Case Report

Bilateral Central Retinal Vein Occlusion and Stevens-Johnson Syndrome Associated with Coronavirus-19: A Case Report

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Abstract

Purpose: To report a case of bilateral central retinal vein occlusion (CRVO) associated with coronavirus-19 (COVID-19) infection.

Methods: A 43-year-old man presented to the emergency department with flu-like symptoms, severe erythema, a rash on his face, and respiratory distress. He was admitted to the intensive care unit, and the reverse transcriptase-polymerase chain reaction test was positive for the severe acute respiratory syndrome coronavirus-2 virus. The routine blood work was unremarkable. The dermatologist noted positive Nikolsky's sign, and the patient was diagnosed with Stevens–Johnson syndrome (SJS), which affected 18% of his body and was later confirmed by skin biopsy. Later, he reported worsening vision.

Results: Ophthalmic examination and fundus fluorescein angiography showed bilateral CRVO. Despite best medical efforts, including treatment with systemic dexamethasone and remdesivir, the patient died on the 6 days of his hospitalization.

Conclusion: This was a rare bilateral CRVO and SJS case in a young patient, probably caused by the COVID-19 infection.

Keywords: Bilateral central retinal vein occlusion, Coronavirus-19, Stevens–Johnson syndrome, Young adult

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Introduction

Central retinal vein occlusion (CRVO) is a condition in which the main vein of the retina is partly or completely blocked.[1] This condition can cause severe retinal damage, resulting in edema, which can worsen ischemia and affect vision.[2,3] Age, smoking, and vasculitis hypercoagulable states are known risk factors for CRVO.[2,3] Although CRVO is a common retinal vascular disease, it has a low prevalence in younger people.[4] In some cases, the central retinal vein in both eyes may become occluded, resulting in bilateral CRVO, a rare disorder that is combined with several chronic systemic diseases.[5-8] However, the prevalence of this condition in younger patients is not well-documented, and only a few published studies have been carried out on this topic.[5,9] We report a case of suspected coronavirus-19 (COVID-19) induced ischemic bilateral CRVO and Stevens–Johnson syndrome (SJS) in a 43-year-old male.

Case Report

A 43-year-old male presented to the emergency department with severe erythema and rash on his face, as well as anuria and respiratory distress. He had flu symptoms 1 week before his referral. His vital signs were as follows; body temperature was 38°C, blood pressure was 135/80 mmHg, pulse rate was 102 beats per minute, and respiratory rate was 31 beats per minute. He was admitted to the intensive care unit after receiving initial emergency treatment due to respiratory

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distress, with an oxygen saturation of 84% measured with a pulse oximeter. A reverse transcriptase-polymerase chain reaction (RT-PCR) was performed to detect the presence of COVID-19 infection. The PCR was positive for COVID-19, which explained all of his symptoms except the erythema and rash that began three to 4 days after his first flu-like symptoms. He also stated that 2 days before his admission, he had noticed nonpruritic facial lesions that had gradually worsened.

Physical examination revealed blisters in the fingers, mouth, and genital area. He had no significant medical history and was not using any medications or herbal remedies. The routine laboratory workup was unremarkable. He had a platelet count of 140,000 with otherwise normal complete blood count (CBC), normal serum electrolytes, partial thromboplastin time (PTT), prothrombin time (PT), and international normalized ratio (INR). No signs of lymphopenia and leukocytosis were seen. As a routine, we checked the erythrocyte sedimentation rate, C-reactive protein, and D-dimer levels, which were 87 mm/h, 80 mg/dL, and 2.14 μg/ml, respectively (normal ranges, 0–22 mm/h, 0.8–1 mg/dL, and under 0.5 μg/ml, respectively).

A peripheral blood smear was ordered, which showed no signs of schistocytes or hemolysis. Furthermore, a blood culture (BC) was ordered, which was negative; however, before the BC results, only intravenous azithromycin 500 mg per day was administered. No other antibiotics were given since we suspected that the patient had SJS. The patient's dermatologic lesions were treated with corticosteroid ointments. Vitamin A ointment was administered daily under the patient's eyelids to prevent scarring due to suspicion of SJS.

A dermatologist consultation was requested on the 2nd day of his admission. The consultation revealed a positive Nikolsky's sign, and the patient was diagnosed with SJS, which affected 18% of his body, based on the dermatologist's evaluation. A skin biopsy later confirmed the diagnosis. Figure 1 demonstrates the appearance of skin lesions. We administered intravenous dexamethasone 8 mg twice daily, remdesivir 200 mg infusion for 1 day, and remdesivir 100 mg infusion for 5 days. To treat SJS, intravenous immunoglobulin with a dosage of 1 gram per kilogram of body weight per day began. His visual acuity on both eyes had dramatically declined relative to baseline on the 2 days of his admission. He stated that the problem began abruptly, and he had no similar experiences in the past. In the ophthalmic examination, a diagnosis of CRVO was made and further confirmed on optical coherence tomography [OCT, Figure 2]. Additional laboratory workup for antiphospholipid antibodies (cardiolipin antibodies and β-2 glycoprotein 1 antibodies (immunoglobulin G, immunoglobulin M and immunoglobulin A), and lupus anticoagulant testing) serum fibrinogen and homocysteine levels, antinuclear antibodies (ANA), serum complement (C3 and C4) levels, and the recheck of PT, PTT, and INR were ordered. No abnormalities within antiphospholipid antibody levels and lupus anticoagulant were detected (all immunoglobulins were under 20 U/mg), fibrinogen levels were 290 mg/dL; homocysteine was 11.4 μmol/L, ANA was negative, and C3 and C4 levels were 183 and 49 mg/dL, respectively (both within the normal range).

However, an increase in his PT and PTT levels was detected (PT was 15.5 s and his PTT was 60). We planned to treat the patient's CRVO with intravitreal injections of bevacizumab combined with triamcinolone; however, despite treatment, the patient's condition began to deteriorate. CBC workups on the 5 days of admission revealed a decrease in platelets from 140,000 to 75,000, as well as an increase in creatinine values from 1 to 2.3 mg/dl. Urine analysis revealed hemoglobinuria, and a peripheral blood smear revealed less than 1% schistocytes. Thus, we began plasmapheresis due to suspicions of hemolytic uremic syndrome or thrombotic thrombocytopenic purpura (TTP). However, later lab results ruled out the possibility of TTP based on the normal levels of ADAMTS13 (short for A Disintegrin and Metalloproteinase with Thrombospondin Motifs) protein. Furthermore, a spiral chest computed tomography revealed a severe COVID-19 infection involving the majority of both

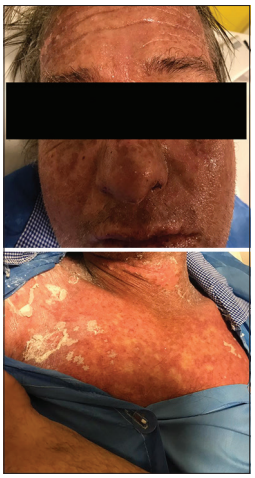

Figure 1: The face and neck images displaying sores within the lips alongside inflammation and peeling, blisters, and skin peeling

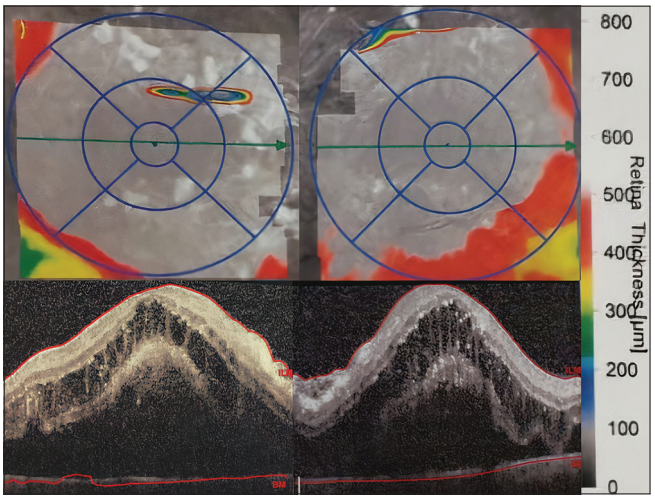

Figure 2: Optical coherence tomography images showing severe macular edema consistent with bilateral central retinal vein occlusion

lungs. Despite our best efforts, the patient died from COVID-19 cardiopulmonary failure on the 6 days of admission. This case report was approved by the Ethics Committee and Ethics in Research of Alborz University of Medical Sciences. Written consent was obtained from the patient on the 3 days of his admission and from his kin after his death to use his data for research and publication purposes.

Discussion

COVID-19 infection has been reported to be associated with several ocular diseases.[10] We believe that SJS and bilateral CRVO, in this case, are due to COVID infection, as other possible underlying causes were ruled out. The association between severe COVID-19 and SJS has been reported previously.[11] However, no previous study has identified bilateral CRVO in a patient with COVID-19. Patients with leukemia, multiple myeloma, and other inflammatory systemic disorders may experience CRVO, despite the fact that it is relatively rare, particularly in the younger population.[6,7,9] Other causes of CRVO include disseminated intravascular coagulation and TTP,[11-15] all of which can cause CRVO due to the hypercoagulable state resulting from their inflammation.[5,11-15] However, in this case, a viral infection produced a vast inflammatory response that probably predisposed the patient to a state of hypercoagulability, resulting in the aforementioned complications. A thorough follow-up ocular examination was not possible due to the patient's sudden deterioration. Although further evaluations and reports are needed to conclude the exact relationship of COVID-19 with the aforementioned conditions, the severe inflammatory responses arising due to COVID-19 infection and the fact that the infection can cause severe cytokine storm that can result in retinal vasculitis secondary to thromboinflammatory cascades should be considered.[16,17]

Declaration of patient consent

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

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Conflicts of interest

There are no conflicts of interest.

References

1. Williamson TH. Central retinal vein occlusion: What's the story? Br J Ophthalmol 1997;81:698-704.
2. Osborne NN, Casson RJ, Wood JP, Chidlow G, Graham M, Melena J. Retinal ischemia: Mechanisms of damage and potential therapeutic strategies. Prog Retin Eye Res 2004;23:91-147.
3. McAllister IL. Central retinal vein occlusion: A review. Clin Exp Ophthalmol 2012;40:48-58.
4. Fong AC, Schatz H. Central retinal vein occlusion in young adults. Surv Ophthalmol 1993;37:393-417.
5. Tomasini DN, Segu B. Systemic considerations in bilateral central retinal vein occlusion. Optometry 2007;78:402-8.
6. Al-Abdulla NA, Thompson JT, LaBorwit SE. Simultaneous bilateral central retinal vein occlusion associated with anticardiolipin antibodies in leukemia. Am J Ophthalmol 2001;132:266-8.
7. Aggio FB, Cariello AJ, Almeida MS, Rodrigues CA, De Moraes NS, Colleoni GW, *et al.* Bilateral central retinal vein occlusion associated with multiple myeloma. Ophthalmologica 2004;218:283-7.
8. Saari KM, Rudenberg HA, Laitinen O. Bilateral central retinal vein occlusion in a patient with scleroderma. Ophthalmologica 1981;182:7-12.
9. Balogh Z, Berta A, Pfliegler G, Nagy V. Bilateral central retinal vein occlusion caused by malignant hypertension in a young patient. Clin Exp Hypertens 2011;33:53-5.
10. Bertoli F, Veritti D, Danese C, Samassa F, Sarao V, Rassu N, *et al.* Ocular findings in COVID-19 patients: A review of direct manifestations and indirect effects on the eye. J Ophthalmol 2020;2020:4827304.
11. Lagziel T, Quiroga L, Ramos M, Hultman CS, Asif M. Two false negative test results in a symptomatic patient with a confirmed case of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) and suspected Stevens-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN). Cureus 2020;12:e8198.
12. Costa JR, Krause M, Friedman E, D'Amico DJ. Central retinal vein occlusion in a patient with thrombotic thrombocytopenic purpura. Am J Ophthalmol 2001;131:669-71.
13. Issa SA, Qasem Q. Central retinal vein occlusion associated with thrombotic thrombocytopenic purpura/hemolytic uremic syndrome: Complete resolution is possible. J Postgrad Med 2007;53:183-4.
14. Schwartz SG, McPherson AR, Mieler WF, Sessoms SL, Moake JL, Holz ER. Bilateral combined occlusion of the central retinal artery and vein secondary to thrombotic thrombocytopenic purpura. Arch Ophthalmol 2000;118:1304-5.
15. Jung KI, Yum HR, Kim IT. Bilateral central retinal vein occlusion in patient with disseminated intravascular coagulation. J Korean Ophthalmol Soc 2011;52:1005-8.
16. Sheth JU, Narayanan R, Goyal J, Goyal V. Retinal vein occlusion in COVID-19: A novel entity. Indian J Ophthalmol 2020;68:2291-3.
17. Hu B, Huang S, Yin L. The cytokine storm and COVID-19. J Med Virol 2021;93:250-6.