



DIAGNOSIS OF CANDIDA FROM PERIPHERAL BLOOD FILM: A CASE REPORT

Pathology

Dr. Kinnari Sodhatar*	Department and Institution: Department of Microbiology, Greencross Genetic Lab PVT LTD, Ahmedabad. *Corresponding Author
Dr. Ankit Modi	Department and Institution: Department of Pathology, Greencross Laboratory, Ahmedabad.
Dr. Chintan Shah	Department and Institution: Department of Pathology, Greencross Laboratory, Ahmedabad.
Dr. Umang Patel	Department and Institution: Department of Hematopathology, Greencross Genetic Lab PVT LTD, Ahmedabad.

ABSTRACT

Candidemia is the most frequent invasive fungal infection in hospitalized patients. This report describes the case of a nine month old baby on whom three colostomy were performed due to intestinal obstruction. After third colostomy, patient presented with fecal peritonitis. Peripheral blood film examination revealed yeast form of candida. Subsequently candida species was isolated on blood culture and subculture on cornmeal agar and biochemical tests confirmed the presence of *Candida albicans*. A diagnosis of fungal infection based on the peripheral blood film has a potential to lead to early diagnosis and prompt treatment of a life threatening infection.

KEYWORDS

Candidemia, Peripheral blood film, Blood culture

INTRODUCTION

Candidemia is a blood-stream infection caused by *Candida* species. It is the fourth most common group of nosocomial pathogens isolated from patients admitted in hospitals.^[1] Predisposing factors for disseminated candidiasis include immunosuppressive therapy, indwelling catheters, multiple antibiotic treatment and surgeries.^[2] Candidemia has a very high mortality (50-80%) despite appropriate treatment.^[3] The diagnosis of candidemia from peripheral blood film has been rarely reported. Studies have shown that detection of candidemia on peripheral blood film can only occur when fungal elements are present in large numbers in the peripheral blood.^[5] We present the case of a nine months old baby with candidemia diagnosed was on peripheral blood film.

CASE REPORT

The patient presented with fecal peritonitis and the investigations were sent. His blood counts were: Hb:10.6 g/dL; WBC:2.94×10⁹/L; neutrophils:50%; lymphocytes:36%; eosinophils:0%; monocytes: 14%; and platelet count:3.9×10⁹/L. Peripheral blood film showed thrombocytopenia, as well as some toxic changes in neutrophils. Blood CRP rose to 136.1 mg/L. The blood film showed many intracellular budding yeast (Figure 1). *Candida albicans* was isolated from the blood culture, which was confirmed by Germ Tube test, growth on Corn Meal Agar and sugar assimilation tests after three days of peripheral blood finding. Anti-fungal susceptibility test result shows sensitivity to Amphotericin-B, Nystatin, Fluconazole, and Voriconazole.

DISCUSSION

Deep systemic candidiasis is the most commonly found invasive fungal infection in hospitalized patients.^[1] *Candida* species are very rarely seen in peripheral blood film. Only a handful of cases of disseminated candidiasis, mostly *Candida albicans* -diagnosed from peripheral blood film have been reported in literature.^[4] John A Branda et al, reported that - a concentration of at least 5 × 10⁵ CFU/mL is required to detect a yeast on the peripheral blood film. This degree of fungaemia is unusual making a diagnosis of candidaemia by blood film review in most cases.^[5] In most reported cases, the detection of fungal elements on peripheral blood film allowed early diagnosis and initiation of antifungal treatment.^[3] Branda et al, have reported that diagnosis of candidemia on peripheral blood film most commonly encountered when stained with Romanowsky staining method and often when performing a white blood cell count.^[5] Moreover, in candida infected tissues, neutrophils are the primary inflammatory cells.^[6] The presence of yeast forms inside neutrophils and monocytes is often cited as a proof of true fungaemia. In addition, leukoagglutination in a smear has often described as the actual host response to fungal invasion.^[7] Observation of such findings should prompt the laboratory personnel to look for the presence of hyphae and

yeast forms of *Candida*.^[7]

This report suggests the usefulness of peripheral blood films in the diagnosis of fulminant deep fungal infections. Timely diagnosis of candidemia has proven to be difficult as blood cultures often require two to three days of incubation. Although sensitivity of the peripheral film review for candida infection is low, in this case the peripheral blood smear led to the diagnosis of a blood-borne candida infection before blood cultures became positive. In suspected patients, careful examination of a peripheral blood film should be considered.

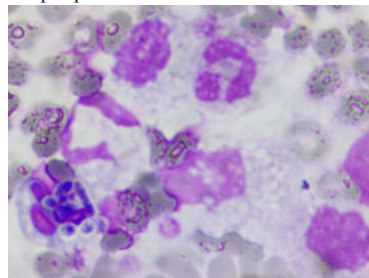


Figure 1: Peripheral blood film showing yeast cells (Leishman stain)

Acknowledgement:

We sincerely thank Dr. Ashwin Patel (MD, MPH, Baylor College of Medicine) for his insightful discussions and suggestions.

REFERENCES

- Handoo A, Nagoti S, Choudhary A. Intraleukocytic *Candida* is Diagnostic of Pathological Candidemia. *Turk J Haematol*. 2012 Dec;29(4):439-40. doi: 10.5505/tjh.2012.05826. Epub 2012 Dec 5. PMID: 24385743; PMCID: PMC3781624.
- Ostrosky-Zeichner L. New approaches to the risk of *Candida* in the intensive care unit. *Curr Opin Infect Dis*. 2005 Dec;16(6):533-7. doi: 10.1097/00001432-200312000-00004. PMID: 14624102.
- Urmichakravarty-Vartak, Shailesh Vartak, Shripad Taklikar, Vasant Baradkar, Neha Bhatt, Heman Patel. An Unusual Presentation of Candidaemia Primarily Detected on Peripheral Blood Smear. *Bombay Hosp J*. 2008;50(1):88-89.
- Yera H, Poulain D, Lefebvre A, Camus D, Sendid B. Polymicrobial candidaemia revealed by peripheral blood smear and chromogenic medium. *J Clin Pathol*. 2004 Feb; 57(2):196-8. doi: 10.1136/jcp.2003.9340. PMID: 14747450; PMCID: PMC1770216.
- Branda JA, Ferraro MJ, Kratz A. Sensitivity of peripheral blood smear review for the diagnosis of *Candida* fungemia. *Arch Pathol Lab Med*. 2007 Jan;131(1):97-101. doi: 10.5858/2007-131-97-SOPBSR. PMID: 17227130.
- Girmenia C, Jaalouk G. Detection of *Candida* in blood smears of patients with hematologic malignancies. *Eur J Haematol*. 1994 Feb;52(2):124-5. doi: 10.1111/j.1600-0609.1994.tb01299.x. PMID: 8119384.
- Berrouane Y, Bisiau H, Le Baron F, Cattoen C, Duthilleul P, Dei Cas E. *Candida albicans* blastocystidia in peripheral blood smears from nonneutropenic surgical patients. *J Clin Pathol*. 1998; 51: 537-538.