The coexistence of PAMM with Impending CRVO to a post-Covid-19 patient

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Case Presentation

Clinical Presentation

A 84-year-old Caucasian male, with a 2-week-history of "yellow foggy veil'' in right eye (OD) (**Sep2022**). No associated pain, flashes, floaters or diplopia. Left eye (OS) low visual acuity possibly due to "a maculopathy".

Past Ocular History: Phacoemulsification OU 10 years ago

Past Medical History: Hypertension, **COVID-19 (Aug2022)**

Medications: Amlodipine, furosemide, ipratropium inhaler, beclometasone-formoterol inhaler, SARS-CoV-2 vaccinations (x4)

Ocular Examination

Best Corrected Visual Acuity: OD 0.7/ OS CF @1m

Pupils: Equal, round reactive to light, no rAPD

Intraocular Pressure: OD: 10 mm Hg / OS: 15 mmHg (by Goldmann Applanation Tonometry)

Slit lamp examination: Lids/Lashes - Sclera/Conjuctiva: normal OU, Cornea: Superficial punctate keratopathy OU, Anterior Chamber: deep and quiet OU, Iris: normal OU, Lens: PC-IOL OU

Dilated fundus examination: Disc: normal, well perfused OU, Vessels: mild tortuosity OD, Macula: Preretinal hemes OD/ atrophy OS, **Periphery**: Preretinal hemes OD

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Additional Testing

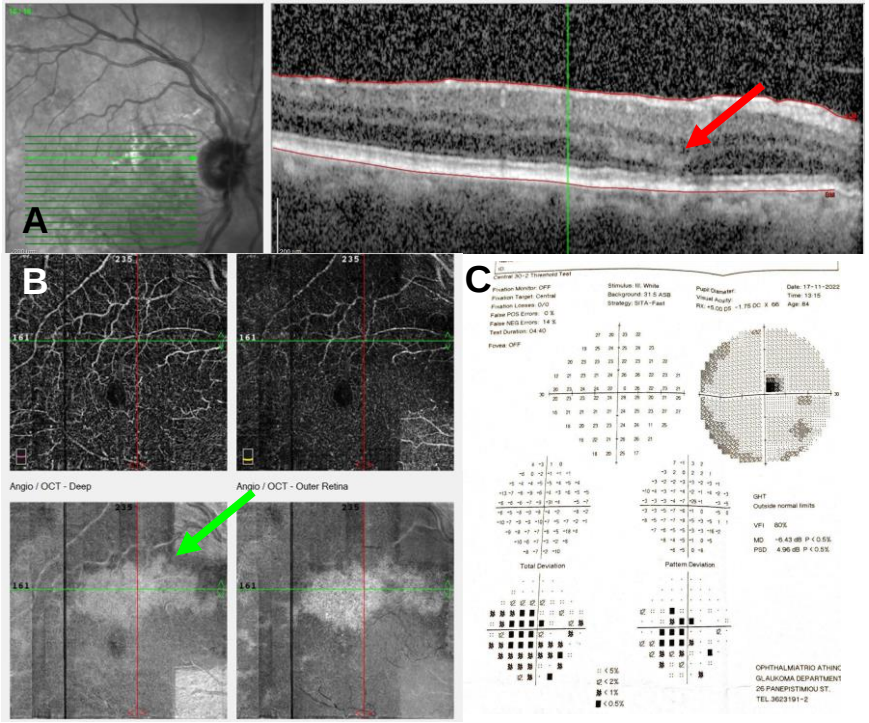

Figure 1. **(A)** Cross-sectional Spectral-domain optical coherence tomography (SD-OCT) illustrates a diffuse band-like hyper-reflective lesion (red arrow) at the level of the inner nuclear layer (INL). **(B)** En face SD-OCT illustrates a **fern-like pattern**(green arrow). **(C)** 30-2 Humphrey visual field testing of the right eye shows a central scotoma and an **inferonasal arcuate** scotoma.

Systemic work-up:

CRP, ESR: normal, ECG-Holter: normal sinus rhythm, Carotid U/S: internal carotid arteries stenosis 40-60% bilaterally.

Clinical Course

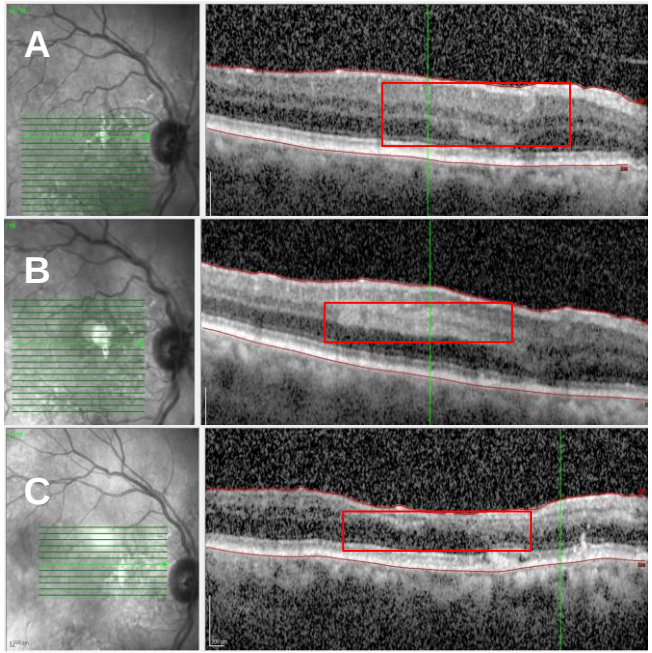

Figure 2. SD-OCT demonstrating the progression of the acute PAMM lesion with INL hyperreflectivity (**A**: September 2022 and **B**: October 2022) to chronic PAMM lesion with INL thinning (**C**: January 2023), over a period of four months.

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Discussion

Paracentral Acute Middle Maculopathy (PAMM) is a **descriptive SD-OCT finding of high clinical significance as it represents an underlying process of intraretinal ischemia**, primarily in the intermediate and deep retinal capillary plexuses. Patients typically present with an **acute central or paracentral scotoma** often associated with decreased visual acuity.[1]

PAMM usually affects older male patients (average age >50) who have **vasculopathic risk factors**. There is a spectrum of etiologies and diseases (systemic and ocular) which have been associated with PAMM, with retinal vascular obstruction being the most common. [2]

Dilated funduscopic examination may be normal or may reveal grayish parafoveal areas. The preferred imaging modalities are SD-OCT and OCT angiography (OCT-A). A **hyper-reflective band-like lesion at the level of the INL in the paracentral region with progressive INL thinning and, deep capillary plexus flow attenuation** are characteristic of the condition on SD-OCT and OCT-A, respectively.[3]

An **ischemic cascade** is characteristic of PAMM and since it may herald an underlying condition, a systemic work up is warranted in order to identify the inciting factor.[4-5]

Our patient had a known hypertension history which was well controlled for years. Due to the **OCT findings characteristic of PAMM** and the vessel tortuosity from the DFE, suspicious of an **impending central RVO,** a more detailed history was obtained. The patient recalled a prior infection with SARS-CoV-2 and an associated pneumonia **four weeks before the scotoma** onset. A systemic work-up (ECG-holter, carotid U/S, ESR, CRP, FBC) was obtained where internal carotid stenosis was found.

Thrombosis is a known hallmark of COVID-19. With the retina being a highly vascularized tissue, its susceptibility to thromboembolic complications is evident and **cases of post Covid-19 retinal vein occlusion (RVO), retinal artery occlusion (RAO)** and PAMM have been described in the literature.

Although we cannot extrapolate a causal relationship between these two events, suspicion was raised on whether COVID-19 **could have triggered a thromboembolic event an eventually PAMM** in our patient with the already known vasculopathic risk factors.[6]

Despite the already described cases in the literature, further research is needed in order to highlight causation between COVID-19 and PAMM.

References

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