Case Report

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Rhino-Orbital Mucormycosis After Covid-19 In the Emergency Department

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Abstract

Rhino-orbital mucormycosis (ROM) is an acute and fulminant infection. The number of ROM cases developing after coronavirus disease 2019 (COVID-19) is increasing. A 62-year-old male patient was admitted to the emergency department in northern Syria complaining of new-onset vision loss, swelling, and severe swelling of the left eye. It was noted that a 3-day course of prednisolone 250 mg was given to treat COVID-19. We found that he had a history of diabetes mellitus (DM) for 10 years. Physical examination revealed ptosis, proptosis, and ocular movement restriction in all directions in the left eye. All other systemic examinations were normal. A cranial and orbital magnetic resonance imaging scan performed after hospitalization for further evaluation and treatment showed an increase in the density of the sphenoid, ethmoid, and frontal sinus walls in the left orbit. Despite antifungal and surgical treatment, the patient died on day 14. The use of steroids in treatment and the presence of concomitant DM are the main predisposing factors. The prognosis of this disease, which has a high mortality and morbidity, is adversely affected in geographic regions where health care is inadequate.

Keywords: COVID-19, emergency service, mucormycosis, rhino-orbital mucormycosis

Introduction

Rhino-orbital mucormycosis (ROM) is an acute and fulminant infection caused by Mucoraceae fungi and occurs in immunocompromised and diabetic patients[1]. While the paranasal sinuses and nose are the primary sites of inoculation, these aggressive fungi can cause life-threatening infections in the orbit and brain through direct or hematogenous spread. Coronavirus disease 2019 (COVID-19 disease) affects T lymphocytes and causes immunosuppression lymphopenia. In addition, the presence of concomitant diseases such as diabetes mellitus (DM), the use of steroid therapy, and the use of other immunomodulatory drugs cause immunosuppression that predisposes these patients to opportunistic fungal infections[2,3]. The coexistence of COVID-19 with invasive ROM is rarely reported in the literature, and diabetes mellitus is often cited as the major predisposing factor. In this case report, a rare case of ROM was reported that developed in a diabetic patient who received high-dose steroid therapy due to COVID-19 treatment.

Case Report

A 62-year-old male patient was admitted to the emergency department in northern Syria complaining of new-onset vision loss, pain, and severe swelling of the left eye. It was noted that he had received 10 days of inpatient treatment for COVID-19 thirty days ago. As part of the treatment, favipiravir, chloroquine, acetaminophen, and 3 days of prednisolone 250 mg were administered. The patient reported that he had had DM for 10 years. The patient's vital signs were stable on admission. Physical examination revealed ptosis, proptosis, and ocular movement restriction in all directions in the left eye (Image 1). All other systemic examinations were normal. A cranial and orbital magnetic resonance imaging scan performed after hospitalization for further evaluation and treatment showed an increase in the density of the sphenoid, ethmoid, and frontal sinus walls in the left orbit (Image 2). A biopsy which had taken from the patient showed Rhizopus spp. IV Amphotericin B was started for the treatment of ROM. Surgical treatment included exenteration of the left eye and sinus drainage. The patient died on day 14 due to multiorgan dysfunction.

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Image 1. Photo of the patient: Face of the patient shows exophthalmos and ptosis in the left eye, nasal deviation to the right, left maxillofacial swelling and edema and right deviation of the vestibulum orris.

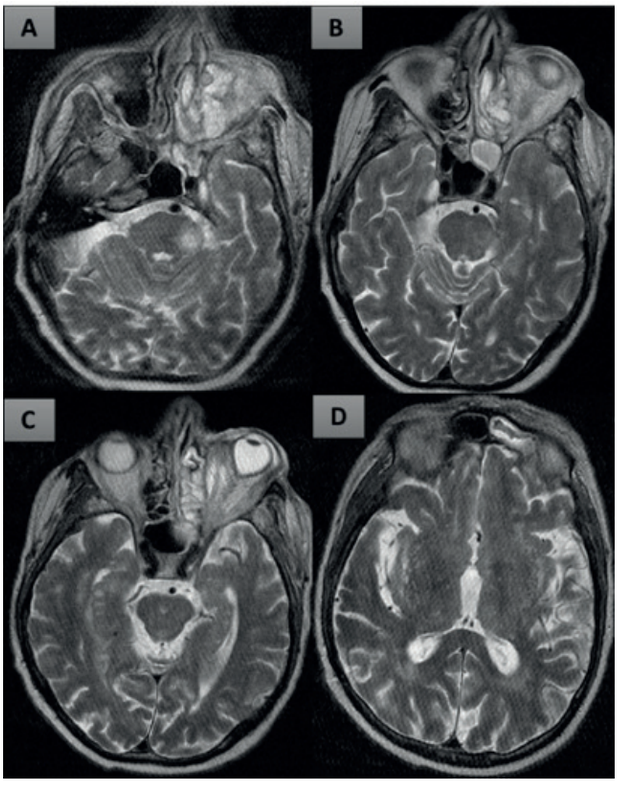

Image 2. Magnetic resonance images of the patient: As a result of mucormycosis; increased density in the left maxillary sinus, deviation of the nasal septum (A), increased density in area of the left parasphenoid and medial paraorbital (B), increased density in the left ethmoid sinus and exophthalmos in the left orbit (C), increased density in the left frontal sinus (D).

Discussion

ROM is a rare disease that is difficult to diagnose and has high mortality and morbidity. Immediate early diagnosis and treatment is lifesaving[4,5]. Although a multidisciplinary approach is of great importance in improving prognosis, treatment approaches may vary depending on the conditions of the health care system. The current treatment modalities include pharmacological treatment following surgical intervention. But the current condition of the health care system in northern Syria from the perspective of resource scarcity and availability of current treatments makes the treatment of rare and deadly diseases more challenging.

DM and corticosteroid therapy are the most common risk factors in ROM cases that develop after COVID-19 [6]. At the same time, medical treatments, hospitalization in the intensive care unit, and treatment with broad-spectrum antibiotics predispose COVID-19 patients to opportunistic fungal infections, which occur in 8% of patients[7,8]. DM remains the most important risk factor in ROM after COVID-19 [9,6]. Besides, dexamethasone, hydrocortisone, and prednisolone are reported to be used in most cases that developed ROM. Although steroids are proven to be beneficial in COVID-19, cautious use is recommended because they cause hyperglycemia and monocytic and neutrophil dysfunction. The dose and duration of steroid treatment which may cause ROM remains uncertain in patients with Covid-19.

According to the European Mycosis Working Group guidelines, treatment success depends on the applicability of surgical techniques and the availability of antifungal therapies[4]. For the maximization of the survival rates a multidisciplinary team consisting of medical, surgical, radiological and laboratory specialities, and rapid diagnostic and therapeutic interventions are required. According to this guideline, the use of systemic liposomal amphotericin B along with early surgical debridement with clean margins is recommended as first-line therapy. The challenging decision of exenteration of the occupied orbit is recommended to remove the fungal load and to prevent cerebral involvement. In addition, intravenous isavuconazole or delayed-release tablet posaconazole are recommended but not Amphotericin B deoxycholate because of its toxicity. In assessing the postwar situation in northern Syria, we believe that the limited availability of the drugs, the lack of multidisciplinary approach and technical equipment for biopsy and surgical treatment negatively affect the prognosis.

Early diagnosis and treatment are very important for the prognosis of the disease[10]. In addition to physical examination findings, radiological imaging and knowledge of risk factors can be helpful for early diagnosis. Biopsy and detection of fungi in CSF or sputum are required for a definitive diagnosis. Evidence of nodular thickening or destruction of the bony walls of the paranasal sinuses and

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the absence of an air-fluid level on imaging may be a sign of invasive opportunistic infection.

Conclusion

The number of ROM cases is increasing after COVID-19. The use of steroids in treatment and the presence of concomitant DM are the main predisposing factors. The prognosis of this disease, which has high mortality and morbidity, is adversely affected in geographic regions where health care is inadequate.

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