Clinical course, diagnosis, and management of bilateral COVID-19 associated conjunctivitis: A case study

Ram Kumar Jaiswal, Aditi Jhunjhunwala

We present a rare case of COVID-19 associated conjunctivitis where patient presented with redness, foreign body sensation, watering, and pain. Symptoms started while patient was COVID-19 positive. On examination, severe conjunctival congestion was present along with follicles. Visual acuity was 6/6 in both eyes. The patient was started on topical antibiotics and showed improvement but again presented with aggravated symptoms. Conjunctival swab was sent for culture and sensitivity, which was negative for any organisms. The patient was then started on oral and topical steroid, which showed improvement. Even though COVID-19 associated conjunctivitis is self-limiting, here it showed a progressive course and resolved only after steroid.

Key words: Clinical feature, conjunctivitis, diagnosis, management, post COVID-19

The ongoing COVID-19 pandemic caused by SARS-CoV-2 is known to affect the respiratory system primarily with symptoms like fever, malaise, and fatigue that quickly progresses to pneumonia. It is also found to be associated with several atypical presentations and infections. While the whole world was talking about COVID-19 associated rhino-orbital-cerebral mucormycosis, very little is known about COVID-19 associated conjunctivitis. Therefore, we present a rare case of COVID-19 associated conjunctivitis, its clinical course and its successful management.

Case Report

A 29-year-old male resident working in the surgery department presented to the ophthalmology OPD on 12 May 2021 with complaints of redness of the eye, foreign body sensation, watery discharge, and pain in both eyes for the last 10 days. At the time of presentation, the patient had no COVID-19-related symptoms but he was posted in the COVID-19 intensive care unit (ICU) during which he developed fever, malaise, shortness of breath, and underwent RT-PCR which was positive. The next day, he noticed redness in his left eye along with foreign body sensation which progressed to involve the right eye along with watery discharge and pain in both eyes. Due to quarantine protocol for active cases, the patient was not able to seek ophthalmology consultation. He visited ophthalmology OPD once he was RT-PCR negative and ocular symptoms persisted.

On examination, the visual acuity was 6/6 for both eyes without correction. Slit-lamp examination revealed mild eyelid edema with grade 2 conjunctival injection in the left eye and grade 1 conjunctival injection in the right eye [Fig. 1a] with mild chemosis and follicular reaction in the upper and lower fornices in both eyes. The cornea was clear, no sign of inflammation was detected in the anterior chamber, and fundus examination revealed vital optic disc and macula for both eyes. Systemic examination did not reveal any lymphadenopathy. Fluorescein staining was negative for both eyes.

Figure 1: (a) Image of the patient showing conjunctival congestion in left more than right eye; (b) Image of patient showing improvement in symptoms after one week of steroid therapy.

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Considering acute conjunctivitis, moxifloxacin eye drop, artificial tears without preservative along with topical antihistaminic were prescribed. Initially, he showed some improvement but came back to us after five days with worsening of symptoms. Fluorescein staining was repeated and was again negative. Conjunctival swab was sent for RT-PCR along with culture and sensitivity but was negative for COVID-19 and other organisms. The patient was then started on topical prednisolone six times a day and oral prednisolone (tab. omnacortil) 10 mg and showed improvement [Fig. 1b].

**Discussion**

SARS-CoV-2 is primarily known to transmit through the respiratory tract and although no ocular symptoms or transmission has been reported in the two previously reported coronavirus diseases, that is, severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS), several reports around the world have reported ocular involvement and shedding of virus in tears in COVID-19. SARS-CoV-2 binds to the ACE-2 receptor to facilitate entry into the cell which is also found in conjunctiva and cornea, and the spread is via droplets or direct inoculation. Hui KPY et al., in a study of viral replication and cellular tropism concluded infection of conjunctival tissue as a potential portal of disease transmission. The pathophysiology is still not completely understood but a three-phase model was put forward: viral replication followed by immune hyperactivity, and then tissue destruction. Cell death releases the virus in tears. COVID-19 has also been found to be associated with cytokine dysregulation and subsequent immune reaction which justifies the use of steroids. Conjunctivitis is the most common ocular manifestation of COVID-19 and is caused directly due to virus or is immune mediated. It can present as follicular conjunctivitis, viral keratoconjunctivitis, hemorrhagic and pseudomembranous conjunctivitis and episcleritis.

In 2020, Güemes-Villahoz N et al., reported that 1 out of 10 hospitalized non-critical COVID-19 patient presents with conjunctivitis during the disease which was self-limiting. Sindhuja K et al., in a retrospective, cross-sectional, single-center study reported that 11/127 had ocular complaints out of which eight had conjunctival congestion. A positive hand-to-eye contact history was elicited in three patients only, which was clinically insignificant. Whereas Chen L et al., found an independent correlation between hand-to-eye contact and conjunctival congestion where out of 535 patients, 27 patients had conjunctival congestion. Nayak et al., reported a case of late follicular conjunctivitis in a diabetic, hypertensive, and asthmatic patient on ventilator during COVID-19 illness.

Our case had a bilateral presentation with a severe conjunctival reaction while COVID-19 positive. Adenoviral conjunctivitis was ruled out as there was no associated corneal involvement and no preauricular lymphadenopathy, which is more common with adenoviral conjunctivitis. Bacterial cultures were negative so *Mycoplasma* was ruled out. After starting the steroids, conjunctival injection resolved completely by the seventh day but follicles persisted for three weeks.

**Conclusion**

COVID-19 has been shown to have ocular involvement, mainly conjunctivitis which is known to be self-limiting, but in some rare cases it can show progressive course and resolve only after steroid therapy.

**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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**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Ozturker ZK. Conjunctivitis as sole symptom of COVID-19: A case report and review of literature. Eur J Ophthalmol 2021;31:NP161-6.

2. Arabi YM, Balkhy HH, Hayden FG, Bouchama A, Luke T, Baillie JK, et al. Middle East Respiratory Syndrome. N Engl J Med 2017;376:584-94. doi: 10.1056/NEJMsra1408795. PMID: 28177862; PMCID: PMC5362064.

3. Yuen KSC, Chan W-M, Fan DSP, Chong KK, Lam DS. Ocular screening in severe acute respiratory syndrome. Am J Ophthalmol 2004;137:773-4.

4. Hui KPY, Cheung MC, Perera RAPM, Ng KC, Bui CHT, Ho JCW, et al. Tropism, replication competence, and innate immune responses of the coronavirus SARS-CoV-2 in human respiratory tract and conjunctiva: An analysis in ex-vivo and in-vitro cultures. Lancet Respiratory Med 2020;8:687-95.

5. Tsui PT, Kwok ML, Yuen H, Lai ST. Severe acute respiratory syndrome: Clinical outcome and prognostic correlates. Emerg Infect Dis 2003;9:1064-9.

6. Sen M, Honavar SG, Sharma N, Sachdev MS. COVID-19 and eye: A review of ophthalmic manifestations of COVID-19. Indian J Ophthalmol 2021;69:488-509.

7. Güemes-Villahoz N, Burgos-Blasco B, García-Feijoo J, Sáenz-François F, Arriola-Villalobos P, Martinez-de-la-Casa JM, et al. Conjunctivitis in COVID-19 patients: Frequency and clinical presentation. Graefes Arch Clin Exp Ophthalmol 2020;258:2501-7.

8. Sindhuja K, Lomi N, Asif MI, Tandon R. Clinical profile and prevalence of conjunctivitis in mild COVID-19 patients in a tertiary care COVID-19 hospital: A retrospective cross-sectional study. Indian J Ophthalmol 2020;68:1546-50.

9. Chen L, Deng C, Chen X, Zhang X, Chen B, Yu H, et al. Ocular manifestations and clinical characteristics of 535 cases of COVID-19 in Wuhan, China: A cross-sectional study. Acta Ophthalmol 2020;98:e951-9.

10. Nayak B, Poddar C, Panigrahi MK, Tripathy S, Mishra B. Late manifestation of follicular conjunctivitis in ventilated patient following COVID-19 positive severe pneumonia. Indian J Ophthalmol 2020;68:1675-7.