



## Retinal Detachment Following Vaccination against COVID-19: A Narrative Literature Review

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### ABSTRACT

Retinal detachment (RD) refers to the anatomical separation of the neurosensory retina from the Retinal pigment epithelium, which, if untreated, ultimately leads to a loss of visual function and blindness. Three main types are recognised based on the pathogenesis: rhegmatogenous, associated with retinal tears/holes; tractional, where there is pulling on the retina from preretinal and/or vitreal fibrotic changes; and exudative or serous, in which the subretinal fluid is due to transudation, exudation, or impaired outer blood-retina barrier. The infection with SARS-CoV-2 has not been directly associated with any type of RD, except in cases of secondary infections or autoimmune conditions. Serous retinal detachment has very rarely been observed following the application of various vaccines against COVID-19, but only in the setting of central serous chorioretinopathy and uveitis. The single case of purported rhegmatogenous detachment has a highly improbable connection with the vaccination. All in all, the described complications have been extremely uncommon, more frequently treatable or self-resolving, and should not discourage COVID-19 vaccination.

### 1. Introduction

Retinal detachment (RD) refers to the anatomical separation of the neurosensory retina from the retinal pigment epithelium, which, if untreated, ultimately leads to a loss of visual function and blindness.<sup>1-3</sup> Three main types are recognised based on the pathogenesis: rhegmatogenous, associated with retinal tears/holes; tractional, where there is pulling on the retina from preretinal and/or vitreal fibrotic changes; and exudative or serous, in which the subretinal fluid is due to transudation, exudation, or impaired outer blood-retina barrier.<sup>1-3</sup>

The main risk factors for rhegmatogenous detachment are the presence of some peripheral retinal degenerations, especially lattice, myopia, acute

posterior vitreous detachment, congenital vitreo-retinopathies, uveitis, and ocular trauma.<sup>1-3</sup> The tractional type is most frequently associated with diabetic retinopathy. The exudative is encountered more commonly in posterior scleritis, some forms of uveitis, and ocular neoplasms, primary or metastatic. Serous subretinal fluid is also observed in central serous chorioretinopathy and exudative age-related macular degeneration.

Therapy depends on the type and causes.<sup>1-3</sup> Surgical therapy is indicated in rhegmatogenous and tractional cases and in only some specific types of exudative. Conservative treatment is utilised in cases of serous detachment associated with scleritis and uveitis. The infection with SARS-CoV-2 has not been

directly associated with any type of RD, except in cases of secondary infections or autoimmune conditions.<sup>4-7</sup> There have been. However, case reports temporally link the new occurrence of RD to vaccinations against the virus.

### **Rhegmatogenous retinal detachment after COVID-19 vaccination**

Rhegmatogenous RD after COVID-19 vaccination has been mentioned in only one case study. Subramony et al.<sup>8</sup> published a controversial report on a 22-year-old myopic woman with bilateral rhegmatogenous detachments following a dose of the mRNA-1273 vaccine. The surgical therapy included pars plana vitrectomy. Regarding the same case, however, Chen et al.<sup>9</sup> have made observations on the provided patient information that there were risk factors for RD and that the described clinical picture implied an onset of RD before the administration of the vaccine. In view of that, the causal relationship with the vaccine becomes unlikely.

Serous neurosensory detachments have been observed in the course of central serous chorioretinopathy (CSC) and uveitis following vaccination.<sup>10</sup> With regard to CSC, Hanhart et al.<sup>11</sup> have diagnosed 4 patients, 3 males between 35-45 years of age and a 65-year-old female, with this condition within one of the administrations of the BNT162b2 vaccine (one case was of reactivation). More cases of CSC post-COVID-19 vaccination with BNT162b2 or ChAdOx1 nCoV-19 have been published by various other authors.<sup>12-17</sup> Most cases were observed without therapy, and 2 had been prescribed eplerenone.<sup>13,17</sup> Overall, the prognosis was good.

The inflammatory condition, in which subretinal fluid has been documented, includes cases of Vogt-Koyanagi-Harada disease (VKH) and a case of bilateral acute multifocal placoid pigment epitheliopathy-like syndrome. Joo et al.<sup>18</sup> have described serous retinal detachment in a 50-year-old Asian woman with Vogt-Koyanagi-Harada (VKH) disease following vaccination with mRNA-1273. A case of VKH with exudative detachment has also been observed in a 59-year-old man after the application of the ChAdOx1 nCoV-19 vaccine.<sup>19</sup> The patient improved with corticosteroids

(CS) but needed long-term immunosuppressive therapy with methotrexate.

Furthermore, De Domingo et al.<sup>20</sup> have documented an exacerbation of VKH disease in a 46-year-old woman following a second dose of an mRNA BNT162b2 vaccine against COVID-19. Brunet de Courssou et al.<sup>21</sup> have observed the de novo occurrence of VKH in a 57-year-old female following the same type of vaccine. Koong et al.<sup>22</sup> reported on an analogous case with a 54-year-old Chinese male. Additionally, a new onset VKH disease was diagnosed in a young Japanese woman after her first dose of BNT162b2.<sup>23</sup> All of the presented cases improved on systemic CS. Apart from the described VKH cases, subretinal fluid has been observed in a 45-year-old woman with an acute multifocal placoid pigment epitheliopathy-like clinical picture after a first dose of BNT162b2.<sup>24</sup> The symptoms had fully resolved in 5 weeks without treatment.

### **2. Conclusion**

Serous retinal detachment has very rarely been observed following the application of various vaccines against COVID-19, but only in the setting of central serous chorioretinopathy and uveitis. The single case of purported rhegmatogenous detachment has a highly improbable connection with the vaccination. All in all, the described complications have been extremely uncommon, more frequently treatable or self-resolving, and should not discourage COVID-19 vaccination.

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