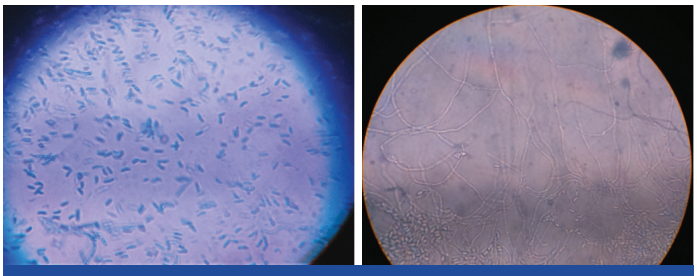
Patient was started on oral fluconazole 150 mg, however, we were not able to follow up the patient as the patient left the hospital against medical advice (LAMA).



[Table/Fig-1]: Gram stain of the sputum sample showing fungal hyphae



[Table/Fig-2]: Blood Agar and Sabouraud's Dextrose Agar showing cream coloured yeast like colonies of *Blastoschizomyces capitatus*



[Table/Fig-3]: Lactophenol cotton blue mount showing annelloconidia and pseudohyphae
[Table/Fig-4]: Dalmau plating on Cornmeal Tween 80 agar showing clusters of annelloconidia

Author	Year	Age & Sex of patients	Treatment offered	Treatment outcome
Wills TS et al., [7]	2004	40-year-Male	Oral Fluconazole + Inj. Amphotericin B	Recovered completely
Gill P and Gill J [8]	2011	70-year-Female	Oral Fluconazole	Recovered completely
Dhevahi E et al., [9]	2014	52-year-male 68-year-male	Oral Itraconazole Oral Itraconazole	Recovered completely
Our study	2015	75-year-Male	Oral Fluconazole	Recovered completely

[Table/Fig-5]: Comparative analysis of various studies on Pulmonary mycosis

DISCUSSION

Invasive fungal infections are increasingly important as causes of morbidity and mortality especially in immunocompromised patients. *B. capitatus* is an infrequent cause of invasive systemic infection in such patients [1]. Lesions have occurred in the lung, kidney, liver, spleen, brain and other organs; it has also caused endocarditis. The organism is distributed in nature and may be found as normal flora of the skin, respiratory tract and gastrointestinal tract [2]. The organism was previously known with different names as *Geotrichium capitatum*, *Trichosporon capitatum* and *Saprochaete capitatai* [3,4]. Fungus forms yeast like, smooth to wrinkled, white to cream colored colonies on blood agar and Sabouraud agar. On Corn-meal agar, round to oval budding yeast cells with pseudohyphae and many annelloconidia are seen. However, similar picture is also seen with *Trichosporon* spp. or *Candida krusei* which may lead to misidentification. Biochemical tests like urease and growth on cycloheximide helps it distinguishing from the above two [5]. Several cases have been reported about *Blastoschizomyces* infection in immunocompromised patients. Acute leukemias resulting in neutropenia has been the dominant predisposing factor in >90% of patients [6]. Not much data is however available on pulmonary infection by *B. capitatus* in an immunocompetent individual. Pulmonary mycosis in non-neutropenic patient affects two main populations: the solid organ transplanted patients and patients whose local defences are altered by chronic underlying lung pathology. An internet search revealed only four cases of Pulmonary mycosis [7-9]. It is evident from the studies [Table/Fig-5] that all the patients were elderly but otherwise immunocompetent males except in study by Gill [8] where the patient was a female. All of them were put on azole group of drugs to which they responded very well and recovered. Patient in study by El-Hassani et al., [10] also had tuberculosis as underlying lung pathology just as our study.

CONCLUSION

Infections due to less pathogenic and non-pathogenic fungi are on a rise. *B. capitatus* is an infrequent cause of invasive systemic infection in immunocompromised hosts. However it can cause pulmonary infection in patients without immunosuppression but with underlying lung pathology. Hence, the use of definitive diagnostic procedures and the rational application of antifungals can only curb the situation.

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