Indian Journal of Medical Case Reports ISSN: 2319–3832(Online)
An Open Access, Online International Journal Available at http://www.cibtech.org/jcr.htm
2020 Vol.9 (1) January-June, pp. 18-20/Kumar et al.
Case Report

FULMINANT DUO OF MUCORMYCETES AND *ALTERNARIA* SPP. IN AN IMMUNOCOMPETENT FEMALE

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ABSTRACT
Invasive mycoses are increasingly being reported in both immunocompromised and immunocompetent individuals. They are fatal infections; therefore, a high index of suspicion should be kept in clinically appropriate settings. Mixed fungal infections are not uncommon in immunocompromised individuals, but they are extremely rare in immunocompetent individuals. Also, in such conditions, their individual role in pathogenesis is not clearly known. We present one such case of Rhino-orbital mycosis in an immunocompetent female with coexisting mucormycosis and *Alternaria* spp.

Keywords: *Rhino Orbital Mycosis; Dual Fungal Infection; Invasive, Alternaria Rhinosinusitis*

INTRODUCTION
Global burden of immunocompromised conditions such as diabetes or those related to immunomodulation has been on a rising trend. This has led to an upsurge in the incidence of invasive fungal infections (Enoch *et al.*, 2017; Webb *et al.*, 2018; Klingspor *et al.*, 2015). Rhino-orbital-cerebral mycosis (ROCM) is a life-threatening condition with very high mortality rates. It occurs in individuals with risk factors such as uncontrolled diabetes/ diabetic ketoacidosis, solid organ transplants, haematological malignancies (Mignogna *et al.*, 2011). It is usually diagnosed by visualizing the broad aseptate hyphae on microscopy. Rarely, other fungal structures can also be noted on the microscopy. Although, they may be considered as colonisers/ contaminant, their presence in a critically ill patient is difficult to ignore. Invasive fungal infections with dual fungal aetiology have been reported in immunocompromised individuals (Njk *et al.*, 2017). We report a case of suspected dual infection of mucormycosis and *Alternaria* spp in an apparently immunocompetent individual.

CASE
A 37-year-old-female, without any known comorbidities, presented with complaints of swelling around left eye and left cheek for 5 days. This was acute in onset, rapidly progressive and was associated with reddish-black discolouration of involved areas. She also had painless, progressive diminution of vision in both eyes. She developed altered mental state one day prior to the presentation. She was referred to us from a local hospital in an altered state and was intubated in view of her altered sensorium. On examination, necrotic lesions were noted on eyelids, cheeks and nasal/oral cavity (Figure 1a). Her pupils were bilaterally dilated and fixed; plantar response was extensor in both the lower limbs. Haematological and biochemical parameters (liver function, renal function tests and HbA1C) were normal. Contrast enhanced computed tomography of the orbit and sinus were suggestive of extensive orbital cellulitis with pansinusitis. With a suspicion of mucormycosis, she was immediately started on liposomal amphotericin B (3mg/kg) based on the presentation. She underwent left orbital exenteration, left total maxillectomy, removal of pterygoid plates, right infrastructural maxillectomy and removal of all nasal and sinus mucosa. Microscopic (KOH mount) examination of nasal scraping in the point of care laboratory showed the presence of broad aseptate hyphae with spores of *Alternaria* spp. and demodex mites (Figure 1b-d). The patient was planned for voriconazole therapy in addition to amphotericin to cover for

the possible infection with *Alternaria* spp. Despite aggressive management protocol including rapid provisional diagnosis, empirical antifungal therapy and surgery, she continued to worsen and succumbed to her illness within 24 hours of presentation in the post-operative period.

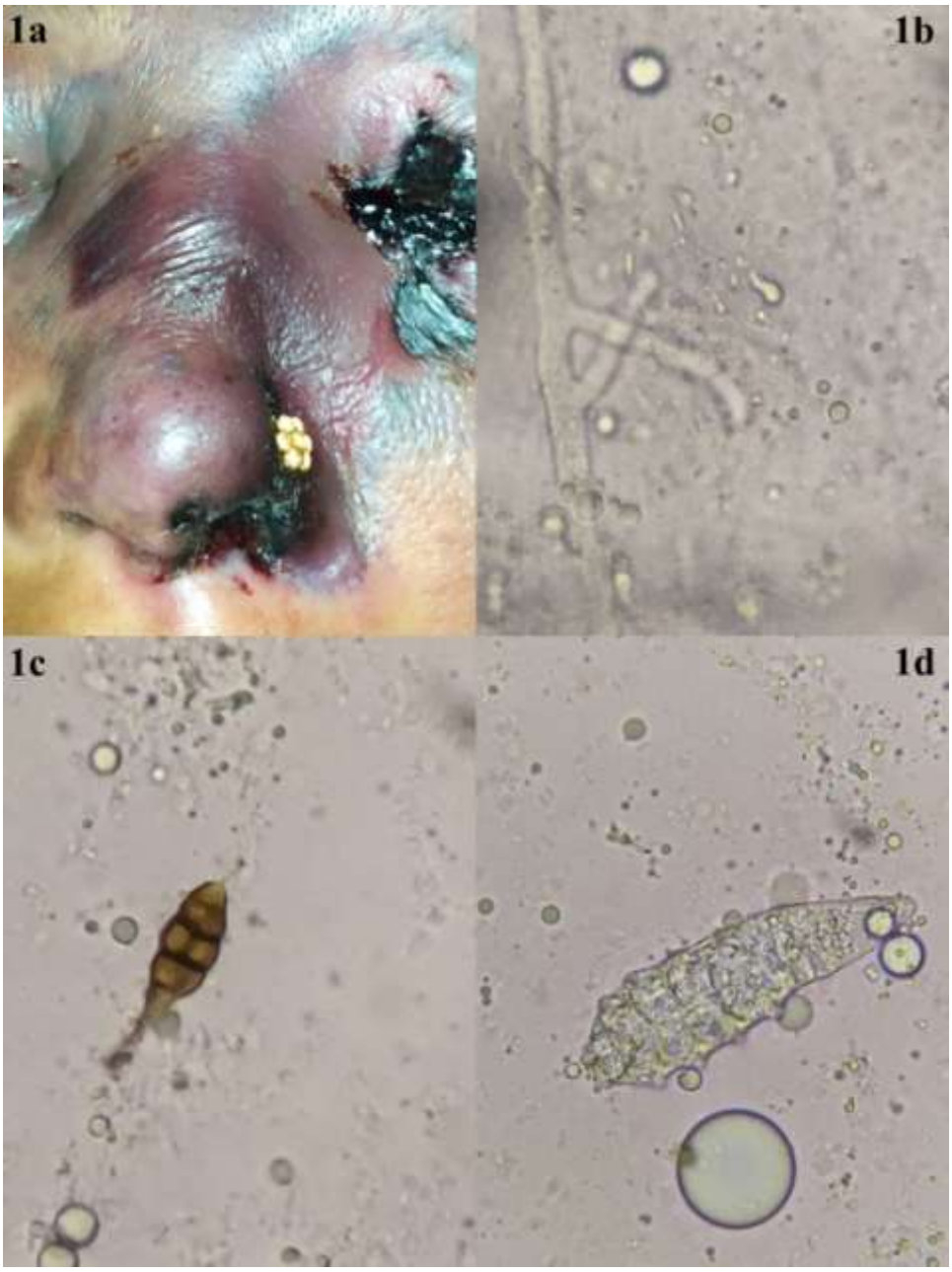

Figure 1: 1a. Black necrotic lesion on the face, 1b. Broad aseptate hyphae 1c. Spore of *Alternaria* spp., 1d. Demodex mite

DISCUSSION

Fungal rhinosinusitis is caused by inhalation of fungal spores and depending upon extent of invasion, manifestations range from allergic rhinosinusitis to invasive rhinosinusitis (may extend to involve the orbits and brain). The presence of extensive necrotic lesion in the oral cavity, nasal

cavity, eyes and radiological involvement of the sinuses/ orbit pointed towards a diagnosis of invasive sinusitis (Gupta *et al.,* 2009). Mucormycetes and *Aspergillus* spp. are commonly known to cause invasive (Valera *et al.,* 2011). Although, the drug of choice for *Aspergillus* spp is voriconazole, it would not cover for Mucormycetes which was more likely to be the possibility in this case considering the rapid progression. The patient was started on amphotericin which would cover for both Aspergillus spp. and Mucormycetes. The patient presented after 5 days of rapidly worsening symptoms and the early initiation of broad spectrum anti-fungal by the primary care physician would have played a role in the outcome (Gupta *et al.,* 2019). *Alternaria* sp. has been also reported to cause non-invasive or invasive rhinosinusitis in immunosuppressed individuals (Hattab *et al.,* 2019). Invasive *Alternaria* sp. infections are rare in immunocompetent hosts, and therefore, it was difficult to ascertain whether spores were pathogenic or innocent by-stander. Although, amphotericin would cover for *Alternaria* spp. but we planned to add voriconazole considering the worsening status of the patient.

We report this case to highlight the possibility of multiple fungal infections in critically ill patients and create awareness amongst the primary care physicians regarding the need of early diagnosis and initiation of broad spectrum antifungals in such cases.

There are no conflicts of interest
Informed consent was taken from the patient's relative
Acknowledgement – not applicable

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