**Unusual Case of Mucormycosis-Associated Central Retinal Artery Occlusion Without Orbital Involvement: A Case Report   
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**ABSTRACT**

Mucormycosis is an invasive fungal infection caused by the fungi in the order Mucorales.

It can lead to mortality and morbidity in immunocompromised and diabetic patients.

We herein present a patient with untreated type 2 diabetes who was admitted for her acute progressive vision loss. Following the diagnostic findings, she was determined to have mucormycosis that had directly infiltrated the cerebral arteries, resulting in blindness in her left eye. This represents an uncommon presentation of mucormycosis, as it led to artery invasion without involving the orbit. This case underscores the significance of promptly diagnosing mucormycosis in susceptible individuals to avert catastrophic outcomes.   
 **KEY CLINICAL MESSAGE:** The main point of this case is to know that Mucormycosis can rarely as a case report, involve the retinal artery leading to blindness but not the orbit itself.   
 **KEYWORDS:** Mucormycosis, retinal artery, orbit, diabetes mellitus, fungal infection

**INTRODUCTION**

Mucormycosis is a fungal infection that often manifests as rhino-orbital-cerebral and pulmonary infections, particularly in immunocompromised patients and those with diabetes mellitus[(1)](#c1). It is caused by species of the order Mucorales found in the soil. The fungus grows rapidly and produces spores that can become airborne. While we are exposed to it daily, our immune system typically prevents infection [(2)](#c2).

These organisms thrive in environments with high glucose and acidity due to the ketone reductase enzyme. Therefore, diabetic ketoacidosis is a risk factor for infection[(3)](#c3). Spores attach to nasal turbinates through inhalation[(4)](#c4), and the organism invades blood vessels, leading to tissue infarction[(5)](#c5).

Certain underlying conditions increase the risk of mucormycosis, such as diabetes mellitus, glucocorticoid therapy, hematologic malignancies, organ transplantation, AIDS, and recent COVID-19 infection[(6)](#c6). Rhino-orbital-cerebral infection is more common in individuals with diabetes[(7)](#c7). It presents as acute sinusitis with symptoms like fever, nasal discharge, headache, and sinus pain. The infection can spread to the palate, orbit, and brain[(8)](#c8).

**CASE PRESENTATION**

We present a case of a 38-year-old woman who complained of headache, pain, and swelling on the left side of her face from 10 days ago. She had progressive vision loss from 3 days ago. Accompanying symptoms were fever, rhinorrhea, coughing, and nausea.  
Physical examination findings were fixed left pupil, non-light perception (NLP) visual acuity in the left eye, normal extraocular muscle movements, and decreased sensation in the left frontal and infraorbital area.  
She was diagnosed with untreated type 2 diabetes mellitus, with a blood sugar of 600 mg/dl upon hospital admission.

In the fundoscopy infiltrative lesions of the optic nerve were seen but other parts of the eye were normal.

Nasosinusal endoscopy showed middle turbinate necrosis, so the middle turbinate was resected and sent to mycology laboratory. The report confirmed the presence of fungal elements with no septate hyphae, indicating mucormycosis. ([Figure1](#fig1))

Paranasal sinuses CT scan showed opacification in both sphenoids, left maxillary, and left ethmoid air cells. Also, mild erosion in the posterior wall of the left maxillary sinus associated with retroantral fat stranding was seen; but there was no evidence of intraorbital or intracerebral spread of infection. ([Figure2](#fig2))

MRI of the sinus showed acute invasive fungal infection. ([Figure3](#fig3))

Brain MRI showed left internal carotid artery fungal invasion and acute external watershed infarction between middle cerebral artery and posterior cerebral artery. ([Figure4](#fig4))

MRI of the orbit showed central retinal artery occlusion with consequent central retinal infarction. ([Figure5](#fig5))  
  
**DIFFERENTIAL DIAGNOSES**Differential diagnoses included ischemic optic neuropathy, optic neuritis, papilledema, homonymous hemianopia, cortical blindness, central retinal vein occlusion, retinal detachment, acute maculopathy, and Aspergillosis. **TREATMENT PLAN**  
  
She received 450 mg/day (5mg/kg per day) liposomal Amphotericin B for four weeks. When the patient showed signs of improvement and a negative assessment for mucormycosis infection in the sinuses by the ENT specialists, the patient was discharged with a prescription for Posaconazole syrup (10ml every 12 hours).      
  
**FOLLOW UP**  
  
After four weeks of treatment with liposomal Amphotericin B the patient's signs and symptoms improved and the ENT specialist's assessment for sinuses infection was negative. However, her left eye did not regain its vision.

**DISCUSSION**

Mucormycosis is an angioinvasive fungal infection that causes mortality and morbidity in immunocompromised and diabetic patients. The most common manifestation of mucormycosis in diabetic patients is rhino-orbital-cerebral infection. This fungus usually attaches to the nasal turbinates and then invades the paranasal sinuses. From there, the infection can progress to involve nearby structures such as the orbit (resulting in orbital cellulitis) and potentially extend into the brain.  
Many cases of central retinal artery occlusion and subsequent blindness after mucormycosis have been reported. However, the fungus primarily affected the orbit in all of these cases.([9](#c9),[10](#c10)).

Recent literature has reported a rare manifestation of mucormycosis that the fungus directly spreads to the cerebral arteries from the sinuses without involving the orbit leading to blindness through occlusion of the central retinal artery.

This highlights the aggressive nature of mucormycosis and the importance of early recognition and treatment to prevent severe outcomes.

**CONCLUSION**

Diabetic patients are more susceptible to mucormycosis due to their compromised immune system and elevated blood sugar levels. The invasion of cerebral arteries without orbital involvement is an uncommon presentation of mucormycosis, indicating that it can lead to disastrous consequences rapidly. Controlling diabetes having a high suspicion of mucormycosis and seeking prompt medical attention if symptoms arise can lead to early diagnosis and treatment, potentially preventing severe complications and improving outcomes.

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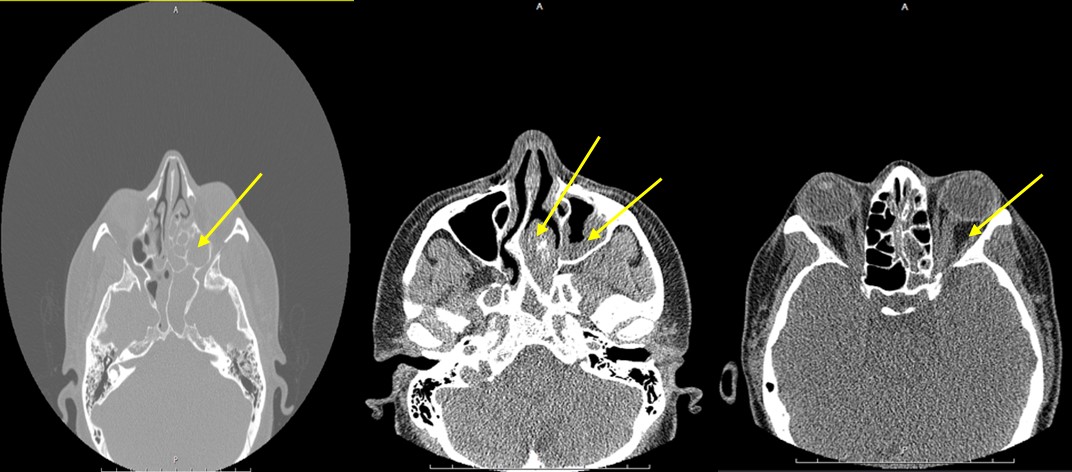
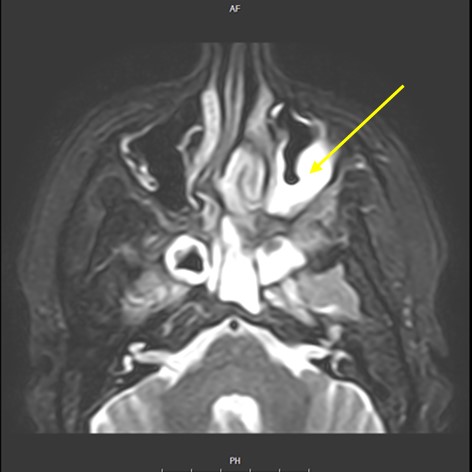


Figure 3 sinus MRI: acute invasive fungal infection

Figure 2 CT scan: opacification in both sphenoid, left maxillary, and left ethmoid air cells. mild erosion in the posterior wall of the left maxillary sinus associated with retroantral fat stranding. there is no evidence of intraorbital or intracerebral

Figure 1 Fungal elements with no septate hyphae

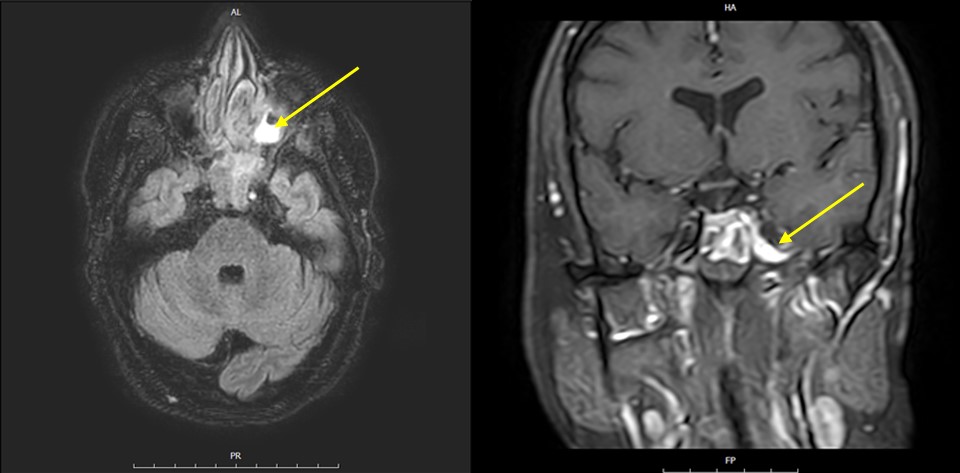


Figure 4 Brain MRI: left internal carotid artery fungal invasion.

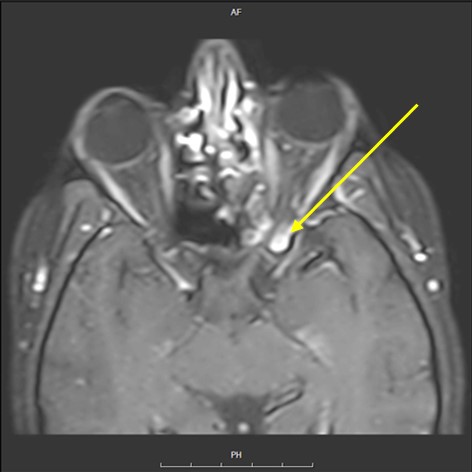


Figure 5 MRI of the orbit: left central retinal artery occlusion