Exudative retinal detachment in COVID-19 - associated rhino-orbital mucormycosis – A rare clinical finding

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Rhino-orbital-cerebral mucormycosis is a life-threatening, opportunistic invasive fungal infection. Patients with moderate to severe coronavirus disease 2019 (COVID-19) infection are more vulnerable to it. Varied clinical presentations can be seen in patients with orbital mucormycosis starting from conjunctival chemosis, proptosis, ptosis, restriction of extraocular movements, exposure keratitis, neurotrophic keratitis, and central retinal artery occlusion. Exudative retinal detachment in a patient with orbital mucormycosis is a rare clinical entity. We, hereby, report a case of orbital mucormycosis with exudative retinal detachment in a patient post-COVID-19 infection.

Key words: COVID-19, exudative retinal detachment, orbital mucormycosis

There is a massive spike of rhino-orbital-cerebral (ROC) mucormycosis in coronavirus disease 2019 (COVID-19) patients during the second wave of the pandemic in India.[1,2] Mucormycosis is an aggressive, opportunistic invasive fungal infection. Patients with moderate to severe COVID-19 illness, uncontrolled diabetes mellitus, nephropathy, and immunosuppressants are more prone to it.[3] Ocular manifestations of mucormycosis can be varied from conjunctival chemosis, proptosis, ptosis, restriction of extraocular movements, relative afferent pupillary defect, exposure keratitis, neurotrophic keratitis, central retinal artery occlusion, and orbital infarction syndrome.[4] Severe retinal detachment (RD) in mucormycosis is a rare clinical finding – one case reported previously by Kim et al.[5] We, hereby, report a case of exudative RD secondary to orbital mucormycosis in a patient with COVID-19 infection.

Case Report

A 63-year-old male diabetic patient presented with acute onset of gross diminution of vision and drooping of the upper eyelid in the right eye (RE) associated with headache, retro-orbital pain. The patient was admitted into the hospital due to diabetes mellitus (DM) of 12 years duration and noticed pain and swelling of the right eye for the past 3 days. On examination, there was severe orbital swelling, chemosis, ptosis, proptosis, restriction of extraocular movements, chemosis of conjunctiva, and exposure keratitis. The patient was diagnosed as having diabetic nephropathy, hypertension, and diabetic retinopathy.

The patient was treated with intravenous fluconazole, amphotericin B, and intravitreal voriconazole and was advised oral voriconazole. The patient was discharged home on oral voriconazole and reviewed after 1 month. The patient showed significant improvement in vision and chemosis.

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pain, facial puffiness, and blackish nasal discharge for 4 days. He had tested positive for COVID-19 by RT-PCR (reverse transcription polymerase chain reaction) 14 days ago and was advised of home isolation. The patient did not receive systemic steroids for the management of COVID-19 infection.

On examination, diffuse facial edema with periorbital edema, complete ptosis with axial proptosis, and restricted ocular movements in all directions of the RE were noted [Fig. 1a]. Best corrected visual acuity in the RE was light perception with an inaccurate projection of rays in all quadrants, and in the left eye (LE), it was 20/32. Intraocular pressure was measured as 17 mmHg in RE and 13 mmHg in LE. Anterior segment examination of the RE showed diffuse conjunctival congestion with chemosis [Fig. 1b]. The pupil was 4 mm, round, and fixed. Fundus examination of the RE showed diffuse disc pallor with total exudative RD and retinal folds [Fig. 1c]. The anterior segment and the fundus examinations were normal in the LE.

Systemically, the patient was diagnosed to have acute kidney injury with a blood urea of 108 mg/dL and creatinine of 1.58 mg/dL. Random blood glucose was 508 mg/dL and Hb1AC (glycated hemoglobin) was 17.8, but urine was negative for ketones. Ultrasound B scan of the RE showed exudative RD, thickening of the retina–choroid–sclera (RCS) complex and minimal subtenon fluid suggestive of scleral inflammation [Fig. 2a]. Contrast-enhanced computed tomography showed pansinusitis with bony erosion of the medial orbital wall, with involvement of the medial and inferior extraconal spaces, and bulkiness of the medial and inferior rectus muscle.

**Figure 1:** Clinical photographs showing (a) complete ptosis and (b) conjunctival chemosis in the right eye. (c) Fundus image of the right eye showing diffuse disc pallor with total exudative retinal detachment and (d) clinical photograph of the right eye postexenteration

**Figure 2:** (a) Ultrasound B scan of the right eye showing exudative retinal detachment, thickening of the retina–choroid–sclera (RCS) complex and minimal subtenon fluid suggestive of scleral inflammation, (b) Contrast-enhanced computed tomography image showing pansinusitis with bony erosion of the medial orbital wall, with involvement of the medial and inferior extraconal spaces, and bulkiness of the medial and inferior rectus muscle

**Discussion**

During the second wave of the COVID-19, there has been a nationwide rise in the cases of rhino-orbital mucormycosis. The major causes responsible for the high incidence of mucormycosis have been hypothesized as the following: Easy germination of the Mucor species. Rhizopus species. Headache or fever, facial puffiness, and blackish nasal discharge for 4 days. He had tested positive for COVID-19 by RT-PCR (reverse transcription polymerase chain reaction) 14 days ago and was advised of home isolation. The patient did not receive systemic steroids for the management of COVID-19 infection.

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**KOH (potassium hydroxide) wet mount of the tissue biopsy sample obtained during surgery showed broad aseptate hyphae, which on subsequent culture had grown Rhizopus species.**

**Figure 2:** (a) Ultrasound B scan of the right eye showing exudative retinal detachment, thickening of the retina–choroid–sclera (RCS) complex and minimal subtenon fluid suggestive of scleral inflammation, (b) Contrast-enhanced computed tomography image showing pansinusitis with bony erosion of the medial orbital wall, with involvement of the medial and inferior extraconal spaces, and bulkiness of the medial and inferior rectus muscle.

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and surgical debridement (FESS); microbiological and histopathological confirmation of the diagnosis are all key factors for better outcomes in terms of vision or globe salvage and patient survival. Our patient needed exenteration despite an initial FESS surgery, thereby reflecting the severity of the orbital involvement.

**Conclusion**

Exudative RD can be a rare retinal manifestation of orbital mucormycosis. It can indicate an associated choroidal and scleral inflammation and, therefore, an extensive orbital involvement.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

**Conflicts of interest**

There are no conflicts of interest.

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