Sub-internal limiting membrane haemorrhage as a manifestation of transiently deranged coagulation profile following SARS-CoV-2 infection

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DESCRIPTION

We herein report a case of unilateral acute-onset transient self-resolving central visual loss following SARS-CoV-2 infection in a 41-year-old man attributed to the presence of sub-internal limiting membrane (ILM) haemorrhage. He tested positive for SARS-CoV-2 infection, confirmed with RT-PCR, was advised home isolation, and treated with antipyretics, multivitamin medications only. He developed a drop in vision in the right eye 4 weeks after testing positive for COVID-19. His presenting visual acuity was 20/60 for distance, N10 for near in right eye while left eye had normal vision (20/20, N6). Dilated fundus evaluation exhibited the presence of yellowish-white altered sub-ILM bleed at the fovea in the right eye. The left eye had the presence of cotton wool spots along the inferotemporal arcade along with segmental arteriolar attenuation (figure 1A,B). Optical coherence tomography (OCT) showed the presence of focal hyper-reflectivity in the inner retinal layers underneath ILM with back shadowing (figure 1C) features consistent with sub-ILM haemorrhage while left eye showed normal OCT scan with foveal contour well maintained (figure 1D). His fundus fluorescein angiography showed normal arm to retina and A-V transit time with mild blocked fluorescence in the right eye. While the left eye showed patchy early choroidal hypo fluorescence with late iso fluorescence indicating either choroidal hypoperfusion or ischaemia. We investigated and found that he had a normal haemogram, normal C reactive protein levels (0.6 mg/mL), normal D-dimer levels (<50 ng/mL), erythrocyte sedimentation rate of 20 mm/hour. However, he had a prolonged (>120 s) activated partial thromboplastin time (aPTT), prolonged prothrombin time (PT) of 29.0 s. He had gradual resolution of sub-ILM haemorrhage with improvement in visual acuity. His visual acuity at 3 months follow-up was 20/25 in the right eye with complete resolution of sub-ILM haemorrhage (figure 2). His aPTT (33.5 s) and PT (11.6 s) achieved normality at this visit.

A deranged coagulation profile is often seen in patients with COVID-19 along with/without elevation of D-dimer levels. D-dimer, commonly elevated in patients with COVID-19, is a fibrin-degradation product that is increased in thrombotic events, indicating fibrinolysis.4 Raised D-dimer values, lead to activation of coagulation cascade secondary to systemic inflammatory response syndrome, correlate to the disease severity and high mortality in such patients.5–7 On the contrary, in our patient D-dimer levels were normal post-COVID while PT and aPTT were raised. With time, the recovery and

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normalisation of aPTT and PT values suggest the self-resolving nature of COVID-19 systemic microangiopathy. Routine ocular fundus examination and ordering D-dimer assay and other coagulation profile tests like PT, aPTT test in patients with COVID-19 presenting with sub-ILM bleed is extremely crucial as prompt anticoagulation is mandated in some of these patients.2 8

Earlier, we had hypothesised the role of retinal capillary plexus ischaemia and its possible association with elevated D-dimer levels leading to retinal ischaemic changes.19 The direct effect of viral infection, hypercoagulation and vasculopathy are proposed to be the factors leading to various retinal changes.1 11 The reason for the development of cotton wool spots in COVID-19 cases, as also seen in the left eye of our case, has been unclear with a unique pattern of self-resolution, localised lesions and occult nature.1 12 We hypothesise that COVID-19 systemic microangiopathy manifesting as transiently deranged coagulation profile could be the cause of transient vision loss with sub-ILM haemorrhage in our case. Further studies to impli-
cate the role of deranged coagulation profile in COVID-19 cases are needed before meaningful conclusions are made.

Patient’s perspective

I am thankful to my ophthalmologist for the early diagnosis of my ocular condition. He reassured and apprised me regarding the nature of the haemorrhage in my right eye. The ophthalmologist kept me under watchful observation for 3 months during which my vision improved to near normal.

Learning points

► Sub-internal limiting membrane (ILM) haemorrhages and cotton wool spots can occur following recovery after SARS-CoV-2 infection.

► COVID-19 microangiopathy leading to transiently deranged coagulation profile can be a self-limiting disease.

► Sub-ILM haemorrhage after SARS-CoV-2 infection can lead to transient visual loss with possibilities of self-resolution following recovery in a deranged coagulation profile.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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REFERENCES

1. Meyer CH, Mennel S, Rodrigues EB, et al. Is the location of Valsalva hemorrhages submembranous or subhyaloidal? Am J Ophthalmol 2006;141:231–2.

2. McCarron MO, Alberts MJ, McCarron PA. Systematic review of Terson’s syndrome: frequency and prognosis after subarachnoid haemorrhage. J Neurol Neurosurg Psychiatry 2004;75:491–3.

3. Foos RY. Vitreoretinal junction: topographical variations. Invest Ophthalmol 1972;11:801–8.

4. Demel- Rodriguez P, Cervilla-Muñoz E, Ordieres- Ortega L, et al. Incidence of asymptomatic deep vein thrombosis in patients with COVID-19 pneumonia and elevated D-dimer levels. Thromb Res 2020;192:23–6.

5. Giannis D, Zogas IA, Gianni P. Coagulation disorders in coronavirus infected patients: COVID-19, SARS-CoV-1, MERS-CoV and lessons from the past. J Clin Virol 2020;127:104362.

6. Porfida A, Pola R. Venous thromboembolism in COVID-19 patients. J Thromb Haemost 2020;18:1516–7.

7. Léonard-Lorant I, Delabranche X, Séverac F, et al. Acute pulmonary embolism in patients with COVID-19 at CT angiography and relationship to D-dimer levels. Radiology 2020;296:E189–91.

8. Elijiany L, Elzouki A-N, D-Dimer, fibrinogen, and IL-6 in COVID-19 patients with suspected venous thromboembolism: a narrative review. Vasc Health Risk Manag 2020;16:455–62.

9. Lani-Louzada R, Ramos CdeV, Cordeiro RM, et al. Retinal changes in COVID-19 hospitalized cases. PLoS One 2020;15:e0243346.

10. Padhy SK, Drucz RP, Kelgaonkar A. Paracentral acute middle maculopathy following SARS-CoV-2 infection: the dimer hypothesis. BMJ Case Rep 2021;14:e2024043.

11. Teo KY, Invernizzi A, Stauengueth G. COVID-19 related retinal micro-vasculopathy - a review of current evidence: COVID-19 related retinal micro-vasculopathy. Am J Ophthalmol 2021;S0002-9394(21)00476-1.

12. Markan A, Bansal R, Gautam N, et al. Longitudinal analysis of cotton wool spots in COVID-19 with high-resolution spectral domain optical coherence tomography and optical coherence tomography angiography. Clin Exp Ophthalmol 2021;49:392–5.