CASE REPORT

Disseminated fusariosis in a patient with bone marrow aplasia

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Introduction

Fusariosis is an opportunistic, cosmopolitan disease caused by filamentous, hyaline fungi of the *Fusarium* genus, widely distributed in nature as soil and plant saprobes. It rarely affects immunocompetent individuals; when it does, the infection usually remains superficial, causing onychomycosis and keratitis, related to direct inoculation. In immunocompromised patients, especially those with hematological cancer, in particular acute myeloid leukemia, and after bone marrow transplantation, invasive fungal infections are associated with 70% mortality. In disseminated infections, 80% of patients develop skin lesions, which may be the only early manifestation of the disease.

In its disseminated form, fusariosis is a rare infection, with an incidence of 0.06% to 0.2% in the United States and Europe; in hematological patients, how-
However, it is associated with high morbimortality, due to the increased incidence and the low effectiveness of treatments.\textsuperscript{3,6}

This report describes a case of disseminated fusariosis with cutaneous involvement in an immunocompromised patient due to bone marrow aplasia.

**Case report**

Female patient, 29 years old, previously healthy, admitted to a tertiary hospital due to the sudden onset of petechiae in the lower limbs two months before, associated with fever of recent onset. On admission, she was diagnosed with pancytopenia and severe febrile neutropenia (neutrophils below 100 cells/mm\(^3\)), and broad-spectrum antibiotic therapy (meropenem and vancomycin) was initiated.

In the investigation, a bone marrow biopsy was performed; the histopathology showed bone marrow hypoplasia of the three hematopoietic cell lines, with only 5% of cells. In addition, all serologies (including parvovirus B19) were requested, and all infectious hypotheses were discarded; therefore, the diagnosis of idiopathic bone marrow aplasia was reached.

The patient had persistent fever despite antibiotic therapy, but without bacterial growth in blood cultures. Due to hemodynamic instability, the patient was taken to the intensive care unit, and amphotericin B was indicated at a dose of 5 mg/kg/day, due to febrile neutropenia unresponsive to antibiotic therapy.

After the seventh day of hospitalization, the patient presented a painful, erythematous-violaceous macula in the left upper limb, which after one week evolved with central necrosis (Fig. 1). A lesion biopsy was performed; the histopathology was compatible with leukocytoclastic vasculitis and numerous hyphae were seen on the vessel wall (Fig. 2). Direct examination of material from the skin lesion revealed filamentous fungi. Culture in Sabouraud’s medium with chloramphenicol from the skin fragment and subsequent microculture of the colony evidenced the growth of *Fusarium* spp. (Figs 3 and 4). After the results of these tests, amphotericin B was associated with voriconazole, and the patient initially benefited from this association.

The dermatological examination also showed paronychia in the second and third left fingers and exuberant livedo reticularis in all lower limbs, extending to the abdomen (Fig. 5).

![Figure 1](https://example.com/image1.png)

(A), An erythematous-violaceous macula on the left upper limb. (B), After one week, the lesion evolved to ulceration with a necrotic center and slight erythema around it.
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Figure 2  Histopathological examination of a lesion of the left upper limb, showing multiple septate, hyaline, and branched hyphae with angiolymphatic invasion. (A, Hematoxylin & eosin, ×10; B, Grocott, ×40).

Figure 3  (A), Skin fragment culture in Sabouraud’s medium with chloramphenicol: white powdery filamentous colony; (B), Lilac-colored pigmentation on the reverse side.
Findings of the skin lesion showed a large number of filamentous fungi, which were stained with lactophenol cotton blue, with macroconidia featuring characteristic canoe-type morphology.

(A), Exuberant livedo reticularis affecting the entire lower limb.

Discussion

Fusariosis is the second most frequent invasive fungal infection in patients with hematological neoplasms; *Fusarium solani* is the most common, virulent, and resistant species, presenting the highest mortality, confirmed in the case presented. \(^{(6-8)}\)

The infection starts by inhaling conidia or by direct contact with materials contaminated by spores. \(^{(1,2)}\) Studies indicate that disseminated cases are usually acquired by inhalation with subsequent dissemination to other organs such as the kidneys, liver, eyes, spleen, and brain. \(^{(1,8)}\) In the reported case, skin lesions preceded sinusitis and pneumonia, suggesting hematogenous spread of cutaneous focus. The infection is classified as disseminated when two or more organs are involved, as seen in the case reported, in which the patient presented sinusitis and pneumonia, confirmed by image examination and the presence of skin lesions. \(^{(4)}\)

The most common presentation is persistent fever unresponsive to broad-spectrum antibiotic therapy in a neutropenic patient, such as the patient studied. Typical skin involvement shows painful erythematous-violet macules or papules, the center of which evolves to necrosis, usually on the extremities; all these findings were observed in the present case. The dermatological examination also showed livedo reticularis in the entire lower limb reaching the abdomen, which probably occurred due to intravascular proliferation of the fungus leading to occlusion and
The patient had severe neutropenia related to bone marrow aplasia, and the authors found in the literature three cases of disseminated fusariosis associated with this hematological disease, all of which also had a fatal outcome.

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Authors’ contributions
Danielle Ferreira Chagas: Conception and planning of the study; elaboration and writing of the manuscript; intellectual participation in propaedeutic and/or therapeutic conduct of studied cases; critical review of the literature.
Lucia Martins Diniz: Approval of the final version of the manuscript; conception and planning of the study; effective participation in research orientation; intellectual participation in propaedeutic and/or therapeutic conduct of studied cases; critical review of the literature; critical review of the manuscript.
Elton Almeida Lucas: Intellectual participation in propaedeutic and/or therapeutic conduct of studied cases.
Paulo Sergio Emerich Nogueira: Intellectual participation in propaedeutic and/or therapeutic conduct of studied cases.

Conflicts of interest
None declared.

References