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Disseminated cutaneous mucormycosis in a patient on high-dose steroid therapy for severe ARDS

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Dear Editor,

A 65-year-old male patient was transferred to our institution for rescue therapy after developing severe ARDS (PaO2/FiO2 = 51) refractory to conventional ventilation (FiO2 1, 0, PEEP 12 cm H2O) following femoral thrombendarterectomy. Veno-venous ECMO therapy was initiated on the day of arrival. The patient was ventilated using a lung-protective strategy. Treatment with methylprednisolone (2 mg/kg/day) had been initiated by the referring institution and was continued throughout the patient's stay in our ICU. The patient was repeatedly placed in the prone position. Initial blood cultures and tracheal secretions showed *Enterococcus* and coagulase-negative *Staphylococcus*, suggesting perioperative pneumonia as the underlying trigger of ARDS. Antibiotic treatment consisted of piperacillin/tazobactam 4.5 g every 8 h. Throughout the first 7 days of treatment the patient required no vasopressor support. There were no signs of further organ failure. Repeated neurological assessment was unremarkable. Oxygenation and lung compliance gradually improved following treatment initiation. A repeat CT scan of the chest on treatment day 9 showed improved aeration of lung tissue and a marked resolution of infiltrates. On treatment day 9 the patient developed severe sepsis with multiple organ failure and a rapid increase of serum creatine kinase. Clinically there were no signs suggestive of compartment syndrome or limb ischemia, as monitored continuously by near-infrared spectroscopy. Duplex ultrasonography showed adequate renal perfusion, and cardiac assessment by TOE showed no valvular pathology suggestive of endocarditis and a normal left-ventricular function. On treatment day 10, red maculae developed on the lower extremities and were present over the whole body surface within hours, progressing to dermal necrosis with black eschar formation (Fig. 1). The patient developed intractable metabolic acidosis and vasoplegia, and died on treatment day 11.

Biopsies from skin lesions revealed cutaneous mucormycosis on culture. The diagnosis of *Absidia corymbifera* was confirmed posthumously by agent-specific PCR. Repeated blood cultures and broad-spectrum molecular analysis of the blood specimen remained negative. Mycologic examination of bronchoalveolar lavage fluid showed no pathogens. Autopsy was not performed.

ARDS represents a major health problem, with current estimates pointing to its incidence being greater than previously reported [1]. Recent data suggest a mortality benefit in severe refractory ARDS by administration of corticosteroids [2]. Steroid-induced immunosuppression is a potential side effect of this therapy that has been addressed in the literature, although none of the randomized controlled trials on glucocorticoid use in ARDS have reported an increased rate of infection [3]. *Absidia corymbifera* is a fungal agent belonging

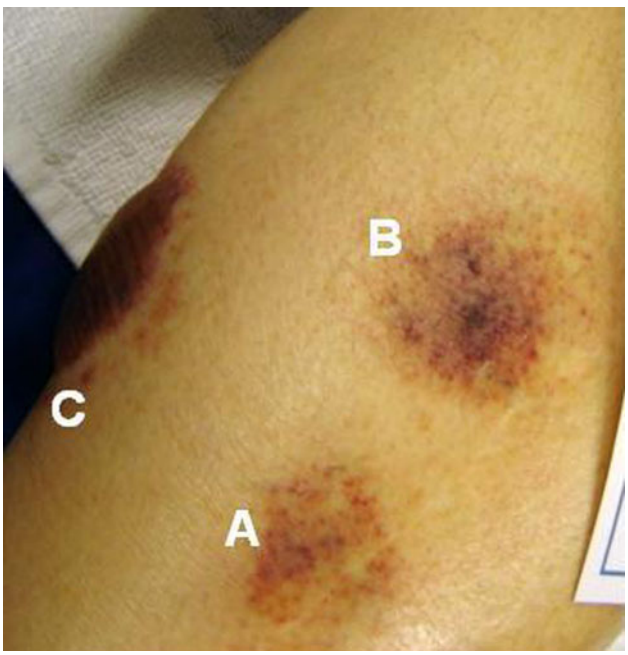

Fig. 1 Skin lesions on the patient's left leg at different stages of development. **a** Skin lesion minutes after initial appearance. **b** Transformation of the lesion's core with central dermal necrosis. **c** Skin lesion approximately 6 h after appearance showing central, black eschar formation and subepidermal fluid collection

to the Mucorales order of Mucormycotina, causing mucormycosis in high risk subgroups, especially immunocompromised patients. Disseminated cutaneous infection, as presented in this case, has a dismal prognosis if surgical debridement and antifungal therapy are not initiated immediately or are not applicable [4]. As to our knowledge, this is the first case of disseminated mucormycosis described in the literature developing under the special circumstances of high-dose corticosteroid therapy for severe ARDS. The potential benefits of corticosteroid therapy and the relative safety of its use as described in recent randomized trials and meta-analyses should not deter clinicians from performing meticulous infection surveillance when initiating such treatment.

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