Fungal sinusitis invading intra as well as extracranial- A rare case report

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Abstract

The primary complaint of a 48-year-old male patient in an Indian hospital was pain in the upper left rear region of the jaw. The patient appeared to be in good health until one and a half months ago, when he began experiencing pain over the upper left back side of his jaw. The patient was taken to the hospital two months ago after testing positive for COVID-19. He was maintained on oxygen for 10 days while receiving Remdesivir injections and steroid therapy. The patient has had diabetes mellitus and hypertension for five years and is currently on medication for both. An MRI of the brain and orbit was performed on the patient. The patient had functional endoscopic sinus surgery (FESS), which is a minimally invasive procedure that restores sinus ventilation and function. The patient was admitted to the hospital for 20 days and given injections of Amphotericin-B (12 doses).

Keywords: Extracranial, Fungal sinusitis, Intracranial, Invasion.

INTRODUCTION

After aspergillosis, mucormycosis is the second most common invasive mould illness [1–3], with increased prevalence recorded in some areas [4–7]. Mucormycosis is an invasive disease caused by filamentous fungi that belong to the Mucorales order. Patients with poorly controlled diabetes, immunosuppressed patients such as those undergoing haematological cancer treatment or recipients of solid organ and hematopoietic stem cell transplantation, and those who have sustained severe soft tissue trauma, often with direct inoculation of organic matter, are all at risk. Importantly, the immunological features of the host influence the clinical presentation of mucormycosis. Patients with diabetes mellitus are more likely to develop rhino-orbital-cerebral mucormycosis (ROCM), while those with haematological neoplasms are more likely to acquire sino-pulmonary illness, and trauma patients are more likely to develop necrotizing skin and soft tissue infections [8,9]. Mucormycosis is characterised by unrelenting tissue invasion and infarction secondary to angioinvasion in all anatomical regions [10–13]. One of the most severe forms of mucormycosis is involvement of the central nervous system (CNS), which often determines the patient’s survival and functional result [14].

Acute invasive fungal rhinosinusitis (AIFR) is a potentially lethal illness that is most commonly detected in immunocompromised patients. It is the most aggressive subtype of fungal sinusitis, with significant morbidity and mortality. Those with cancer, uncontrolled diabetes, AIDS, immunosuppressive and chemotherapeutic medications, and, more recently, COVID-19, are among the most often affected persons with invasive fungal infections [15,16].

We reported a rare case of a 48-year-old male patient with invasive fungal sinusitis with intracranial and left extracranial extensions.
Case Presentation

The primary complaint of a 48-year-old male patient in an Indian hospital was pain in the upper left rear region of the jaw. The patient appeared to be in good health until one and a half months ago, when he began experiencing pain over the upper left back side of his jaw. The pain was sudden in onset, intermittent, radiating to the right side of the head, aggravated by mastication, and went away on its own after some time. There was no prior history of trauma. Since 1 and ½ months, the patient has experienced burning sensations when eating hot and spicy foods, as well as trouble masticating. Since 1 month, the consistency of the saliva has changed from thin to thick and ropy.

The patient was taken to the hospital two months ago after testing positive for COVID-19. He was maintained on oxygen for 10 days while receiving Remdesivir injections and steroid therapy. The patient has had diabetes mellitus and hypertension for five years and is currently on medication for both. The patient had a myocardial infarction two years ago and is currently on medication (nitroglycerine 2.5mg). The patient had also received a blood transfusion three months prior. 4-5 years ago, the patient had a dental prosthesis.

An MRI of the brain and orbit was performed on the patient, which indicated mucosal thickening in the right maxillary sinus, sphenoidal sinus, and bilateral frontal and ethmoidal air cells. A subacute infarct in the left caudate nucleus and Genu of the internal capsule is revealed by MRI of the brain. Intracranial extension in the bilateral front frontal lobe leads to a brain abscess. Orbit-PNS MRI demonstrates invasive fungal sinusitis with intracranial and extracranal expansions on the left side.

Treatment

Treatment of individuals with mucormycosis is difficult, and despite treatment, death is high. The standard treatment plan entails rigorous surgical debridement of necrotic tissues followed by systemic antifungal therapy, the duration of which is determined by the clinical and radiological response as well as the recovery of the host immune system. Amphotericin B deoxycholate (AmB) and its lipid formulations were the first line of treatment in most retrospective investigations, with response rates ranging from 23-58%. AmB is currently the sole antifungal medication approved by the US Food and Drug Administration for the main treatment of mucormycosis, and its usage is being considered as part of any future combination therapy for this category of invasive fungal infections. As salvage therapy for mucormycosis, posaconazole at a maximum daily dosage of 800 mg alone or in combination with other medicines is recommended. Posaconazole has been shown to have response rates of 72-80% in individuals with mucormycosis who have failed or are not tolerating polyene-based therapy[17]. After that, the patient had functional endoscopic sinus surgery (FESS), which is a minimally invasive procedure that restores sinus ventilation and function. The patient was admitted to the hospital for 20 days and given injections of Amphotericin-B(12 doses).
Discussion

SARS-CoV and SARS-CoV-2 belong to the same species and have identical biological and clinical characteristics, according to research. In previous studies, 10 fungal infections were found in SARS patients and were deemed the primary cause of mortality in 25 percent to 73.7 percent of patients. [18-20]. Based on this knowledge, it is necessary to pay close attention to the possibility of fungal infections in conjunction with COVID-19.

Fungi co-infections were discovered in COVID-19 patients. In 99 COVID-19 patients in China, Chen et al. discovered six cases of lung fungal infection.[21] In 52 critically sick patients, Yang et al. discovered three (3/52, 5.8%) individuals with lung fungal infection.[22] Other investigations have discovered that COVID-19 patients have a greater rate of secondary lung infections (8–15%), but it is unclear if this is a bacterial or fungal infection. [23,24]

Fungal sinusitis is a time-sensitive illness that requires timely diagnosis and treatment to avoid life-threatening complications. Surprisingly, a significant increase in the number of COVID-19 patients with this infection has lately been reported. Invasive fungal sinusitis is still uncommon in COVID-19 patients with critical disease. Only isolated case reports demonstrating thsevolving clinical phenomenon have been published.[25,26]

Progression occurs over a few days to a few weeks, with the possibility of vascular invasion and thrombosis. [27] It usually starts with an initial onset of face pain, fever, and nasal congestion that spreads to nearby structures such as the paranasal soft tissues, orbit, and cranial vault. Involvement with the orbit can cause visual loss, whereas sinus or intracranial extension might cause proptosis or neurologic problems, respectively. [27]

Conclusion

In COVID-19 patients, clinical suspicion and early identification of fungal sinusitis are critical for better treatment outcomes. Patients' prognosis may be affected and survival rates improved if antifungal medication is started quickly and surgical intervention is performed quickly.

REFERENCES


