

CASE REPORT

Paracentral acute middle maculopathy and COVID-19 vaccination: Causation versus coincidence finding

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Abstract

The current report is a rare case of paracentral acute middle maculopathy (PAMM) in a previously healthy man following COVID-19 vaccination.

KEYWORDS

paracentral acute middle maculopathy, COVID-19, sinopharm, vaccination

1 | INTRODUCTION

Paracentral acute middle maculopathy (PAMM) is an optical coherence tomography (OCT) finding characterized by the parafoveal hyper-reflective band at the level of the inner nuclear layer (INL).¹ Initially, PAMM was considered a variant of acute macular neuroretinopathy (AMN) in which the lesions are in the INL or outer retinal layers. Currently, PAMM is classified as a different entity.^{2,3} Although the exact etiopathogenesis of PAMM is not understood completely, ischemia of retinal intermediate and deep capillary plexus has been shown to have a significant role.¹

There are few reports of ocular adverse effects following COVID-19 vaccination including acute uveitis,⁴⁻⁷ acute onset central serous chorioretinopathy,⁸ and AMN.^{9,10}

Currently, the exact mechanisms of these adverse effects are unclear. Herein, we report a rare case of PAMM in a previously healthy man following COVID-19

vaccination. It is critical for physicians to understand and recognize these signs and symptoms for an accurate diagnosis to ensure work-up.

2 | CASE PRESENTATION

A 38-year-old man was presented to the ophthalmology emergency room with the complaint of sudden onset of visual loss in his right eye that lasted for about an hour in 24 hours ago that gradually was resolved. On the day of examination, he complained of tiny dark spots in his visual field and flashing lights in the right eye.

He did not have past medical or ocular history. He did not take any medications, and he was otherwise healthy. He was no smoker and had no history of SARS-CoV2 infection.

He had been vaccinated against COVID-19 by inactivated virus vaccine (Sinopharm BIBP COVID-19 vaccine),

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two weeks before the onset of visual symptoms. On ocular examination, visual acuity was 20/20 in both eyes. There were equally round and reactive pupils and negative RAPD. Slit-lamp biomicroscopy of the anterior and posterior segment of both eyes was not noticeable (Figure 1). The intraocular pressure of both eyes was within the normal range. Humphrey visual field 10-2 revealed paracentral scotomas in the right eye (Figure 2).

Spectral-domain OCT demonstrated parafoveal hyper-reflective band involving outer plexiform layer (OPL), INL, and inner plexiform layer (IPL) of the right eye (Figure 3). These features were consistent with PAMM. OCT angiography shows abnormal vasculature at the level of deep capillary plexus at the site corresponding to the

lesion on SD-OCT. A fern-like capillary pattern lesion was present in retinal deep layers of the right eye which was absent in the fellow eye (Figure 4). Systemic evaluation for hypercoagulable state and neurological examinations was not noticeable. Doppler ultrasound of carotid arteries was normal. Close follow-up was planned for the patient.

3 | DISCUSSION

In this report, our patient was a 38-year-old previously healthy man with sudden-onset visual symptoms and OCT findings consistent with PAMM probably associated with receiving Sinopharm BIBP COVID-19 vaccine.



FIGURE 1 Paracentral acute middle maculopathy following COVID-19 vaccination. The montage color fundus photograph shows mildly increased tortuosity of the supratemporal vascular arcade

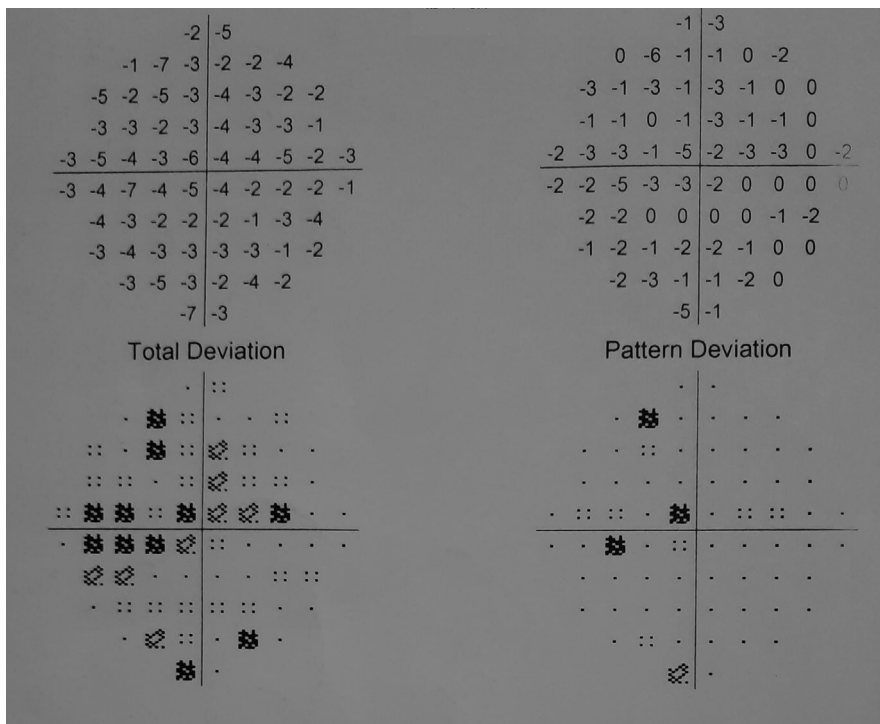


FIGURE 2 Paracentral acute middle maculopathy following COVID-19 vaccination. Humphrey visual field 10-2 shows paracentral scotomas in the right eye

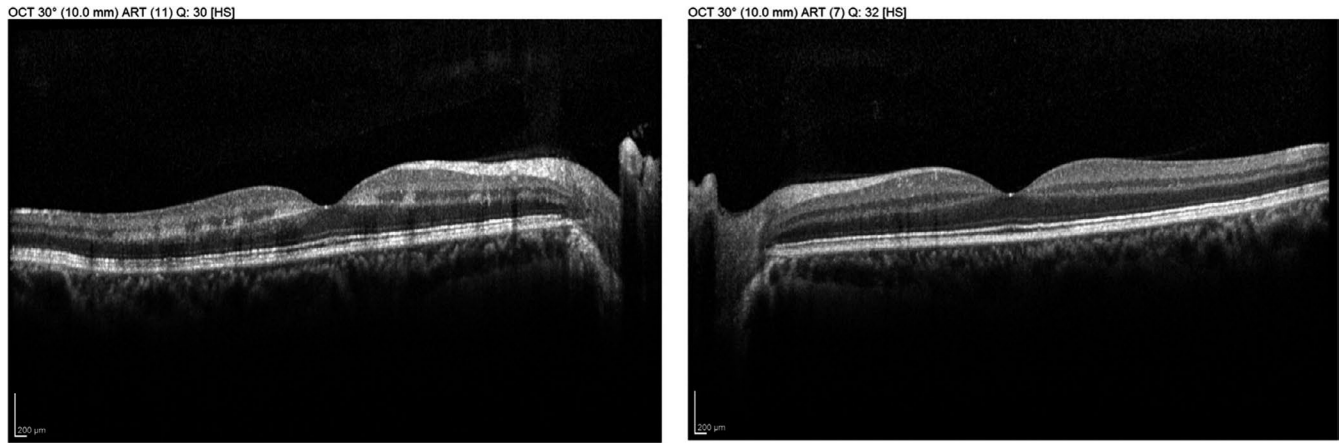


FIGURE 3 Paracentral acute middle maculopathy following COVID-19 vaccination. Spectral-domain optical coherence tomography shows parafoveal hyper-reflectivity in the inner nuclear layer associated with PAMM

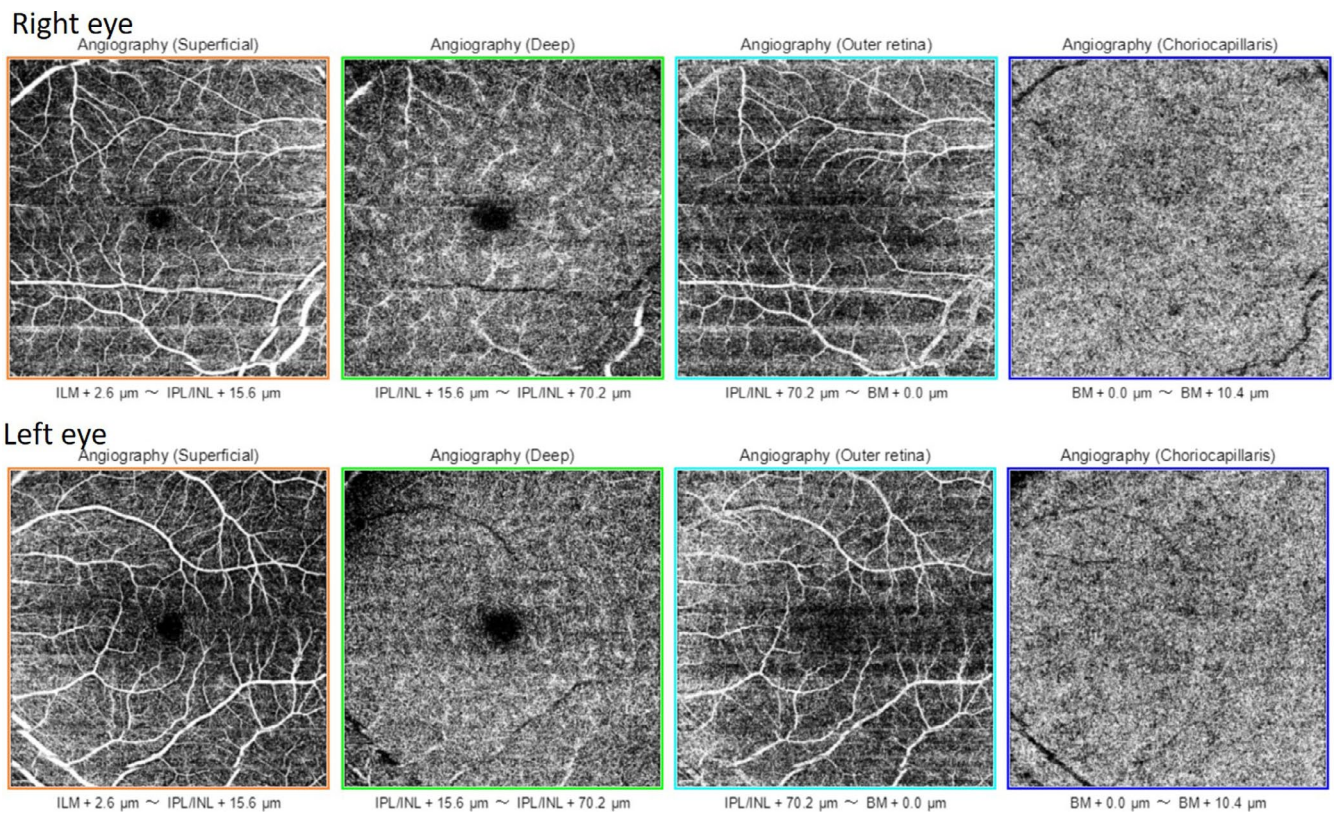


FIGURE 4 Paracentral acute middle maculopathy following COVID-19 vaccination. Optical coherence tomography angiography shows perivascular hyper-reflective and hyper-reflective spots in the retinal deep capillary layer

Although there are several reports of PAMM and AMN in patients with COVID-19,^{11–15} there are few reports of PAMM about COVID-19 vaccination.^{9,16} Pichi et al.⁹ reported a case of AMN, five days after vaccination by inactivated COVID-19 vaccine, Sinopharm BIBP COVID-19 vaccine. They also reported a case of PAMM in a patient being vaccinated in Abu Dhabi.⁹

In another report, Vinzamuri et al.¹⁶ reported a case of PAMM in a 35-year-old man, one month after receiving the

second dose of recombinant "Covishield" vaccine (Astra Zeneca-Vaxzevria, Serum Institute India SII Covishield, and SK Bioscience) in India.

The relationship between COVID-19 vaccination and retinal microvascular pathologies is not clear. There is not enough evidence to support the increased risk of PAMM or AMN in patients after COVID-19 vaccination. It is unclear whether PAMM is an adverse effect of vaccination of COVID-19 or a coincident finding. The aim of the current

report is awareness of physicians about this condition as a potential adverse event related to COVID-19 vaccination. Further investigations are needed to establish or reject this possible relationship.

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CONFLICT OF INTEREST

There are no conflicts of interest reported by the authors. The authors are solely responsible for the article's content and writing.

AUTHOR CONTRIBUTIONS

Alireza Dehghani and Heshmatollah Ghanbari were involved in the patient management and performed investigation. Mohammad-hossein Houshang-Jahromi wrote the initial draft and reviewed the literature. Mohsen Pourazizi revised the manuscript and approved the final version. All authors have contributed to the preparation of this manuscript and have reviewed it prior to submission.

ETHICAL APPROVAL

Ethics approval for this report was obtained from the Ethics Committee of Isfahan University of Medical Sciences, Isfahan, Iran.


CONSENT

The patient was provided with written informed consent to participate in the study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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