Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Medicine

Case Report of Benign Diffuse Anterior Scleritis Associated with SARS-CoV-2

Saidi Sara[1*], Hassan Moutei[1], Mounir Belmlih[1], Fiqhi Aissam[1], Mouzari Yassine[1]

[1]Mohammed V Military Teaching Hospital of Rabat, Hassan II University Hospital Center of Fez, Morocco

DOI: https://doi.org/10.36347/sjmcr.2024.v12i10.048 | **Received:** 13.09.2024 | **Accepted:** 18.10.2024 | **Published:** 25.10.2024

***Corresponding author:** Saidi Sara
Mohammed V Military Teaching Hospital of Rabat, Hassan II University Hospital Center of Fez, Morocco

Abstract **Case Report**

COVID-19 is an emerging infectious disease classified as a zoonotic illness caused by the SARS-CoV-2 strain of coronavirus. This enveloped, positive-sense, non-segmented RNA virus belongs to the order Nidovirales and the family Coronaviridae. Its primary mode of transmission is human-to-human through respiratory droplets. Ophthalmologists worldwide have reported various ocular manifestations associated with the infection. Recent studies have shown that SARS-CoV-2 binds to the cellular receptor for angiotensin-converting enzyme 2 (ACE2) and interacts with the transmembrane serine protease 2 (TMPRSS2), both of which are known to be expressed in the human cornea, retina, and conjunctival epithelium [1, 2]. The aim of this work is to present a case of a patient who developed diffuse viral scleritis related to COVID-19, detailing the diagnostic and therapeutic approaches as well as the patient's progression. We report the case of a 63-year-old man with a history of high triglycerides who developed flu-like symptoms and severe tiredness for over a week. A COVID-19 test came back positive. Ten days later, he had a painful, red right eye but no change in vision. An eye exam showed some redness in the conjunctiva, a clear cornea, and normal pressure in the eye. The fellow eye looked normal as well. He was treated with topical steroids and artificial tears, which helped initially. However, after finishing treatment, his symptoms worsened with more redness and pain, and now both eyes were affected. Further examination of the right eye showed swelling of the eyelid (preseptal cellulitis) and widespread redness in the conjunctiva. The Neosynephrine test was negative, and there was pain when moving the eye. The cornea was clear but had some superficial punctate keratitis, and the anterior chamber looked normal. The left eye also showed redness but was otherwise normal. A full lab workup (including blood tests and serologies for HSV1-2) came back normal. Considering his previous COVID-19 infection, initial improvement with steroids, and the one-sided symptoms, we suspected benign viral anterior scleritis. He was started on oral antiviral medication (valacyclovir) at 3g per day, along with artificial tears. After 72 hours on antiviral therapy, both systemic and topical steroids were added to reduce inflammation. Over time, the eyelid swelling disappeared, pain decreased, and the redness became more localized. Because of his improvement, we gradually reduced the doses of antiviral and steroid medications. After one month, his eye looked normal and was pain-free with both eyes showing no issues. This case illustrates how viral infections like COVID-19 can lead to conditions such as anterior scleritis and highlights the effectiveness of antiviral and steroid treatments in managing this issue.

Keywords: COVID-19, anterior scleritis, valacyclovir, steroids, ocular manifestations.

INTRODUCTION

In 2019, a new virus, commonly known as Coronavirus (CoV); Covid19; was first reported in Wuhan, China. From there, it spread globally and became the fifth reported flu pandemic since 1918. After 2 years of the identification of the pandemic, there had been more than 200 million confirmed cases and over 4.6 million deaths [3]. CoV is a single, positive-strand RNA virus that has a severe effect on the respiratory system in humans. Also, the gastrointestinal and central nervous systems can be affected by it resulting in severe diseases and threats to human lives [4]. The suggested mechanism of the virus's entrance into our cells is defined as receptor-mediated endocytosis, in which CoV uses angiotensin-converting enzyme 2 (ACE2), a cell-surface receptor that is present in many body organs, and importantly, in the alveolar respiratory tract; the epithelial cells of the lungs that ease the viral infection [5]. Ophthalmologists worldwide have reported various ocular manifestations associated with the infection. Recent studies have shown that SARS-CoV-2 binds to the cellular receptor for ACE2 and interacts with the

transmembrane serine protease 2 (TMPRSS2), both of which are known to be expressed in the human cornea, retina, and conjunctival epithelium [1, 2]. Knowing the prevalence and type of ocular manifestations of COVID-19 can help physicians diagnose the infection better and sooner in the course of the disease.

The aim of this work is to present a case of a patient who developed diffuse viral scleritis related to COVID-19, detailing the diagnostic and therapeutic approaches as well as the patient's progression.

CASE REPORT

We report the case of a 63-year-old man with a history of high triglycerides who developed flu-like symptoms (fever and cough) and severe asthenia for over a week. The patient reported no history of eye trauma, autoimmune disease, or other ocular pathology prior to this episode. He was tested for SARS-CoV2 with Real time-polymerase chain reaction (RT-PCR) on nasopharyngeal swab sample and was found to be positive. Seven days later, he had a painful, red right eye but no change in vision. An eye exam showed some redness in the conjunctiva, a clear cornea, and normal pressure in the eye. The fellow eye examination was normal. He was treated with topical steroids and artificial tears, which helped initially. However, after finishing treatment, his symptoms worsened with more redness and pain. Further examination of the right eye showed swelling of the eyelid (preseptal cellulitis) with diffuse scleral redness and no involvement of the posterior segment. The Neo synephrine test was negative, and there was pain when moving the eye. The cornea was clear but had some superficial punctate keratitis, and the anterior chamber looked normal. The left eye also showed some redness but was otherwise normal. Importantly, there were no signs of systemic inflammatory conditions typically associated with scleritis, such as rheumatoid arthritis or lupus.

Considering his initial improvement with steroids, and the one-sided symptoms, with the absence of systemic signs or history of a systemic disease, we suspected benign viral anterior scleritis. He was started on oral antiviral medication (valacyclovir) at 3g per day, along with artificial tears. Meanwhile, a full lab workup (including blood tests and serologies for HSV1-2, TPHA-VDRL) was done, after days the results were correct. So we concluded that it was a benign diffuse anterior scleritis linked to COVID-19, especially that it occurs just after a covid episode and the RT-PCR was positive. Both systemic and topical steroids were prescribed to the patient. Over time, the eyelid swelling disappeared, pain decreased, and the redness became more localized. Because of his improvement, we gradually reduced the doses of steroid medications. After one month, his eye looked normal and was pain-free with both eyes showing no issues. This case illustrates how viral infections like COVID-19 can lead to conditions such as anterior scleritis and highlights the effectiveness of early treatments in managing this issue.

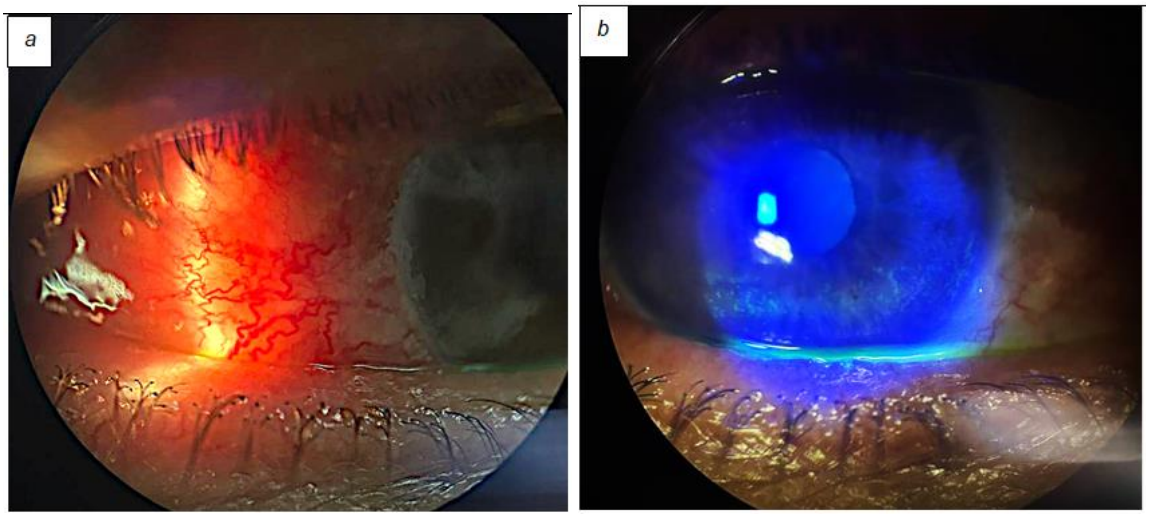

Figure 1: (a) Clinical image from the slit lamp, showing the scleritis in the right eye, (b): Clinical image from the slit lamp of the same eye with fluorescein test showing an inferior superficial punctate keratitis

Figure 2: External image of the right eye showing palpebral edema (preseptal cellulitis) and diffuse redness of the eye

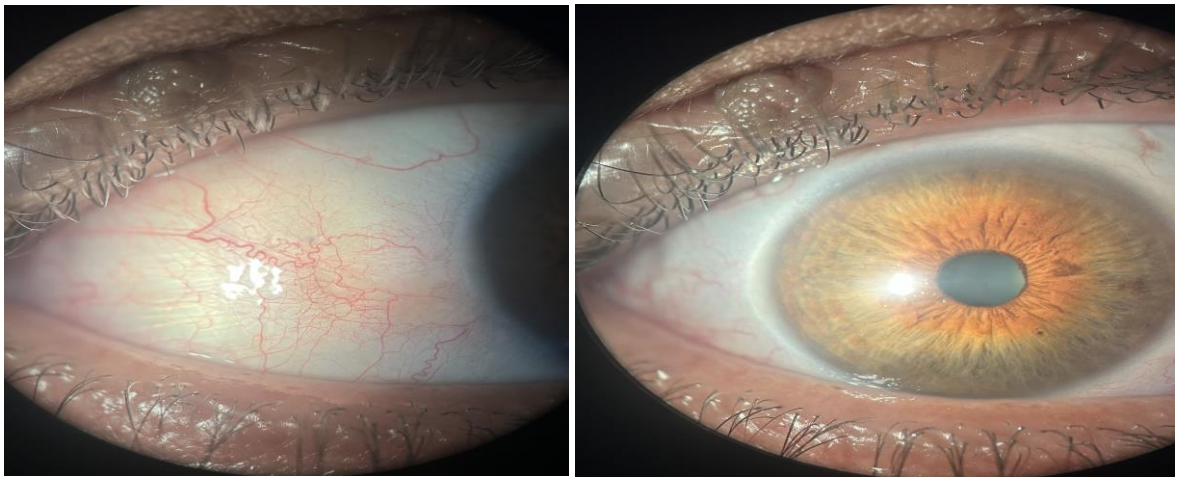

Figure 3: Clinical image from slit lamp after treatment, showing disappearance of ocular redness and complete recovery of the right eye

DISCUSSION

Scleritis is an inflammatory condition affecting the outer layer of the eye. It is typically classified as anterior or posterior, depending on which part of the sclera is involved. Anterior scleritis, the more common form, can present as diffuse, nodular, or necrotizing. The case described here involved diffuse anterior scleritis, characterized by widespread inflammation without localized nodules or tissue necrosis. Autoimmune scleritis accounts for the majority of cases. The preferred treatment in these instances is topical and/or systemic corticosteroids. Rarely, scleritis may have an infectious cause, occurring in 5% to 10% of cases. While there is a known association between scleritis and herpes viruses, no evidence has yet been found linking it to SARS-CoV-2 [6].

Rare cases of scleritis associated with COVID-19 have been reported in the literature, the first case published in the American Journal of Ophthalmology in March 2022 was a case of nodular scleritis being the presenting feature in a patient with COVID-19 infection. Another unusual feature of the case is that the patient had very mild systemic features with only ocular features which resolved with supportive treatment and did not require hospitalization [7].

Two cases have been reported of patients with confirmed COVID-19 who developed anterior scleritis after their systemic symptoms had improved [8]. In these instances, a comprehensive systemic evaluation did not reveal any underlying autoimmune diseases. One patient experienced necrotizing anterior scleritis and required treatment with intravenous cyclophosphamide, subcutaneous adalimumab, and oral prednisolone. The other patient had sectoral anterior scleritis and responded well to topical betamethasone and oral prednisolone [8].

Additionally, there have been reports of COVID-19 patients developing acute follicular conjunctivitis, conjunctival hyperemia, chemosis, epiphora, and increased ocular secretions [9, 10]. These

symptoms, however, have been observed more frequently in patients with severe pneumonia and during the middle phase of the illness [11]. In a study of 38 cases, only one patient was noted to have conjunctivitis as the initial manifestation of the disease [11]. There was also a report of a patient who presented with conjunctival congestion, which rapidly progressed to severe acute respiratory illness within a few hours [12].

This could be one of the rare reports of scleritis associated with an active SARS-CoV-2 infection. While the patient did exhibit fever and cough, the symptoms were mild enough to require home quarantine rather than hospitalization, contrasting with previous reports where ocular manifestations occurred in patients with severe respiratory distress often requiring intensive care unit admission [13].

Although previous studies postulated that Covid-19 ocular symptoms were generally low, reporting that only 9 out of 1099 patients across China were recorded to have conjunctival congestion [14]. More recent studies and meta-analyses have supported a higher incidence of ocular signs and symptoms with a prevalence ranging from 2 to 32% [14]. Common symptoms reported in patients comprised conjunctivitis, ocular pain, redness, swelling, and discharge. Follicular conjunctivitis was the first seen symptom as a result of eye involvement in the CoV manifestations [15]. In 2020, a systematic study of 2347 confirmed cases revealed that 11.64% of patients had ocular surface manifestations like pain, redness, and discharge, with pain being the most prevalent at 31.2% [15]. Another meta-analysis conducted by Nasiri et al., in 2021 published a pooled prevalence of all the possible ocular symptoms among 7300 Covid-19 patients as 11.03% [16]. In the meta-analysis, the most frequent ocular signs were conjunctivitis, dry eye or foreign body sensation, redness, tearing, and itching: 88.8%, 16%, 13.3%, 12.8%, and 12.6%, respectively [14, 16].

CONCLUSION

This case report highlights the potential for benign diffuse anterior scleritis to be associated with SARS-CoV-2 infection. Although scleritis is a rare ocular manifestation, this case underscores the need for clinicians to consider COVID-19 as a potential underlying cause in patients presenting with unexplained inflammatory eye conditions. The benign nature of the condition in this instance suggests that with proper management, including the use of anti-inflammatory treatments, patients can recover without severe complications. Further research is required to understand the mechanisms linking SARS-CoV-2 to ocular inflammation and to guide the development of targeted therapeutic strategies.

REFERENCES

1. Ziegler, C. G., Allon, S. J., Nyquist, S. K., Mbano, I. M., Miao, V. N., Tzouanas, C. N., ... & Zhang, K. (2020). SARS-CoV-2 receptor ACE2 is an interferon-stimulated gene in human airway epithelial cells and is detected in specific cell subsets across tissues. Cell, 181(5), 1016-1035.
2. Li, W., Moore, M. J., Vasilieva, N., Sui, J., Wong, S. K., Berne, M. A., ... & Farzan, M. (2003). Angiotensin-converting enzyme 2 is a functional receptor for the SARS coronavirus. Nature, 426(6965), 450-454.
3. Liu, Y. C., Kuo, R. L., & Shih, S. R. (2020). COVID-19: the first documented coronavirus pandemic in history. Biomed J, 43(4), 328–333.
4. Yesudhas, D., Srivastava, A., & Gromiha, M. M. (2021). COVID-19 outbreak: history, mechanism, transmission, structural studies and therapeutics. Infection, 49(2), 199–213.
5. Hamming, I., Timens, W., Bulthuis, M. L. C., Lely, A. T., Navis, G. V., & van Goor, H. (2004). Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus. A first step in understanding SARS pathogenesis. The Journal of Pathology: A Journal of the Pathological Society of Great Britain and Ireland, 203(2), 631-637.
6. Dockery, D. M., Rowe, S. G., Murphy, M. A., & Krzystolik, M. G. (2020). The ocular manifestations and transmission of COVID-19: recommendations for prevention. The Journal of emergency medicine, 59(1), 137-140.
7. Jain, V., Garg, P., & Sharma, S. (2009). Microbial scleritis—experience from a developing country. Eye, 23(2), 255-261.
8. Adenwala, A., Shetty, R., D'Souza, S., Mahendradas, P., & Kundu, G. (2022). Nodular scleritis-a rare presentation of COVID-19& variation with testing. American Journal of Ophthalmology Case Reports, 25, 101396.
9. Feizi, S., Meshksar, A., Naderi, A., & Esfandiari, H. (2021). Anterior scleritis manifesting after coronavirus disease 2019: a report of two cases. Cornea, 40(9), 1204-1206.
10. Chen, L., Liu, M., Zhang, Z., Qiao, K., Huang, T., Chen, M., ... & Wang, J. (2020). Ocular manifestations of a hospitalised patient with confirmed 2019 novel coronavirus disease. British Journal of Ophthalmology, 104(6), 748-751.
11. Shetty, R., D'Souza, S., & Lalgudi, V. G. (2020). What ophthalmologists should know about conjunctivitis in the COVID-19 pandemic?. Indian journal of ophthalmology, 68(5), 683-687.
12. Wu, P., Duan, F., Luo, C., Liu, Q., Qu, X., Liang, L., & Wu, K. (2020). Characteristics of ocular findings of patients with coronavirus disease 2019 (COVID-19) in Hubei Province, China. JAMA ophthalmology, 138(5), 575-578.
13. Daruich, A., Martin, D., & Bremond-Gignac, D. (2020). Ocular manifestation as first sign of coronavirus disease 2019 (COVID-19): interest of

telemedicine during the pandemic context. Journal francais d'ophtalmologie, 43(5), 389-391.

14. Hu, K., Patel, J., Swiston, C., & Patel, B. C. (2022). Ophthalmic manifestations of coronavirus (COVID-19). StatPearls Publishing.
15. Willcox, M. D., Walsh, K., Nichols, J. J., Morgan, P. B., & Jones, L. W. (2020). The ocular surface, coronaviruses and COVID-19. Clinical and Experimental Optometry, 103(4), 418-424.
16. Nasiri, N., Sharifi, H., Bazrafshan, A., Noori, A., Karamouzian, M., & Sharifi, A. (2021). Ocular manifestations of COVID-19: a systematic review and meta-analysis. Journal of ophthalmic & vision research, 16(1), 103-112.