Late manifestation of follicular conjunctivitis in ventilated patient following COVID-19 positive severe pneumonia

Bhagabat Nayak, Chanchal Poddar, Manoj Kumar Panigrahi, Swagata Tripathy, Batjayantimala Mishra

A 65-year-old known diabetic, hypertensive, and asthmatic patient was admitted for suspected coronavirus disease 19 (COVID-19) infection following complaints of breathlessness. He tested positive for COVID-19 and was put on ventilation. He developed severe follicular conjunctivitis of the right eye while on a ventilator, which was treated conservatively. The resolution of ocular signs was noted over 2 weeks without any complications. This case highlights the timeline of events and discusses the late ophthalmic manifestations in patients with COVID-19 infection.

Key words: Conjunctivitis, COVID-19, follicular conjunctivitis, ocular manifestations

The global pandemic of COVID-19 is associated with mild upper respiratory tract infection to severe respiratory syndrome. With the increasing number of cases, atypical symptoms such as conjunctivitis, gastrointestinal symptoms, altered hearing, and taste have also been reported either as presenting or as associated symptoms.[1] Given its highly contagious nature, documentation and follow-up of mild clinical features is difficult and might go unreported. Herein, we report a case of conjunctivitis in a COVID-19 positive patient; discussing the clinical course and follow-up.

Case Report

A 65-year-old man presented to our COVID-19 center with complaints of rhinorrhea, cough, and breathing difficulty for the past 3 weeks. He was the primary contact of a known COVID-19 patient and had underlying comorbidities like diabetes, hypertension, and asthma. Initially, the patient was
managed with high flow oxygen awaiting his COVID-19 result. Twelve hours later to his admission nasal swab reverse transcription-polymerase chain reaction (RT-PCR) was reported positive and in the next 2 hours his respiratory distress worsened. He was intubated and mechanically ventilated. Chest radiograph and blood gas parameters were suggestive of severe pneumonia. He had elevated C-reactive protein and procalcitonin (3 ng/mL) levels on admission. Hemogram showed neutrophilic leucocytosis (white blood cell count 14200/mm$^3$ with neutrophil 88%). Serum lactate dehydrogenase was within normal limits. The patient was paralyzed, sedated, and ventilated on assist control mode for the first 10 days, after which he was extubated and noninvasively ventilated. On the 14th day of admission, he was completely liberated from ventilatory support as he maintained normal blood gas parameters on spontaneous breathing without any fatigue. Titrated doses of midazolam and vecuronium were used for sedation and paralysis, respectively. He was never on vasopressors or inotropes.

By day 7 from the time of ventilation, redness and severe injection of the conjunctiva in the right eye was noted. While in isolation, the patient was attended with personal protective equipment (PPE). A severe follicular reaction was noted in lower palpebral conjunctiva with conjunctival prolapse during torchlight examination and a clinical photograph was taken with the tabloid, especially dedicated to the intensive care unit (ICU) for communication purposes [Fig. 1a]. The cornea was clear and anterior segment findings were normal. The left eye was appearing normal. The conjunctival swabs for bacteria and fungus were negative. The diagnosis of acute follicular conjunctivitis was made, the patient was put on lubricants and prophylactic antibiotics of the preservative-free moxifloxacin 0.5%.

The conjunctival congestion resolved over the next 5 days [Fig. 1b] and follicles over the next 2 weeks from the time of onset of eye symptoms. The left eye was asymptomatic throughout the hospital stay. The patient was declared cured after RT-PCR for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) tested negative on endotracheal aspirate and was extubated on the 14th day from the time of intubation. (Timeline of events shown in Fig. 2).

**Discussion**

Ocular symptoms have been reported in around one-third of COVID-19 positive patients with some variability in these figures in published studies. In the majority of patients, the onset of ocular signs was observed between 7–14 days from the onset of systemic COVID-19 symptoms. On the other hand, there are reports of conjunctivitis as first presenting symptoms of COVID-19 and the presence of the virus in conjunctival sac before the onset of systemic illness. The observed spectrum of manifestations is conjunctival congestion, conjunctival injection, follicular reaction, epiphora, and increased ocular secretions. Conjunctival infection presented in the mid-phase of illness and studies has noted the occurrence of ocular complication at the time of active pneumonia or at the time when the patient is on critical life support. Our case had a unilateral presentation with a severe conjunctival reaction while on ventilation; 32 days from the time of onset of systemic symptoms. An ocular surface problem related to dry eyes, corneal staining with erosion, and chemosis may also occur in a ventilated patient for long days which were differentials diagnosis in this case but there was no corneal staining or

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**Figure 1:** (a) Photograph showing right eye severe conjunctival injection with lower conjunctival prolapse. Both bulbar and palpebral conjunctival congestion noted and the cornea was clear. (b) The resolution of conjunctival congestion and prolapse 5 days after the onset

**Figure 2:** Timeline of events
erosion in this case. Besides, there was no lagophthalmos or
infrequent blinking response and the patient was able to close
his eyelid properly. Other possible causes of conjunctivitis
like adenoviral conjunctivitis and nosocomial *Mycoplasma*
conjunctivitis should be kept in mind. However, in our
case, there was no associated corneal involvement and no
preauricular lymphadenopathy which is more common
with adenoviral conjunctivitis and also bacterial culture was
negative so *Mycoplasma* was ruled out.

Although ocular abnormalities have been reported
more commonly in severe forms of COVID-19, the clinical
course of these patients was favorable with the resolution of
conjunctivitis within 7 to 10 days.

 Conjunctival secretions were tested positive in
COVID-19 patients with conjunctivitis.[9] But the viral load
is less than that from the respiratory specimen and decreases
with a decrease in body viral load. It was also learned from
recent observations that conjunctival sampling may not be an
ideal site for diagnosis and may not be necessary to test in all
active COVID-19 patients.[6] Although conjunctival discharge
could not be tested for the RT-PCR test, in this case, there may
be a probability of virus shedding in the conjunctiva route
till the late stage of the disease even after the negative report
from a nasopharyngeal swab. Further investigation in this
direction may throw some light regarding its potential mode
of transmission and thereby to continue to isolate the patient
even after the nasopharyngeal swab becomes negative.

In the present case, conjunctival injection resolved
completely by the 5th day but follicles persisted for 2 weeks.
The role of antiviral therapy in reducing the viral load of
tears and conjunctival secretions is yet to be determined. The
present case emphasizes the effective way of mitigating ocular
complications with conservative management.

Due to the setting of ICU and COVID-19 status, a detailed
evaluation to rule out corneal involvement such as corneal
infiltrates which can be picked up on slit-lamp examination
could not be performed. Medical fraternity consisting of
non-ophthalmologists should be aware of such clinically
favorable ocular abnormalities in confirmed/suspected
COVID-19 patient’s so that they can even transfer the clinical
photograph of the eye to the ophthalmologist if there is no
vision loss and it can be managed conservatively and followed
up avoiding unnecessary entries into the isolation room.

**Conclusion**

In conclusion, based on our report, conjunctivitis occurs late
in the disease course and appears to have a rapid resolution
and is self-limiting.

**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.

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