

# Central Serous Chorioretinopathy Developed Following Covid-19 Vaccine

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## ABSTRACT

A 40-year-old male patient, an office worker, is a hospital staff. He applied with the complaint of sudden onset of blurred vision in the right eye. He stated that he had the first dose of inactivated covid vaccine (sinovac) 4 days ago in his story. In his examination, his vision was 0.5 in the right eye, 1.0 in the left eye, and his intraocular pressure was in both eyes. It was at the level of 15 mmHg. Biomicroscopically, the anterior segment looked natural. CSC was diagnosed in the FFA and OCT examinations. Treatment with oral acetazolamide (2x250 mg), topical nepafanac (4x1) was started. On the 13th day of the treatment, there was insufficient improvement in clinical findings, and oral acetazolamide was used. The dose was reduced (2x125 mg), oral epleronone (50 mg) was added. On the 70th day of the treatment, the vision in the right eye increased to full level in the control examination and it was observed that the retina returned to its normal appearance in the OCT examination.

**Keywords:** corioretinopathy, covid.

## INTRODUCTION

The novel coronavirus (COVID 19) has become a current issue by observation of pneumonia findings in many people present in Sea Food and Stockyard Market at Wuhan City, China in December, 2019. Li Wenliang, a young ophthalmologist in Wuhan, is one of the first people emphasized pandemics by social media<sup>1</sup>.

Central serous chorioretinopathy (CSCR) is a chorioretinal disease with unclear etiology, which is characterized by serous detachment of neurosensory retina and/or retinal pigment epithelium (RPE), involving macula in most instances<sup>2</sup>. Although there is no ocular clinical presentation other than conjunctival epithelium for SARS-CoV-2 in human, it was reported that this novel virus causes pyogranulomatous anterior uveitis, retinal detachment, retinal vasculitis and choroiditis in cat and rodents species<sup>3</sup>. Sinovac is an inactive virus vaccine. Although inactive vaccines are considered to be relatively safe, it should be kept in mind that inactive vaccines can also cause ocular disorders as it was the case in our patient.

## CASE REPORT

A 40-years old male patient was an office worker in a hospital. He presented with acute onset of blurred vision in the right eye. In his history, it was found out that he received first dose of inactive Covid-19 vaccine (Sinovac) 4 days ago. In ophthalmological examination, visual acuity was 0.5 in the right eye and 1.0 in the left eye while intraocular pressure was 15 mmHg in both eyes. On slit-lamp examination, anterior segment was normal. On FFA and OCT scans, the patient was diagnosed as CSCR (Figure 1 and 2). The patient was prescribed acetazolamide (2x250 mg), topical nepafenac 4x1 daily). On day 13, acetazolamide dose was reduced (2x125) and oral eplerenon (50 mg) was added to treatment due to lack of sufficient recovery (Figure 3). On day 70, visual acuity was improved to full vision and retina was found to have normal appearance on OCT scan (Figure 4).

## DISCUSSION

SARS-CoV-2 uses human angiotensin enzyme-2 (ACE-2) receptor to enter into cell in respiratory tract and pulmonary epithelium<sup>4</sup>. It was shown that ocular ACE-2 receptors are most abundantly expressed in optic nerve, ciliary body, choroid, retinal pigment epithelium and

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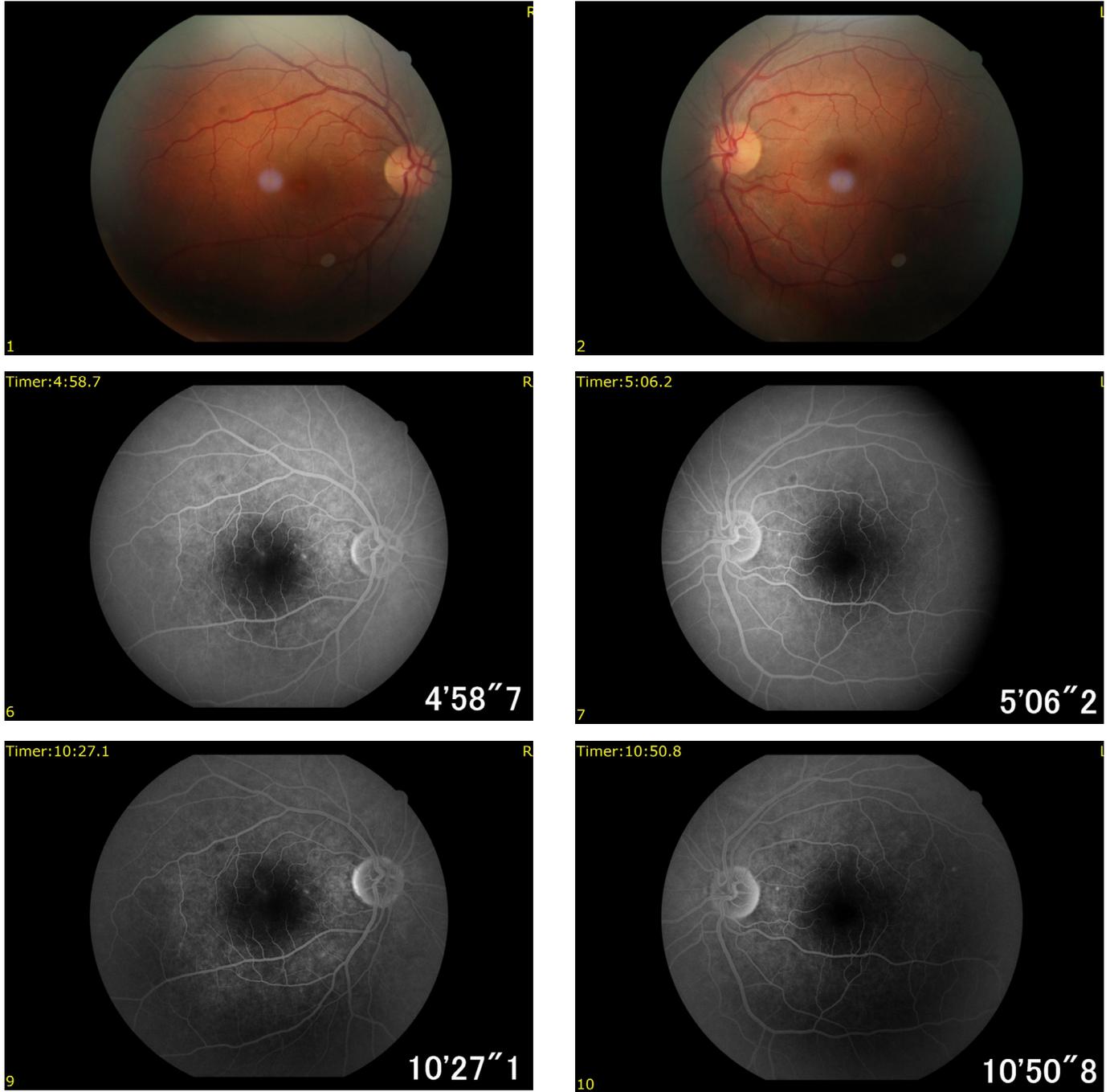
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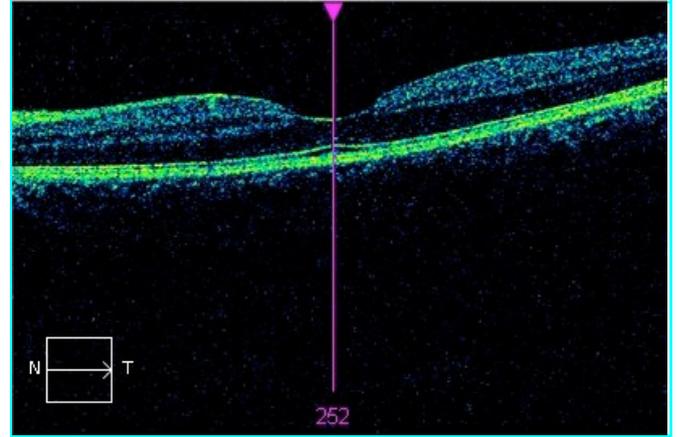
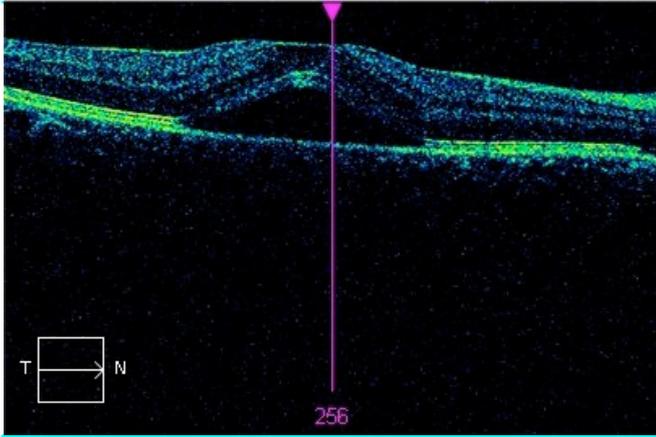
**Figure 1:** Renkli fundus resimleri ve FFA görüntüleri.

vascular endothelium<sup>5</sup>. Although virus cannot be detected in eye tear using reverse transcription- Polymerase chain reaction (RT-PCR)<sup>6</sup>.

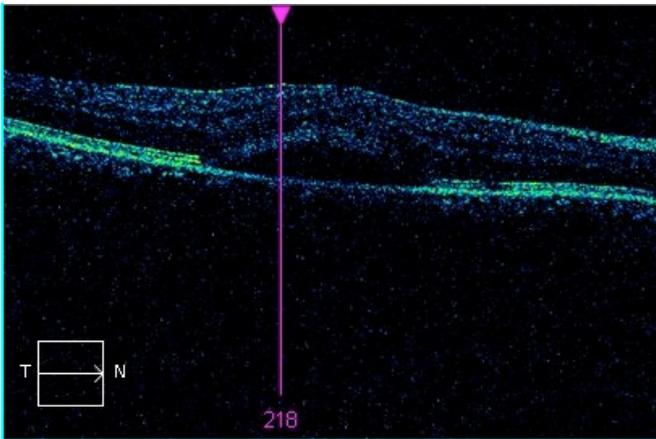
COVID 19 does not only involve vascular pericytes by ACE-2 expression but also cause ocular vascular involvement through complement-mediated endothelial dysfunction and micro-vascular injury caused by virus<sup>7</sup>.

In the assessment of 12 cases with PCR- or serology-proven COVID-19 using optical coherence tomography (OCT), hyper-reflective lesions were detected in ganglion

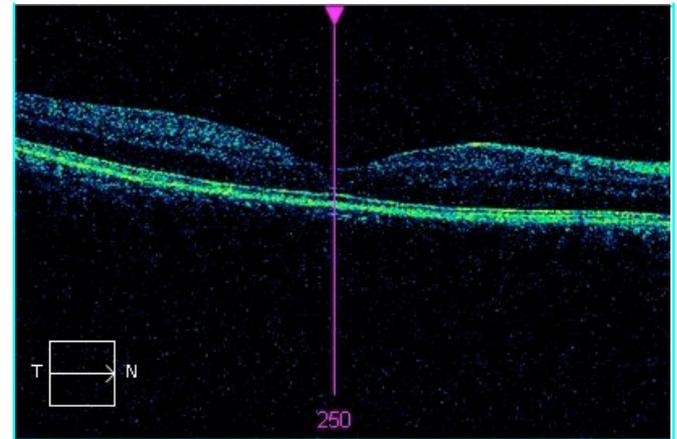
cell layer and inner plexiform layer in all cases. It has been proposed that ganglion cell layer or inner plexiform layer involvement can be associated with neurological involvement<sup>8</sup>. In the literature, it has been discussed that the hyper-reflective areas corresponds to normal retinal vasculature or they may indicate complement-mediated thrombotic microangiopathy<sup>9</sup>. The OCT angiography was performed in 80 patients with history of COVID-19 disease and it was found that the radial pericapillary plexus perfusion was decreased when compared to controls; this finding was linked to micro-vascular injury<sup>10</sup>.



**Figure 2:** Sağ ve Sol göz OCT görüntüleri.



**Figure 3:** Sağ göz tedavinin 13. günü



**Figure 4:** Sağ göz tedavinin 70. günü

The CSCR is generally seen in middle-aged male individuals with Type A characteristics; it mainly has benign course and manifest with an acute presentation which spontaneously regresses without treatment within a few months after symptom onset; in 5% of the cases, a chronic course develops and can be associated with photoreceptor injury, diffuse RPE changes and atrophy which may lead severe loss of vision due to refractory neurosensory detachment<sup>11</sup>. The CSCR is attributed excessive permeability of choroidal vasculature, impaired auto-regulation of choroidal vascular system and/or disruption of barrier and pumping functions of retinal pigment epithelium (RPE). The CSCR pathogenesis hasn't been fully elucidated; however, it is believed that choroid anomalies are primary pathophysiology underlying CSCR<sup>12</sup>.

Sinovac Biotech Ltd is a Chinese pharmaceutical company which is familiar to vaccine production. The company is experienced in the production of hepatitis A and B vaccines, chickenpox vaccine, enterovirus 71 vaccine, H5N1 (bird flu) and H1N1 (swine flu), and seasonal influenza vaccines.

Inactive vaccines are relatively safe. It has advantages such as availability of inactive flu vaccines and use of known technology in the production of the Sinovac<sup>13</sup>.

In the literature, there are reports of CSCR following Covid-19 vaccination. We think that post-vaccination CSCR development may be affected by excessive stress in hospital staff during Covid-19 pandemics, effects of clotting triggered by vaccine or unknown mechanism.

## REFERENCES

1. Han Q, Lin Q, Ni Z, You L. Uncertainties about the transmission routes of 2019 novel coronavirus. *Influenza Other Respir Viruses*. 2020;14:470-1.
2. van Rijssen TJ, van Dijk EHC, Yzer S, Ohno-Matsui K, Keunen JEE, Schlingemann RO, et al. Central serous chorioretinopathy: Towards an evidence-based treatment guideline. *Prog Retin Eye Res*. 2019;73:100770.
3. Doherty MJ. Ocular manifestations of feline infectious peritonitis. *J Am Vet Med Assoc* 1971;159:417–24.
4. Zhou P, Yang X Lou, Wang XG, Hu B, Zhang L, Zhang W, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*. 2020; 12;579:270–3.

5. Senanayake, P., Drazba, J., Shadrach, K., Milsted, A., Rungger-Brandle, K., Nishiyama, K., Miura, S., Hollyfield, J., G. Angiotensin II and its receptor subtypes in the human retina. *Invest Ophthalmol Vis Sci*, 2007;48:3301–11
6. Belser JA, Rota PA, Tumpey TM. Ocular Tropism of Respiratory Viruses. *Microbiol Mol Biol Rev*. 2013; 77:144-56.
7. Gavriilaki, E., Brodsky, R., A. Severe COVID19 infection and thrombotic microangiopathy: success does not come easily. *British Journal of Haematology*, 2020;189:227-30.
8. Marinho, P.M., Marcos, A.A., Romano, A.C., Nascimento, H., Belfort J.R. Retinal findings inpatients with COVID-19. *Lancet*,2020;395(10237):1610- 6.
9. Zhang, Y.,Xiao, M., Zhang, S., Xia, P., Cao, W., Jiang, W., Zhang S. Coagulopathy and antiphospholipid antibodies in patients with COVID-19. *New England Journal of Medicine*, 2020;382:38.
10. Savastano, A., Crincoli, E., Savastano, M.C., Younis, S., Gambini, G., De Vico, U.Rizzo, S. Peripapillary Retinal Vascular Involvement in Early Post-COVID-19 Patients. *Journal. Clin. Med.*,2020; 9:2895.
11. Liegl R, Ulbig MW. Central serous chorioretinopathy. *Ophthalmologica*. 2014;232:65-76.
12. Wong KH, Lau KP, Chhablani J , Tao Y, Li Q, Wong IY. Central serous chorioretinopathy: what we have learnt so far. *Acta Ophthalmol*. 2016;94:321-5.
13. Yavuz E. COVID-19 Aşılıarı. *Türk Aile Hek Derg* 2020; 24: 227-34.