

CLINICAL IMAGE

***Mycobacterium genavense* invading the bone marrow in a HIV-positive patient**

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Introduction

Mycobacterium genavense is an ubiquitous nontuberculous mycobacteria (NTM) considered an environmental organism, that has been reportedly isolated from tap water, animals, and gastrointestinal tract of healthy individuals [1]. The first clinical cases of life-threatening infections caused by *M. genavense*, were described in HIV-infected patients and transplant recipients [2]. Detection of *M. genavense* by smear examination in BM, stool, or biopsy specimens is essential, as only one-third of the smear-positive specimens become culture positive [2, 3]. Considering the infrequent presentation of *M. genavense* as a human pathogen and the diagnostic challenge that this fastidious pathogen represents, we present a patient's case in whom early diagnosis was performed identifying mycobacteria within histiocytes by conventional microscopy.

Case Report

A 40-year-old HIV-positive male with history of previous cytomegalovirus infection, esophageal candidiasis, and IgA nephropathy presented for a hematologic

Key Clinical Message

Nontuberculous mycobacteria infrequently cause disseminated infections in immunocompetent hosts. However, they are increasingly being recognized in immunocompromised patients. We present the case of a 40-year-old HIV-positive male presenting with lymphadenopathies and pancytopenia in whom disseminated infection, with bone marrow involvement by *Mycobacterium genavense* (*M. genavense*) was diagnosed.

Keywords

Histiocytes, *Mycobacterium genavense*, nontuberculous mycobacteria.

evaluation because of disseminated lymphadenopathy and pancytopenia. His initial complete blood count showed hemoglobin 5.3 g/dL, platelets of $35 \times 10^9/L$, and white blood cell count of $1.2 \times 10^9/L$ with absolute neutrophil count of $785/\mu L$. At time of presentation, CD4 + lymphocyte count $11 \text{ cel}/\mu L$ and viral load 3,245 copies/mL.

A BM aspirate was performed, showing a hypocellular BM with the presence of multiple macrophages with abundant dot-needle-like shaped forms on the inside (Fig. 1). A Ziehl–Neelsen stain from the marrow smear sample corroborated the presence of acid-fast mycobacterium. Isolation and subsequent identification of *M. genavense* was achieved on bone marrow Löwenstein–Jensen cultures with addition of mycobactin J, and by polymerase chain reaction (PCR), respectively. Treatment with clarithromycin, ethambutol, and rifampicin was started. However, the patient condition deteriorated developing severe bacterial nosocomial pneumonia with further respiratory failure and consequently dead.

Discussion

Mycobacterium genavense has been reported as the etiology in about 4% to 13% of the HIV-positive patients that

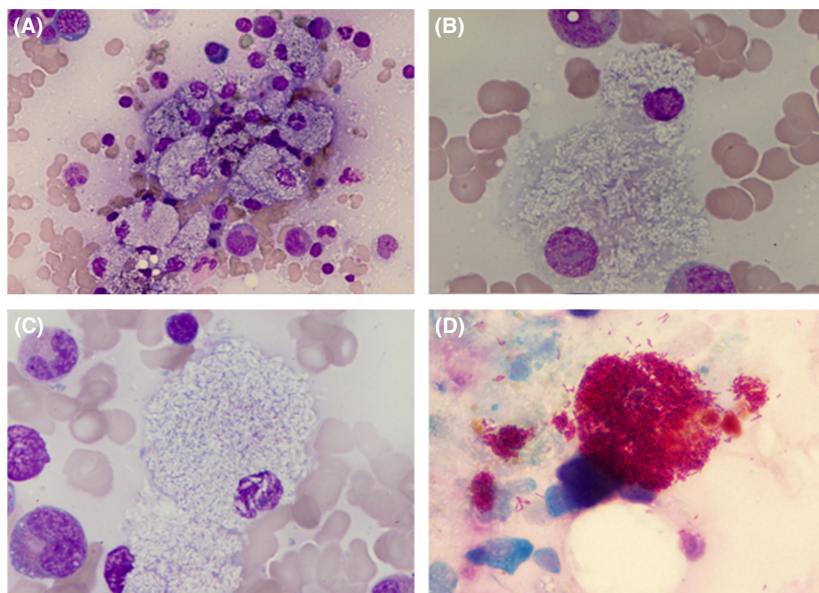


Figure 1. Wright staining of the bone marrow aspirate showing infiltration by pseudo-Gaucher cells (A) containing cell debris and rod-like elements that did not absorb the colorant (B, C). Ziehl-Neelsen staining confirming the presence of acid-fast mycobacterium (D).

present with a NTM infection, particularly in those from the prehighly active antiretroviral therapy (HAART) era [1]. The clinical features related to this emerging opportunistic pathogen are similar to those found in patients with disseminated NTM infections, particularly *Mycobacterium avium complex* (MAC). Although, the primarily affected organ in disseminated infections is the bowel, followed in less frequency by lungs, central nervous system, and soft tissues, the most frequent imaging findings include enlarged abdominal lymph nodes and hepatosplenomegaly, due to the route of dissemination [4–6].

Diagnosis of *M. genavense* represents a challenge for clinicians due to the lack of specific clinical signs and symptoms, and the difficulty to isolate the microorganism with standard culture methods [7]. Initial identification of acid-fast bacilli by smear examination has been reported in about 21% to 25% of the cases. However, only 33% of the smear-positive specimens consequently grow *M. genavense* on culture [8]. As a fastidious NTM it requires a liquid media, acid pH, higher than usual temperature (45°C), mycobactin J as a supplement, and at least 3 months of incubation to grow. Additional molecular techniques such as sequencing and PCR are needed for identification after isolation [4].

Prognosis of patients presenting with *M. genavense* disseminated infection has changed dramatically over the last decades. Before the HAART era the median overall survival rate from time of diagnosis was 10%, contrasting with a current survival of 52% at 5-year follow-up [1, 4]. As outcomes are directly associated with the underlying deep

immunodeficiency and prompt identification of the microorganism, optimal treatment should be focused on reestablishing the immunity by means of HAART and start an efficient antimicrobial therapy [4, 7, 9]. Drugs that have shown to be effective include clarithromycin, ethambutol, rifampicin, amikacin, fluoroquinolones, and pyrazinamide [1].

We present an uncommon case of a disseminated NTM infection with bone marrow involvement, in a patient with HIV due to *M. genavense*. A prompt diagnosis was possible due to the identification of mycobacteria on histiocytes as initial finding, underscoring the importance of detailed examination of specimens. Unfortunately, despite an appropriate management was started in this case, the outcome of our patient was fatal due to additional complications.

Conflict of Interest

None declared.

Authorship

CB: involved in conception of the work, critical revision, and final approval; CVS: involved in data collection; XLK: involved in critical revision.

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