Dermatology Practical & Conceptual

Fatal Disseminated Mucormycosis by Cunninghamella in Newly Diagnosed Acute Myeloid Leukemia: Case Report and Diagnostic Challenges

Sebastián González-Valdés[1], Magdalena Vial[2], Renate Steffen[1], Mauricio Lechuga[3]

1 Department of Dermatology, Escuela de Medicina, Pontificia Universidad Católica de Chile, Santiago, Chile
2 Clínica San Francisco, San Fernando, Chile
3 Department of Dermatology, Complejo Asistencial Dr. Sótero del Río, Puente Alto, Chile

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Corresponding Author: Mauricio Lechuga Ramírez, MD, Department of Dermatology, Complejo Asistencial Dr. Sótero del Río, Avenida Concha y Toro 3459, Puente Alto, Chile 8150215. E-mail: lechugamd@gmail.com

Introduction

Mucormycosis is a rare infection caused by fungi of the order Mucorales, with the most frequently associated genera being *Rhizopus* and *Mucor*, and to a lesser extent, *Lichtheimia*, *Apophysomyces*, *Cunninghamella*, and *Rhizomucor* [1-3]. The most significant risk factors for its development are diabetes mellitus and hematologic malignancies [1,4,5], with acute myeloid leukemia (AML) posing the highest risk [3]. Depending on the affected body area, it is classified as rhino-orbital-cerebral, pulmonary, or cutaneous mucormycosis, followed less frequently by gastrointestinal, disseminated, and uncommon presentations [1,4].

Case Presentation

A 66-year-old man with chronic hypertension and prostate cancer in follow-up initially presented to the Emergency Department with a clinical picture of two weeks of fatigue and persistent epistaxis. Laboratory studies revealed a complete blood count showing hemoglobin of 10.5 g/dL, a white blood cell count of 19.600, platelets of 44.000, and 21% blasts, leading to hospitalization. A bone marrow examination confirmed the diagnosis of AML, and an induction chemotherapy regimen of 7+3 (cytarabine and daunorubicin) was initiated. The patient developed respiratory distress, and a chest CT scan showed a consolidation in the right middle

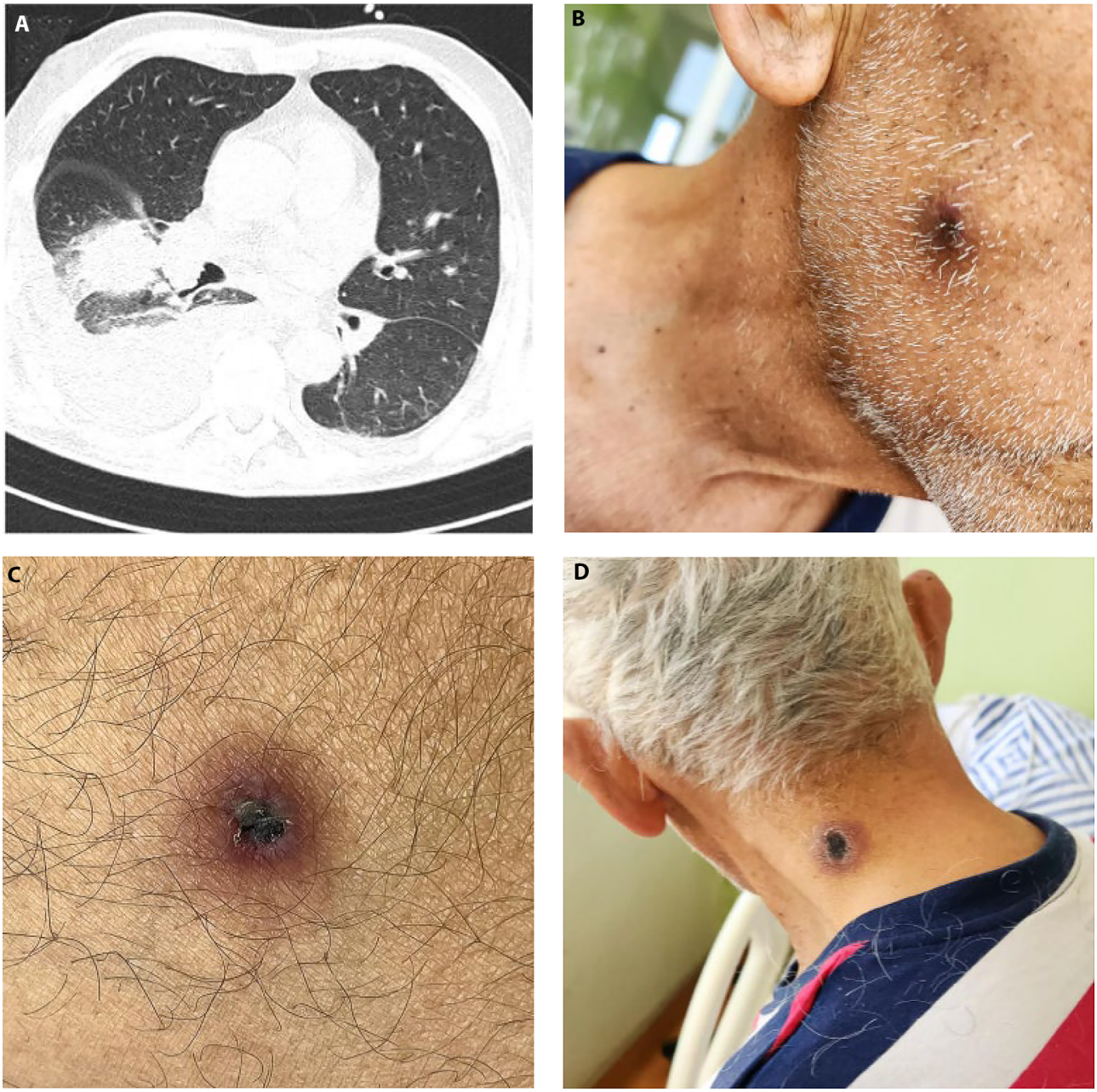

Figure 1. Clinical cutaneous and radiological pulmonary findings. (A) Chest CT scan with lung window showing evidence of consolidation in the right middle lobe and ipsilateral pleural effusion. (B-D) Hyperpigmented nodules with central necrotic crust and erythematous halo.

lobe suggestive of invasive fungal infection with a right pleural effusion (Figure 1A), whose culture was positive for *Cunninghamella spp*. One week later, the patient developed hyperpigmented nodular skin lesions with erythematous halos and central necrosis (Figure 1B, 1C and 1D). Histopathology of the right lower limb lesion (Figure 2A-C) revealed suppurative interstitial dermatitis with aseptate, ribbon-like intravascular hyphae, intraluminal thrombosis, and culture also positive for *Cunninghamella spp*. An otolaryngology evaluation ruled out rhinosinusal involvement. Liposomal amphotericin B therapy was initiated, but the patient's condition worsened, developing pleural empyema with signs of loculation. A video-assisted thoracotomy revealed a necrotic-appearing parietal pleural and pulmonary abscess, with microbiological studies confirming the previously described microorganism. The patient completed more than 30 days of liposomal amphotericin B, followed by a transition to oral isavuconazole. The patient died three months later due to secondary respiratory failure from a new pulmonary abscess.

Conclusion

We report a case of an uncommon presentation of mucormycosis in a disseminated form, which corresponds to the infection of two or more non-contiguous organs or the isolation

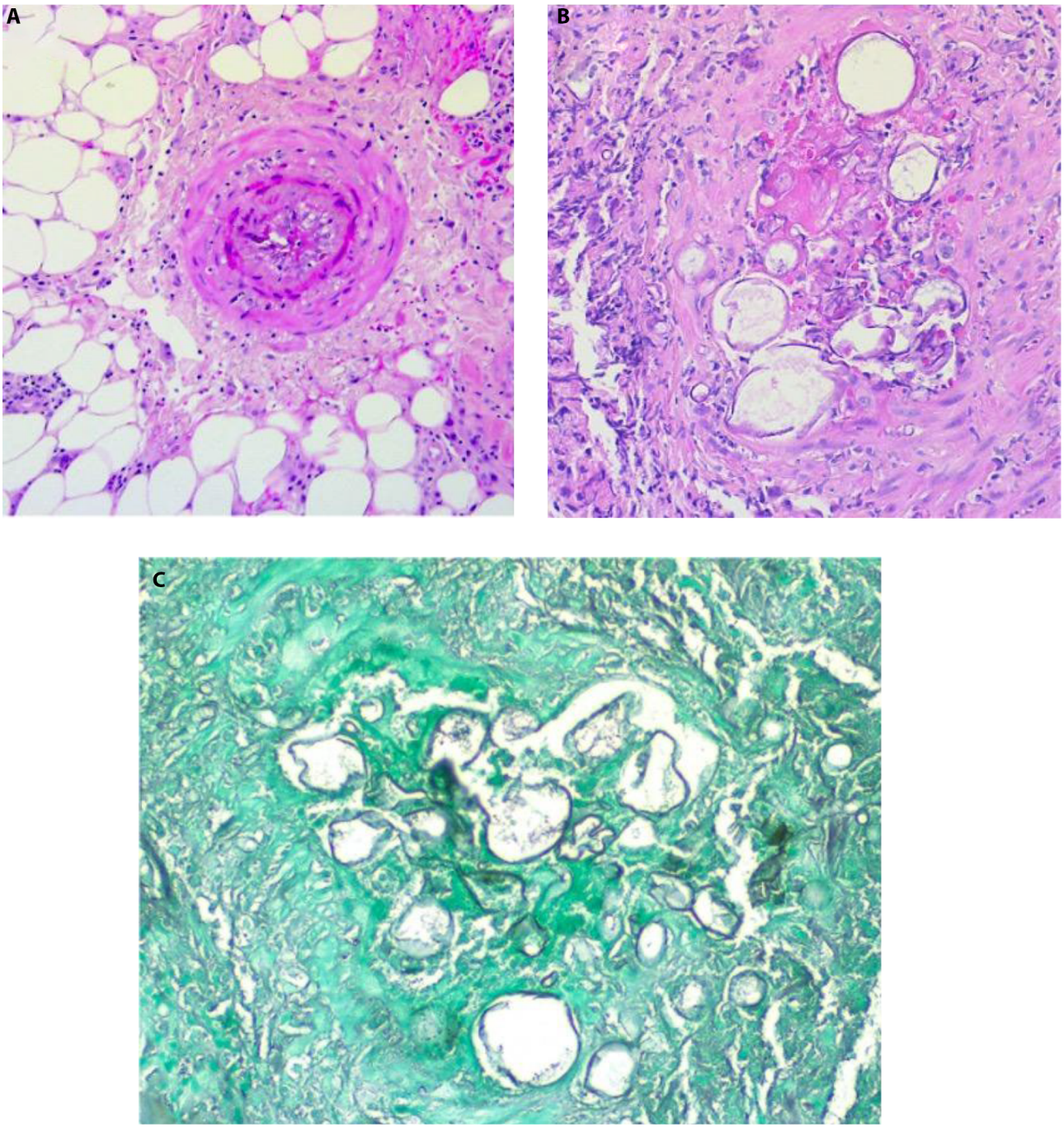

Figure 2. Histopathological findings of cutaneous lesions. (A) H&E stain of a medium-sized vessel with intraluminal thrombosis. (B) H&E stain showing presence of intravascular aseptate hyphae and microthrombi. (C) Gomori-Grocott stain highlighting intravascular fungal elements (Courtesy of Dr. Claudio Pinto).

of a Mucorales in the blood [1,2]. This form of presentation is associated with a high mortality rate, which, according to various series, ranges from 68% to 96%, especially in cases of infection by *Cunninghamella spp* [1,2,5]. Hematogenous dissemination more frequently occurs from the skin to other non-contiguous organs; however, the reverse occurs less than 3% of the time, hence the rarity of this case [2,3]. Cutaneous manifestations are diverse, primarily presenting as necrotic eschars, and less frequently as erythematous macules, blackish nodules, target-shaped plaques, vesicles, blisters, and other forms [3,5]. Definitive diagnosis is made through histopathological and microbiological studies. Early suspicion and multidisciplinary treatment are crucial in patients with risk factors and compatible clinical lesions, given the high morbidity and mortality associated with this condition [5,6].

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