

Multiple evanescent white dot syndrome relapse following BNT162b2 mRNA COVID-19 vaccination

Lucas Sejournet¹, Laurent Kodjikian^{1,2}, Amina Rezkallah¹, Philippe Denis¹, Thibaud Mathis^{1,2}, Olivier Loria¹

¹Department of Ophthalmology, Hôpital de la Croix-Rousse, Hospices Civils de Lyon, Lyon F-69004, France

²Laboratoire UMR-CNR 5510 Matéis, Université Lyon 1, Villeurbanne 69100, France

Correspondence to: Lucas Sejournet. Department of Ophthalmology, Hôpital de la Croix-Rousse, 103 grande rue de la Croix-Rousse, Lyon F-69004, France. lucas.sejournet@chu-lyon.fr

Received: 2023-05-31 Accepted: 2023-08-10

DOI:10.18240/ijo.2023.10.25

Citation: Sejournet L, Kodjikian L, Rezkallah A, Denis P, Mathis T, Loria O. Multiple evanescent white dot syndrome relapse following BNT162b2 mRNA COVID-19 vaccination. *Int J Ophthalmol* 2023;16(10):1724-1726

Dear Editor,

We report a case of multiple evanescent white dot syndrome (MEWDS) relapse following mRNA corona virus disease 2019 (COVID-19) vaccination.

MEWDS is a choroidal inflammatory disease belonging to the group of “white dot syndromes” group, with an excellent prognosis^[1]. MEWDS is usually idiopathic, but there have been reports of MEWDS following viral infection or vaccination^[1-2]. COVID-19 vaccines can cause a variety of transient local and systemic reactions such as pain, fatigue, headache, or chills^[3]. Several ocular complications have also been reported after mRNA vaccines, including thrombosis, central serous retinopathy, Vogt-Koyanagi-Harada or choroiditis^[4].

Influenza vaccines have previously been associated with MEWDS^[2], and several cases of MEWDS following mRNA Pfizer vaccine have been reported^[5-8], including recurrence of MEWDS following Moderna COVID-19 vaccine^[9]. However, there are no reports of MEWDS relapse occurring after a Pfizer mRNA COVID-19 vaccine. Herein, we describe such a case.

A 25-year-old Caucasian woman presented with a ten-day history of visual loss and photopsia in the right eye (OD). She had no symptoms in the left eye (OS). She had received a

second dose of mRNA COVID-19 vaccine two months prior. Fever and flu-like symptoms (headache, myalgias and chills) were present the days following vaccination. She had no visual symptoms the days following vaccination and the first dose was not associated with any symptoms. She did not have history of prior COVID-19 symptoms.

Her past medical history was significant for MEWDS episode two years prior. At that time, she had a visual loss from 1.0 to 0.8 OD. Fundus examination showed multifocal white dots and papillitis, and fundus autofluorescence and angiography were typical of MEWDS. No abnormality was seen in OS. Biological and systemic investigations for syphilis, tuberculosis, human immunodeficiency virus, herpes virus and sarcoidosis were negative. C-reactive protein and antinuclear antibodies were also negative. One month later, full recovery was observed with visual acuity of 1.0 OD and resolution of optic disc edema on optical coherence tomography (OCT).

At the present initial examination, the best corrected visual acuity (BVCA) was 0.9 OD and 1.0 OS. Intraocular pressure was 10 mm Hg OD and 13 mm Hg OS. Slit lamp examination showed normal anterior segments, with no cells or flare in anterior chamber. Fundus examination of OD showed multifocal white dots in the posterior pole retina and optic disc oedema without any vitritis or snowballs. OCT of OD showed multiple disruptions of the ellipsoid zone with occasional hyperreflective foci in the outer retina. Autofluorescence showed multiple hyperautofluorescent spots around the optic disc and the posterior pole (Figure 1). Fluorescein and indocyanine green angiography were not repeated. Biological tests were not repeated, as they didn't show any abnormality initially. Examination of the left eye was normal.

Symptoms improved spontaneously after 1mo with BCVA increasing to 1.0 and complete resolution of the anatomical lesions was observed 3mo later (Figure 2).

Uveitis and other ocular adverse events have been described following mRNA COVID-19 vaccination^[5]. Herein, we describe a case of MEWDS relapse two months after administration of COVID-19 vaccination. Fundus appearance, autofluorescence, OCT lesions, and spontaneous resolution were all consistent with MEWDS. MEWDS usually follows

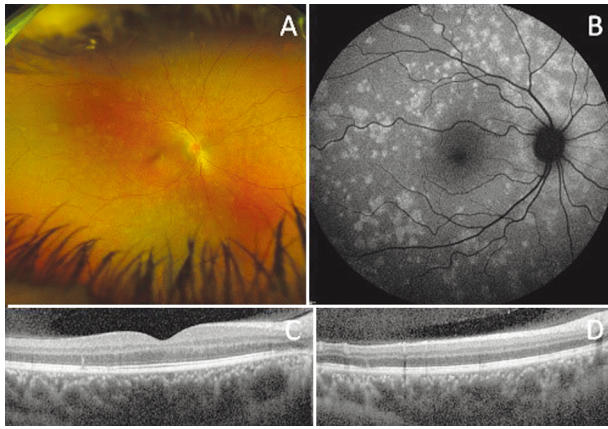


Figure 1 Fundus photo (A), fundus autofluorescence (B) and optical coherence tomography (C, D) at the initial visit Numerous hyperautofluorescent small ill-defined deep grey-white patches sparing the fovea, with inner-segment/outer-segment junction disruption.

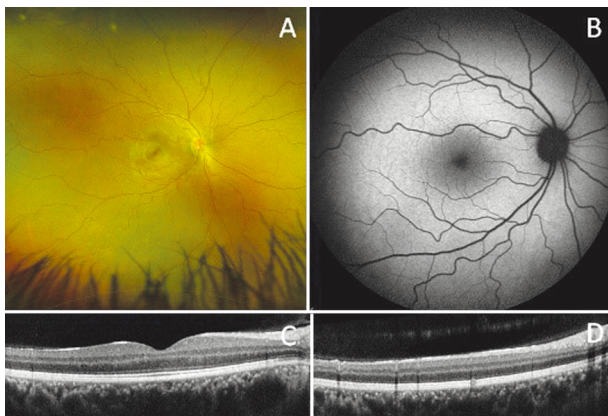


Figure 2 Fundus photo (A), fundus autofluorescence (B) and optical coherence tomography (C, D) at 3mo Disappearance of the numerous spots at autofluorescence and fundus examination.

an infection with flu-like symptoms^[10], which was not the case for this patient, but she received mRNA COVID-19 vaccine and had fever and flu-like symptoms before the onset of ocular symptoms.

To date there are a few MEWDS-like cases reported to occur after mRNA COVID-19 vaccination^[5-7], including recurrence of MEWDS following Moderna COVID-19 vaccination^[9], but no reports of relapse in patients after BNT162b2 mRNA vaccination. In addition, the time to onset of symptoms was usually between a few days and one month after vaccination, but in this case symptoms began almost two months after the second dose of vaccine. In previous reports, most patients developed ocular complications after the second dose of vaccine, as was the case here. To our knowledge, this is the first case to report late-onset relapse of MEWDS-like presentation following mRNA COVID-19 vaccination.

The mechanisms underlying vaccine-associated autoimmune manifestations remain unclear and the pathogenesis remains to be elucidated. One possible mechanism is the similarity

between vaccine adjuvants and uveal self-antigens^[11-12]. Adjuvant-induced autoimmune disease is more common in patients with family or personal history of autoimmune disease^[13], as it was the case for this patient.

Although previous studies have reported MEWDS following COVID-19 vaccination, a definitive association is difficult to establish and ocular inflammation following vaccination could be coincidental. In our case, the recurrence of MEWDS may have occurred independently of COVID-19 vaccination and the association observed here may have been merely coincidental. Further studies with large numbers of patients are needed to prove the association between COVID-19 vaccine and the occurrence of ocular inflammation.

MEWDS relapses may be triggered by mRNA COVID-19 vaccination. Physicians and patients should consider MEWDS among the autoimmune manifestations induced by COVID-19 vaccine.

ACKNOWLEDGEMENTS

Conflicts of Interest: Sejournet L, None; Kodjikian L, None; Rezkallah A, None; Denis P, None; Mathis T, None; Loria O, None.

REFERENCES

- 1 Abu-Yaghi NE, Hartono SP, Hodge DO, Pulido JS, Bakri SJ. White dot syndromes: a 20-year study of incidence, clinical features, and outcomes. *Ocul Immunol Inflamm* 2011;19(6):426-430.
- 2 Ng CC, Jumper JM, Cunningham ET Jr. Multiple evanescent white dot syndrome following influenza immunization—a multimodal imaging study. *Am J Ophthalmol Case Rep* 2020;19:100845.
- 3 Polack FP, Thomas SJ, Kitchin N, *et al*, C4591001 Clinical Trial Group. Safety and efficacy of the BNT162b2 mRNA COVID-19 vaccine. *N Engl J Med* 2020;383(27):2603-2615.
- 4 Ng XL, Betzler BK, Testi I, *et al*. Ocular adverse events after COVID-19 vaccination. *Ocul Immunol Inflamm* 2021;29(6):1216-1224.
- 5 Bolletta E, Iannetta D, Mastrofilippo V, *et al*. Uveitis and other ocular complications following COVID-19 vaccination. *J Clin Med* 2021;10(24):5960.
- 6 Smith E, Tran T, Gillies A, Yeung S, Ma PE. Multiple evanescent white dot syndrome following COVID-19 mRNA vaccination in two patients. *Ocular Immunol Inflamm* 2022;30(5):1240-1243.
- 7 Wiley ZC, Pakravan M, Charoenkijjajorn C, Kavoussi SC, Lee AG. Uveomeningeal syndrome presenting with bilateral optic disc edema and multiple evanescent white dots syndrome (MEWDS). *Am J Ophthalmol Case Rep* 2022;26:101538.
- 8 Rabinovitch T, Ben-Arie-Weintrob Y, Hareuveni-Blum T, *et al*. Uveitis after the BNT162b2 mRNA vaccination against SARS-COV-2 infection: a possible association. *Retina* 2021;41(12):2462-2471.
- 9 Soifer M, Nguyen NV, Leite R, Fernandes J, Kodati S. Recurrent multiple evanescent white dot syndrome (MEWDS) following first dose and booster of the mRNA-1273 COVID-19 vaccine: case report and review of literature. *Vaccines* 2022;10(11):1776.

- 10 Cozubas R, Ungureanu E, Instrate SL, Alexandrescu C, Nanu RV, Carstocea L, Voinea LM, Ciuluvica R. Similarities and differences between three different types of white dot syndrome and the therapeutic possibilities. *Rom J Ophthalmol* 2018;62(3):183-187.
- 11 Stangos A, Zaninetti M, Petropoulos I, Baglivo E, Pournaras C. Multiple evanescent white dot syndrome following simultaneous hepatitis-A and yellow fever vaccination. *Ocular Immunol Inflamm* 2006;14(5):301-304.
- 12 Fine L, Fine A, Cunningham ET. Multiple evanescent white dot syndrome following hepatitis a vaccination. *Arch Ophthalmol* 2001;119(12):1856-1858.
- 13 Cohen Tervaert JW. Autoinflammatory/autoimmunity syndrome induced by adjuvants (ASIA; Shoenfeld's syndrome): a new flame. *Autoimmun Rev* 2018;17(12):1259-1264.