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A case of acute periorbital necrotizing fasciitis

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ABSTRACT

Periorbital necrotizing fasciitis is a rare but potentially fatal infection. It is most commonly caused by Gram-positive group A β-haemolytic *Streptococci* and rarely by fungal infections. In this report, we present a rare case of periorbital necrotizing fasciitis caused by *Aspergillus* species in an immunocompromised patient. He presented to us with a history of a slowly progressive eyelid necrosis leading to a loss of vision in one eye. The patient was started on an antibiotic and subsequently, surgical debridement and enucleation were performed. A few days post-operatively, yellow white mould colonies were noted to grow on the wound surface. Microbiology cultures identified them as *Aspergillus* species and intravenous amphotericin B 10 mg was added daily. However, despite the extensive medical and surgical treatments, he failed to respond and succumbed from septicaemia and multi-organ failure.

1. Introduction

Necrotizing fasciitis (NF) is a severe soft tissue infection. It is characterized by a rapidly progressive necrotizing infection of the superficial fascia accompanied with necrosis of the overlying skin. It frequently involves the groin, abdomen and lower extremities. Periorbital NF is an uncommon but life-threatening infection. It is most commonly caused by Gram-positive group A β-haemolytic *Streptococci* (GABHS), *Pseudomonas* species and other facultative organisms as single or mixed infections. NF is seldom reported to occur from fungal infection. There have been only two cases reported of fungal periorbital necrotizing fasciitis in an immunocompetent adult: one infected with *Cryptococcus neoformans* and the other with mixed infections of *Candida* and *Aspergillus flavus*[1,2]. There is also a case report regarding *Candida* infection of the eyelid in an immunocompromised patient[3]. Herein, we report a rare case of periorbital NF along with ocular involvement caused by *Aspergillus* species (spp.) in an immunocompromised patient who failed to respond despite a multi-disciplinary approach to his condition.

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2. Case report

A 72-year-old gentleman presented to us with a gradual onset of blackish skin discolouration around the right eye for the last 2 weeks. He claimed that his vision had also rapidly worsened during this time. He denied any history of fever, trauma or recent surgery over the affected area. Prior to developing the discolouration, the patient had a periorbital swelling which had been treated elsewhere as preseptal cellulitis. He claimed that though the swelling had improved, the periorbital skin had slowly darkened.

The patient was known to have multiple underlying medical conditions including diabetes mellitus, ischaemic heart disease, congestive cardiac failure, chronic liver disease, thrombocytopaenia and end-stage renal failure. He was on regular hemodialysis three times a week.

On his first visit to our clinic, he had a visual acuity of no-perception-of-light in the right eye and hand-movements in the left eye. In the right eye, the upper eyelid was swollen with necrotic tissue covering the medial half of the upper and lower lids, medial canthus and superior half of nasal ridge and extending into the eyeball (Figure 1). The conjunctiva was necrosed, chemosed and injected. The cornea was hazy with a large epithelial defect and deep stromal infiltration. The fundus could not be visualised due to the media opacity. However, B-scan showed vitreous clumps and a flat retina. Examination of

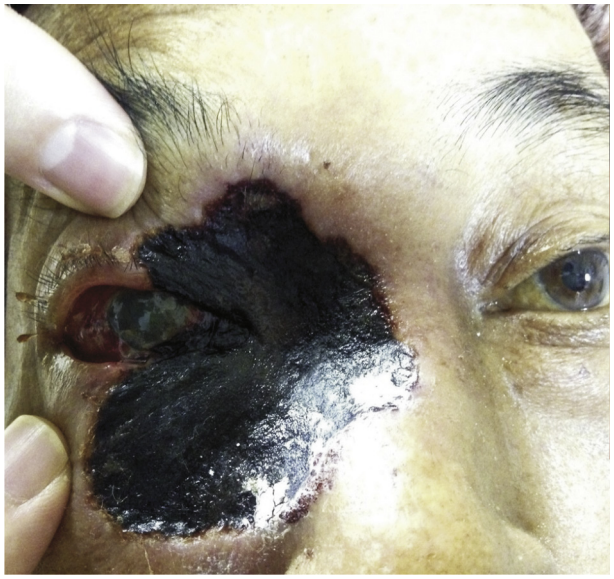

Figure 1. Periorbital necrotizing fasciitis with a black eschar.

the fellow eye was unremarkable apart from a pale optic disc. General examination showed that the patient looked lethargic and with a sallow appearance. The rest of the physical examination was unremarkable.

A full blood count, coagulation profile, liver function test, arterial blood gases, cardiac enzymes and other laboratory investigations had grossly abnormal parameters.

CT scan showed features suggestive of orbital and periorbital cellulitis of the right eye, maxillary sinusitis and white matter oedema of bilateral frontal lobes and ischaemic changes in the bilateral internal capsules (Figure 2).

He was treated initially with intravenous ceftriaxone 1.0 g twice a day, moxifloxacin eye drops hourly and gentamycin 0.9% eye drops hourly in the right eye after a conjunctival swab for culture was taken. Despite of this treatment, the condition of his right eye worsened (Figure 3). Ultimately, it was decided to perform wound debridement, enucleation of the right eye and endoscopic sinus surgery by a multi-disciplinary team involving

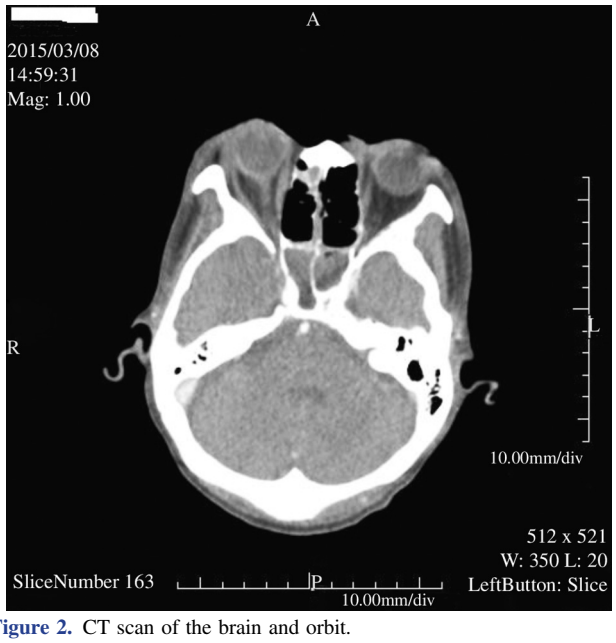

Figure 2. CT scan of the brain and orbit.

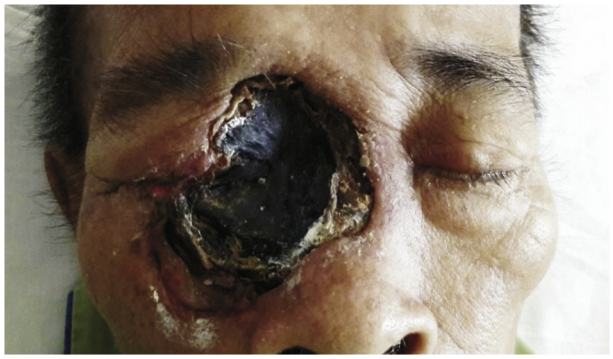

Figure 3. Necrotic tissue spreading over the adnexa and orbit.

ophthalmology, plastic surgery and otorhinolaryngology departments.

Intra-operatively, we could identify the necrotic tissue involving the anterior two-thirds of the conjunctiva and Tenon's capsule. The necrosis was extending downwards to involve the inferior rectus muscle and reaching the orbital floor (maxillary bone). Medially, the necrotic tissue had extended to the nasal bone and septum, extending to the paranasal sinuses. The necrotic tissues were debrided and the eye was enucleated. The otorhinolaryngology team performed a nasal endoscopy, which was unremarkable and did not show any signs of sinusitis.

His post-operative course was complicated by recurrent hypotension, hypoglycaemia and adult respiratory distress syndrome. On the third day of wound debridement, a yellow green mould was noted to grow in the nasal cavity (Figure 4). A culture of debrided tissue, eyeball, vitreous and maxillary mucosa was also done. On histopathology examination, black coloured vitreous was noted. Microbiologic examination of the mouldy lesions reported them to be *Aspergillus* spp.

In view of the diagnosis of fungal infection, he was started on intravenous amphotericin B 10 mg daily (renal dosage) and the antibiotic changed to intravenous Meropenam 500 mg daily (renal dosage) after consultation with the infectious diseases team. The wound was regularly debrided and dressed by the plastic and reconstructive surgery team. Ten days following the surgical intervention, his general condition deteriorated. He developed septicaemia and hospital-acquired pneumonia and was intubated for airway protection. However, 2 weeks later he succumbed from septicaemia and multiple organ failure.

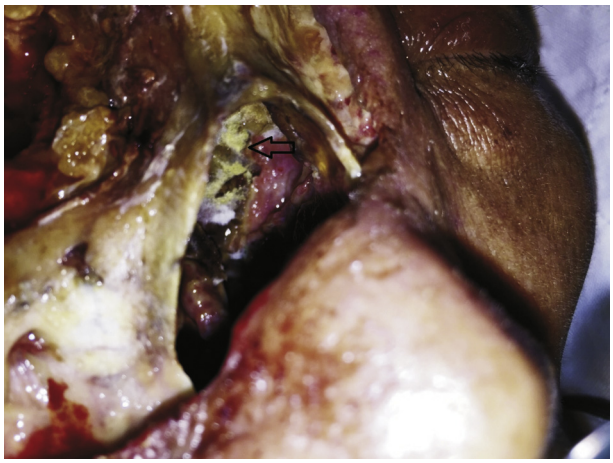

Figure 4. Yellowish-green mouldy colonies growing in the nasal cavity (arrows).

3. Discussion

Periorbital NF caused by fungal infection is rare. Two cases have been reported in immunocompetent adults with a preceding history of trauma to the ocular region[2,4]. One case of *Candida* infection of the adnexa in a human immunodeficiency virus-positive patient has also been reported[3]. Apart from trauma, surgery near or at the periorbital area, immunosuppression and coexistent infection have also been reported as predisposing factors[1,5]. In about 27% of the cases, no predisposing factors are found[1]. In our case, the patient was considered immunocompromised because of his old age and multiple co-morbidities.

The presentation of the periorbital NF is usually early due to the thin eyelid skin and lack of subcutaneous tissues. Therefore, early recognition and prompt treatment should be employed to prevent mortality and morbidity. In our case, the patient presented late as the disease was not progressing rapidly. There was no pain or fever, classically part of the symptoms of periorbital NF. The patient had been treated initially for preseptal cellulitis. This probably led to a partial response and gave an opportunity for the organism to invade into the ocular and adnexal tissues.

GABHS is the most commonly isolated organism in periorbital NF. All reported cases of death were found to be infected by GABHS alone or associated with other bacteria but none had fungal infection[1,5]. The significant predictors of mortality from NF are age (>50 years), immunosuppression and streptococcal toxic shock syndrome from GABHS[1]. Lazerri has emphasised the importance of the type of causative organism as the main risk factor for morbidity in patients with NF[5]. Occurrence of only *Aspergillus* spp. infection in periorbital NF eventually leading to mortality has not yet been reported. In our case, the patient died of septicaemia and multiple organ failure.

The mortality rate from periorbital NF is about 8.5%[1]. A significant delay in diagnosis is often responsible for the mortality. Early recognition and hospital admission for initiation of high-dose antibiotics combined with tissue debridement help to decrease the mortality. In our case, the diagnosis of periorbital NF was straightforward. However, there was a delay in initiation of parenteral antibiotic and surgical debridement as the patient reported nearly two weeks after the development of symptoms. Despite initiating a multi-disciplinary approach and removal of a significant amount of infected tissues, the patient unfortunately succumbed to septicaemia and multiple organ failure. This can be attributed to a number of factors including delayed presentation, multiple co-morbidities and a rapid onset of septicaemia leading to multiple organ failure.

To the best of our knowledge, periorbital NF along with ocular involvement by fungi has not been reported. Besides, this is also the first case of mortality of periorbital NF caused by fungal infection (*Aspergillus* spp.). This case report is a pointer that we should have a high index of suspicion for fungal infections in case of slow development of NF, especially in immunocompromised patients.

Conflict of interest statement

The authors report no conflict of interest.

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