

Case Report

Orbital Inflammation and Dacryoadenitis after COVID-19 Vaccination

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Keywords

COVID-19 · Vaccination · Orbital inflammation · Dacryoadenitis

Abstract

The aim of this paper was to report the case of a patient with orbital inflammation and dacryoadenitis after COVID-19 vaccination. During the COVID-19 pandemic, we noticed an increase of post-viral syndromes, both linked to infection and to vaccination. A 53-year-old male presented with proptosis, chemosis, hypotropia, and ophthalmoplegia of the right eye, 1 day after his COVID-19 booster shot. Anecdotally, he suffered similar symptoms after his initial two vaccinations. Idiopathic orbital inflammation and dacryoadenitis were diagnosed, and the patient was successfully treated with oral steroids. Orbital inflammation and dacryoadenitis after infection or vaccination are no new entities, but due to the scale of the current pandemic and the associated vaccination programs, these rare ocular diseases could be encountered more often.

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Published by S. Karger AG, Basel

Introduction

During the COVID-19 pandemic, we noticed an increase of post-viral syndromes, like uveitis and acute macular neuroretinopathy after both infection with the SARS-CoV-2-virus and vaccines against it [1, 2]. Although post-viral diseases are not new and have been described prior to the pandemic, the sheer amount of infections or vaccinations caused an increase of such diseases [3, 4]. In this paper, we report the case of a patient with acute unilateral orbital inflammation in combination with dacryoadenitis after vaccination against COVID-19 with an mRNA vaccine.

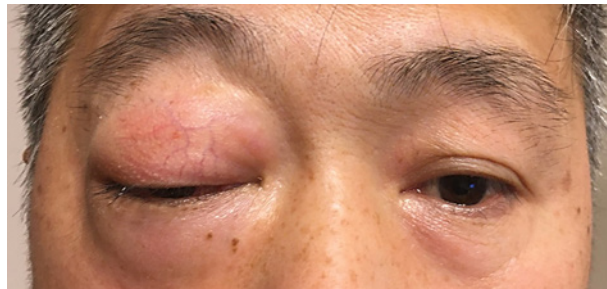


Fig. 1. Patient photo, illustrating swelling, proptosis, and hypotropia on the right side.

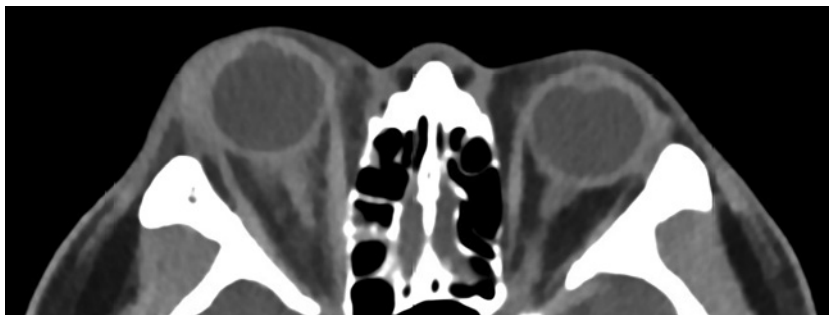


Fig. 2. Axial CT scan with intravenous contrast, showing diffuse inflammation in the right orbit.

Case Presentation

A 53-year-old male, who is under treatment at our department for intermittent angle glaucoma in the right eye for which he received two implants, presented with sudden proptosis, chemosis, hypotropia, and ophthalmoplegia of the right eye, 1 day after his COVID-19 booster shot (Spikevax[®], COVID-19 mRNA vaccine; ModernaTX Inc., Cambridge, MA, USA) (Fig. 1). He anecdotally suffered comparable, self-limiting symptoms for 5 days after his initial two vaccinations (Comirnaty[®], COVID-19 mRNA vaccine; Pfizer/BioNTech, New York City, NY, USA). The severity was described as similar to the current symptoms, which subsided without treatment. Patient did not seek medical attention for these episodes. At presentation, visual acuity was 2/20 and intraocular pressure was 19 mm Hg. Slit-lamp examination showed no signs of intraocular inflammation, and papilledema was seen on fundoscopy. Examination of the left eye was normal. Leukocytes were normal ($6.9 \times 10^9/L$), and C-reactive protein was slightly elevated (17 mg/L). Computed tomography with intravenous contrast showed induration of the lacrimal gland and intraconal and extraconal tissues in the right orbit (Fig. 2). Idiopathic orbital inflammation and dacryoadenitis were diagnosed, and oral prednisone (60 mg daily) was started under a cover of amoxicillin/clavulanic acid. After 1 day, swelling reduced markedly, and visual acuity returned to 10/20. Prednisone was tapered over a period of 2 weeks, after which residual symptoms subsided.

Conclusion and Discussion

Both unilateral orbital inflammation and dacryoadenitis have been described after COVID-19 and/or vaccination [5–8]. This is the first report of a combination of both. Previously, a direct infection of the lacrimal gland by the SARS-CoV-2-virus was postulated to cause

dacryoadenitis in COVID-19 [5], but the fact that (mRNA) vaccination has also been correlated to the disease implies an immunological response [6]. Similarly, other ocular immune diseases, like scleritis, uveitis, Vogt-Koyanagi-Harada disease, and optic neuritis, have been described after various types of COVID-19 vaccines (mRNA, vector, protein subunit, whole virus) [4]. Since similar entities are also seen after SARS-CoV-2-virus infection, a common pathway between the virus and vaccine-mediated immune response is suggested [4]. The exact underlying immunological mechanism however remains unknown. One theory is molecular mimicry between the virus or vaccine proteins and ocular tissues, leading to the production of auto-antibodies, causing very site-specific inflammation [3, 4]. This does not explain why some of these auto-immune phenomena only happen unilaterally. In our case, diffuse orbital inflammation and dacryoadenitis only happened in the right eye, which had prior glaucoma implant surgery. However, this is not known to be a predisposing factor. Our patient showed quick response to treatment with steroids, supporting the theory for an immunological origin.

Orbital inflammation and dacryoadenitis after infection or vaccination are no new entities, but due to the scale of the current COVID-19 pandemic and the associated vaccination programs, these rare ocular diseases could be encountered more often. Familiarity with the clinical presentation warrants prompt recognition and treatment.

Statement of Ethics

Ethical approval is not required for this study in accordance with local or national guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

Conflict of Interest Statement

The authors declare no conflict of interest.

Funding Sources

No funding was required for the realization of this paper.

Author Contributions

Maarten B. Jalink, Berend B. Burger, and Rachel Kalmann have made a significant contribution to this paper. Maarten B. Jalink, Berend B. Burger, and Rachel Kalmann have seen and treated the patient that was mentioned in this report. Maarten B. Jalink drew the initial draft, which was expanded upon by Berend B. Burger and Rachel Kalmann. Rachel Kalmann acted as a supervisor.

Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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