

## Case Report

# Cryptococcal Meningitis in a Human Immunodeficiency Virus Sero-positive Patient – A Case Study

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## ABSTRACT

A 42-year-old female patient was admitted to the hospital with moderate grade fever, severe headache, loss of appetite and sore throat. She was suspected for Meningitis and her CSF sample was sent to the Laboratory for Microbiological Examination. The CSF sample obtained showed the presence of capsulated budding yeast cells on India Ink Examination and *Cryptococcus neoformans* was isolated on sabroud's dextrose agar (SDA) culture. The patient was recently diagnosed as HIV-Sero Positive and was immunocompromised leading to acquiring of Cryptococcal meningitis. The lack of awareness of human immunodeficiency virus infection-acquired immune deficiency syndrome (HIV-AIDS) and delayed diagnosis of Cryptococcal meningitis led to the poor prognosis. Early diagnosis of HIV and timely treatment can improve the prognosis of the disease.

**Keywords:** cryptococcal meningitis, human immunodeficiency virus, cerebrospinal fluid, central nervous system, gram staining.

## INTRODUCTION

*Cryptococcus neoformans*, so far is the most common cause of Cryptococcal meningitis in adults with high human immunodeficiency virus infection (HIV) seroprevalence. The prevalence is higher in Sub Saharan Africa despite of having improved retroviral therapies. Also, prevalence of Cryptococcal meningitis in non-HIV patients is a matter of concern [1]. In India, it is the most common opportunistic infection of central nervous system (CNS) in HIV Patients. HIV patients having CD4 count less than 100 cells/ $\mu$ l are usually affected with Cryptococcal meningitis [2].

Diagnostic procedures include examination of cerebrospinal fluid (CSF) wet mount, India Ink, Cryptococcal antigen tests and

culture methods [3]. With limitations in therapies with antifungal drugs due to raised intracranial pressure, Amphotericin B along with flucytosine is the drug of choice for two weeks followed by Fluconazole for another 8 weeks. Here, we report a case of Cryptococcal meningitis in patient with positive Retroviral Disease due to low immune status [4].

## CASE REPORT

A 42-year-old female patient, recently diagnosed with retroviral disease was brought to outpatient department on January 21, 2022. She was apparently well 20 days back but suddenly developed moderate grade fever with chills which were relieved with simple medication. 10 days later she had a complain of

severe headache (Holocranial - more in occipital area extending till neck). She also complained of sore throat and loss of appetite. There was no history of nausea, vomiting, cough, breathlessness, palpitation, dizziness, involuntary movement, or loss of consciousness. Examination showed poor G and C bases of deoxyribonucleic acid (DNA), pulse rate 74 mm Hg, blood pressure of 160/90 mm Hg, SpO<sub>2</sub>: 98% on room air and random blood sugar (RBS) was 216 mg/dl. On admission, neck rigidity was positive.

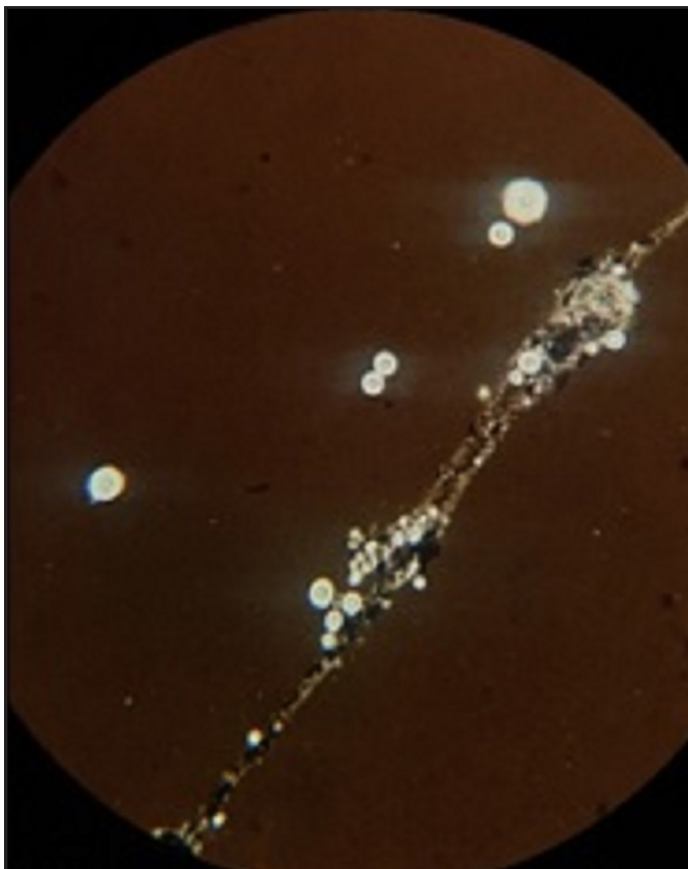
The patient was admitted to medical intensive care unit (MICU0) and CSF sample was sent to microbiology laboratory. Wet

mount, India Ink, Gram staining, and culture was performed immediately for the CSF samples as per standard procedures.

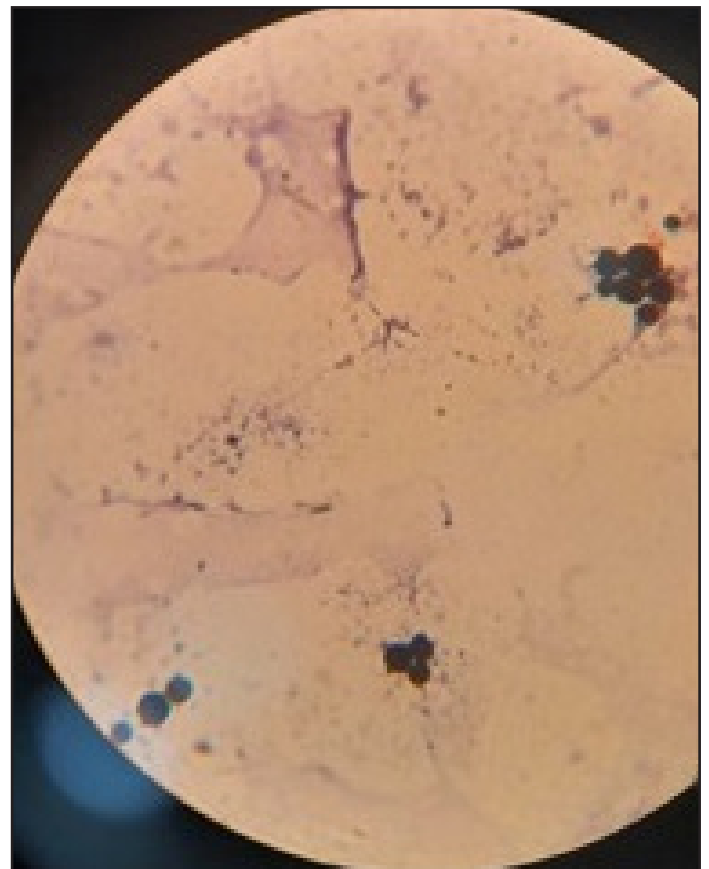
Wet mount examination revealed, 2-4 pus cells/ hpf, > 15 red blood cells (RBCs)/ hpf and 0-1 Epithelial cell/ hpf. India Ink

examination revealed, few capsulated budding yeast cells with diameter 4-7 μm (Figure 1). Gram staining examination revealed, few pus cells were seen and few budding yeast cells (Figure 2). On sabrou's dextrose agar, CSF was cultures by standard microbiological procedures. After 48 hours of incubation, Creamy white mucoid colonies were observed (Figure 3). The wet mount, Gram stain, and India Ink preparation from the growth revealed capsulated budding yeast cells (Figure 4). The organism was further confirmed by brownish color colonies on bird seed agar and by a positive urease test (Figure 5 and Figure 6). Hence according to the microscopic and culture findings, the organism isolated was *Cryptococcus neoformans*.

Also, on correlating with CSF routine and microscopy, the CSF protein levels were increased to 128.28 mg/dl and CSF glucose levels were decreased to 39.7 mg/dl. Correlating the clinical symptoms and the microscopic and culture finding, the diagnosis of Cryptococcal meningitis was confirmed.



**Figure 1.** CSF sample showing capsulated budding yeast cells in India Ink



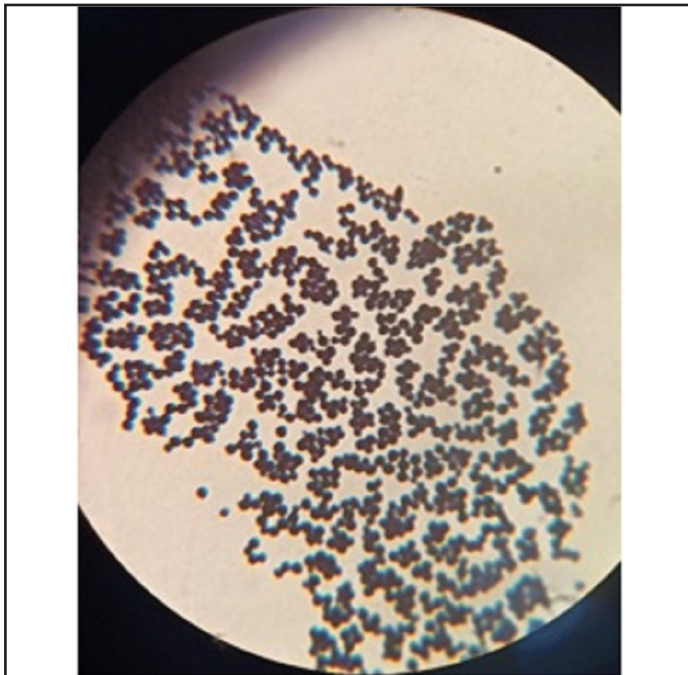
**Figure 2.** CSF sample showing budding yeast cells in gram staining



**Figure 3.** Creamy white mucoid colonies on sabroud's dextrose agar



**Figure 5.** Bird seed agar showing brown colored colonies



**Figure 4.** Gram staining showing budding yeast cells of colonies grown on sabroud's dextrose agar



**Figure 6.** Positive urease test

## DISCUSSION

Cryptococcal meningitis is one of the most common opportunistic infections associated with human immunodeficiency virus infection-acquired immune deficiency syndrome (HIV-AIDS). It is the leading cause of death with a mortality rate of 7-15% in HIV Patients around the world. The major reason behind the high mortality rate is mis-diagnosis due to late presentation of disease, serious complications and lack of awareness about HIV-AIDS and its associated opportunistic infections [5-7].

In this case study, the patient was recently diagnosed with HIV disease which indicates that her CD<sub>4</sub>-CD<sub>8</sub> count was lower making her prone to the opportunistic infections. The patient was admitted in the MICU and she was treated with Injection Ceftriaxone 2 gm and her CSF sample was sent for microbiological examination but before her diagnosis of Cryptococcal meningitis could be made, she collapsed as appropriate antifungal therapy could not be started on time.

To treat this deadly disease, antifungal agents like Flucytosine and Liposomal Amphotericin B are used although they have poor CNS penetration effect. These medications are quite expensive and cannot be afforded by the poor families like this patient. Hence instead of Flucytosine, consolidation therapy consisting of Fluconazole 400-800 mg/day can be administered. To check the prognosis of disease, the CSF sample should be tested again in 2 weeks after the start of therapy as Flucytosine is a fungistatic medication [6,8].

The antifungal doses should be reduced with the prognosis of disease as to avoid the resistance towards these antifungal agents as reduced susceptibility towards these antifungal agents have also been documented. Also, in HIV Sero positive patients, these antifungal therapies should be started in combination with Anti-retroviral therapy so as to prevent opportunistic infections in patients with CD<sub>4</sub> count less than 200 cells/ml [9-11].

## CONCLUSION

Cryptococcus are majorly found in soil contaminated with excreta of birds particularly pigeons. The humans are infected by inhaling the contaminated aerosols with Cryptococcus. This patient worked as a laborer at a construction site which could be a major reason for her to acquire Cryptococcal meningitis as she was already an immuno compromised patient. Cryptococcus is the most common fungal pathogen in AIDS patients as it can lead to increased mortality if not treated immediately.

Hence, studies on spectrum and prevalence of prevalence of opportunistic infections should be done regularly to create awareness towards HIV and its co-infections among clinicians as well as among patients as in the case of this patient who was recently diagnosed with HIV and was not aware about the opportunistic infection leading to untimely diagnosis, treatment and ultimately death.

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**Conflict of Interest:** The authors do not have any competing interests.

**Author's Contribution:** The final manuscript was reviewed and approved by all authors.

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***How to Cite;***

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