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LETTER TO THE EDITOR

Central retinal vein occlusion occurring immediately after 2nd dose of mRNA SARS-CoV-2 vaccine

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Dear Editor,

Central retinal vein occlusion (CRVO) and other thromboembolic events have been extensively documented after infections with SARS-Cov2 [1, 2]. We observed a 50-year-old healthy nonobese and non-smoking patient with CRVO occurring immediately after the 2nd vaccination with an mRNA-based vaccine.

Immediately after the second COVID19 vaccination (BioNTech/Pfizer lot number EP6017 expiry 30/06/2021) on 20/03/2021, during the 15 min mandatory surveillance with monitoring of vital signs the patient experienced retrobulbar pain, red eye and vision reduction on his left eye. He was referred and e-consulted externally and prescribed moxifloxacin eye drops. At presentation on 11/04/2021, BSCVA was OU 1.0/0.5 due to a hemorrhagic CRVO with ischemic areas (Fig. 1a). The fellow eye was unremarkable. The OCT showed a cystoid macular edema (central retinal thickness (CRT) 515my) (Fig. 1b), mild papilledema (prominence 809my), the Zeiss-Humphrey VF30-2 an inferonasal coecoceal visual field defect (MD − 5.43 dB) and the fluorescein angiography vascular staining and mild macular leakage. The patient was PCR negative for SARS-Cov2 and healthy except for atopic dermatitis on topical treatment. No history of myocardial infarction and stroke was known, blood pressure was 121/76 mmHg (11/04/2021) and the HbA1c 5.1% (11/04/2021). The thrombophilia panel and CBC including platelet count were unremarkable, and d-Dimer was not elevated (0.3 mg/l). Antithrombotic treatment of 100 mg/d low-dose acetylsalicylic acid was accompanied by monthly and ongoing aflibercept injections starting on 12/04/2021, which resulted in a fast decrease of the macular edema with recovery of vision to BSCVA 1.0/1.0 already after 3 days (CRT 319my) (Fig. 2a,b). Anticoagulants (e.g., factor Xa inhibitor) used in COVID19-associated deep vein thrombosis were not administered.

A wide range of thromboembolic events after COVD19 vaccinations with adenovirus vector-based vaccines has been reported and has been associated with systemic inflammation, platelet and endothelial dysfunction [3, 4], however, ophthalmic adverse events seem to be rare [5]. The CRVO immediately following the 2nd vaccination with an mRNA-based vaccine in an otherwise healthy patient suggests that thromboembolic events may not only occur in vector-based but also in mRNA-based vaccines. The pathophysiology and the role of atopy in this case are currently unknown, and causality may be revealed in future studies.

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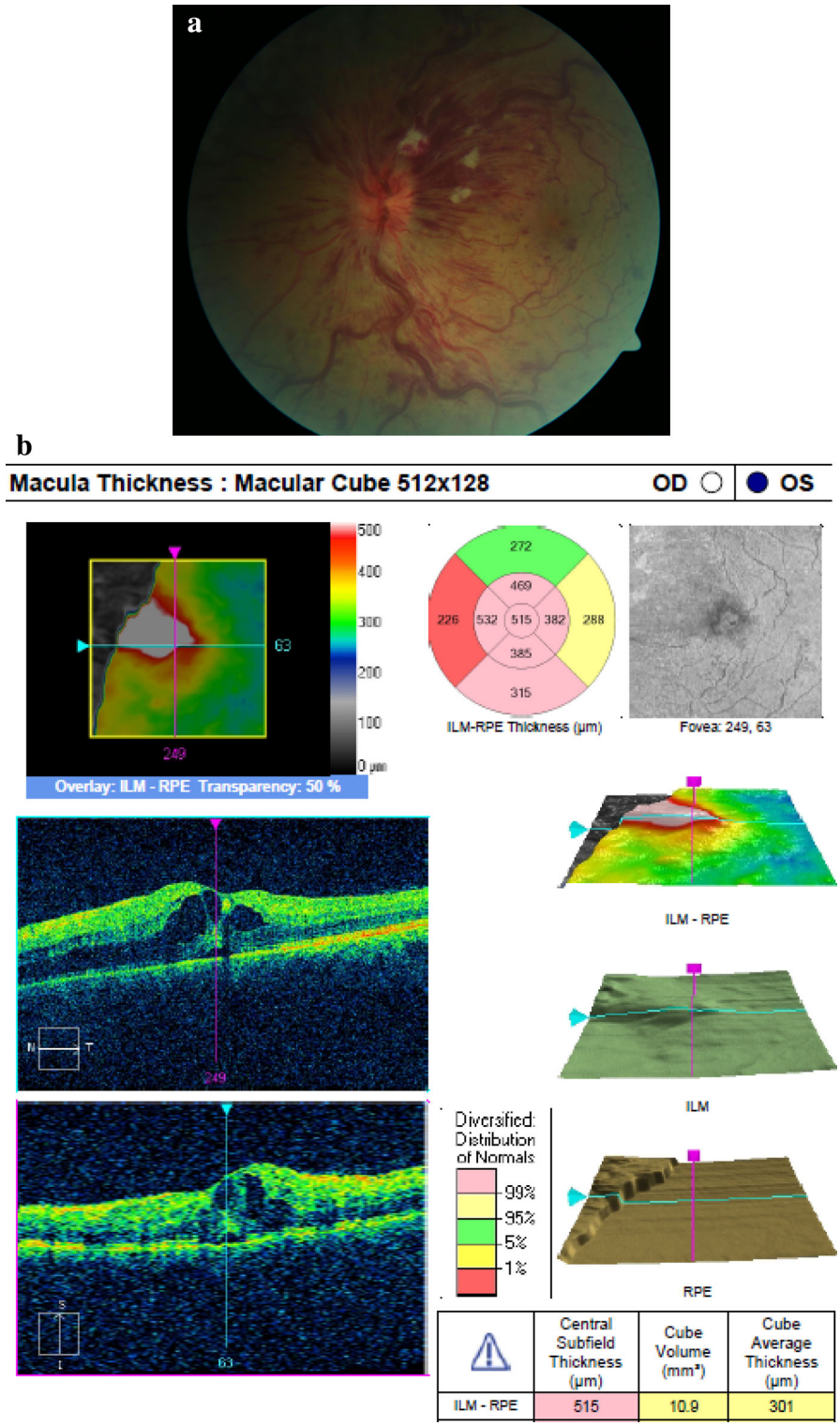

Fig. 1 **a** 50-year-old healthy man presenting on 11/04/2021 with sudden vision reduction on his left eye 15 min after the 2nd COVID19 mRNA-based vaccination, BSCVA 0.5 and a hemorrhagic CRVO and mild papilledema. An inferior nasal coecocecal defect was noted in the VF 30–2 (not shown). **b** The OCT macula of the left eye of the patient in Fig. 1a on 11/04/2021 showed pronounced intraretinal cysts (CRT 515my), and subretinal fluid coming from a mid-peripheral superior leakage area. He was started on monthly intraocular aflibercept injections on 12/04/2014

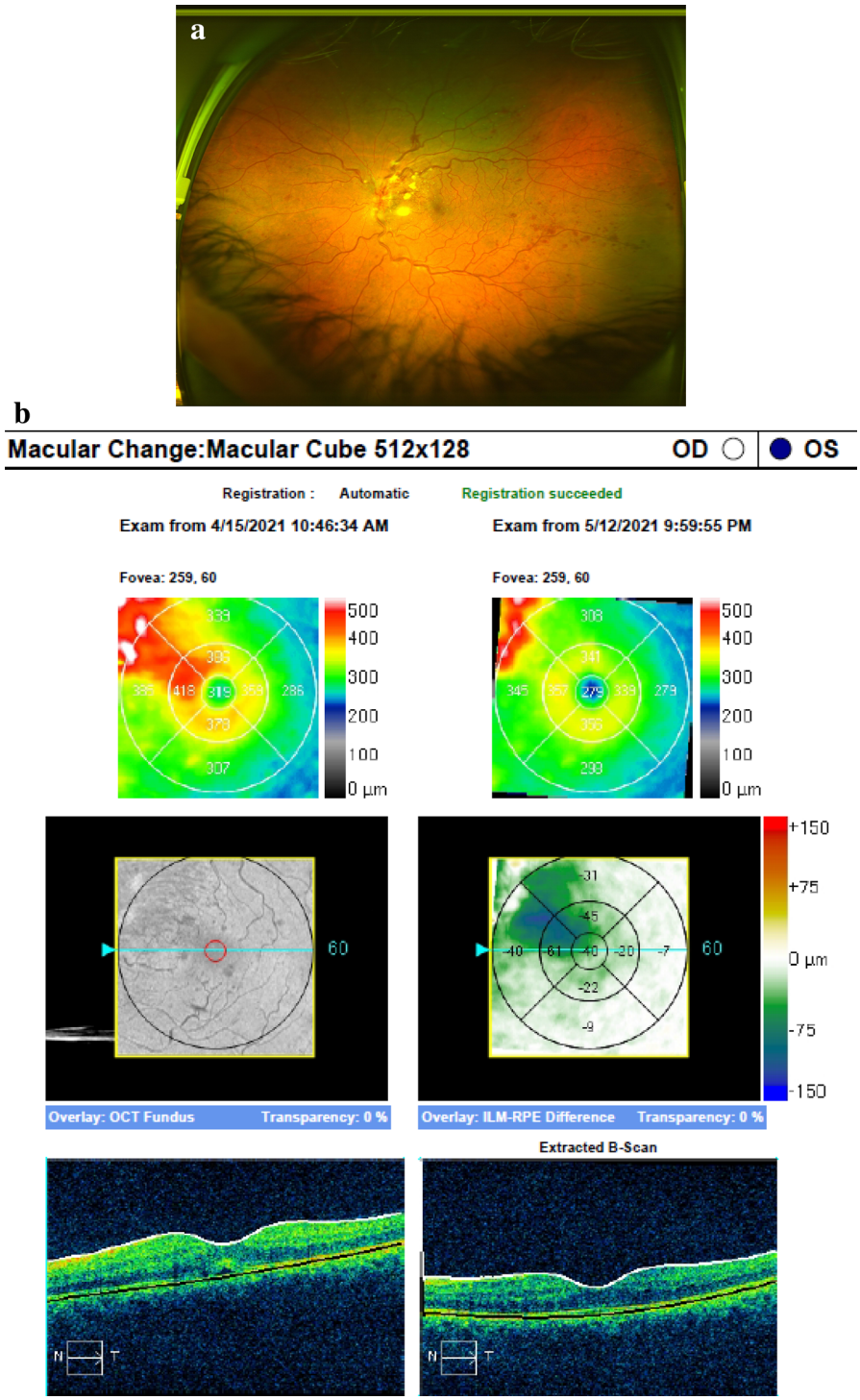

Fig. 2 **a** The patient from figs. 1a,b presented on 15/04/2021 and on 12/05/2021 after the first aflibercept injection with significant improvement of hemorrhages and cotton wool spots and a BSCVA of 1.0. Monthly aflibercept injections are planned over 12 months to stabilize the retinal condition. **b** The OCT macula of the left eye of the patient in Fig. 2a shows an early significant reduction of the macular edema on 15/04/2021 (CRT319my) and a resolution of the cystoid macular edema after 1 month (CRT 276my)

In summary, CRVO as a manifestation of noninflammatory occlusive retinal vasculopathy may have to be added to the spectrum of ophthalmic complications after mRNA-based COVID19 vaccinations. Further observations are warranted, and e-consultations of symptomatic patients after vaccinations are discouraged.

Declaration

Conflict of interest

The authors declare that they have no conflict of interest.

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References

1. Sen M, Honavar SG, Sharma N et al (2021) COVID-19 and Eye: a review of ophthalmic manifestations of COVID-19. Indian J Ophthalmol 69(3):488–509
2. Avila J, Long B, Holladay D, Gottlieb M (2021) Thrombotic complications of COVID-19. Am J Emerg Med 39:213–218
3. Neri P, Picchi F (2020) COVID-19 and the eye immunity: lesson learned from the past and possible new therapeutic insights. Int Ophthalmology 40(5):1057–1060
4. Carli G, Nichele I, Ruggeri M, Barra S, Tosetto A (2021) Deep vein thrombosis (DVT) occurring shortly after the second dose of mRNA SARS-CoV-2 vaccine. Intern Emerg Med 9:1–2
5. Case Series Drug Analysis Print Name: COVID-19 vaccine AstraZeneca analysis.print.https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/978315/050421_AZ_DAP.pdf posted 12/04/2021, retrieved 15/04/2021